

STATE OF NEW JERSEY.

FIFTEENTH ANNUAL REPORT

OF THE

STATE BOARD OF AGRICULTURE.

1887.

PRINTED BY ORDER OF THE LEGISLATURE.

TRENTON, N. J. :
THE JOHN L. MURPHY PUBLISHING CO.
1888.

STATE BOARD OF AGRICULTURE.

OFFICERS FOR 1888.

PRESIDENT,

HON. EDWARD BURROUGH, Merchantville, Camden County.

VICE-PRESIDENT,

WILLIAM R. WARD, - Newark, Essex County.

TREASURER,

D. D. DENISE, - - Freehold, Monmouth County.

SECRETARY,

FRANKLIN DYE, - Trenton, Mercer County.

EXECUTIVE COMMITTEE,

DR. GEO. H. COOK, - New Brunswick, Middlesex Co.

MORRIS BACON, - - Greenwich, Cumberland Co.

HON. JOSEPH B. ROE, - Woodbury, Gloucester County.

ALSO,

THE PRESIDENT, VICE-PRESIDENT, TREASURER AND SECRETARY.

To the General Assembly of New Jersey :

In accordance with the provisions of the Act creating a State Board of Agriculture, adopted April 22d, 1884, I have the honor to present the annual report for 1887.

FRANKLIN DYE,
Secretary.

TRENTON, Mercer County, N. J., March 25th, 1888.

FIFTEENTH ANNUAL SESSION
OF THE
NEW JERSEY STATE BOARD OF AGRICULTURE,
TRENTON, N. J.,

February 1st, 2d and 3d, 1888.

FIRST DAY.

MORNING SESSION.

The Board was called to order at 10:30 A. M., in the Supreme Court room, State House, Trenton, February 1st, 1888, by the President, Hon. Edward Burrough.

The President—Gentlemen, the hour for the meeting of the State Board has arrived.

I wish to request, as an especial favor, that in addressing the Chair you will be as distinct as possible. The Chair will endeavor to announce the name of the speaker, but when the name is unknown we would esteem it a favor if some other gentleman of the Board would kindly announce the name to the Chair. The parties so addressing the Chair will please remain standing until recognized by name, in order that the stenographer may record the remarks under the name of the person speaking.

The first business in order will be the calling of the roll of delegates. The Secretary will please call the roll.

The Secretary called the roll, and the following gentlemen answered to their names:

STATE BOARD OF AGRICULTURE.

OFFICERS OF THE BOARD.

Hon. Edward Burrough.....	Camden	President.
Wm. R. Ward.....	Newark.....	Vice-President.
Wm. S. Taylor	Burlington.....	Secretary.
Franklin Dye.....	Trenton.....	Treasurer.
Dr. Geo. H. Cook.....	New Brunswick.	} Executive Committee.
D. D. Denise.....	Freehold	
Morris Bacon.....	Greenwich	

CLASS A.

Charles E. Elmer.....	Bridgeton	Geological Survey.
Wm. M. Force.....	Newark.....	“ “
Henry P. Simmons...	Passaic	Board of Visitors.
Caleb Wyckoff.....	Belvidere	“ “ “
A. W. Duryea.....	New Durham.....	“ “ “
David A. Shreve.....	Haddonfield.....	“ “ “

CLASS B.

John De Mott.....	Middlebush	President Exp. Station.
Geo. H. Cook.....	New Brunswick....	Director Exp. Station.
Richman Coles.....	Woodstown	Master of State Grange.
M. D. Dickinson.....	Woodstown	Secretary of State Grange.

CLASS C.

P. T. Quinn.....	Newark.....	State Agricultural Society.
E. A. Wilkinson.....	Newark.....	“ “ “
Wm. R. Ward.....	Newark.....	State Horticultural Society.
E. Williams.....	Montclair	“ “ “
J. H. Brakeley.....	Bordentown	Cranberry Growers' Ass'n.
A. J. Rider.....	Trenton.....	“ “ “
Herman Trisch	Egg Harbor City...	Atlantic County Board.
Charles Kraus.....	Egg Harbor City...	“ “ “
Alfred Satterthwaite..	Crosswicks.....	Burlington County Board.
Joshua Forsythe.....	Pemberton.....	“ “ “
John A. Meredith.....	Haddonfield	Camden County Board.
Van Buren Griffin....	Camden	“ “ “
Thos. E. Hunt.....	Greenwich.....	Cumberland County Board.
W. O. Garrison.....	Bridgeton	“ “ “

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Wm. Diecks.....	Livingston.....	Essex County Board.
O. E. Freeman.....	Orange Valley.....	“ “ “
B. R. Black.....	Mullica Hill.....	Gloucester County Board.
Thomas Borton.....	Mullica Hill.....	“ “ “
Jos. Hagerman.....	Sergeantsville	Hunterdon County Board.
H. F. Bodine.....	Locktown.....	“ “ “
Franklin Dye.....	Trenton	Mercer County Board.
J. M. Dalrymple.....	Hopewell	“ “ “
D. C. Lewis.....	Cranbury	Middlesex County Board.
J. M. White.....	New Brunswick....	“ “ “
John C. Vandoren....	Manalapan.....	Monmouth County Board.
Wm. S. Combs.....	Freehold.....	“ “ “
W. F. Ely.....	Madison.....	Morris County Board.
W. J. Meeker	Hanover.....	“ “ “
J. Walter Pancoast...	Sharpstown.....	Salem County Board.
J. W. Dickinson.....	Woodstown	“ “ “
D. C. Voorhees.....	Blawenburg.....	Somerset County Board.
Wm. S. Potter.....	Somerville..	“ “ “
Wm. A. Stiles.....	Deckertown	Sussex County Board.
Thos. Armstrong.....	Deckertown	“ “ “
N. W. Parcell	Elizabeth	Union County Board.
D. C. Crane.....	Roselle.....	“ “ “
James Lippincott.....	Mount Holly.....	Burlington Pomona Grange.
David S. Adams	Mickleton.....	“ “ “
John T. Cox	Readington	Hunterdon Pomona Grange.
Theo. Cubberley.....	Hamilton Square...	Mercer Pomona Grange.
E. L. Borton.....	Woodstown	Salem Pomona Grange.

The Chair—The next business in order will be the adoption of the order of business as offered and printed by the Executive Committee. What is your pleasure?

The Secretary—I think a copy has been placed in the hands of all present.

Mr. Rogers—I move it be adopted as the order of business for this session of the State Board of Agriculture.

The question being on the adoption of the order of business as presented by the Executive Committee, it was so ordered.

The Chair—The next in order is the reading of the minutes of the last session of the State Board, in 1887. What is your pleasure?

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Mr. Ege—As the minutes have been printed and are in the hands of all the members of this State Board, I move we dispense with the reading. So ordered.

The Chair—The next business in order will be the appointment of committees; I will announce the Committee on Credentials.

COMMITTEE ON CREDENTIALS.

E. Williams.....	Essex.
M. D. Dickinson.....	Salem.
N. W. Parcell	Union.

The Chair—The Committee on Credentials will please meet after the adjournment of the Board. I would suggest they take their positions to the left of the Chair, where delegates can hand in their credentials.

The balance of the committees I will announce later on.

The next business in order will be the reading of the report of the Executive Committee. Will the Secretary please read?

[See report.]

The Chair—What is your pleasure in regard to the report of the Executive Committee? I would like an expression of views.

Mr. Dudley—There is a subject mentioned there it would perhaps be just as well for me to say a word about at this time. I refer to the matter of the Farmers' Congress.

I was appointed by Governor Abbett to attend the Farmers' Convention, or Farmers' Congress, last year, and, by the rules of that organization, a person appointed as a delegate holds his office for two years. Supposing that I was a member of that Congress I attended the meeting. On attending that meeting I was very sorry to find that the persons who had been appointed by Governor Green were not there. I was recognized immediately, however, and there was no difficulty about that. I handed in my certificate which I had from the State, and they said: "Under the rules you are the delegate, because having been appointed to serve before, by our rules your office holds for two years, and you are, therefore, the only delegate we could have recognized, even if the others were here." I feel sure the others would have been recognized, however, and do not think there would have been any difficulty about it.

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I was sorry I was the only one there from New Jersey, as there are many who could have filled the office much more profitably than I could have done myself.

Whilst there I read a paper, or made a reply to a gentleman from Virginia, and the discussions during the session were of much interest to farmers generally.

The Congress was in session three days—the busiest of sessions, very interesting and profitable. It was composed of the finest and most intelligent-looking men I ever saw gathered together in any body, and I must say if they were specimens of farmers they could not have been surpassed by any body of men from any profession in the United States. [Applause.]

Many questions of interest were discussed, the questions of the sorghum and silk industries being of exceeding interest. There was also a paper on wool-growing, by Judge Lawrence, of Ohio, a very valuable paper, indeed. It went into the whole history of the wool-growing industry in the United States, and after these and many other interesting subjects were discussed the Congress adjourned to meet in Topeka, Kansas; and the Topeka men present said we should have a very warm reception if we would come. I think they will take steps to have commutation tickets to Topeka from all points, and to entertain the delegates free of cost.

This is what I wanted to say in reference to the matter touched upon by the Executive Committee.

I have no doubt the next meeting will also be of exceeding interest and the treatment we may expect will be of the best, judging from the manner in which they treated me.

I also attended other sessions of this body—one at Washington and one at Chicago—and I hope to be able to attend that at Topeka.

I have no doubt the institution could be incorporated, if thought proper. It is a farmers' organization and it has been doing a great deal of good work for the farm interests.

I hope the report as offered by the committee will be adopted.

The Secretary—Although a little out of order in speaking of this matter at this time, I would like to say, in explanation to Mr. Dudley, that I believe this is not the same institution or the same convention that these gentlemen were asked to attend. This one has at its head Mr. Joseph Real, while the one you refer to, as I under-

stand it, has Colonel Hall as its head. It stands entirely different in the farming community.

Mr. Dudley—Then if Mr. Real is at its head it is entirely different, undoubtedly. The two organizations are entirely distinct. I was laboring under a mistake.

The Secretary—I know that that meeting stands very high among agriculturists, but this one has at its head Mr. Joseph Real, though the two might be concentrated under one head, we think.

Mr. Dudley—The Farmers' Congress is a national institution. Under the recent changes made, Colonel Hall has now been made President of the organization, and Mr. Pierson the Secretary. Mr. Connor, of Indianapolis, is the Treasurer, and it is a very powerful institution.

I hope all the farmers will go out to their meeting at Topeka next summer and meet the farmers who assemble there, for I believe it would be a matter of exceeding interest to you to hear the discussions and papers.

Mr. Forsythe—I move that the report of the Executive Committee be received, and referred to the Committee on Reports of Officers.

The question being on the adoption of the motion of Mr. Forsythe, it was agreed to.

The Secretary—I think it would be proper for this State Board to extend an invitation to the Governor, to the Senate and House of Assembly, to attend our sessions. They are now in session.

Mr. Forsythe—I move that the Secretary be instructed to extend to His Excellency the Governor, to the Senate and to the Assembly, an invitation to be present at our deliberations.

The question being on the motion of Mr. Forsythe, it was agreed to.

The Secretary—In former years much valuable time was expended in reading the County Board reports. It was thought best by the Executive Committee this year to make a brief synopsis of matters of interest suggested in these reports as likely to be discussed by the State Board, and with this end in view we have had such a synopsis prepared and printed for distribution to-day.

The Chair—As stated by the Secretary, the members of the Board will remember that much time has been consumed in former sessions in listening to reports which could just as well be read in our annual report, and on account of the time thus consumed the Executive Com-

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mittee thought proper to collate the more important features presented in these reports, and give to the Board a concise synopsis of these matters, briefly as possible. The County Board reports will, of course, appear in the annual report of this Board, where they can be read by all.

The Secretary here read the synopsis.

[See County Board reports.]

TOPICS FOR DISCUSSION RECOMMENDED BY THE PRESIDENT.

That the State Board be merged into a State Department of Agriculture, with resident Commissioner.

That when the new capitol building is completed, the Secretary of the State Board have an office in the building, where all records, exchanges and printed matter may be kept, and where farmers can have access to the same.

That the salary of the Secretary be made such that he can give his time and attention to the work of the Board alone.

That a State Entomologist be appointed, and that he report to the Executive Committee of the State Board.

That delegates be appointed, whose duty it shall be to attend meetings of all other Agricultural Associations in other States, when such associations are recognized by State or National authority, and that these delegates report to the Executive Committee of the State Board in writing, and they, in turn, to the State Board, all matters of interest so reported as occurring at other meetings, and that the State pay the expenses of such delegates for traveling and at hotels, not including allowance for time.

That legislation be asked in regard to contagious diseases.

That more care and attention be given to County Boards, and that County Boards endeavor to secure lecturers on subjects of interest.

That too much dependence cannot be placed on articles in agricultural papers from the pen of theoretical farmers, and that any recommendations thus appearing be taken with allowance, and be verified before making extensive trials.

That a more extended organization be effected among farmers, as it is only by organization that the need of the farmers can be served.

That the tariff on farm products be increased to such figure that

such tariff will prohibit importation while the home market is over-supplied.

The Chair—What will you do with this synopsis?

The Secretary—I would suggest that we wait until the printed copies of the synopsis are in the hands of the members before taking any action on it. They can then understand the subjects better.

Mr. Dye—Mr. Rider is here, with a report of the American Cranberry Growers' Association, and if convenient he would like to offer his report this morning.

Mr. Forsythe—I move that he be allowed to read his report now.

The question being on the adoption of Mr. Forsythe's motion, it was so ordered.

[See report.]

Mr. Rider—I would say in this connection, in reference to the standard measure by which cranberries are sold, that our committee discovered that our Pennsylvania friends and Philadelphia friends have a smaller quart than we have here in New Jersey. The standard quart in Philadelphia does not mean the same as a standard quart in Trenton. It may be on account of a trouble similar to that of the milk measure [laughter], but their quart in Philadelphia is not the same as the Trenton quart. That is an assured fact.

In determining this, a careful canvass was made, and we took the opportunity of going to the different grocers and buying a quart in each place, having a large market basket to hold them. I went from store to store, and ascertained there was a great irregularity in the quantity given for a quart. We found in this way that the quart varied from a weight of fifteen to seventeen ounces, and generally it was below a pound. On account of these results the committee thought it a proper thing for them to do to recommend a standard measure, or system of measures, which would extend from the grower to the dealer, and to the consumer. This should govern what should be given the dealer by the grower as a bushel, and what should be given the consumer by the dealer as a quart.

Our committee has gone to work on this basis, and it is probable they will recommend that the measures be established by weight. If they find it impracticable, as we find it is in some cases—for the larger the fruit the lighter—then some other means of arriving at a standard

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should be recommended. Our conclusion was that it was scarcely practicable to have a standard weight, but we think we could have a standard size for packages. Such packages should have a specified length, and a specified breadth, and a specified height.

I would add that we think the gentlemen who instituted the law in regard to a standard size for such packages made a slight mistake. They were rather generous than otherwise, and they instituted sizes which held the required quantity when the berries were simply emptied into the crates, which held a rounded bushel. It is well known to all cranberry growers that cranberries cannot be shipped in loose packages, but that they must be shaken down and pressed in tightly. When you do this, shaking them down, and pressing them slightly, to prevent settling in carriage, the package measures from thirty-five to thirty-six quarts, and the grower is the loser by this much. The intention of this committee was that growers should give gospel measure, evidently, but they have gone beyond that, and have given us a package which compels us to give thirty-five or thirty-six quarts for a bushel. This the grocers have discovered, as we had discovered it before.

The entire trouble may be laid at the door of those retail dealers who fail to discriminate between the standard package holding thirty-six quarts and the pony package holding but twenty-two quarts. Could the cranberry growers receive more for their larger packages all would be well, but the retail dealers fail to discriminate, and therein lies the trouble.

They would take the twenty-two-quart package instead of the thirty-six-quart package. On the whole, we think the whole measure question one well worthy the attention of some action by the State Board of Agriculture, and we would like the expression of this State Board and their help in the matter towards obtaining an equitable and just law for the measurement of cranberries. It is a question which interests everybody, if not as growers, at least as consumers.

Mr. Forsythe—I would ask if this law is to apply to the grower, as you propose it, and not to the retail dealer?

Mr. Rider—I made the statement that this committee wished to have the law bear equally on the grower and on the consumer. It should cover the standard crate for the grower and for the dealer, and a standard quart for the retailer.

Mr. Forsythe—I am glad to hear it.

Mr. Rogers—Since the meeting of the Cranberry Growers I saw the report of the Butchers' Association and the Grocers'. On investigating the matter, I find they claim that a quart contains seventeen ounces, and a round quart nineteen to twenty ounces. I went to several places in Newark and began to weigh them, and found if you took seventeen ounces as sold in the stores it would not nearly fill a Jersey measure. It took nineteen or twenty ounces to fill the dry measure, or sealed measure of the State of New Jersey. The New York measure may be still smaller, and I think the matter should be looked into very carefully indeed.

The Chair—I notice there are several cranberry growers present with us and would like to hear an expression of their views.

Mr. Forsythe—The fact is that the Jersey gospel measure is one pressed down and running over. [Laughter.]

Mr. Lippincott—I have experimented and find that the Jersey measure will hold thirty-six quarts.

The Chair—In this connection I would remind the Board that some efforts have been made by the Board to have a standard of weights. I think this matter was referred to Dr. Cook at the time, and he found the United States had no standard of weights and measures. This shows the necessity of a standard of that kind. If the cranberry growers will present this matter in the form of a resolution it will be proper for the Board to consider it.

Mr Idell—This whole matter could be very nicely arranged by naming a size for the box for the solid measure of the berries. Let that box be the only one to be used by any one handling berries and boxes. The matter of weighing the berries would amount to about the same. We buy the cranberries to eat, and if we buy large berries we find them hollow. If we buy the small berries we get the solid fruit. So far as the Massachusetts standard is concerned, as referred to in the paper read, that is no standard at all. A rule that can be varied is no rule at all. I think the law is that the package shall hold so many quarts, level measure. Now, what is level measure? There are no less than three and perhaps four different sizes of boxes sent to the New York market, all of which are called standard, and they vary several quarts, I think three, between the large and small-size standard. A law of that kind cannot be standard. A standard is simply *one thing*. I think the national government should make a law regulating and fixing the size of these boxes and bushels, and say that a

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bushel or a package shall contain so much, and that the packages shall contain so many cubic inches of solid fruit. If this could be done, then shippers and jobbers, and wholesale men and consumers, would all get what they pay for.

Mr. Dudley—In this whole matter we are simply pinching at the leaves and not getting at the root. As stated here, there is no national standard of weights and measures in the United States. It may be an astonishing thing, but it is a fact. It is left for every State to fix its own standard of weights and measures. It is a misfortune, and it ought not to be so. It comes out of the fact that there is no universal standard of weights and measures, or even of money, in the world. There are four nations in the world that stamp coin, France, Belgium, Switzerland and Italy, all with different systems, with different weights and measures, and different coins. For instance, France has her Franc, Germany her Mark, England her Shilling. Again in weights and measures, France has her Metre and her Litre, and England her Gallon and her Yard, and we in the United States have copied the English Yard and Foot and Inch and Gallon and Quart, and yet, when we come to compare them in different States of the United States, we frequently find a great difference, as already stated by my friend on the right. It is a great misfortune that it is so, but such is the fact, and I think this Board should take some steps looking to a uniform system of these weights and measures. We should have an international system of weights and measures, as we have of coin. The Constitution has provided for that, and has not left it to the individual States, as in the case of their weights and measures, for the individual States have no right to make money—to stamp gold and silver—but, so far as a standard system of weights and measures is concerned, there is no provision in the Constitution for this, nor has there ever been. You find this same difficulty all over the world—this lack of uniformity.

I was once appointed to investigate the question of labor and production in England, Germany, France and Belgium, and we were surprised, astounded—I was acting in connection with Mr. David A. Wells—we were surprised to find in England, among manufacturers, two or three different systems of weights and measures in common use, and especially was this variation noticeable in the ton. For instance, they would sell a ton of iron in the Black District at two thousand two hundred and forty pounds, but they required the laborer

making this iron to give two thousand four hundred pounds to the ton, while in buying coal they required three thousand pounds per ton. There were these three different variations in the ton right in the same district or works. Mr. Wells and myself were perfectly astonished. They would tell us they bought coal here at one price, and at another place another price was paid per ton, and we could not understand what caused this variation in price, until we found there was such a variation in weight. Of course they all paid about the same price for their coal per ton actually, the difference being required by some manufacturers, three thousand pounds per ton, while at another place they would require two thousand four hundred pounds, and at another two thousand two hundred and forty pounds per ton, the rate per pound being nearly the same. I merely mention this to show you how irregular are the weights and measures in other countries. Take what in England is called a score, at Liverpool it is one figure, while at Manchester, thirty miles away, it is another figure, and all over the world you will find this discrepancy in weights and measures. There ought to be a universal congress held to bring these discrepancies together under a uniform system, that France with her metre and litre and franc, and England, with her shilling and yard and gallon, the United States, with her similar weights and measures, and the countries of the Old World all should be brought under one universal system. The present state of affairs interferes with commerce and interferes with trade, and enables men who are dishonest to take advantage of honest men.

I am glad to see the matter brought before this body, and hope the State Board will take some steps towards having a uniform system of measuring cranberries and everything else, that a man, when he buys a quart of cranberries or a quart of vinegar, in Philadelphia, it shall be the same as if he bought that quart of cranberries or of vinegar in Trenton. Every honest man will second you and will demand that this be done. It ought to be so, and I can see no reason why it should not be so. There is a difference in the weights and measures in our States, and this has been brought about from the fact that the regulations in regard to them have been left with the individual States, and if these States cannot take some action looking to a uniformity, the present condition of affairs must necessarily continue. The States should have a uniform system, even if we cannot have a uniform system throughout the world.

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Mr. Lippincott—I think there is a mistake about there being no standard of weights and measures in the United States. I think there was an enactment on that question when Mr. Garrett Wall was in the United States Congress. The entire matter was brought about on account of a dispute as to the length of a chain used in measuring property in our neighborhood. Mr. Wall brought the matter before Congress, and I think I have at home the data when this was done. There was some action taken then, I am quite positive. I know that soon after that time there were measures deposited in the Clerk's office at Mount Holly, and they are there now. These measures were sent there by the United States government as a standard for the State, or for Burlington county, and all others were to conform to them. I understood that the yard-stick placed there, which was made of brass, was an exact copy of a standard yard-stick which is kept in the Tower of London, and these comparisons were made by officials sent there for that purpose. I think the main man was a Philadelphian, who was then Sealer of Weights and Measures. The question was brought up through a controversy between surveyors as to the length of the chain, and these surveyors wanted to find out which was the proper length. One of them stated that he made his so many feet in length; he was asked what he called a foot in length and he said twelve inches, but he could not reply when asked what constituted an inch in length. This man in Philadelphia bought an ordinary carpenter's rule and used that as his standard of measure.

I think the samples at Mount Holly are as established by the general government.

Mr. Dudley—I don't think there is such a provision in the United States laws. I feel quite positive there has been no legislation looking to the establishment of a standard system of weights and measures for the United States. I am quite positive our laws are deficient in this.

Dr. Cook—This Board assigned the subject to me for investigation as has been stated by one of the preceding speakers. I went to Washington, and was surprised to find there had been no legislation whatever on the subject by our general government.

The general government has deferred a great deal of business of this sort to the United States Coast Survey, and they have sent officers abroad, who have compared the standard weights and measures and taken great pains to get standard copies of the weights and meas-

ures used by the English. These copies they brought with them to this country, and, while the general government has never, by any act, authorized their adoption as a standard, they have authorized the Coast Survey to establish a factory or machine shop to make copies of them to be furnished the different States, and a copy of them was sent to New Jersey, and was deposited in the State Department here in Trenton—and they were here in the State House when it was burned. They were greatly damaged by fire, and they are at this time in the office of the United States Coast Survey at Washington, where they were sent for repairs and verification. There is, however, as has been stated, no recognition of this standard, except in this roundabout way. I went there and saw the Superintendent of the Coast Survey—and in this connection let me say that the Superintendent of the Coast Survey has written a lengthy article, which has been printed in Appleton's Encyclopedia, which is the best article I have ever seen on the subject. I think many of you have access to that work, and you can see how the matter now stands.

Mr. Lippincott—By what authority were those measures sent to the different States and counties?

Dr. Cook—There was a law passed to that effect. I forget the officer who was authorized to get copies and have them deposited in each of the counties of the different States. I do not know who was authorized to do this, but he was authorized to have copies deposited in each of the counties, to verify the accuracy of the weights and measures used in the sale of products. This verification was formerly attended to by an officer who acted as Sealer, but this practice has now fallen much into disuse.

Mr. Williams—I think this one of the most important subjects that could engage the attention of this State Board. I think our Congressmen could tell us how many inches a bushel contains, or Congress should. Take the difference in the weight of oats as sold in different States; for instance, in New York thirty-two pounds of oats are given to the bushel, and in New Jersey thirty pounds are required. A man can go over there and buy oats and bring them over here, pay the freight on them, and make money on them, at the same price per bushel. The sooner this matter is looked into the better. We should have a uniform standard of weights and measures. This will prevent further trouble with “snide” measures and weights in our markets.

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The Chair—Will the gentleman present the matter in writing in the shape of a resolution ?

I will state for the information of the Board, there is now in the Clerk's office of Camden county, and I presume of each county, a set of weights and measures marked "United States Standard," but there is no record, to my knowledge, defining what that certain standard is.

The Secretary—I move that the report of the Cranberry Growers' Association be received and printed in our annual report.

The question being on the motion of the Secretary, it was so ordered.

The Secretary—Mr. Idell, of Hudson, offers the following resolution :

"Resolved, That a committee of three be appointed by this Board to confer with the Produce Exchanges of New York and Philadelphia, with a view to establishing a common standard of weights, as equivalent to the measures used in the sale or purchase of various farm, garden, agricultural and horticultural products, and report to the Executive Committee, with a view to securing legislative action in its favor."

Mr. Nicholson—I move the adoption of that resolution.

The question being on the adoption of the motion of Mr. Nicholson, it was agreed to.

The Chair—I will appoint on that committee Mr. Idell, of Hudson ; Mr. Nicholson, of Camden ; Mr. Forsythe, of Burlington.

The Chair—We would like to hear from the New Jersey State Agricultural Society. Is that Society ready to make their report ? Mr. Quinn is present, I believe.

Mr. Quinn—We will submit our report to the Secretary in writing.

I would say here, however, that the State Society has been very prosperous, and that we held a very successful and prosperous fair last season, with a larger attendance than ever before, and with larger exhibits in every department.

We will submit a report of the entire business of the Association to the Secretary of the State Board in the course of a few days.

The Chair—If there be no objection the report, when received, will be ordered printed in our annual report.

It was so ordered.

[See report.]

The Chair—Is the Secretary of the State Horticultural Society ready to report ?

[See list of officers, &c.]

The Chair—Is the State Grange ready to report?

Mr. Coles, Master State Grange—I thought I would not occupy any of your valuable time, at this session, with a report, but a few days ago I received a postal card from one of the officers of your State Board, asking me to make some sort of a report, and if there are no objections I will offer it at this time.

[See report.]

The Chair—What is your pleasure with this report?

Mr. Griffin—I move it be received, and referred to the Committee on Reports of Officers, to be printed in our annual report.

The question being on the motion of Mr. Griffin, it was so ordered.

The Chair—As the hour for the noon recess is rapidly approaching, before further business I will announce the committees, as follows:

ON CREDENTIALS.

E. Williams	Essex.
M. D. Dickinson.....	Salem.
N. W. Parcell.....	Union.

ON RESOLUTIONS.

Ralph Ege.....	Mercer.
W. F. Ely.....	Morris.
John De Mott.....	Somerset.

ON LEGISLATION.

Hon. Jos. B. Roe.....	Gloucester.
Hon. Theo. Budd.....	Burlington.
Hon. I. M. Smalley.....	Cumberland.

ON REPORTS OF OFFICERS.

Dr. W. S. Combs.....	Monmouth.
Herman Trisch.....	Atlantic.
J. N. White.....	Middlesex.

ON REPORTS OF COUNTY BOARDS.

Van Buren Griffin.....	Camden.
Henry P. Simmons.....	Passaic.
Thos. Armstrong.....	Sussex.

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Among the things which should be done early in this afternoon's session, is the naming of the Committee to Nominate Officers for the ensuing year. As there is to be one from each county, it would be well for the members from each county to meet during the noon recess to decide on whom they will name as their member of this committee.

On motion, adjourned to meet at 2 o'clock P. M.

AFTERNOON SESSION.

Meeting called to order at 2 o'clock P. M. President Edward Burrough in the chair.

The President—For the information of members appointed on committees, the Secretary will please read the list of appointments.

The Secretary here reads names of members appointed on committees.

The Secretary—I would suggest to the Committee on Reports of County Boards that they read the papers presented to them, and make their report at the close of the session, and that any resolutions they may find embodied in those reports be formulated and presented to the Committee on Resolutions, and that committee then to report them in proper shape for the action of this Board.

The Chair—Is the Committee on Credentials ready to report?

Mr. Williams—We can present but a partial report—we report progress.

The Chair—The report so far as made will be received and the committee continued. The next business before us will be the appointment of a Committee on Nomination of Officers, to consist of one member from each county to nominate officers for this Board for the ensuing year.

As the Secretary calls the list of counties the members will please announce the name of their member of the committee, as selected by them.

The Secretary here reads the list by counties, and the following gentlemen were named by the members from those counties as a

COMMITTEE ON NOMINATION OF OFFICERS.

Atlantic county.....	Herman Trisch.
Burlington county.....	Alfred Satterthwaite.
Bergen county.....	Not represented.
Camden county.....	Elwood Evans.
Cumberland county... ..	Thomas E. Hunt.
Cape May county.....	Not represented.
Essex county.....	Wm. Diecks, Jr.
Gloucester county.....	Thomas Borton.
Hunterdon county.....	Jos. Hagerman.
Hudson county.....	Chas. W. Idell.
Mercer county.....	Ralph Ege.
Middlesex county.....	D. C. Lewis.
Monmouth county.....	J. C. Van Doren.
Morris county.....	W. F. Ely.
Ocean county.....	Not represented.
Passaic county.....	Henry P. Simmons.
Salem county.....	Edwin I. Borton.
Somerset county.....	John De Mott.
Sussex county.....	W. A. Stiles.
Union county.....	D. C. Crane.
Warren county.....	Caleb Wyckoff.

The Chair—The next business on our programme is the reading of an address by the President.

[See address.]

The reading of the President's address was followed by applause.
Mr. Blish—I move that the address of the President be received and referred to the Committee on Officers' Reports.

The question being put by the Secretary, it was so ordered.

Mr. Blish—I have here a paper which I would like to present.

The County Board of Middlesex, in looking over the expenses in our county, to see if some reduction could not be made in the taxation, have thought we have too many Freeholders, and that we had better commence at home to reduce expenses where it would not do any damage.

We now have one Freeholder from each township, and one from

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each ward in the cities, making nineteen for Middlesex county. The expenses of these nineteen Freeholders, in the annual report for Middlesex county, are \$7,680. We have found that in many other States, in Massachusetts and others, they have Commissioners, who do the same work as this body of Freeholders, and perhaps a little more work. We found, in counties having double the population of Middlesex, the whole expense does not exceed \$2,000 annually. They have three of these Commissioners, and these three men are sufficient to do the business there, and do it well, and besides at less expense than with the present cumbersome system in New Jersey. In addition to this you can hold them responsible, where there are but three of them, while with nineteen they become an unwieldy body, with no man responsible, and eighteen men to lay the blame to, when one man is called to account in his neighborhood. It is, too, an old-fashioned concern, which does not work well at all. As it is now, each township sends one man, and each ward in the cities one man, but here is a bill, drawn up by the members of our County Board, to do away with all but three of these men in each county, and these three men can be denominated "Commissioners."

Shall I read the bill?

By the permission of the Chair the bill is here read by Mr. Blish, as follows:

"A Further Supplement to an act entitled 'An act to incorporate the chosen freeholders in the respective counties of the state,' approved April sixteenth, one thousand eight hundred and forty-six.

"1. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That the several boards of chosen freeholders in the counties of this state shall consist of three members only, and shall be elected by the people of their respective counties at the time of electing the members of the general assembly, once in every three years, the first of said elections to take place in the year one thousand eight hundred and eighty-eight; and that they shall hold office for the term of three years and until their successors shall be elected.

"2. *And be it enacted*, That each of the said chosen freeholders shall receive as full compensation for his services eight hundred dollars per annum in counties whose population shall not exceed fifty thousand; one thousand dollars per annum in counties whose population shall exceed fifty thousand and not exceed seventy-five thousand; fifteen hundred dollars per annum in counties whose population shall exceed seventy-five thousand and not exceed one hundred

thousand, and two thousand dollars per annum in counties whose population shall exceed one hundred thousand, which said compensation shall, in every case, include all traveling expenses incurred by the said chosen freeholders, respectively, in the discharge of their duties.

"3. *And be it enacted*, That all acts and parts of acts conflicting or inconsistent with the provisions of this act, in so far as so inconsistent, be and the same are hereby repealed."

Mr. Blish [continuing]—This change would save the county of Middlesex about \$5,000 a year or more, as the Freeholders' expenses frequently run up higher than that. Our business would be much better done, I am sure. That was the sentiment of our County Board at our last meeting. I refer to the County Board of Middlesex, of course.

There are many other things that might be said in regard to this County Board—not the County Board of Middlesex, but the County Board of Freeholders. One of our Freeholders said he was tired of working with eighteen contrary men [laughter]; that every time anything is to be done there are eighteen contrary men to fight, and every time anything is said to any one man there are eighteen others for him to fall back upon and lay the blame to, and so it goes. The Board of Freeholders, as at present made up, is unwieldy, is out of date, and belongs to a day gone by.

Mr. White—I move that this be received and acted on by this Board at once. So ordered.

(After a somewhat lengthy discussion of this whole subject the resolution offered by Mr. Blish was lost. The discussion is not here given.)

Mr. Blish—I believe there is something in the programme about the cattle disease. I would like to say a word concerning the treatment of this disease, in the lower part of our county.

There were several herds of cattle, in which some were taken sick, and the owners sent for the State authorities. In one herd of nine there were three sick, and one of them died. The authorities said, "We will kill all of this herd; there is no use in doctoring them." They were asked to kill the sick cattle and try to cure the others, the ones that appeared to be well yet. They said that would not pay, so they killed them all, and after they were killed they sent over to a bone-boiling place, about ten miles off, for the proprietor to come and

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take the cattle away, and the party came and carted them away, ten miles, past many fine herds of cattle along the road. The owners of these herds thought it was not the proper thing to do. If the disease was pleuro-pneumonia, and was as contagious as is claimed, it certainly looked to the owners of these other herds so exposed, as if there might be great danger and they felt very uneasy about it. One gentleman, present when the cattle were killed, a Mr. Pierson, said, "I see you don't slash the meat and hides. Are you going to take any of the liver or lungs, to see what is the matter with them?" And one of the men said to one of the others, "Oh, well ; save a piece of the liver of some of them sick ones." This was done, but the owners of the cattle were very much dissatisfied with the whole transaction.

The law compels them to bury such slaughtered or diseased animals four feet deep, unless in large cities, where it is impracticable, or when the weather is too cold to do so. We, in Middlesex county, never knew it to be too cold to bury a man when he dies, or too hot, [laughter], but this was in September or October, and not very hot nor very cold, and these diseased cattle—or they said they were diseased—were carted ten miles to the bone-boiling and fertilizing factory. We don't know anything about this bone-boiling arrangement, and we don't say anything about it, but these people get, under the law, \$5 a head for killing these diseased cattle and I don't blame them for wanting to kill the whole herd, for it pays better to kill a whole herd than to kill just one or two or three or four out of the herd—it makes more money. Five dollars apiece for a whole herd pays best, so I have here a bill covering these few points, but it don't go half far enough, not half as far as it should. The bill is intended to do away with the option given these parties about the hot and cold weather. Of course in a large city it would be difficult to bury them, and perhaps it is not possible to bury them there—there is no proper place. When a herd of cattle are diseased and we believe it to be pleuro-pneumonia we want that the State authorities, instead of killing the whole herd, shall examine them and examine the characteristics of the disease, to see if this is the pleuro-pneumonia before doing anything else.

I will be obliged if the Secretary will read the bill offered, but, before he does, I want to say a few words more.

I remember very well, a good many years ago, that when a contagious disease like the small-pox, for instance, came around, they inoculated everybody with the small-pox—instead of vaccinating

them they inoculated them. Now they try to cure people. We have veterinary surgeons who spend their time in killing cattle [laughter] instead of curing them. It don't pay to give veterinary surgeons \$5 a head for killing diseased cattle—a butcher can do it for half price. The surgeons are supposed to stamp out the disease and not to kill the cattle. Why don't you employ a butcher to do the killing, or employ some cheap man? It is a butcher's business to kill cattle, and not the business of a veterinary surgeon. A butcher will kill eight or ten of them for \$1 a head, and very glad to do it, too. It is the wrong way to treat dumb animals, if diseased, to kill them.

The pleuro-pneumonia has been in the neighborhood in which I live. Some twenty years ago a veterinary surgeon was sent for to treat a case of pleuro-pneumonia, and he succeeded in curing it. When he came there and looked at the herd he said of one of the sick cows, "That cow will die; I will kill her and show you why she can't live." The others he thought could live, but this one he said would die he killed and opened, and described the action of the disease on the animal. He then gave medicine to the others, and said, "You can't afford to pay me for coming out here so far, and I will give you a prescription and you can attend to them yourself." They did as they were told and they didn't lose another animal, except what he pronounced incurable—and there were probably twenty of them sick at the time that were cured by his treatment. Our surgeons nowadays don't attempt to cure, but all I can say is, they should make some attempt at least.

Mr. Blish—I move the bill be received and referred to the Committee on Legislation. So ordered.

The Chair here introduced Mr. Bingham, of Camden, and asked him to explain his system of protecting plants from frost.

Mr. Bingham—I have for several years been looking into the matter of protecting plants from frost. We think we have succeeded in reducing the cost of doing this at least twenty-five per cent., and the cost of heating at least fifty per cent.—more, we think.

I have recently constructed a plant-house, about the middle of last month, and have carried it over this cold weather with less than half the heating capacity usually required for such houses.

The main advantage is in doing away entirely with the expensive foundations heretofore used. Brick and stone, as you all know, are not as good a protection against frost as wood is. I use two-inch boards or planks.

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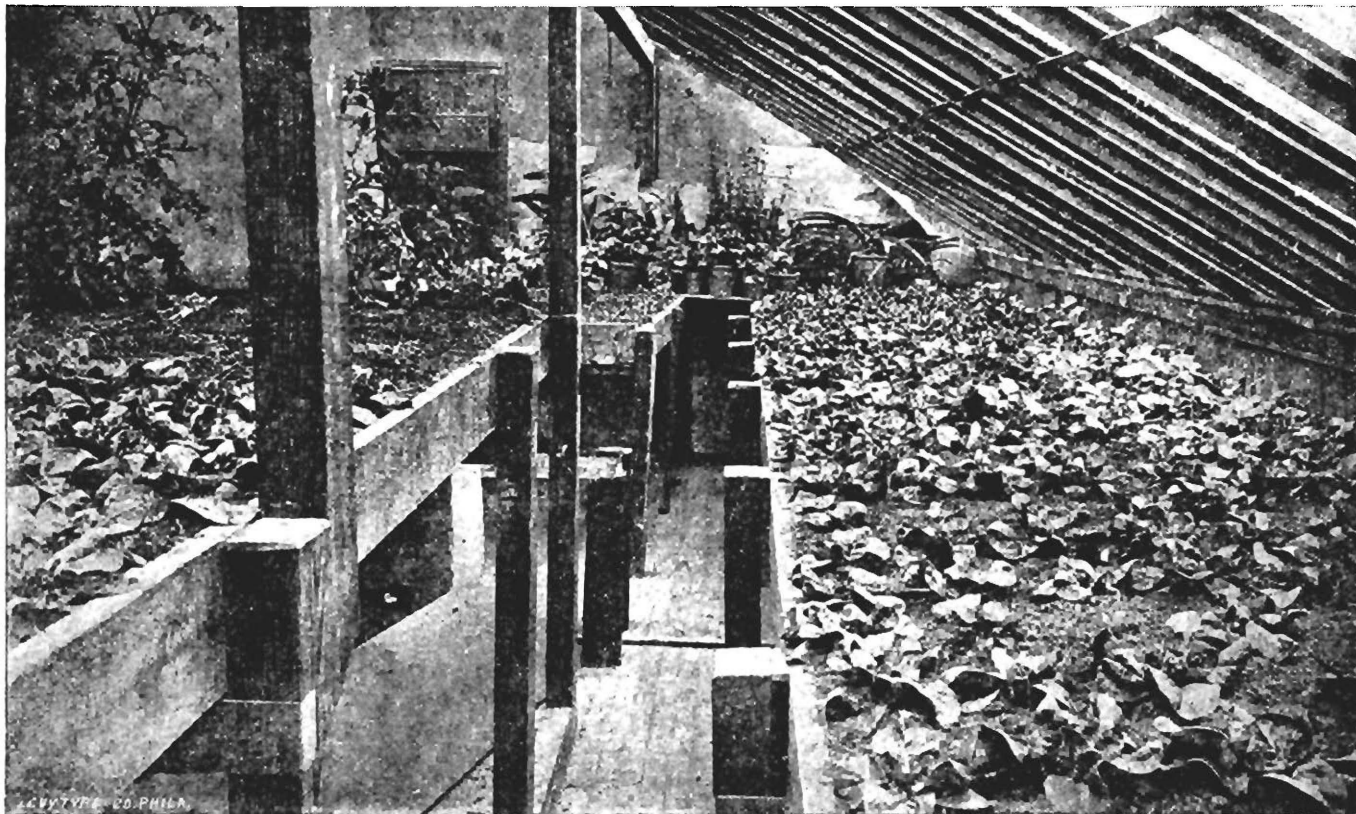
In the first place, I have all the work prepared in a planing-mill, and can put up a structure twenty-six by one hundred and twenty-four feet, all by myself, without any help. It can be done without help, though it is handy, of course, to have some one to help you.

The main saving is in the heat, and this is effected by running steam pipes in the ground some six or eight inches below the surface. In the ordinary way of building such houses the pipes are run along the sides, and the heat rises in all directions from these pipes, and more than one-half the heat thus produced never touches the plants or the plant bed at all, but it rises and escapes very rapidly. By carrying them under the surface of the ground I save the heat and warm the ground. It is so constructed that the glass is near the plants, and the paths I make a foot and a half, and then I have six feet left in the middle, and four beds in width, and I have no trouble about warming the whole house or the beds in the house.

The advantage of this method is that I can cultivate the ground where it is to be placed, in the fall, and then I place on it for winter this structure, and use the house for roots and plants, &c. Towards spring I plant cabbages, egg plants, &c., and when there is no further danger of frost I remove this top part and pile it up out of the way and cultivate the ground again with summer crops. In that way we get the use of the ground summer and winter.

So far as the heat is concerned I have no trouble, for although the house was just enclosed before the snow storm in the middle of January we carried it through the very cold weather, and have not lost a plant. Seeds planted in the beds where they were full width came up—over the pipes they came up in about four days, but on the sides they did not come up quite so soon.

The importance of this can be readily seen when it is remembered that our State, in location and soil, is wonderfully adapted to market gardening. Taking the months of June and July we have forty-five hours more of sunshine than they have in Mobile, and this matter of making use of your ground from the time frost comes until warm weather comes round again, is one of great importance, and the advantage of this arrangement will be readily seen in the advancement of the plants in their growth. I have one house of this kind now, and propose to build another as soon as I can get the ground prepared for it, and any one contemplating building such a structure I will be glad to have call and examine mine.



Plant Room 20 x 28, with iron and glass roof, in third story of residence of R. Bingham, near Camden, New Jersey. From photo taken February 4th, 1888, showing Radishes and Lettuce fit to pull, Green Tomatoes, Strawberry and Flowering Plants in bloom, all protected from frost by the surplus heat from the rooms below, and grown with sunshine through the glass roof.

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A Member—Can it be seen where the pipes are under the ground, by the growth of the plant, or is there no difference?

Mr. Bingham—You can readily recognize where the steam pipes are without any difficulty—that is, you can see what portion of the bed they are under, by the advancement of the plants over those in other portions of the bed further removed from the heat of the pipes.

Mr. Carhart—Will that process answer for sweet potatoes?

Mr. Bingham—I am sure it would. I have not grown any in this way yet, but I am not afraid to say there will be no difficulty in raising sweet potato plants in this way.

Mr. Burrough visited the room January 28th, 1888, when the temperature outside was only two degrees above zero and the ground covered with snow. The temperature of the room at that time was a little above sixty degrees, showing a temperate heat sufficient for the healthy growth of vegetables and plants.

The roof cost about as much again as an ordinary tin roof. Ventilating flues from the rooms below, open into the plant room, and the *surplus heat* from the *kitchen* and *dining-room* protects the plants from frost and *furnishes all the artificial heat necessary*. The room was completed in December, 1886, and planted with lettuce, radishes and watercress. When these crops were taken off, the beds were sown with cabbage, cauliflower and tomatoes. Egg, pepper and sweet potato plants were also grown. The success of Mr. Bingham's attic garden presents a subject to the farmers of New Jersey well worth their consideration.

Mr. Bodine—I have a resolution to offer if there is no objection.

[See report of Committee on Resolutions.]

The Chair—The next business in order is the report of the Committee on a National Board of Agriculture. Is that committee ready to report:

Mr. De Cou here reads the report, as follows:

TRENTON, N. J., February 1st, 1888.

To the President and Members of the New Jersey State Board of Agriculture:

At the last meeting of your Board the following resolution was adopted:

“Resolved, That a committee of three be appointed by the Chair, whose duty it shall be to correspond with other State Boards of Agriculture, and take such other steps as they shall deem necessary for the purpose of forming a United States Board of Agriculture, and report to this State Board at its next annual meeting.”

Your committee, appointed in accordance with the above resolution, beg leave to report as follows:

We have corresponded with twenty-four State Boards of Agriculture, including all those of whose existence we were able to learn.

We have received replies from the State Agricultural Society of Vermont, the Wisconsin State Agricultural Society, the Board of Agriculture of the State of Connecticut, the State Board of Agriculture of Illinois, the Columbia Agricultural College, the Board of Agriculture of the State of Delaware, James A. Reall, President of the American Agricultural and Dairy Association; the Commonwealth of Pennsylvania Board of Agriculture, the State Agricultural Society of Alabama, and the Board of Agriculture of Virginia.

Several of these Boards have appointed similar committees with whom we have been in correspondence.

As a result of our investigations we find that the agricultural interests throughout the State, are fully alive to and appreciate the advantages that would result from a national organization, and we are assured of their hearty co-operation and support in any steps we may take to that end.

That it would be of advantage in concentrating and protecting the vast agricultural interests of the country is so obvious and so generally admitted as to obviate the necessity of any discussion of the question.

If the local farming interests of a State demand and receive State protection and support, it certainly seems reasonable to suppose that Congress should take similar steps in the largest interest of the country—an interest in which eight millions of people are actively employed. Such assistance is required for the formation of a national Board of Agriculture.

Your committee respectfully suggest that, encouraged by the communications they have received, this State Board take the initiative in petitioning the representatives from this State, the President of the United States, and the Speaker of the House of Congress, that they

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take steps towards the formation of a United States Board of Agriculture.

Your committee further recommend that the other State Boards be advised of our action, and be invited to co-operate with us by adopting similar measures and presenting similar petitions.

(Signed)

ISAAC DE COU.

J. B. ROGERS.

Mr. De Cou—That is the report, and we have here a resolution or series of resolutions we would like to offer as the suggestions of the committee:

“WHEREAS, We believe it would be of inestimable advantage to the agriculturists of the United States to be able to act in unison with each other in matters appertaining to their interests, to meet in friendly intercourse for promoting their general good and taking such action as may be deemed necessary to secure national legislation favorable to agriculturists and protection against measures inimical to their interests; be it therefore

“*Resolved*, That this State Board of Agriculture of New Jersey respectfully request the co-operation of other State bodies in petitioning their respective Senators and Congressmen, the Speaker of the House, the President of the Senate, and the President of the United States, for the passage of a law providing for assistance in forming a United States Board of Agriculture.

“*Be it further resolved*, That a copy of this preamble and resolutions be transmitted by the Secretary to the various State Boards of Agriculture, to the representatives at Washington from this State, to the Speaker of Congress, the President of the Senate, and the President of the United States.”

The Chair—Unless objection is offered, the report will be received and referred to the Committee on Reports of Officers, and the resolutions will be referred to the Committee on Resolutions.

Mr. De Cou—I move that we take action on the resolutions at once, without waiting for a report of the committee.

So ordered.

The Chair—The report is before the Board; what is your pleasure?

Mr. De Cou—The reports we have received from the Secretaries and Presidents of different societies pretty much all point in the same direction. There appears to be a general feeling in favor of such an

institution. The report of the Executive Committee of this State Board also embodies a recommendation to the same effect, and the President's address also. I therefore move the adoption of the resolutions.

The Secretary—I think this matter wants to be very thoroughly digested. The President recommends something of this kind in his address, and the Executive Committee of this Board also recommends something of the same kind. But mere petitions will amount to nothing, and I hardly think we have arrived at that stage when petitions will answer the purpose we want them to. It is necessary for us first to formulate our ideas and find exactly what we want before we ask for it, or we may make a mistake and ask for something that will not answer our purpose at all. There is no question but that the agriculturists of this State and of other States might be benefited by a proper organization—by a properly-organized National Board of Agriculture, that would be composed of representatives from the various States of the Union, but I do not think that mere petitions will ever accomplish the result.

It strikes me it would be far better for our committee—and I hope they will, when they take up these reports and the address of the President—to formulate something on which we can take action, with other bodies, and finally decide on some feasible plan. Of course the decision of this Board alone would not be final, and it is possible any plans we might have to suggest would have to be very much altered before we consummated anything, on consultation with other States, nor do we know how generally other States would co-operate with us in such an object.

It strikes me we must do a good deal of missionary work before we petition or before we ask the authorities to pass the law.

I would move that these resolutions be referred to the Committee on Executive Committee's Report, and they can report that with whatever recommendation they think best.

Mr. Dye—I would favor that. I have just looked over the paper. The sentiment of the paper is embodied in the recommendation of the Executive Committee, and I have no doubt this committee can harmonize the two.

Mr. De Cou—I have no objection to that course.

Mr. Williams—I think there will be no dissent from the sentiment of the resolutions, but it does seem as if this Board, in connection with

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other Boards, could formulate such a bill, stating just what they want, and then Congress could be asked with more effect than if we merely asked the other Boards to co-operate with us in a petition to that effect.

The question being on the motion to refer to the Committee on the Executive Committee's Report, it was agreed to.

[See report of that committee.]

The Chair—Is the Committee on Bragdon's Hog Cholera Cure ready to report?

Mr. Dye, Chairman of the Committee on Bragdon's Cure for Hog Cholera, reports as follows:

Your committee appointed by the President of the Board at the last annual meeting, on the somewhat indefinite mission, "Bragdon's Cure for Hog Cholera," would respectfully report:

This committee has not yet been called together for concerted action, not feeling the inclination to announce ourselves the indorsers and advocates of a private preparation, the contents of which are known only to the makers, and its claimed efficacy not satisfactorily proved.

We have, however, made inquiry as to its value to the farmer where used, and have sent it for trial to trusted parties in whose care and veracity we have perfect confidence.

Perhaps the most valuable trial and testimony on the subject, is that from the Department of Animal Industry at Washington, where, through the courtesy of the President of this Board, Honorable Edward Burrough, and by order of the Executive Committee, a quantity of Bragdon's Hog Cholera Specific was sent for scientific trial.

In answer to letters of inquiry sent to the Honorable Commissioner of Agriculture, Norman J. Colman, the Chief of the Bureau of Animal Industry, D. E. Salmon, sends the results of the use of the Specific up to date, in the statements herewith presented.

Dr. Arthur T. Neale, of our State Experiment Station, has also made diligent inquiry concerning the medicine and the results following its use. His letter explains itself.

Dr. William K. Newton's opinion regarding it is also given.

In addition to the above, the chairman of the committee has sent a

package of the medicine to a reliable member of the Mercer County Board for trial. The letter of the farmer who used it, in the manner most farmers would use it or any other medicine, is of value, and is also herewith printed.

From all information gathered by the committee, it is found that if, in certain stages of a disease, the symptoms of which are described on the wrapper of the cans containing Bragdon's Specific, the Bragdon's Specific be used as directed, it may do good, and we have every reason to believe it will, and, on the principle of "any port in a storm," we would suggest its use as described above.

PATERSON, N. J., January 17th, 1888.

Franklin Dye, Esq.:

MY DEAR SIR—I know nothing about Bragdon's Specific, but, on general principles, would condemn any secret preparation. If he is willing to reveal the ingredients to us, we can tell if it is of any use.

The first thing to know is "What is Hog Cholera?"

(Signed)

Very truly yours,

WM. K. NEWTON.

NEW BRUNSWICK, N. J., January 17th, 1888.

Mr. Franklin Dye, Chairman of Committee on Bragdon's Cholera Specific:

DEAR SIR—Bragdon's Specific for Hog Cholera was first used in this State upon the plantation of the Rio Grande Sugar Company, and disinterested people credit it with curing a large number of sick hogs after several hundred in the same herd had died. According to the stories told in Rio Grande, at that time from twelve to fifteen hogs were dying daily when Mr. Bragdon began his work. After this compound was used, few if any deaths occurred. Critics say, however, that during a similar outbreak of the same disease in 1885, the trouble suddenly stopped without the use of said specific, leaving between one and two hundred hogs still in the infected pens.

(Signed)

ARTHUR T. NEALE.

NEW BRUNSWICK, N. J., January 26th, 1888.

Mr. Franklin Dye, Chairman of Committee, &c.:

DEAR SIR—I have not been successful in my attempts to secure definite information regarding this cholera specific; all that I have learned about it comes directly or indirectly from persons who have

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been in some manner interested in its introduction. Their reports indicate :

First. That if Bragdon's Specific is mixed with the food of healthy hogs it will be found useful in preventing the cholera.

Second. That if Bragdon's Specific be used in the earliest stages of the disease, it is claimed in nearly every case to effect a cure.

Third. That in the latter stages of the disease Bragdon's Specific is of very little use.

I am told unofficially that the mixture is guarded as a trade secret.

(Signed)

Yours truly,

ARTHUR T. NEALE.

HOPEWELL, N. J.

Franklin Dye, Esq., Chairman of Committee :

DEAR SIR—I gave the package of hog cholera medicine to Henry Hart, who had three pigs that looked very bad. Their sides were flattened and broken out in sores. Their eyes were filled with yellow matter and they presented altogether a dejected and miserable appearance, having almost totally refused to eat for several days.

To-day I went to see them again and they looked altogether different. They seemed to be bright and well. Mr. Hart said the medicine or something else had done them good. They were eating regularly and as much as pigs should eat, and appeared to relish their food. Their sides seemed filled out naturally and the sores in them had dried up. No matter was working out of their eyes and they were certainly better in every respect.

Mr. Hart and myself are of the opinion that it must have done good in this case.

(Signed.)

Yours, &c.,

D. J. BLACKWELL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY, }
WASHINGTON, D. C., January 30th, 1888.

*Franklin Dye, Esq., Treasurer New Jersey State Board of Agriculture,
Trenton, N. J.:*

DEAR SIR—Your favor of the 20th instant to the Commissioner of Agriculture has been referred to me for reply. I have held the letter a day or two since its receipt in order that the experiment might be

finished which was then in progress. I have been trying to test the remedy ever since it was received, but it is such a difficult matter to get the conditions just right for the test. The last experiment made was in this respect the most satisfactory, and, I think, indicates what may be expected from using the mixture. I enclose brief notes of the experiment.

It will be noticed that the medicine produced no appreciable effect in this experiment. One of the pigs which had received the preventive treatment died with an acute attack of the disease, while one which had received both the preventive treatment and the larger doses was affected with chronic cholera.

It might be supposed that the sudden change in the type of the disease which occurred in this experiment was due to the medicine, but this evidently was not the case, because the same change was noticed in other experiments going on at the same time at the Station. It was evidently due to atmospheric conditions.

I would not say from this experiment that the medicine is useless, but it is certain that the disease cannot be entirely prevented by it, even when given in large doses.

Very respectfully,

D. E. SALMON,
Chief of Bureau.

SYNOPSIS OF NOTES OF EXPERIMENT WITH BRAGDON'S HOG
CHOLERA MEDICINE.

A concreted pen, divided into three compartments separated by open board partitions, is selected for the experiment.

January 3d, 1888—Six pigs, all previously exposed to cholera and three of which being sick with the chronic form, are placed in this pen and the partitions removed. A large dose of hog cholera viscera is fed to these and is readily eaten.

January 4th, 1888—The above six pigs confined to the central compartment, and in each lateral compartment are placed four healthy pigs, three to three and one-half months old. The four pigs of one lateral compartment given one rounded teaspoonful of the specific once daily (evening) in the feed. This is one-fourth the dose prescribed for adults. The other lot of four pigs reserved as checks. The diet consisted of corn meal, light ship and middlings, of each two parts, and oil meal one part, fed mixed up with water.

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January 10th, 1888—Some of the pigs in each lateral compartment have watery discharge from the eyes. This is often the first symptom observed in the disease.

January 11th, 1888—One of the check pigs dies suddenly this morning—a case of acute hemorrhagic hog cholera.

January 12th, 1888—The four experimental pigs, *i. e.*, the pigs given the specific as a preventive, transferred to a clean pen removed from contagion. The three remaining checks transferred to another similar pen. Three of the four experimental pigs show evident symptoms of cholera. The three checks are looking better than the experimental pigs, but they all show symptoms of the disease.

January 13th, 1888—One of the experimental pigs found dead this morning—a case of acute cholera. In this case, at least, the specific failed to prevent the disease, although given yesterday in treatment doses. Beginning with yesterday the experimental pigs are given each one-half teaspoonful of the specific three times daily, as directed for treatment. (One-fourth the dose directed for adults, as before.) The three checks also treated with the specific in doses of one-half teaspoonful three times daily. The corn meal is stricken from the diet, as directed. The bowels continue normal throughout the experiment (in one or two instances a little loose), except for the coal-black color given to them by the medicine.

January 28th, 1888—This treatment with the specific continued. At this date all three of the experimental pigs appear to have the cholera in a chronic form. Of the three checks that have received treatment only since January 12th, one is very sick, so weak as to be scarcely able to stand, and cannot live longer than a day or two. A second has been gradually failing for some time and is now very unthrifty and considerably emaciated. The third is apparently unaffected.

Post mortems.—This morning one of the original experimental pigs and the two sick checks killed and examined. The very sick check found to be a severe case of chronic cholera with extensive ulceration of cæcum. The experimental pig a mild case of chronic cholera with few ulcers. The other check showed no satisfactory lesions of cholera and no lesions to account for its poor condition. The remaining living check is the only pig of the experiment that is looking as well as at the time of exposure.

For some unexplained reason the outbreak of the disease, which at the outset of the experiment assumed an acute type, suddenly changed

to a chronic form, even with the pigs fed with the viscera, and exposed for the express purpose of keeping up the disease.

The Chair—Unless objection is offered, the report will be received and referred to the Committee on Reports of Officers.

The Chair—The Chair desires to state that, in accordance with the resolution passed this morning, an invitation was extended to His Excellency the Governor, to the Senate and House of Assembly.

The Secretary has here a communication from the Speaker of the House relative to the evening session.

The Secretary here reads a communication from James P. Logan, Esq., Clerk of the Assembly, granting the use of the Chamber for the evening sessions.

The Secretary—We have arranged for an address by the Hon. Edward Burnett, to-night, and hope to see a full attendance of the members of this Board in the Assembly Chamber at 8 o'clock.

The Chair—The next business in order will be the discussion of the topics recommended by the County Boards. If it is the desire of any members to discuss these topics this is the proper time.

The Secretary—There is one important matter we should discuss and which we should draw out an expression of feeling in regard to, and that, too, at this meeting. That is, we should take some action towards securing proper quarters in this building for the State Board of Agriculture as soon as it is completed. This should be not only an Agricultural Office, but it should be large enough for keeping the accumulation of our different reports and products that may be sent here of different kinds. It should be large enough for our farmers to derive some benefit from it, as it is intended. Our Secretary has, as the President says, lived in the saddle for the last two or three years, and it is very inconvenient, to say the least, especially in a private house, to have it stored full of these books and reports which accumulate so rapidly and which are of no value to us as they are now. The Agricultural Department asked me if I had the reports of Insect Defoliators. I said I had received them, but had been compelled to put them in the waste-basket, as I had no other place to put them.

I can only add that such an office here in Trenton will be of great value to our farmers. I think if we ask for such accommodations in the right way, there will be no trouble about securing them.

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Mr. Nicholson—I move that the President of the Board and the Executive Committee confer with the Legislature, in order that a proper room may be secured for such an office.

The Chair—Put that in the form of a resolution, please.

The Secretary—I think it would be better to write out a resolution expressing our views and the wish of this Board on this subject, and let that be sent to the Building Commission. The Executive Committee have conferred with them, and, so far as we know, they are favorable to the idea of giving us an office and headquarters. We want to know whether the members of the Board really desire it.

In this connection I would like to say that the reason the time of the annual meeting was postponed was because of our inability to secure this room. We could not get it, as it was in use. The Vice-Chancellor holds his court here, and we could get no guarantee of the use of the room until this week, and that is the reason the second notice of the meeting was not sent out earlier. At the last moment we have had the County Board reports to print and arrange, and notices of annual meeting to send out. When you get a suitable room for an office and the meetings of this Board, much of this trouble will be obviated. When we get such an office we would like every farmer in the State to feel that he has a welcome and a part here. We feel that we should have some recognition here at the State Capitol. The time has come for us to ask this, and our legislators are only waiting for us to indicate what we want, and if we do this in any reasonable way I think we will get it, and the time will soon come when farmers, coming to the capital of the State, will have a place where they can meet and talk over farming interests, and where they can find valuable papers on the subjects of most importance to them. At present you cannot do this. We have nothing compiled and nothing on record.

Mr. Nicholson—I have something here which I think will draw an expression of opinion from the Board on this subject of an office in the Capitol building :

“Resolved, That the State Board of Agriculture, now in annual session, do most earnestly request the Public Building Commission to set apart a room in the Capitol for the use of this Board.”

Mr. Nicholson—I hope the time will soon come when the farmers of New Jersey can come to the State Capitol and have a place where

they can talk over the farming interests of the State, and I therefore move the adoption of the resolution.

So ordered.

A Member—I suppose the Commission of Public Buildings will want to know what kind of a resolution this Board will pass in regard to the room they want in the State Capitol Building, whether it is to be a hall as large as this room, or a room seven by ten. Possibly a room seven by ten would hold all the archives of this Board at the present time, on account of the inability of our officers to save the papers that should have been saved, but we want a room now that will be of sufficient size for the storage of these archives as they accumulate in the future. When farmers come here they want a large room, and some one in the room, too, to attend to it all the time, so that the farmers can find any statistics they may want, and matters of that nature, pertaining to the farming interest. I think it a very important matter that this Board state what kind of a room and how large a room they want, and how large a room they can fill.

The Secretary—In Ohio, at the Capitol building, at Columbus, the Governor has a large room on the first floor, about the size of this, and possibly a little larger, and then another chamber, perhaps three-fourths as large, adjoining that, and directly opposite the Governor's chambers, on the same floor, is the room assigned to the Board of Agriculture, divided into two rooms, of exactly the same size as those occupied by the Governor. In these rooms are kept the papers of the Board; the walls are lined with their reports and statistics, gathered from all over the country, during a number of years. On the same floor on the other side is the Secretary of State.

I mention this to show you in what estimation the agricultural community and the agricultural interests are held in the State of Ohio. That they consider it of importance is shown by the fact that they give the Department of the best rooms in the Capitol building.

Mr. Williams—In Ohio they think a great deal of their agricultural interests; they cannot afford to do otherwise. I do not know whether we can expect as much from our State Department, but now is the time to ask for what we want. If our Legislature thought as much of the agricultural interests as they do in the West, they would not be so hard to approach, and we would not have so much trouble in getting anything out of them.

Mr. Blish—It seems to me, speaking for the members of the Mid-

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dlesex County Board, that the agricultural interests of this State are such as to warrant a pretty good-sized room, and I think we are entitled to it and deserving of it. I don't think a room seven by ten in size would satisfy us at all. This room to-day is none too large, and won't be big enough to-morrow for our uses. The new building being erected is quite large, and I can't see but that the agricultural interests are entitled to a good-sized space in it, especially as they pay very largely towards the cost of the erection of it. Let the Executive Committee confer with the Building Commission, and see what they can get from them.

Mr. White—I think it would be a good idea for our Executive Committee not to ask too little. It is better to ask for more than you want, and then you have room to come down. [Laughter.] We never get more than we ask for. I move it be referred to the Executive Committee, and they be instructed to confer with the Building Commission in regard to the room wanted.

So ordered.

The Chair—As there appears to be nothing else before the Board I will recognize Mr. Coffin, form Camden county, who desires to explain the operation of an instrument for aerating and cooling milk.

Mr. Coffin here reads paper explaining the principles of his aerating machine.

A Member—Will it remove foreign tastes?

Mr. Coffin—In answer to that, if the animal has eaten anything liable to make the milk taste, this will, by aerating the milk, remove all the foreign impurities and leave it as pure as can be. Aeration is absolutely necessary for the preparation of milk for market. The French do not believe in this system, but think that by heating the milk to a high temperature the foreign matters may be driven out, but the aeration is by far the better method of the two. Instead of refrigerating the milk, they bring it up to nearly the boiling point. I do not believe it is as good a system as that of refrigerating the milk, unless the refrigeration was very complete after the boiling.

Mr. Abbott—I agree with Mr. Coffin in the points he has made.

I think the refrigeration is far better than the French system of boiling the milk. In Paris it is almost impossible to get milk in the afternoon, as the milk is sold directly from the dairies in the morning. Many of the herds there are still kept within the city, the fodder being brought in for them from the country districts adjoining.

Mr. Pancoast—I have here a resolution which was passed at the last meeting of the Salem County Board. If it is the proper time I would like to submit it now.

The Chair—If there is no objection the resolution will be received and referred to the Committee on Resolutions. So ordered.

Mr. Lewis—I have here a resolution I would like to offer.

The Chair—If there is no objection it will be received and referred to the Committee on Resolutions. So ordered.

Mr. Pancoast—I have another resolution.

The Chair—If there is no objection the resolution will be received and referred to the Committee on Resolutions. So ordered.

Mr. Dye—Mr. Cubberley, of Hamilton Grange, has a resolution to offer.

[For the four resolutions named above, see report of Committee on Resolutions.]

The Chair—If there is no objection it will be received and referred to the Committee on Legislation. So ordered.

Mr. Williams—You are probably aware there is an effort being made to secure a reduction of postage on third-class matter. In regard to this matter I would offer the following resolutions :

“WHEREAS, The United States Postal Association is endeavoring to secure a reduction of postal rates on fourth-class matter, especially on seeds, plants, scions, &c., and also for the re-issue of fractional postal currency for use in the mails, and the abolishment of postal notes, &c.; therefore be it

“*Resolved*, By the New Jersey State Board of Agriculture, That we approve of these efforts, and appeal to our Senators and Representatives in Congress to give their efforts in support of these measures.

“*Resolved*, That a copy of this resolution, attested by the President and Secretary of the Board be forwarded to our Senators and Representatives.”

Mr. Williams—I offered this resolution as one in the interests of the whole agricultural community. The agriculturists of the country live, in many cases, several miles from the post-office, or from offices whence money may be sent, and if they wish to send money safely my mail they must come to the post-office during certain hours of the day, not too early and not too late, or they cannot get their postal-notes or postal order. A postal-note is no better than fractional cur-

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rency, and if you want to send a money order you cannot do it, except at certain hours of the day. They tell you you must come during those hours or they will not accommodate you, and it is very inconvenient, to say the least, for a farmer to leave his work on purpose to go to the post-office during those hours. I know what I am saying, for I "have been there" myself. I go for my mail in the evening, and if we had postal currency or fractional currency I could send it through the mails when I came to the office at odd times, or in the evening. As it is now, I find the postal-note office closed when I go for my mail. You all know how inconvenient it is to send any fractional part of a dollar through the mails. If you send it in a letter it may get to its destination and it may not.

The National Grange has already agitated this question, I think, and it seems to me the utility of such a measure is apparent to all, and I think, if this body takes the same view of the matter that I do, it will be a great benefaction to the whole community.

I do not know that I need offer any more remarks on the subject. You know we had better postal facilities a few years ago than we now have. Then we could send four pounds by mail for eight cents. The postage is increased in the interest of express companies, and for nothing else. I think this is one of the things that is for the people, and which appeals to the people. In this community we should have the best of postal facilities, and this is one of the features of it that should be changed.

The Secretary—I think it would be well to amend this resolution by adding that the New Jersey State Board of Agriculture approves of these efforts, and also of the efforts of our members of Congress to obtain a lower rate of postage on the Agricultural Reports of this State Board, and of the Agricultural College. Mr. Buchanan has introduced a bill to that effect, so that these reports may be sent the same as newspapers, at newspaper rates, by the pound, being issued from the office of the Secretary or of the college itself, and in that way we could distribute them far more widely than at present. This year it cost us between \$600 and \$700 for postage on our reports sent out, and it would make a very large reduction in this item of expense if it could be changed as suggested. We sent out about five thousand copies of the report, and there is a large demand for many more of them. I believe it would do good if they could be distributed still more widely.

Mr. Williams—I will willingly accept the amendment offered by the worthy Secretary. I have had some experience in that line, as I published the annual report of the Horticultural Society. Formerly I got our postmaster to take them at newspaper rates by the pound, I being considered as the publisher of them. Under the new dispensation, since they have learned so much down at Washington we must pay double-priced postage. I accept the amendment with a great deal of cheerfulness and heartily second it. I think the reports of all these agricultural and horticultural societies should be put on the same par with publishers, if their Secretary publishes and gives the reports out.

The resolutions, as amended, were read and adopted, and are as follows:

“WHEREAS, The United States Postal Association are endeavoring to secure a reduction of postal rates on fourth-class matter, especially on seeds, plants, bulbs, scions, &c., and also for the re-issue of fractional currency for use in the mails, the abolishment of postal notes, &c.; therefore be it

“*Resolved*, By the New Jersey State Board of Agriculture, That we approve of these efforts, and appeal to our Senators and Representatives in Congress for their efforts in support of the measures, and also approve of their action looking to a reduction of postage on agricultural and horticultural reports.

“*Resolved*, That a copy of this resolution, attested by the President and Secretary of the Board, be forwarded to our Senators and Representatives.”

Mr. Bodine—I suppose that, as a matter of course, the President's address will be printed in the annual report of the State Board of Agriculture, but I move that, in addition to being printed in the annual report, three thousand copies of the same be printed separately and circulated throughout the State through the County Boards.

Mr. Lewis—I would amend that by having them printed “forthwith.”

Mr. Bodine—I accept the amendment.

The question being on the adoption of the motion as amended, it was so ordered.

The Chair—I rise to a question of privilege. I am surprised at the action of the Board in ordering printed three thousand additional copies of my address, which I read before you. Inasmuch as it has been de-

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cided that these extra copies shall be printed, I ask the Board for the privilege of being furnished with a proof before it is sent out to the public. The paper is very much disjointed, having been gathered up by piecemeal, and it needs a careful revision and re-arrangement. I would like to take it and put it in different order.

Mr. Armstrong—I move that we reconsider our former action in regard to having three thousand copies additional printed for distribution.

So ordered.

Mr. Armstrong—I now move that, instead of having three, we have ten thousand copies printed for general distribution.

The question being on the motion of Mr. Armstrong, to print ten thousand copies, it was agreed to, with the understanding that the President should first revise the paper before submitting it for publication.

Mr. Lewis—I now move that the Executive Committee distribute five thousand copies of the address so printed, and that the balance be sent to the County Boards and other agricultural and horticultural societies of the State.

So ordered.

Mr. Carhart—I noticed in a farm journal, within a week or two, an article written on the growth of a new grass, called Lucern. I would like to ask whether any of the members of the Board have had any experience with this crop; is it of value to the farmers of our State?

Mr. Dye—I think one of the county papers makes a reference to this crop.

The Chair—The question is a pertinent one, and we would be glad to hear from any one who has any information to convey on this subject of Lucern.

Mr. Carhart—I wondered whether the statement of its being so good was only on paper, or whether there was something in it.

The Chair—I think Professor Cook can tell us something about it.

Dr. Cook—It is not all on paper, I assure you—not by any means. On the contrary, very good crops of it can be grown. Some of my neighbors across the river from New Brunswick, sowed some broadcast, I think about seven years ago, and they had, if I remember rightly, three crops in the season. Another farmer sowed it broadcast

in the spring, on ground that had had potatoes on it the year before, and he got a good growth, which he cut three times in one season.

We went over from the Experiment Station and cut some parts of it and we found it very fine. Three crops were raised and cut—one in the beginning of July, another early in August, and the third in the latter part of September—and the sum of the three amounted to about eighteen to twenty tons per acre, which is as large a crop as you can get from Indian corn. It can be grown in drills and cultivated like other drill crops, or it can be grown by sowing it broadcast without cultivation. We had only a small part of an acre, and tried it for experiment only. We grew some of it in drills, and that we cut three times; and the first time we cut it we got at the rate of seven tons to the acre, and the next time it was cut it yielded between eight and nine tons to the acre, and the third time it yielded quite as much as the first, making, on the whole, between twenty-one and twenty-two tons to the acre.

A Member—How is it as a feed for milch cows?

Dr. Cook—Every person who tries it will be satisfied that as a feed for milch cows it is excellent, and of good quality as a milk-producer.

Mr. Blish—You weighed it green, as you cut it, I suppose?

Dr. Cook—We weighed it green, just after we cut it.

A Member—When did you cut it?

Dr. Cook—Just as it was coming into blow. When we tried it we thought the crop was killed by the weeds. It comes up very slender, and we thought it was lost. When it got pretty well up we cut it weeds and all, and let it grow a second time, and cut it again and let it grow, and got a third crop. Both methods of raising gave us remarkable results—both that in drills and that sown broadcast. Few persons who saw it expected much from it, but the results were very gratifying. The advantages of this crop are that it is a very excellent crop green, and it is tender when dried, and it can be continued from year to year without any great expense or attention, beyond keeping the ground good. It is a very promising crop. I presume with careless management it would not do very well.

A Member—How much seed does it require per acre for seeding?

Dr. Cook—It requires from twelve to fifteen or sixteen pounds of seed to the acre. It needs considerable care in cultivation. It has long roots, which extend well down into the ground, and therefore it

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stands dry weather better than any other crop except, perhaps, sorghum.

Mr. Carhart—How far apart is it sown?

Dr. Cook—About sixteen inches. As close as you can manage to cultivate it with the horse.

Mr. Lippincott—When is the proper time to sow the seed?

Dr. Cook—The latter part of April, we planted this I speak of.

Mr. Jessup—This is a new plant, and we have heard considerable about growing it and about planting it, but nothing about curing it. Now, another point of importance to farmers, is it easily exterminated when you wish to follow it with other crops and when you want to clear the land of it? There are some plants grown, some flowers that are grown by our women folks, as a matter of fancy, and when those plants gets a hold in the ground they cannot be exterminated. Can this Lucern be easily exterminated, or is it one of the kind of plants I have referred to?

Dr. Cook—There is no difficulty about that—none at all. It is not always killed by the first plowing, but it will be with the second. It has very long roots and in that respect it is better than clover, but there is no trouble in getting rid of the whole of it. It may not be quite as easily killed as clover, perhaps.

There is another thing that may be said in its favor; it occupies that important place in the rotation of crops we are looking for. It is a leguminous plant. It is also an excellent crop to come in in rotation.

The Chair—We are nearing the close of our day's sessions, and before adjourning I wish to call the attention of our committees to the work that has been referred to them. It is very desirable that these different committees get together and receive the work referred to them and prepare to report to the Board to-morrow morning, or at such time as we can call for their reports.

*The Secretary—I think these committees should be announced again, and that they should come forward, or have their chairman do so, or, where the chairman is not present, some other member of the committee, to receive the papers referred to them. I will announce the names of those committees.

Mr. Pancoast—In order to facilitate the work of the committees I have here some resolutions I would like to present. [Reads resolutions one, two and three.]

[See report of Committee on Resolutions.]

The Chair—If there is no objection, these resolutions will be received and referred to the Committee on Resolutions.

The Secretary—As these committees have so much work on hand, I move that we adjourn to meet in the Assembly Chamber to-night, at 8 o'clock.

The question being on adjournment, the Board adjourned to meet in the Assembly Chamber, at 8 o'clock P. M., to listen to an address by the Hon. Edward Burnett, of Massachusetts.

[See address.]

MORNING SESSION.

THURSDAY, February 2d, 1888.

Board called to order at 9 o'clock A. M., President Burrough in the chair.

The Chair—We will begin our business this morning by calling for the reports of some of our committees.

We will hear from the Committee on Resolutions.

Mr. Ege—We have here resolutions offered by Mr. Pancoast, of Salem :

WHEREAS, It is believed that under the tax laws of the State of New Jersey, in their practical operation, real estate, especially farm property, pays more than its just share of taxation ;

1. *Resolved*, That the Board appoint a committee to report at its next session whether such be the fact, and, if so, to submit to the Board such alterations in the present laws as will remedy that defect ; and

2. *Resolved*, That this committee be authorized to employ, at the expense of the Board, such assistance as may be necessary to a proper discharge of their duty.

Mr. Ege—Your committee reports favorably on the first resolution and adversely on the second.

The Secretary—I move that we concur in the report of the committee.

Mr. Pancoast—I would like to see that second resolution adopted.

Mr. Ege—The question is on concurring in the report of the committee.

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Mr. Pancoast—I move to amend the report by adopting all the resolutions offered, as presented.

The Chair—The question is simply on the adoption or rejection of the report as presented.

The question being on concurring in the report of the committee, it was agreed to.

Mr. Ege [reads]—

WHEREAS, The purchasable vote controls many, if not all, counties of the State; and

WHEREAS, It is understood a bill, embodying the prominent features of the Australian election system, will be presented this winter;

Resolved, That we instruct the Legislative Committee to strongly support this bill if, in their judgment, such a law would largely lessen the buying and selling of votes.

Mr. Ege—Your committee reports favorably on this resolution.

A Member—I move to accept the report of the committee.

The question being on accepting the resolution as reported by the committee, it was agreed to.

Mr. Ege [reads]—

WHEREAS, The State College for the Benefit of Agriculture and the Mechanical Arts has been of little practical benefit to agriculturists;

Resolved, That we request the State Board to appoint a committee to report at its next session what changes, as to income and course of instruction, will secure to those pursuing the agricultural course as thorough and practical instruction as is afforded by the best agricultural colleges in the nation—one of which is situated in a State only equal in population, and in wealth inferior to the State of New Jersey.

Mr. Ege—Your committee report as a substitute for this resolution the following [reads]:

WHEREAS, Some question as to the adaptation of the course of study in the New Jersey Agricultural College has been raised; and

WHEREAS, All those who have visited the college and become familiar with its workings, have borne uniform testimony to the thoroughness and efficiency of the course of instruction; therefore,

Resolved, That a committee of five be appointed by the State Board of Agriculture to visit the college and the college farm, and the laboratory of the New Jersey Agricultural Experiment Station, and report at the next meeting.

Mr. Pancoast—In 1879 the Board of Trustees of the Agricultural College made a report, showing there were one hundred and five graduates, and out of these one hundred and five graduates six were farmers, and of the under-graduates, fifty in number, seven were farmers. The President of the Agricultural College of Massachusetts said that fifty per cent. of the graduates in Massachusetts were farmers. Of those in Mississippi fifty-six per cent. have engaged in farming, and in five years they have had one thousand eight hundred and ninety graduates, or one thousand eight hundred and ninety students—I can't remember which now. Of that number fifty-six per cent. are engaged in farming. We are getting no results from our college, or no results that will begin to compare with those in these other States I have mentioned. We want to get more benefit from our State College than we are getting now. If it is necessary, they should have more money, and the course of instruction should be changed. Something should be done to give us better results in this direction.

Mr. De Mott—I didn't come here to defend the Agricultural College, but I would like to say that of the money received, it is necessary that most of it must necessarily go to salaries. Then the State has to furnish a farm, and pay all the expenses besides. I think the amount appropriated is something a little short of \$7,000, and the results from this small sum are good, I think. It would not be possible or practicable for the faculty to compel young men to engage in agriculture after they are through with their instruction. If the depression in agriculture is such that they prefer to go into some other business, it is impossible for the faculty to prevent their doing so. Many of them occupy honorable positions to-day. We have forty-three scholarships, and all those counties who wish to avail themselves of these scholarships can do so, but some counties have never availed themselves of the chance thus given them. In fact, it is from those counties failing to avail themselves of the privileges of the college that we hear the most complaint. I think the faculty of the college have more than fulfilled their engagements to the State. I have visited the college a great many times, and attended a great many examinations, during the past ten years, and I know for myself I can see great advances being made. I don't suppose there are many of the men here present who wish their sons to do manual labor on the farms; in fact, they could not do so, for they have

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enough to do to attend to their studies. If they want to know anything about that part of the work they can learn it at home. Most of the knowledge they get they can apply at home. I certainly think this college a great advantage to the inhabitants of this State. Farmers' sons are enabled to take higher positions in the world, and generally to do better than their parents have done, and this is certainly an advantage that it is so.

I think the work at the college is fairly and squarely performed.

Dr. Cook—Mr. De Mott has spoken for the Board of Visitors, who are appointed by the Governor and the Senate to report to the State of New Jersey, and to say whether or not the Agricultural College is carried on satisfactorily and in the interests of the State, and he is one of the oldest members of the Board of Visitors, has been there the longest, and is able to give you his views in regard to it. We do not know how to do any better than we are doing and have been doing. The State chose this method of investigating the method of the college, and it has been regularly done for two or three times each year since the original law was passed.

In regard to the comparison made with Massachusetts and Mississippi, we all know that the people of Mississippi are almost exclusively engaged in agriculture. That is the leading business of the people of that State, the fashionable business, and one that everybody follows who can, as being the most respectable for the most ambitious men in the community.

Massachusetts is also an agricultural State, and has a most admirable Agricultural College, but it has not the advantages that New Jersey has. I should say these institutions are established, not for the benefit of agriculture alone, but for agriculture and the mechanic arts, and it means all the arts which benefit men, by educating them for other pursuits as well as for farming. You know that the industries of New Jersey in the mechanic arts are nearly five times as great as the agricultural industry. If we had five students to go forward in the mechanical arts to one student who engaged in farming it would not be out of proportion; it would only be what we have the right to expect. You know the inducement for following other than the agricultural pursuits is so much greater, that it need not be wondered at that so many of our young men ultimately engage in other than agriculture. In fact, I think we should be proud that they are enabled to take part in such other industries. Many of our young men

are drawn away from farming by the advantages offered by the two great cities of Philadelphia and New York.

We have had come to us at the college young men—farmers—who have asked permission of the neighboring farmers to take care of the cattle and milk, so they can earn their board. We have four of these young men just now. Some of them from a county adjoining Salem county. They have always helped to work on the farm, and they are not afraid to work now. They get up at four or five o'clock, and do whatever is necessary, in order to get an education. It is easily seen that they know how to work. They work during all the time they can, and earn their clothing and board. Whether these men turn out to be farmers, I don't know. We cannot compel them to engage in farming. I am sorry I did not send for some of these young men and have them come here and tell us what they are doing, and what they think of their work. We have some who are writing for the papers, and we have those who are doing their work as well as any people in the State. I am only sorry we have not got some of them here to speak for themselves. I profess to be interested in the advancement of agriculture, and the material interests of New Jersey. I feel satisfied the Agricultural College is doing its work well and honestly. We are always glad to have visitors to call on us there, and we are willing that any investigations may be made that it is thought desirable. We are always ready for it, and are glad to have it done. Mr. Sears, who is going to take charge of the farm, will always be interested and glad to see you, if you will send him notice of your coming, either as individuals or as delegates. He will always be glad to see you. He will be ready to show you around, and convince you that the work is being well done. I would like to enforce the invitation given in the resolution, and ask that a committee be appointed to investigate our college, and see whether the interests of the State are being fairly subserved in its operations.

I would like to speak a word on behalf of the Board of Visitors. I ask that the committee confer with them, before skipping over what they have done in the past. I would like that committee first to see what the Board of Visitors have done there, before undertaking to do anything, or before recommending any changes. I hope this deference will be given them, as they have worked hard for the success of the college. I am not one of them, however, and only speak for them.

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The Secretary—I move the adoption of the substitute as read by Mr. Ege.

The question being on the adoption of the substitute as offered, it was agreed to.

The Chair—By whom shall that committee be appointed?

Mr. De Mott—By the Chair.

The Chair—I have thought it best to appoint on this committee men entirely outside of these matters, and I have no doubt that those gentlemen who desire to investigate these matters for themselves, will be received and welcomed, and have no doubt the committee appointed will be glad to have them accompany them on their inspection.

The committee on visiting the Agricultural College will be as follows:

S. B. Ketcham.....	Mercer.....	Pennington.
Amos E. Kaighn.....	Cumberland	Ellisboro.
J. B. Hollingshead.....	Burlington	Burlington.
H. Allan.....	Monmouth	Allaire.
S. S. Stout.....	Hunterdon.....	Ringoos.

Mr. Pancoast—A committee has been appointed to visit the Agricultural College, with instructions to report. I will offer this resolution:

“Resolved, That a committee to visit the State College of Agriculture, for the Benefit of Agriculture and the Mechanic Arts, be instructed to make such recommendations as to increasing the income, and changing the course of instruction of the agricultural department of the college, as will, in their opinion, make it more useful to the agriculture of the State.”

I move its adoption by this State Board.

Mr. Shreve—I second the motion.

The question being on the motion of Mr. Pancoast, it was so ordered.

The Chair—The reports of the other committees will be deferred until the opening of the afternoon session.

Our next business in order is the report of the Dairy Commissioner, Dr. Wm. K. Newton. I believe Dr. Newton is present, and will now address you. I think he is familiar to most of you, but I take pleasure in introducing him to this Board.

Dr. Newton—I have not done exactly what was expected of me, as given on the programme. I have not prepared an elaborate report, but will merely outline the work done during the past year, under my charge as Dairy Commissioner.

You will remember that last year I spoke to you about the form and operation of the laws, so I will not touch on that in this paper.

[See paper.]

Mr Forsythe—I would like to ask a question with regard to the matter of cheese. Have you examined the cheese sold in the city of Philadelphia, sold as full cream cheese? Is it not adulterated with lard?

Dr. Newton—There are no larded cheeses sold in New Jersey. This larding cheese is practiced in the West, where such cheese is sold.

Mr. Forsythe—Have you examined what is called “full cream” cheese, as sold in Philadelphia?

Dr. Newton—No, sir.

Mr. Forsythe—These cheeses are sold in New Jersey, and my experience is you cannot get a full cream cheese in Philadelphia.

Dr. Newton—I have been unable to find any sample of larded cheese in this State.

Mr. Forsythe—They are sold in Philadelphia, though, and are brought home through New Jersey, lots of them.

The Chair—Unless objection is offered, the report of Dr. Newton will be received and printed in our annual report.

The next business before the Board is the discussion of the present milk law. The first subject under that head will be—

1. Should skimmed milk be sold?

The proper method to start that would be by a resolution, if you want to take any action on the question.

Mr. Griffin—As to that first subject, as to whether or not skimmed milk should be sold, I would offer for the consideration of this Board the following resolution:

WHEREAS, There has been much controversy and great annoyance to dealer and consumer regarding the sale of skimmed milk, or milk from which the whole, or a part, of the cream has been removed; therefore,

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Resolved, That it is the sense of this Board that milk known as skimmed milk is a commodity demanded by a large proportion of the community, and when properly designated as such, should be sold in the markets of the different States.

Mr. Forsythe—I move the adoption of that resolution.

Mr. McBride—I desire to offer the following as an amendment to the resolution, and move its adoption.

Resolved, That the State Board of Agriculture is opposed to any legislation that shall change, in any way, the present laws affecting the sale of skimmed milk, believing, as we do, that it will be injurious both to producer and consumer.

Mr. Betts—I would like to know what the present law is.

[The Secretary here reads the present milk law to the Board.]

[See law entitled “Milk Legislation.”]

Mr. Diecks—I would like to ask Dr. Newton how the present law operates in cities of the first class. Is the Doctor of the opinion that the law is a good one?

Dr. Newton—It certainly acts very satisfactorily. There are only two cities of first class in New Jersey, where the skimmed-milk law applies, and where the adulteration has been carried on so extensively. It has operated very satisfactorily, and every consumer, of any intelligence, is thoroughly satisfied that the law is well framed, and thoroughly answers its purpose.

Mr. Diecks—The Doctor is well aware that there are thousands and thousands of small cities where they are entirely dependent on milk, and where it is necessary that milk shall be pure, and not skimmed. I would like to ask whether children can be kept on skimmed milk. [Laughter.]

Dr. Newton—I am somewhat astonished by the remarks made by the gentleman, because skimmed milk can be sold in every city in the State, except in Jersey City and Newark, as these are the only two cities of the first class in the State. There is no restriction elsewhere, except that the cans shall be plainly marked, showing that their contents consist of skimmed milk. It can be sold out of such cans anywhere in the State, except in these two cities I have mentioned. The amendment to the law prohibiting the sale of milk in

these two cities was introduced by the farmers of Essex, Sussex and adjoining counties, as skimmed milk was largely sold in these two cities, not only because of its interference with the regular trade in milk, but because it was dangerous to health.

The skimmed milk, as we all know, contains a large amount of nourishment, and when it is properly and honestly sold there can be no objection to it. As long as it can be kept under control it is all right, but in large cities like Jersey City and Newark it is beyond control, and opens the door for dishonest sales of milk. In these cities it had frequently undergone fermentation, and was unfit to be sold oftentimes when furnished to the consumers. The law is entirely satisfactory in our section of the State, where at least six-tenths if not seven-tenths of all the milk in the State is produced. Any one can sell skimmed milk if he so desires outside the two cities mentioned, if properly put on the market as skimmed milk.

Mr. McBride—I had not intended to take any part in this discussion, because, notwithstanding I saw this would be on the programme, I did not presume that it would be possible for a convention of the farmers of New Jersey, after the action which those farmers took during the past year or two, in reference to securing the passage of a bill to prohibit, so far as possible, the sale of a fraud, which we then said was effecting the destruction of the dairy interests of the country.

I am well aware of the fact, Mr. President, that pressure was brought to bear on the Representatives of every State, in the Congress of the United States, by the farmers of this State and by the farmers of every State in the Union, and the great cry at that time made by the farmers was that they should be protected from this infamous fraud. We were all in favor, and in favor only, of putting upon the markets an honest production, for which we wanted to receive honest prices. This pressure was brought so strongly to bear by the farmers of this country that the bill passed the House of Representatives and the Senate with but little delay, and the President of the United States deemed it of sufficient importance to do, what seldom is done, or never is done, and that is, to give his reasons for signing that bill. [Applause.]

The record which the farmers of this State made then, and the record that the farmers of this whole country made then, the bitter cry which they made then, and which they should be making now, is "honest products and honest prices," and the introduction of that

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resolution to-day, coming, as it does, from the grand State of New Jersey [applause], on behalf of the State Board of Agriculture, if passed, stamps our constituency, and the Representatives who voted for the passage of that bill, in good faith, and stamps the farmers of the State of New Jersey, when you say you want honest goods and honest prices—when you said this before you simply lied. This is the long and the short of it. As a farmer and as a milk-producer I say let the present law stand as it is, and I say it would be a shame for the State Board of Agriculture of the State of New Jersey, to-day, to pass a resolution, asking the Legislature of this State to give them the right to sell an adulterated article, and if that right is given to palm off on the public, as before the law, as a strictly pure and legitimate article, this article that is dishonest. There is not a man here in the State Board of Agriculture, who is conversant with the milk business, but who knows that, should the right be given them, this adulterated article would be palmed off on the public. If you want to buy skimmed milk now you can buy it, except in the two cities mentioned. The proposition is, with one sweep of legislation, to legalize the sale of a fraud, notwithstanding you have put yourselves on record as being in a position of wanting to sell no illegitimate or spurious articles as the products of your dairies. I have had my say. I can only add that I regret exceedingly that this step should have been proposed. I shall feel like hedging my bets. I shall feel that if it shall be my duty to ask, in the Senate of the State of New Jersey, anything for the benefit of farmers of the State of New Jersey, on the ground of protection, that when I am confronted with the fact that the State Board of Agriculture of the State of New Jersey has asked us to allow the farmers of New Jersey to palm off upon the consumers of the State of New Jersey a fraudulent article—I shall feel like a lie, and we cannot give you, nor we won't give you any legislation to protect your industries. I will go further than that, and say that if this resolution is adopted, that if the Congress of the United States should attempt to introduce a bill to repeal the oleomargarine law, they could point to the action of the State Board of Agriculture, and say that you gentlemen came here through your representatives, and through your committees and asked us to protect your industries, and now you ask the Legislature of the State of New Jersey to pass a bill that means, from beginning to end, nothing but fraud. I say if you adopt that bill you have no right to ask, and no reason to expect, any

protection at the hands of the Legislature of the State of New Jersey, from the frauds and rascalities too frequently perpetrated on the honest and industrious farmers of this and other States.

Mr. Abbott—I cannot see the propriety of a farmer representing an article as fraudulent, which I presume is daily set out for consumption in his own household, especially when it is such a healthful and desirable article of food, and comparing it with oleomargarine. Where is his comparison? [Applause.] I would like to hear some little discussion as to the merit and worth of skimmed milk as a food.

I would like to ask Dr. Newton a question on this subject. I would like to ask whether you ever knew of a dealer being furnished with new milk who was not furnished with skimmed milk, and whether the keeping of skimmed milk out of the city prevents the sale of skimmed milk to the consumer?

Is it not a well-known fact that there is a large demand for skimmed milk in the cities? How is this skimmed milk to be obtained when it is not brought in from the farms? By this law you force dealers and others into the position of robbing their milk to get the skimmed milk and the cream for sale. Where are they to get the cream from which they must supply, and what will they do with the milk thus robbed of its cream? Is it possible to prevent this robbing? Now, I contend that the keeping of skimmed milk out of any market, in no sense prevents the sale of skimmed milk in that market, but rather encourages it. I would like to hear from the Doctor on those points.

Dr. Newton—I think it is very doubtful, but it is possible; I suppose that some dealers might do this, but we have had no difficulty in this respect.

Mr. Abbott—If in order, I would like to make a few remarks on the propriety of the sale of skimmed milk.

Mr. McBride—I rise to a point of order—that the only question before the Board is upon the adoption of the amendment to the original resolution—*i. e.*, that we shall not change the existing milk laws.

Mr. Ege—The gentleman from Camden has the right to state his reasons for opposing that amendment.

The Chair—Mr. Abbott is in order.

[Mr. Abbott here starts to read address, whereupon]—

Mr. McBride—Will you allow me to interrupt you? Will you be

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kind enough in your elaborate remarks to explain why it is to the farmer's interest to sell skimmed milk?

Mr. Abbott—I am proceeding to that, if you will allow me. Had you not interrupted you would have heard why. [Laughter.]

Mr. McBride—I shall listen to it with the greatest of pleasure.

Mr. Abbott—I will proceed to it and you shall hear it.

Mr. McBride—I have got to leave at a little after 12 o'clock, and I suppose many of my friends here will be very glad of it. [Laughter.]

If I am allowed to interrupt I would like to ask the President and Secretary what were the answers to the questions propounded in the different slips sent to the different Agricultural Associations throughout the State in the different counties; whether they were satisfied with the present milk law or not.

I have understood that nine-tenths of the replies indicated that they were entirely satisfied.

Mr. Dye—The farmers in the northern part of the State all appear to be satisfied—the larger majority all over the State appear to be satisfied with the existing law.

Mr. McBride—The principal dissatisfaction existing is in the county of Camden?

Mr. Dye—The claim made by the Camden county men is that the legal per cent. of solids is too high.

Mr. McBride—May I ask how many cans of milk there are shipped from the counties dissatisfied with the existing laws? How many cans are shipped to the Camden and Philadelphia market?

The Chair—The receipts at Camden from the Pennsylvania railroad and its tributaries, I am informed officially, during the year 1887 was something over a million quarts a month—an average of about a million quarts a month.

Mr. McBride—How many cans would that make?

Mr. Abbott—The cans vary in size, but I should say there were from six to ten car-loads shipped daily to Camden and Philadelphia from New Jersey.

A Member—I was appointed on a committee of four to confer with a committee of three from Camden county. Of that committee but one member wanted to have the per cent. of solids lowered at all.

A Member—The cans run twenty and forty quarts, and it is difficult to state the number of cans.

Mr. McBride—Will your cans average forty quarts each, or less than that?

Mr. Abbott—There are none larger than forty quarts; they will not average that.

Mr. McBride—They will average about thirty quarts, I suppose?

Mr. Abbott—You must add one-fifth to that, for the milk is sold by dry measure, as you know.

Mr. McBride—I would like to say, right here, that I believe if the skimmed-milk laws had not been enforced the effect would have been to drive the dairymen from the market—the honest dairymen. I will tell you why. Some men profess to have a great love for the dear farmers [laughter], and these same men have raised this great cry that they think the sale of skimmed milk beneficial to the farmer. This cry was raised by milkmen, creamery men and others, whose interest it was to have skimmed milk sold. What was the effect? It was sold at 1 cent and $1\frac{1}{2}$ cents a quart less than pure milk. When pure milk was $2\frac{1}{2}$ cents a quart they could get the skimmed milk for $1\frac{1}{2}$ cents, and on the Susquehanna road—and I think my friend here on the right will bear me out in what I say—and on the line of the Erie road you could see any quantity of cans of skimmed milk standing, as blue as blue could be, palmed off on the consumers for pure milk, and the honest farmer was compelled to keep his product at home, because the farmer with fewer scruples of conscience would palm off the adulterated article for pure milk.

I know in my own dairy, Mr. President, during one summer we were compelled to keep three cans at home from a daily product of seven cans, and all on account of this state of affairs, the skimmed milk flooding the market, and leaving no market for the pure article. I could not understand at the time how it was. I remember asking a gentleman how it was, and I was answered by a boy—children and fools always tell the truth, they say. [Laughter.] He said the reason why they did not want the three cans was because they got three cans of skimmed milk for 1 cent a quart. That accounted for it. They would take the skimmed milk and mix it with the pure article, and then sell that mixture as pure milk, and we were obliged to keep the pure milk at home.

Mr. Abbott—Still there is a large amount of it purchased. There is no reason to do so when the pure milk-supply is unlimited. Perhaps when pure milk was difficult to be had in the cities this was

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brought into the market. The creameries are benefited, as well as the producers, to my mind, when skimmed milk is allowed to be sold. Nothing, in my opinion, is worse for the milk market than that in these times of a scarcity of milk the whole milk fraternity should be on the hunt for milk, bringing a large number of additional dairies into the market on account of this scarcity, to remain, probably, after that time.

Mr. McBride—As near as I can figure it out, the milk product from Camden county, averaging it at forty quarts to the can, or the milk shipments that have been referred to as averaging one million quarts per month, amount to about eight hundred cans of milk per day.

I want to say that, opposed to that, on the line of the New York, Susquehanna and Western railroad, is an average, I think the lowest is one thousand five hundred cans of milk at forty quarts per can, each day. On the line of the Delaware, Lackawanna and Western railroad there is an average of—putting it low—five hundred cans each day, of an average of forty quarts per can.

A Member—All from this State?

Mr. McBride—Chiefly from New Jersey, with the exception, perhaps, of five hundred cans from west of the State line. A great deal of it comes into Jersey City. The gentlemen complaining against the law are complaining on the ground of Philadelphia milk, and we must make the same comparison with New York. Consequently, we have the right to make the comparison as we have with Philadelphia milk. I want to say, opposed to the shipments to Philadelphia, from over the line of the Erie, there are nearly four thousand cans of milk sent to New York each day. Opposed to the claims of these eight hundred cans, there are nearly ten thousand cans per day.

Mr. Sears—Sixteen thousand cans per day.

Mr. McBride—Opposed to that, then, there are nearly sixteen thousand cans per day—twenty times as much.

Mr. Sears—I don't know that I have any right to take part in this discussion, but I have been asked by some friends here to say something. I expect to be a part of your State after the 1st of April, and whatever I can add to your deliberations here belongs to you, and I will make a few remarks on this subject of the milk business.

Up in Orange county, we have had so many milk meetings that whenever you say anything about milk meetings it is like the con-

ductor's bell on the horse car, or like saying "sic" to a dog [laughter]—we jump right in.

I oppose the gentleman from Philadelphia with a great deal of consideration, because, unlike those who generally advocate the selling of skimmed milk, his name as a respectable dealer has reached us even up in Orange county, and we believe he differs with us honestly and from a very large experience in the milk business. My experience in this business is not so great. For thirty years I have been in the dairy business, and have kept from fifteen to sixty cows, all milked as an old lady friend of mine said—she said her daughter had moved out to Plainfield, and "they have a dozen cows, and they milk them all by hand" [laughter], and I have done that for a long time. Eight years ago yesterday, I put a wagon on in New York to sell my own milk. That business has now grown from one wagon, selling one hundred quarts per day, to four wagons, selling one thousand quarts per day, and from the experience thus gained I would like to say a few words in regard to the sale of skimmed milk.

Between 1850 and 1860 a man who lives in the city of New York was a dealer in milk. One of my neighbors sold him milk which he refused to pay for, because it was said the milk was not up to standard, and when asked to test the milk it was found that skimmed milk at sixty degrees would run up to twenty-five by the lactometer. He took the case to court and lost it, and he went home after losing his case, and he said that was a good suit for him. He at once started a creamery, and in his sales he was very careful and made a great deal of money out of the business. Following him, many others started in the same business, until now our neighboring county over the line is famous for its creameries, where a few years ago, they were just as famous for their skimmed milk, immense quantities of which were sent in over the Erie road every night. It may seem strange, but I never knew a single quart of that immense quantity of skimmed milk to be sold as skimmed milk. I have been around among the dealers in the Bowery on the east, from the North river to the East river, and I have never seen a man sell a single quart of skimmed milk, though I saw milk sold at prices that must have been for skimmed milk. I went to collect a bill for a man, and he complained and said, "Why, John Betts is selling milk for 5 cents a quart," and the milk I was collecting for cost the dealer $4\frac{1}{2}$ cents per quart. You can imagine what kind of milk was being sold for 5 cents per quart.

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Mr. Abbott—In what year was that ?

Mr. Sears—About fifteen years ago, I think.

Mr. Abbott—I knew of the same condition there about five years ago.

Mr. Sears—Since we have had the law ?

Mr. Abbott—Not since the law.

Mr. Sears--Not much of that since the law was passed, I think. There is milk sold to-day for five cents a quart, and it is good milk. The grocers sell it for five cents per quart simply to draw custom. Of course they make nothing on it, but they wish to draw custom for other things. You know we can't compete against that kind of dealing. He probably buys skimmed milk too, and when his pure milk becomes scarce he puts in skimmed milk, so he can work off all his stock, and he does not want, either, to run out of pure milk.

I fear I am getting somewhat off the track, but I would like to say to you that the average of milk going into New York and its adjoining cities during the whole year of 1887, was sixteen thousand cans per night, of forty quarts per can, or six hundred and forty thousand quarts per night. In addition to this, two thousand three hundred and sixty-eight cans of milk are sent there daily in the shape of cream. That is, there was cream enough sent in daily to represent two thousand three hundred and sixty-eight cans of milk. Now, that cream is sent there by men who make it their business to sell milk, and when there is no demand for cream they sell milk. Their milk is inspected very regularly. They understand the law thoroughly and their milk never fails to pass inspection.

Our friend, Mr. Abbott, says that skimmed milk is the result of sales of cream, or that cream cannot be supplied unless skimmed milk is sold, but that cream *is* supplied and one of the men supplying cream lives close to my friend, Mr. McBride, and one of these men came to me the other day and told me he had bought an additional farm, and he is already the owner of three or four or half a dozen, and another of these cream men was a customer the other day for one of the largest farms in Blooming Grove, and who is doing a very fine business. These men don't want to have skimmed milk sold, and I will tell you why. Just because they are making money in selling cream. Cream can be sold without selling skimmed milk ; of that I have no doubt, for it is being done. The whole of New York

city is being furnished with cream, and that, too, without selling milk that falls below the standard.

Mr. Abbott—What do you do with the surplus milk you have? You all know that the demand for milk varies.

Mr. Sears—We churn it in New York and we churn it at home. We send a small quantity of cream ourselves to our customers, which cream is taken sweet. The skimmed milk is fed to calves. We sell pure milk, and only pure milk. We sell it out of the cans, good, pure milk as can be had anywhere, at seven cents per quart. We deliver our bottled milk at 8 cents a quart. It is just a fair-paying business and that is all. And I know of no other business in New York city or throughout the country that is not very close in profits.

Now, if you allow this skimmed milk to be sold, who gets the benefit of it? Farmers cannot get the benefit, because they are not fixed for it, and it must go to the creameries. The creamery man sells his cream, and, if you allow him to sell his skimmed milk, he sells that too. So you see he gets the benefit, and not the farmer. You also know that he can afford to do this better than the farmer, for he pays you half a cent a quart less than the market price.

Anyone conversant with the market knows that two hundred and fifty cans of surplus milk will bring down the price of these whole sixteen thousand cans of milk half a cent a quart, and we all lose that half a cent a quart. If there is a shortage of one hundred cans per day, for a few days, it will go up half a cent a quart. You cannot make that half a cent a quart if you allow skimmed milk to go into the market. You cannot afford to let that skimmed milk be sold. We, as dealers (Mr. Abbott and I)—and I am very glad to be classed with honest dealers, even if I do it myself [laughter]—we cannot afford to have that kind of competition. With that sort of competition, if the dealer has two cans of skimmed milk and good milk, and the supply of pure milk gets low, he dumps the skimmed milk into the pure-milk can, and sells it all for pure milk, rather than get out of it.

I am sorry these men are not as honest as some of our dealers are, but the fact remains the same. They will do their business in this way, and you cannot help it or prevent it.

Now, as to the consumer. My friend, Dr. Leaming, of New York city, told me that skimmed milk was a very good food. He told me of a man with Bright's disease who was in bed for six weeks, and he

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was fed entirely on skimmed milk and he got better. If I was going to lie in bed for six weeks I think I should want nothing but skimmed milk, too. [Laughter.]

Mr. Abbott—Would you take oleomargarine? [Laughter.]

Mr. Sears—No, sir; I would perhaps prefer skimmed milk, under some circumstances, but ordinarily I would want the cream with the skimmed milk to make it digest. [Laughter.]

With all due deference to my friend, Dr. Cook—and I learned thirty years ago to sit at his feet and take knowledge from him—with all due deference to him, the chemical analysis don't tell you whether it is good food or not, and when my friend says he knows people who were brought up on skimmed milk he means on milk from which the mother had blown back the cream, but if the milk had been put through a separator and every particle of fat taken out of it, and you had been brought up on such food, you would not be here to-day to tell us anything about it. [Laughter.] That is just the difference.

Mr. Griffin—We have to-day living in Camden a gentleman who has lived for thirty years on skimmed milk alone. [Laughter.] It is doubly skimmed at that [laughter]; he has it skimmed twice. He lives on this skimmed milk and weighs one hundred and eighty pounds. [Laughter.]

Mr. Sears—A gentleman who was second Postmaster-General under General Garfield was sick in New York. He was very bad, and had not been out on the pavement for three months—and this is to balance Dr. Lyman's story—and he took this milk diet. He took two or three bottles per day of our milk. [Laughter.] It was about the time Jake Sharp had his trial [laughter], and he said he heard a great deal about Sharp about that time. [Laughter.] In six weeks from the time he began that diet he went to his office every day, and has been very well until two or three months ago, when he was again obliged to stay at home. We hope to sell him more milk and get him about again.

I am sorry to occupy so much of your time on this subject, but we in Orange county think we know something about milk, and we think we must say something, and I would just like to say that you can depend upon it that the sale of skimmed milk will not pay. Eight years ago milk sold for 5 cents a quart, and when I speak of the farmer selling milk to the dealer, I mean that it was delivered on the platform, and the dealer in New York pays the freight. I

then sold my milk for 2 cents a quart for five months; for five months more I sold it at $2\frac{1}{2}$ cents per quart, and I got 3 cents for it during the months of November and December, and those were the top prices.

I made my milk in winter as in summer, and I got very poor [laughter], and the next season I started out for myself. After I started I never could buy it so cheaply as I had been selling it. Then they began the enforcement of this skimmed-milk law, and from April, 1886, until April, 1887, milk never sold so high— $3\frac{1}{2}$ cents per quart from the 1st of October to the 1st of February. If skimmed milk had been sold, those prices would never have gone as high as that.

Mr. McBride—I recollect the year you refer to, and if the price you received was 2 cents for five months, then it was better, by one month, than the average market prices of milk, for the price that year was made 2 cents for six months, and the winter following was when they adopted the skimmed-milk law in New York.

Mr. Sears—I have never had much experience in drinking skimmed milk myself [laughter], though it may be first-rate for calves. For myself, I prefer the cream, too. I don't think any of you want your children raised on skimmed milk, for they can't digest it. We have had patients brought up from the lowest form of pneumonia—patients sixty years old and over—on cream alone. It is the most pleasant way of all to take cod liver oil, and it is a most excellent food for invalids.

Let me repeat, you may depend upon it that if you open the sluiceways for the sale of skimmed milk, you do a great harm, a great injury, to the producer and the dealer—the honest dealer—and you do a great injury to the consumer, necessarily, and most necessarily of all to the consumers among the poorer people, who can get their fats as cheaply in no other way as in milk.

Mr. Crane—I think the question as to whether skimmed milk should be sold has been pretty fully discussed.

I want to say I have no objection to skimmed milk being fed to calves, for that is where it should be. In the address given by Mr. Burnett last night, I asked him the question in regard to this, and I think the answer fully coincides with the statements made. I asked him in regard to feeding calves the first six months, and he said he fed whole milk for a few days. He then fed them with skimmed

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milk. For what purpose? For the purpose of giving them a large digestive apparatus, making them pot-bellied. [Laughter.] Apply this to feeding children, and what will you have? [Laughter.] Do we want to raise our women in that way? [Laughter.] No; we want bone and muscle and brains. Of course we want them to have good digestive apparatus, to keep the machinery going. These are facts, and we cannot controvert them. Anyone having experience with calves will bear me out that this is a true statement.

In regard to the cost of skimmed milk. Take it at half a cent. The creameries send it to the cities and they sell it for $2\frac{1}{2}$ and 3 cents. A man selling a hundred quarts must have 3 cents a quart profit. The retail dealers must have at least 3 cents profit. Some of them want a great deal more than that. We will say 3 cents; 3 cents and 2 cents are 5 cents, at the lowest estimate, and out of this the farmer gets what? Just half a cent. The profit all goes into the pockets of the dealers. That is why they want it to go into the market, because they can make twice or three times as much profit as on the whole milk.

As to this question, "Should Skimmed Milk be Sold?" I would say that, viewed from the standpoint of the New Jersey farmer, it should be answered in the negative.

The dairy interest of New Jersey has necessarily become one of the first importance to the farmers of this State, as they cannot compete with the West in the raising of grain, cattle or hogs, and the Southern States are rapidly gaining control of the market for early vegetables and small fruits. New Jersey, situated between the two largest cities in the Union, and dotted over with the fast-growing manufacturing towns and cities, has, from necessity, become a milk-producing State.

Our natural location makes the production of milk the New Jersey farmer's birthright, and such being the case, our Legislature should faithfully shield and guard us by enacting laws to protect us as we desire.

We answer the question for the following reasons, also, in the negative:

First. Our milk-producers do not realize one cent from the sale of skimmed milk; the business is controlled entirely by the creameries, and after the creameries have delivered it to the retail dealers it comes in competition with milk furnished by the dairymen, to their great

loss and disadvantage, although our laws make it a finable offense to sell skimmed milk except under its proper name, and from cans so marked that all may see what are the contents. Yet there are so many ways of evading the law that, though every consumer should turn detective, it could still be sold as whole milk, and undoubtedly would be so sold, and the only way to avoid this gross injustice to dairymen is to suppress the sale of skimmed milk entirely.

Second. Skimmed milk is of comparatively little value as a food. Among farmers it rates at about half a cent a quart; as to its nourishing qualities, compare a calf raised on skimmed milk with one raised in the natural manner by its mother. At weaning-time the one will be large and finely formed, with a glossy coat, while the other will be runt and pot-bellied, with a rough, staring coat of hair.

Children fed with such food are defrauded of their proper nourishment, and death finds easy victims among them. Yet it costs as much to transport this wishy-washy stuff to market as it does the whole milk, and even when sold under its proper name, with the added profit of the dealer, it costs the consumer nearly or quite as much as unskimmed milk.

Third. Considering the cheap and nearly worthless character of skimmed milk, and the ease with which it can be substituted for the better article, it seems like offering a premium for rascality to allow it to be sold at all, and the decisions of the Supreme Courts of Missouri and Pennsylvania in oleomargarine cases will apply as forcibly to the sale of skimmed milk as to that of counterfeit butter.

In the report of the New Jersey State Board of Agriculture for last year, page 208, we find the following, which I will read you :

[See report.]

It has been said by Senator McBride—and all great minds run in the same channel, you know—[laughter], that as the farmers have taken the stand on the oleomargarine question, and nearly unanimously, too, we should follow out the same principles in this question. We have settled the oleomargarine question very nearly to our satisfaction. For us to compromise our integrity in the eyes of the public by substituting or indorsing another fraud formed by us and passed by us in order to put a little money in our pockets, is not right, and we place ourselves in a very compromising position in the eyes of the public. Take this matter into consideration, think well

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of it, and see where we stand in this case. I do not think it would be a wise and wholesome thing to do to extend the law to permit the sale of skimmed milk in this State, or in any other State.

Mr. Lippincott—I am not opposed to the present milk law, with one exception. I would offer an amendment to the resolution offered, that no separator skimmed milk be sold. I have been attending the meetings of the New Jersey, Pennsylvania, Delaware and Maryland Associations for the last three years. I have attended monthly the meetings of the Directors in Philadelphia, and am somewhat conversant with the doings of the milk business and the sale of separator skimmed milk, which floods Philadelphia at a time when there is a scarcity of pure milk. Gentlemen who formerly kept calves on skimmed milk now send them to Philadelphia, for no separator skimmed milk would keep them alive. I don't oppose the sale of skimmed milk entirely. At one time I lived for three months on skimmed milk [laughter], and worked on it, too. I believe that any person wanting skimmed milk should be able to get it. I would like to amend the resolution by having it "that separator skimmed milk cannot be sold in the State."

Mr. McBride—I make the point of order, with all due respect to the gentleman, that the amendment he offers is not a proper amendment to make, according to the resolution that is under discussion.

The Chair—We can reach that properly afterwards.

Mr. Abbott—In regard to separator skimmed milk, it must be borne in mind that both Professor Lang and Professor Trimble have reported on the worth of that as a food. The separator skimmed milk is said to be five times as valuable as an article of diet, as beef and mutton. In relation to the skimmed milk increasing the sale, our friend here says that because a fraud has been perpetrated in some articles of diet, we should not advocate the sale of milk that has been skimmed. Skimmed milk is made by the dealers in this way: They are sometimes supplied with more milk than there is a demand for, and thus have a part of it left over. In Atlantic City I had a little difficulty with the Inspector, and was obliged to abandon the sale of skimmed milk. This meant a loss to us, as we were not able to make full use of the milk left over by skimming it. We had been in the habit of skimming what we had left over each day, and selling it.

Mr. McBride—Will you permit me to interrupt you for the sake

of asking a question? Did you sell any milk that had been skimmed, as pure milk?

Mr. Abbott—I did not expect to be questioned in that manner.

The result of this stopping the skimming of our milk has been to make a very material diminution in the total sales of milk in Atlantic City, as I have been unable to take as much milk daily by ten to twenty per cent. as I had taken prior to that time. Formerly I was able to utilize it by skimming what I had left over and selling the cream and skimmed milk. So much for my point that the sale of skimmed milk would augment the sale of pure milk, or new milk. Who gets the benefit of the sale? Even granting that the creameries are doing most of the business, they cannot get better prices. The price regulates everything. The point made by the Senator cannot be held at all. If additional milk goes into the market it makes a market.

Mr. McBride—Yes, it makes a market for the creamery men.

Mr. Diecks—I am a milk-producer myself. The milk-producers in Essex county and in Morris county, and in the adjoining counties, in the neighborhood of the cities of Newark and Jersey City, where the sale of skimmed milk is forbidden, seem to be satisfied with the workings of the milk law as it is at present. I think the law works not only to the greatest satisfaction of the producer, but to the satisfaction of the dealers and to the satisfaction of the population. I don't see why we should want to force this on the people when they are satisfied with things as at present. Why you want to do this is something I cannot understand.

Mr. Abbott—It is simply a question as to whether skimmed milk shall be sold, and I would like to read a paper containing a few reasons why it should be sold, if allowed.

There being no objection—

Mr. Abbott [reads]—

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

In answer to the subjoined questions, ordered for discussion by the New Jersey State Board of Agriculture at its annual meeting, 1888, the following was submitted :

Question 1. "Should skimmed milk be sold?"

I answer "Yes," because it is a cheap, wholesome, nutritious and bone and sinew-making article of diet, constituting alone nearly a

complete food. It is a staff of life and he who breaks it destroys one of the Creator's best gifts and is an enemy to mankind. That it is a cheap article of diet has always been recognized; but of late the results of chemical analyses have furnished definite proof thereof. That eminent authority, Prof. James Lang, of London, has shown the superiority of skimmed milk over lean beef as a diet, when viewed from an economical standpoint. Prof. Trimble, of Philadelphia, has compared skimmed milk with beef and also with mutton, with like results. In short, analytical investigation demonstrates that skimmed milk has, cost considered, from three to five times the food value of beef or mutton. That skimmed milk is wholesome and nutritious, will not be doubted by most of those present, who, with myself, well remember that when boys it formed a principal, agreeable and easily-assimilated article in our daily diet.

As to its value as a bone and sinew-making food, witness those who, having been reared largely upon it in their country homes, are to-day the men of best physical development throughout the land.

Our Irish brethren who have made this the country of their adoption exhibit a physique that speaks well for their early diet, composed principally of skimmed milk and potatoes.

Skimmed milk should be sold because its sale tends to secure an honest milk-supply, by honestly meeting the ever-present and positive demand for cheap milk. Why is professedly whole milk sold at such a range of prices in New York city and in Brooklyn? I believe it to be because the sale of skimmed milk is forbidden; as a consequence, dealers are subjected to a pressure from the public for a cheap milk which they cannot honestly supply. The law itself thus encourages sophistication.

Skimmed milk should be sold because the public have a right to it as to every other cheap and wholesome food, and he who takes away this privilege, robs the poor man's purse.

Skimmed milk should be sold because thereby a valuable and honest market is created for a bi-product in the supplying of cream and to a limited extent in the manufacture of butter.

Lastly, skimmed milk should be sold because it is to the producer's interest that it should be sold.

The sale of skimmed milk largely increases the total consumption of milk, which is manifestly to the interest of the farmer.

Question 2. "Is the present standard of per cent. of solids too high?"

Waiving the question whether all limits are unjust, and I believe they are, it is manifest that the standard or "legal limit" of twelve per cent. of total solids, inflicts a special hardship upon producers of and dealers in milk. It must be admitted that a limit so high as to render nearly all producers and dealers in milk, liable each year to fine, and for non-payment of the fine, to imprisonment, is unjust; yes, infamous. The limit does so render them liable. There is no room for argument as to whether the State's limit is too high; it is a question of fact. Exhaustive investigation has demonstrated that few herds in this country or in any other country, not of breeds noted for richness, escape condemnation under this limit. If any doubt the statement, I will gladly put them in possession of convincing affirmative proof thereof.

The "legal limit" is too high, because it demands the slaughter of a large majority of the herds of the State of New Jersey.

The "legal limit" is too high, because honest dealers, valuing their reputations, as they become aware of the jeopardy in which they are placed, will decline to market the milk of the native cow or any other breed not peculiar for richness. Only richer milk at higher prices can be sold with any degree of safety, and the tendency will be to place milk among the expensive foods, and, to an extent, banish it from the tables of the public, which also means decreased consumption and a curtailed market for farm products.

I purchased the milk of five herds of general or common breeding, during the entire year of 1887.

Weekly analysis was made of the milk of these herds, as well as of that of every herd I received milk from. The milk of each of the five herds (and it was all that I marketed of this description during the entire year) fell below twelve per cent. upon one or more occasions, though the average for the year was 12.92. That of two grade Jersey herds also fell below twelve per cent. In all fifteen instances, I sold milk which, by analysis, I afterward found to have been below twelve per cent. in total solids, and the dairymen certified the milk to have been pure in every case. Now, as the analysis was made but once each week, it is only necessary to multiply fifteen by seven to obtain the probable number of times that I was amenable to the law during the year 1887. It will be seen that had the penalties

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been enforced, there is every reason for believing they would have amounted to \$10,000 during the year.

I shall take the risk no longer ; if the present Legislature does not give some relief, I shall withdraw from the sale of all milk in the State of New Jersey, except the product of Jersey and of Guernsey herds, or of high grades of these breeds. I will not, even then, obtain safety from the consequences of accidental low results, but I will thereby reduce the risk.

Question 3. "Is injustice done to any class by our present method of inspection?"

I answer, milk inspection as conducted in New Jersey, works injustice to producers of and dealers in milk, and to consumers also.

The milk law is an abuse of the power of the Legislature, because it singles out those engaged in producing and selling milk, and persecutes them without reason or justice.

There is upon the statute-books of New Jersey a law of a general character, that makes provision for the protection of the public against food adulteration. The general law provides for food inspection by officers of the State, and inflicts heavy penalties upon persons convicted of adulterating food or having adulterated food in their possession. This law is very minute and particular in its details, protecting from every method of milk adulteration.

The milk law simply amplifies upon this general law by applying certain tests and methods to milk inspection that will secure the conviction of the innocent and guilty alike.

The first section of the milk act is unjust because it is calculated to destroy honest trade in that cheap and wholesome commodity, skimmed milk, and to foster deception in its sale. This is accomplished by the imposing, as a condition of sale, of difficult and impracticable performances. This section is unjust, also, because it is open to the construction that skimmed milk must not be transported or carried in other than marked vessels, though not intended for sale.

This first section is supplemented by an act utterly forbidding the sale of skimmed milk in cities of the first class, which is a flagrant injustice to both producers and consumers.

The second section is unjust because of the omission of the word "knowledge," whereby milk producers and dealers are denied the right accorded defendants charged with even the grossest criminalities, that is, that of establishing an absence of guilty knowledge or intent.

The fourth section is unjust because it is framed with the direct object of securing the conviction of the accused without the slightest regard for his guilt or innocence. Under this section good citizens are traduced and their characters blackened, and honesty and integrity go for naught.

This fourth section declares that a certain per centum of solids should be found in milk or that it shall be deemed adulterated. Nature lays down no such rule, and no decree of law will ever change the course of nature.

Milk varies greatly from natural causes in the yield of solids. So great is this variation in healthful, normal milk, that the establishment of a legal limit for solids does violence to justice and common sense. The law bases a definite and exact charge upon nature's indefinite and varying conditions. The law says milk shall contain twelve per cent. of solids or be deemed adulterated, while experience establishes beyond question or doubt that the milk of healthy cows, well fed and cared for, falls below the standard at times. But this is only a part of the injustice of the law. Could the per centum of solids in milk be determined before sale, parties could render compliance, however unjust the requirement. No person can safely have milk in his possession, for sale, until it has been analyzed. The cost of analysis absolutely precludes this, and the perishable nature of the milk forbids that its sale be deferred until the analysis be made. An impossibility, then, is demanded, and the alternative, for non-performance, is penal fine, and if, from inability or other cause, the fine is not paid—and no honest man should pay the fine—then imprisonment.

Statistics indicate that of those producing honest, wholesome milk for sale in this State, a large proportion would annually, if the law were thoroughly and impartially enforced, be subjected to its penalties, and still more would be subjected to the accompanying obloquy that conviction in a penal prosecution imposes.

This establishing of a legal limit is entirely unnecessary and quite unwarranted, and it should not be submitted to by the dairy interests.

Great Britain has very effective legislation of this character without it, Parliament refusing to fix a limit for natural products. In trials there, certificates of analysis are produced with the accompanying opinion of the analyst, which has due weight with the court, but does not, as with "legal limits," shut off all defense.

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Paris, also, with its excellent system of food inspection, has no "legal limit" for milk.

The eighth section is unjust because therein the time-honored principle of law, that the accused shall be deemed innocent until proven guilty, is quite ignored, probably because too mild for application to dairymen. This section reverses the rule by providing that, in milk prosecutions, the accused shall be deemed guilty until proven innocent, and then prosecutors under the act have insisted that the opportunity to prove innocence should not be accorded, and that the question whether the accused had adulterated the milk or not, had nothing to do with the case, but that the only question for the court and jury to decide was, whether the analysis and data offered by the prosecution had been furnished in accordance with the law. Thus the law places the burden of proof on the defendant, then takes away the privilege of defense. Juries are deliberately asked to convict men of a penal offense and to impose upon them heavy penalties when the prosecution admits its belief that the accused is clear of any moral turpitude, and is of unimpeached honesty and integrity. It is unjust to place jurors in such a position as this, a position in which they are obliged to make choice between a violation of their oaths or the condemning of a fellow-citizen as an adulterator of milk, inflicting fine and imprisonment upon him, though his integrity is unquestioned, and all because of the occurrence of circumstances beyond his control.

The ninth section is unjust because it permits the Inspector to convey about with him his own hired witness; this hireling is produced in court and reads his testimony from notes, as to what is said and done at the time of the seizure of the milk. The Inspector likewise reads his notes, to the same effect, of course. These men are continually in each other's company, the occupation of the witness depending upon the pleasure of the Inspector, and his satisfaction with his performance.

Such a witness is not deserving of any standing in court, and such testimony is hollow mockery.

Again, the ninth section is unjust because under its provisions the Inspector, with his companion witness, may sample milk in the absence of the owner, or of any other person whatsoever; may convey such sample to his chum analyst, may together agree upon a report, which, issuing from the secrecy of the analyst's laboratory, is sufficient to set in motion the whole machinery of the law, crushing,

with its weight, the unsuspecting victim, whose first knowledge of the whole procedure may be the constable's arresting hand. I do not charge nor suggest that the Inspector and his colleagues have been guilty of such conspiracy, but I do arraign a law that makes such conspiracy both possible and easy.

Dairymen should earnestly protest against a method of inspection that so needlessly and so ruthlessly places the property, the liberty, and above all, the honor and reputation of citizens so entirely at the mercy of officers of the law.

I maintain, therefore, that the milk act should be repealed, or that it should be altered in the following particulars :

[See Burlington county report.]

I might well insist that the word "knowingly" should be inserted in the second section. Justice demands that it *should be* inserted, and unless the above alterations are all made, the introduction of this word "knowingly" should be positively demanded.

The Chair—The matter has been pretty thoroughly discussed, and I think we should call for the question.

The question being on the motion of Mr. McBride, to substitute his resolution for the first offered, it was agreed to by a rising vote, by eighty-seven votes in the affirmative and thirty in the negative, the announcement of the result being followed by applause.

The Secretary—In regard to the afternoon session, the Executive Committee desire to announce that they had invited Governor Roby to address the Board, but at a late hour he informs us he is not able to be with us. We have tried to find other parties, gentlemen who would interest you, but we found such gentlemen engaged by the institutes, and were unable to find anyone to talk to you during the evening session, and so we thought, having had so much of agriculture, we would have an address this evening which will probably not be agricultural, but on other topics of interest, and we have secured Colonel Fuller, Chairman of the Board of Education, a gentleman from Hudson county. We do not know what his subject will be, but it will be entertaining, at all events.

The evening session will be held in the Assembly Chamber at 8 o'clock, where we would like to see a full attendance.

On motion, adjourned to meet at 2 o'clock P. M.

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AFTERNOON SESSION.

Board called to order by Hon. Edward Burrough, President, at 2 o'clock P. M.

The Chair—I will announce the Committee on Exhibits, to examine and report on the exhibits we have before us on the tables:

Thomas Borton.....Gloucester.

W. R. Lippincott.....Burlington.

D. C. Voorhees.....Somerset.

We are now ready for the report of the Committee on Nominations of Officers; is that committee ready to report?

There being no response—

The Chair—I will call for the Committee on Reports of County Boards.

There being no response, the Chair calls for other business.

Mr. Applegate—I would like to offer a resolution at this time, if in order.

It is a very important one, to my mind. We have heard many remarks on the subject of the milk laws, and in regard to patent extractors, but, gentlemen, of all extractors, I would like to refer to one here, which, to my mind, is far more of an extractor than anything that has been referred to here. I think I can show you an invention which is second to none as an extractor.

I come here from a society which is second only to the State Board of Agriculture, and if there is no objection I would like to offer the following :

“WHEREAS, The illegal and oppressive discriminations, so hurtful to the common interests of all the people of this State, as practiced by the common carriers of our freight and passengers, and which grievous burdens are being steadily increased, notwithstanding the protests of all our leading societies, and the solemn decree of our highest court; therefore,

“Resolved, That our Legislature be, and they are hereby most earnestly requested to favor the passage of laws similar to those which have proved of such material benefit in other States, in regulating and controlling the business of common carriers of freight and passengers.

"Resolved, That the Legislative Committee be requested to call the attention of the respective members of our Legislature to the adoption of this resolution."

That is a subject-matter which the State Grange has labored long and earnestly upon. There are now bills before the Legislature which we have earnestly called their attention to last year and the year before. They are strictly in accordance with the recommendations of the Governor, and this same matter has been called to the attention of the National Congress by the President of the United States.

Now, gentlemen, a few facts on that subject.

I can show you that such is the undue preference given other States, against New Jersey, that we are now in a far worse condition, practically, than before the passage of the Inter-State Commerce Law. This act, as you know, has no bearing upon freight transported between points within the boundaries of the State. We are, consequently, at the mercy of the corporations who control the avenues of railway. Take the one item of coal; coal is shipped to South Amboy, Perth Amboy and Jersey City, at one time, I know, as low as 50 cents per ton, for a carriage of three hundred miles, on the average, while those living much nearer than this, and requiring a cartage of much less than this distance, are compelled to pay far more. Take the case of a friend of mine. He thought, by having his coal come through, and then having it re-shipped, his rate of freight would be lower, through getting the benefit of the through haul. What was the result? Why, they charged him 85 cents per ton for a haul of seven miles. Think of it. Where is the justice in such discrimination? Charging dealers 50 cents for hauling the coal three hundred miles, and charging people in my vicinity 85 cents for hauling the same coal seven miles! This matter should be remedied by legislation, and we ask your co-operation.

Now, in regard to the milk question. The committee of last year was told by a gentleman largely interested in the milk business, that his freight that year was \$1,500, so that he had studied, and knew something about the milk business.

We have also looked up the question of the milk trade, and find the railroads charge 40 cents for a cartage of forty miles, and even then it does not arrive in good condition, sometimes. Farmers have been induced to lock up their capital in stock, and have been induced

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to enter into the milk trade, and then what next? When these men are in the business, with their capital locked up, these railroads put on refrigerator cars, and go two hundred miles to the county of Orange, and carry it that two hundred and forty miles to the same place, and for the same price charged for a carriage of forty miles.

Well, gentlemen, I turn to the other hand, down here to Burlington county, and what do we find? In my section of the county we find large interests in other business, which are hampered by this same extractor—I refer especially to the matter of marl. We find the rates charged on this business are such that the men who were formerly able to carry on a paying business with it are now going out of the business, one by one—compelled to by the extortions of the giant monopolies. Their rates on the marl are simply prohibitory. Why should they carry a ton of coal three hundred miles for 50 cents, and charge prohibitory rates for carrying this local business? One gentleman, in conference with one of the railroad officials, spoke of this draft on them, and was asked what he had to complain of. He mentioned this one subject, and asked him why it was they were charged so much for carrying their marl thirty miles if they could carry a ton of coal three hundred miles for so little. He was told that it was a through rate, and was asked what he considered a fair rate for the carriage of the marl. The gentleman replied that he considered 50 cents per ton on the marl a fair charge, but the railroads were charging them 85 cents, and have practically destroyed the industry—driven the men out of business, and the Sheriff's hammer is now hanging over them.

Farmers are able to get other fertilizers cheaper even than marl, owing to these high freight rates. It costs 25 cents per ton to load, and then the railroads charge them 85 cents a ton for hauling the marl thirty miles, bringing the price so high that we cannot afford to buy it when it is offered in competition with other fertilizers, and the marl industry is practically wiped out. It is the same thing with lime, and everything of that sort. You will find that a short carriage of that material, from the Delaware river to points within the State, costs more for extra freight than the lime is worth, thereby driving us to the use of phosphates, whereon the freight is of less consequence to these companies, on account of its being in a more concentrated form.

Again, at one time, I remember the freight rate from Chicago was

15 cents per hundred pounds to New York city, while, when I came to pay my freight bill for a shipment coming but forty-five miles, it was 12 cents per hundred pounds, so there was a Chicago shipper who was able to put his materials in the New York market, coming hundreds of miles, for 10 cents per hundred, while I was obliged to pay 12 cents per hundred for freighting a distance of but forty-five miles. How long can I afford to do that, do you suppose? How can any one do it? Instead of receiving the benefit I should naturally have the right to expect, from living on the main arteries of travel between two of the greatest cities in the Union—the greatest markets in the country—we are actually placed at a disadvantage. Are we to be ground down under the heels of these corporations in this manner? Suppose you were to raise a crop of potatoes, averaging two hundred bushels to the acre. The difference between the legitimate rate, which the court sitting in this very room has said you shall pay, and which the Court of Errors and Appeals says shall be charged equally to all—the difference between this rate and the rate you are actually compelled to pay adds greatly to the cost of your farming, or to the amount you are compelled to pay to market your produce. They charge me on two hundred bushels of potatoes, or twelve thousand pounds, a rate that is equivalent to an annual charge per acre of \$12 counting your interest at six per cent.

I submit there is more milk and cream in that subject than in the whole business. [Laughter.] It is an old illustration under a new idea. They used to represent lawsuits by having one man at one end of a cow pulling at the tail, while the other was at the other end pulling at the horns, while the lawyer is running away with the milk [laughter], and you are talking about these other things while this separator I have spoken of is running away with all the cream and the solids, too.

I don't know how long land can stand this illegal tax of \$200 per acre that I have referred to. To my way of thinking it cannot long keep up under the load. I find, also, that in the message of the President in 1883 he refers to this very subject-matter of complaint.

Other governments of States have said the same thing in terms much more significant, and President Garfield has said the same thing.

One bill is now before the House to regulate these matters, and another is shortly to be introduced by Senator McBride, and therefore

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I am here to ask you to aid your sister society in calling the attention of our legislators to this important subject, and urging the necessity of the passage of a law controlling these corporations.

I therefore move the adoption of the resolution which I have offered without reference to the Committee on Resolutions.

The question being on the adoption of the motion of Mr. Applegate, it was agreed to.

Mr. Forsythe—I hold in my hand a resolution which is presented by one of the largest Agricultural Societies in the State of New Jersey. This resolution is for the benefit of the other Agricultural Societies without, in any respect, interfering with the benefits from the State to other societies. I will read it:

“For the better advancement of the agricultural interests of the State, and for the encouragement of the farmers in improving their stock and products, be it

“*Resolved*, That the Legislature be requested to pass an act appropriating to each of the County Agricultural Societies, regularly incorporated under the laws of the State, \$20 for each \$100 in premiums actually paid by each and every society, for cattle, sheep, swine, poultry, field crops, fruits, vegetables and dairy products; the money so appropriated to be disbursed under the direction of the State Board of Agriculture.”

The Chair—What will you do with the resolution just offered?

Mr. Forsythe—It strikes me that this would be a wise act on the part of this State Board of Agriculture—to bring this matter before the Legislature of this State, and to urge its passage, because it will benefit the other Agricultural Societies of the entire State, and thus all the benefit of help from the State will not go, as it does now, to the State Agricultural Society, which at present receives all the emoluments. It does not interfere with what they get, at all, but it gives something to the other Agricultural Societies, and assists them. I think those societies which are much poorer than the State Agricultural Society should also be aided.

I move the adoption of the resolution, without reference.

The question being on the adoption of the resolution, it was so ordered.

The Chair—We will now proceed with the second clause in this morning's discussion, in regard to the standard of solids in milk, as

required by law. Is it too high? Is there a resolution offered on that subject?

Mr. Abbott—If you will grant your indulgence for a moment we will prepare a resolution.

The Chair—As there is nothing before the Board but this, we will wait for your resolution.

While we are waiting we will hear from Prof. Cook, on the Weather Service; if he is not here, Dr. Hunt will represent Dr. Cook on that question.

[See "State Weather Service."]

Mr. Hunt—At some other time, if allowed, I would like to make a few remarks on another matter—that of contagious diseases of animals in the State.

The Chair—We will be glad to have Dr. Hunt continue on that subject, if he desires.

Dr. Hunt—You are probably aware that the United States government has passed a bill with reference to contagious diseases of animals.

The Governor of this State, through corresponding with the United States Department, has endeavored to adjust that bill to our law, and this has been done finally, though there are still one or two matters which it seems almost impossible to adjust, and therefore the United States Commissioner of Agriculture has requested legislation upon that subject. We are very unwilling to have any legislation in this matter without first having it passed upon by this State Board, and I have therefore placed in the hands of the President of this Board a paper, with the request that it be referred to the committee before whom such matters properly will come, and if it meets with your approval that it then go into the hands of some member of the Legislature.

While I am speaking I will call the attention of the farmers to a number of circulars that are placed on the desk for distribution. They pertain to matters of interest to farmers, and they are for free distribution. They are in regard to homes and farms, and also in regard to the contagious diseases of animals. You will find them of interest to you, I feel sure, and you are welcome to them.

The Chair—I think, with a little necessary legislation, the national government would assume the entire expense of running this veterinary business here for us.

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Dr. Hunt—I agree with you. There are certain matters other than pleuro-pneumonia that would still entail some expense, probably about \$600 a year, which will probably pay the entire expense hereafter. Within the past six months they have assumed nearly all the expense. By the provisions of the bill the proper legislation can be had, and I hope the thorough attention of your committee will be given the matter.

The Chair—Do I understand you that with this bill here you will accomplish that purpose?

Dr. Hunt—Yes, sir; that is the intention.

The Chair—If there is no objection the bill will be received and referred to the Committee on Legislation. So ordered.

Dr. Hunt—I hope you will not overlook the matter of the Weather Service.

Mr. McCann—I have here a copy of the bill which has been adopted by twenty-one States in the Union. We have twenty-six State Weather Services, and twenty-one of them are in good working condition financially. The other five are supported by the State Boards of Agriculture, while the former are supported by the States.

The State Board of Minnesota has spent \$140 apiece in furnishing all their stations. They are supplied with a thermometer, an anemometer, wind vane and the standard instruments I have mentioned.

“An Act to establish a meteorological bureau for the state of New Jersey.

“1. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That there be and hereby is established at the state agricultural college, New Brunswick, New Jersey, a central office for meteorological observations, with Professor George H. Cook, of said college, the secretary of the state board of agriculture, and a third person to be appointed by the governor, as a board of directors; the members of the board of directors shall be commissioned by the governor, and be duly qualified as like officers of the state.

“2. *And be it enacted*, That Professor George H. Cook, of said college, is hereby appointed president of the board, and by and with the advice of the directors shall establish, if practical, one volunteer weather station in each county, and supervise the same; he shall receive reports therefrom, and reduce the same to tabular form, and report the same monthly for publication as the ‘New Jersey weather report,’ and shall annually make a report to the governor, which shall contain a detailed statement of all expenditures made during

the year, and a summary of the observations made at the various stations.

"3. *And be it enacted*, That the president of the board be directed to print, under contract, two thousand copies of each monthly report, one thousand copies of which shall be distributed by said board, and one thousand copies shall be delivered to the secretary of this state, to be distributed by him in the same manner as other state documents.

"4. *And be it enacted*, That there is hereby appropriated for the ensuing year for the establishment and maintenance of said bureau and stations, the sum of one thousand dollars (\$1,000), or so much thereof as may be necessary for the purpose of meeting the actual expenses of carrying out the provisions of this act; no part of said sum shall be paid for salaries of any officers, or for office rent.

"5. *And be it enacted*, That no money shall be expended, except under the order of the president director, by and with the approval of the board.

"6. *And be it enacted*, That this act shall take effect from and after its passage."

Dr. Hunt—I move that the bill be referred to the Committee on Legislation.

So ordered.

The Chair—We will continue the subject of the milk law where we left it this morning.

Mr. Crane—In order that we may have something as a guide I move that we take up the resolutions which came from the Essex County Board of Agriculture.

The question being on the motion of Mr. Crane, it was so ordered.
[The Secretary here reads the following]:

"WHEREAS, The farmers of Essex county are largely engaged in the production of milk for the city market, and regard with deep interest anything that will tend to diminish the demand for this most wholesome article of diet; and

"WHEREAS, The Essex County Board of Agriculture is desirous to conserve and advance the interests of all agriculturists by every legitimate means; therefore, be it

"1. *Resolved*, That the Essex County Board of Agriculture earnestly requests the State Board of Agriculture to use its utmost efforts to prevent any change in the existing laws, that will have the effect of removing the safeguards now placed about the sale of milk.

"2. *Resolved*, That lowering the present legal standard of milk solids, or permitting the sale of skimmed milk in large cities, must work to the detriment of producer and consumer alike, while benefiting only such dealers as may be inclined to dishonesty."

Mr. Blish—I move the adoption of the resolutions as read by the Secretary.

Mr. Crane—I consider the first question—should skimmed milk be sold?—is settled by the adoption of the resolution of Mr. McBride. It does not re-open the whole question, as I understand it.

Mr. Abbott—The present law fixing the legal standards of milk denies the right of trial to those supposed to have violated the law. I believe there never has been a trial convened in court under the law. It is not worth while to call a court. The law does away with the right of the defendant to prove anything before the jury, and at present the trials are simply conducted by the lawyers hunting around to find some way to let a man out. The whole law is unjust, so far as the trial of the offender is concerned, and it detracts from the dignity of the court, and is a gross injustice.

Mr. Crane—You are allowed a trial by jury?

Mr. Abbott—You can bring no evidence before the jury. It amounts to nothing.

Mr. Crane—I did not intend to say anything on this subject, but I will make a few remarks relating to this question of milk standards.

I have on my farm a piece of low land—what we call bog-pasture. If we burn that off early in March, it affords our cattle a bite of good green pasture. I turn my cows out pretty early, and they go into this bog-pasture and fill themselves pretty well on the grass, and as a consequence when they come to be milked their milk is not up to the standard for solids, though I believe that some of them would not be up to the standard even without the bog-pasture.

But, if we allow the standard to be lowered, and it has been done once already, from thirteen to twelve, we open the door for adulteration. We don't want to be unjust; we are willing to accept anything reasonable, and we made no objection to lowering the standard from thirteen to twelve, but now, if we lower it still more, we are only opening the door for all sorts of fraud. I consider such a course a great injustice, and a premium for honest men to turn rascals, and I sincerely hope that this part of the law will not be tampered with, and that the milk solids' standard will be allowed to remain at twelve per cent. [Applause.]

Mr. Fithian—There are some men down in Cumberland county who don't like the law. They are much in the same condition as the Irishman who had done something he was afraid he would be pun-

ished for. His friend told him he need not be afraid to appear before the judge, for he was honest and just, but the Irishman said that was just what he was afraid of—his being just. [Laughter.] Some of our milkmen in Cumberland county are in the same position—they don't like the present milk law, because it is a just one. [Laughter.] The Milk Inspector has been down there a number of times and has found a number of men selling milk below the standard. They acknowledged the fact, but they said they kept ice in their cans to keep the milk. [Laughter.] Others said their hired men put water in their milk because they had scolded because the yield of milk was not large enough. [Laughter.] In not one instance did he find a man who did not admit that there was water in the milk. He also told these men they must grain their cattle more, as the excuse had been that they were fed on the meadows.

I bespeak for the farmers of Cumberland county entire satisfaction with the milk law as it is now, and we ask no change. [Applause.]

Mr. Abbott—I would like to add that every shipper certified to the purity of the milk on the occasions when I had trouble with the Inspector. I remember the letter of one man said he had fed his cows continually right through the year.

One other point. The result of this law is this: I have been a buyer of milk from the common herds of Salem county—though I do not think what I am about to say will frighten any of you—but I propose, for my own protection, that, unless this law is changed, to discontinue the taking of milk from every herd of common stock in the State. I will no longer be amenable to the law as it is now. I will do a lawful business and stand up for my rights, but I can no longer take this risk I am daily running now, and I will reduce this risk by buying only the milk of registered Jersey or Guernsey herds. I have analyzed the products of different dairies during the past two years, and if another man does this he will find he is in jeopardy all the time he is buying milk from the common herds of this State. I propose to reduce my risks to a minimum, by going out of the business.

Mr. Forsythe—It strikes me as manifestly unjust to leave this law stand as it is, as every honest man in this State is liable, at times, to be held amenable to the law and to its punishment, when he knows he is entirely innocent. Several instances have come under my own observation and I do not think the gentlemen from the upper part of

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the State would wish to see men punished for a crime for which they are not guilty. I know an instance in my own experience. I began shipping milk last spring and the milk was at first kept in the family cellar. After the house was shut up, during the night, one of my men working for me, without my knowledge went down stairs for a drink, went into the cellar, saw the milk, took a cup and drank some of the cream off the top. Had that milk been inspected by the Inspector the next morning I would have been subject to a penalty. My milkman immediately wrote me that the cream had been taken off, and I made immediate inquiry and found out where the cream had gone, but if that milk had been examined I should have been punished for the neglect or carelessness of others. I have fixed it differently now, for I have built a milk-house, but this shows exactly what risks we have to run. I would have been subject to penalty, though not *knowingly* guilty. I would have suffered for the act of another, for I had no knowledge of this man's act at all.

Another instance of a man known to be as honest as any one in the State. He sent his milk to Camden one day when he was going down himself. When he arrived there he found the Inspector making an examination of his milk, not knowing that the owner was present. He put his lactometer into the bottom of the can of milk, and he found that it was not up to the standard. Mr. Gaskill, standing by, told him to stir up the milk and it would be up to the required standard. The Inspector said he would not do it. Mr. Gaskill then did so himself, and it was all right. Had not Mr. Gaskill been there himself he would have been subjected to this penalty for selling milk that was below the standard of solids. These things will happen to all of us.

Should an honest man be punished for a crime he knows nothing about? Should not this word "*knowingly*" be inserted in the law, so that a man, if he is a criminal, shall be made to answer for his criminality, and so that an honest man shall not suffer for what he knows nothing of? If he is honest and innocent he should not be compelled to suffer the penalty the same as if he were guilty. Is it right that a man's character at home shall be ruined for life, and he be stigmatized for that which he knows nothing at all about?

Milk has been shipped on the train and tumblers and cups have been found in the bottom of the milk cans when it got to its destination. The cream had been drank off by the train men. This milk is not

inspected at the platform where it is loaded on the cars, but in the city of Camden, twenty-five miles from where I live. My milk may be opened and part of it drank off before it reaches the destination, and it may be examined when it reaches Camden and I be made to suffer the penalty for violating the law—I, who am ignorant of what is done, and who am innocent of any wrong-doing. Is there anything just about that? Do these gentlemen from the upper part of the State wish to subject farmers to such penalties? Is it fair? Are you willing to place yourselves, or to place others, in this situation? We are endeavoring to place ourselves in a position where we can protect ourselves or where we will be protected.

Is this the course that is pursued with regard to other foods that are adulterated? You cannot point to one. Almost all foods are adulterated, yet no man is punished for selling adulterated food unless it is proven that he did this himself—that he sold it, *knowing* it to be adulterated. You buy your sugar or your molasses adulterated, and is the dealer punished for selling you an adulterated food?

Take the question of adulterated cheese. I know of my own experience it is almost impossible to buy a full cream cheese in the Philadelphia markets. I have gone to the best stores, and they have shown me the best New York State cream cheese, weighing as high as sixty pounds apiece, and they were all larded. This cheese is made in New York, shipped to Philadelphia and is bought there by farmers and others and taken home, and it is an adulterated article. Where is the criminality? Who is the criminal? Suppose we sell some of these, and we are liable to what? We subject ourselves to a penalty for something we know nothing at all about. What farmer wishes to put this liability on us? Mr. Crane and other gentlemen may be caught in the same situation that others have been placed in, without any knowledge of their own. We may, any one of us, be caught with our milk below twelve per cent. of solids, and for which, justly, we are not at all liable, and yet we are subject to this penalty. I do not believe the Milk Inspector wishes to be unjust or do an unjust act. He must carry out the law as he finds it, necessarily. That is what he is required to do.

Now, let us so amend and alter and fix this law that he can carry it out honestly and justly, and not be obliged to commit unjust acts on honest men. [Applause.]

Mr. Voorhees—From what little I have learned here, the fact of

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the cream being taken off did not make the difference. I think Mr. Abbott said it was better without. I look at the matter in the other light. I look upon the present law as a protection. We can't get around it as it is now. Milk has been watered frequently, and I know it has been customary for some people to put water in the cans of milk. This law interferes with that practice.

I know that when the Inspector came around to our neighborhood there was no trouble about the milk coming up to the standard after that. [Laughter.] I know of four cases in my neighborhood where the farmers were caught. I think if there are any poor cows in the State of New Jersey they ought to be killed at once. [Laughter.] The cows belonging to the four farmers I speak of were cows that ought to have been killed. [Laughter.] They had nothing to eat but fence rails, and cedar bushes, and gravel stones, and yet their milk came up to the standard after the Inspector came around. [Laughter.] When the Inspector saw that milk he didn't know where it came from, but he told them they must feed up a little. We have some of the best farms, but when he came to the milk from one man he said, "You must grain up, for your milk just passes, and no more."

I never saw the Inspector, and don't know anything about him, but from what he did in Bridgeton, he is straight and fair, and acts to the satisfaction of all milkmen, and I think it is our duty to see that he is backed up in his inspections, and that the law should remain as it is.

Mr. Anderson—I can't understand why it is that all the complaints come from the lower part of the State. We have an Inspector who inspects our milk once a month, or probably oftener. I do not think we have had more than three or four cases where milk was below the standard. These parties who were thus caught acknowledged they put water in the milk, and that is all the trouble we have had in our locality. As all this trouble seems to come from the lower part of the State there must be some deficiency somewhere.

Mr. Appleton—Speaking of milk, if it is not stirred up, not coming up to the standard, if you were to put a lactometer to the bottom of the can it would be better. I have yet to see any one who has been fined the second time for having milk below the standard. Improve your farms, and the grass will get better, the milk will get better, the feed will get better and the butter will get better. The dealers may get fined more than once, but the farmers, never.

Mr. Forsythe—One remark more. It is a fact that the farmer is not only compelled to sell his crops by the bushel, but his milk must be sold by the bushel too [laughter], but in this work of the milk law as it stands he is compelled to put a per cent. of solids into them that is above the legal standard, for fear the Inspector may catch him and put the penalty on him. For fear of this the farmer will of course never be caught a second time with too little of solids, for he will feed until he gets far beyond the standard of twelve per cent. He is compelled to feed his cows high, to increase his per cent. of solids, for fear he will be captured again. He makes his milk thirteen or fourteen per cent. of solids, but who gets the benefit of it? The dealers, of course. What is the per cent. of solids? Is it worth anything to the farmer? After giving bushel measure he is compelled to give still more than the actual requirement of the law, for fear he will be fined, and all because he is not able to test his per cent. of solids. What is one per cent. additional? It is just one-twelfth. If I ship a certain amount of milk in a year, say three thousand quarts, and give him one per cent. more of solids than the law requires, I give him one-twelfth of the three thousand quarts additional, and that, too, without being paid one cent for it. The dealer finds my milk is high grade, and he is enabled to reduce it just that amount in excess of the requirement. In Pennsylvania he can put it down to eleven per cent., or even lower, if he wants to. I have no protection and get nothing for this extra amount of solids I give him. I cannot analyze my milk every night and every morning. I have not the means or the appliances for the purpose. Suppose you make your milk twelve per cent. or thirteen per cent., or perhaps fourteen per cent. regularly, and if you are caught one day with it below that standard what is the result? You are subjected to the full penalty of the law. Not only that, but your character is gone, and your milkman has got all the benefit; you have given it to him without an equivalent.

What is the condition of things, then? The "per cent. of solids" means no more than "proof" in whiskey. [Laughter.] What does the manufacturer of whiskey get who makes it above proof? The government rates its taxes on it at 90 cents at proof. If it is above proof does it go to the consumer? No, it is charged for, every particle of it. I had a twenty-gallon cask which I sent to get filled and they put in twenty-eight gallons of whiskey [laughter], and I had to pay for it, too. Twenty-eight gallons in a twenty-gallon cask!

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The whiskey men don't give you more than their per cent. of solids. [Laughter.] They make you pay for just what you get, according to the proof of the liquor, and you get no more than you pay for. The manufacturer or producer of whiskey is not obliged to throw his product away in part, as the farmer must, but he gets its full value according to its proof. He makes you pay for the per cent. of solids in it. He looks at the cask and finds the number of gallons and the strength, and you are charged for it accordingly. The poor farmer is compelled to give this extra per cent. to his milkman, in order that he may keep out of trouble with the Inspector. After he gets it he thinks—I can put in that much water and have that much more milk to sell [laughter]—and many of them do this, too.

Mr. Crane—Would you consider a man an honest one if you furnished him with fourteen per cent. of solids and he watered it to twelve per cent.?

Mr. Forsythe—Would you consider it honest? You have given such a history of the honesty of the people of New York and New-ark that we don't know. [Laughter.] And here a gentleman tells us they feed their cows on brick-bats and gravel stones to make them give a percentage of solids—we don't know. [Laughter.]

Mr. Crane—No honest man need have a lactometer on his premises. If he cares for his cows properly there is not the slightest danger that, by moderate feeding, the milk will fall below the standard. As Mr. Forsythe says, I am in danger of being tripped up, but my milk has been examined in a great many cases. I don't know that my wagon has ever been overhauled, but in the stores it has been examined so much that the Inspector has got tired of trying to catch me, and he goes by those fellows without stopping. [Laughter.] The law is a help to every honest man in the business. Of course we are liable for the acts of our servants, though it has been said that such is not the case. I think no one will deny that if we send a man out we are responsible for the damage that man does. You cannot provide a law that will answer for or prevent these mishaps. Every man is responsible for his servants, and you can't get out of it.

Mr. Forsythe—As Mr. Abbott has told you, the milk will run down, and you don't know when it has run down until it is too late. You are expecting a penalty which it is impossible for you to foresee, and which you cannot prevent. Why should not this word "knowingly" be inserted in the law, and thus protect farmers? The honest

man should not be compelled to suffer on the rack of punishment. The innocent man should not be liable for what he has unknowingly done. Insert the word "knowingly" and let the dishonest man be punished but the innocent man go free. [Applause.]

Mr. Diecks—Mr. Forsythe thinks if the farmer feeds his cows well it will increase the percentage of the milk, and he derives no benefit from it. Mr. Forsythe has been in the milk business for only a short while, if I understood him aright. I have been in the business for twenty years and I find that the more I feed my cows not only do they give better milk but a great deal more of it. [Applause.] I am benefited, the dealer is benefited, and the consumer is benefited, and everybody is benefited except the constable, who does not get my milk below the standard and get his fine. [Laughter and applause.]

Mr. Lippincott—I am not always in fear of being fined because my milk does not come up to the standard. Neither do I find it necessary all the time—and I have been in the business for fifteen years—to feed my cows during the summer. My milk is always ready to be tested. The Inspector was at Jobstown last summer when pasture was plenty and examined my milk, and he told the first party he met afterwards—a disinterested party—that the milk on the platform from every shipper would bear a test of thirteen per cent. [Applause.] If you can turn your cows out to pasture and the milk shows thirteen per cent. of solids there is nothing to fear from the Inspector when he examines your milk. I have known of no case where the milk has been found below the standard where the farmer has not put water in his milk in some way. Either the farmer did it or his hired man—it was put in in some way.

I have here a letter from Dr. Newton in regard to this milk question, an extract of which I will read to you. He saw my name in the paper and wrote to me. He says:

"I have so often noticed that those complained of for violating the milk law are very much impressed with the idea that the standard is too high, but I have also noticed that all future shipments from these people are far above that standard.

"Quite recently it became necessary to make complaints against farmers in Gloucester county for bringing watered milk to a creamery, and they one and all denied the charges, and the local paper printed a bitter attack on the law for oppressing the 'honest farmer.' But that paper did not say that each man came into court a few days

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later, plead guilty and paid the penalty, at the same time explaining *how* the water got in. I heard nothing, however, from the paper or those who said my course in bringing these men to justice was wrong, nor did they correct the former statement. Now, how am I to understand this method?

"I am free to say that very few farmers in our State would be guilty of violating the law, hence I am at a loss to account for their apparent indorsement of those who *do* violate the law. I find that the farmers in this section are the strongest supporters of the law and think that the standard is too low, and I agree with them.

"There may be a cow here and there that produces milk below the standard, but are we to take these abnormally debased milks as the standard with which to compare the pure milk of the rest of the State? Certainly not.

"The standard represents the average of the milk of common cows, and is far below the pure milk of commerce, such as we see all over the State."

I do not think it is necessary that this meeting should lower the standard to protect the farmer.

There have been many instances known where men have been fined when they were not personally at fault, and where their men have watered the milk. We have known of men on trains who have drank the milk from the cans, and then made up the deficiency with water.

Mr. Abbott—This matter of the responsibility of employers for the acts of their agents, it is true, cannot be avoided, but it is a civil and not a criminal responsibility. This liability to criminal action is what should be changed.

To illustrate, if a man, in driving along the road, injures another, kills him, perhaps, the owner of the team can be held for civil damages, but he is not criminally responsible, and cannot be held for murder.

Mr. Borton—I don't want to say anything before this intelligent audience, but should like to have some of these men who desire such a high standard of milk in connection with the milk law go through what I have experienced. On the 9th of last April I had my milk tested on the platform at the cars. The train was coming and I had to turn around to get my team away from it. A sample of the milk was taken while I was away. That milk was tested and brought in as better than the legal standard. On the 13th of April a warrant

was served on me showing me to be guilty according to the law. Knowing I was innocent I said I would not pay the fine, and I meant what I said.

That set me to thinking about the matter. I took some pains to find how my milk would analyze. My dairy at that time consisted of about two-thirds Holsteins and other grades, and the others were of common stock. I had one cow of Guernsey stock. I took a sample of her milk and a sample from one of the poorest of the herd, and sent it to the Experiment Station to be analyzed, and found there was a difference of nearly four per cent. The common-stock milk showed 10.51, and the Guernsey showed 14.40, though both were fed with the same kind of feed, in similar quantity and under the same conditions throughout. Then I took samples of the night's milk and morning's milk and sent that for analysis, and we found that the morning milk was much better than the night milk. The night's milk showed 11.72 per cent., and the morning's milk showed 12.34 per cent. That would bring the average about twelve per cent., but the Inspector in taking samples of milk does not look for the average, but takes the lowest he can find. The night's and morning's milk you cannot mix so as to get an average grade, without they are of the same temperature. In this way you can see how we are at the mercy of the Inspector, through the variation of the milk from different cows at the same time from the same feed, or the variation between night's and morning's milk from the same cow. You cannot regulate the matter.

Mr. Shreve—I am well satisfied that the milk produced in Camden county, from the best grade stock will fall below the legal rate of standards.

Some three years ago we wanted to make a thorough test on this question. I am not a milk-producer, and am not interested in milk, particularly, but this matter came under my observation. We appointed a committee of three to make twelve tests, each and every month in the year, and then have these twelve samples thus taken analyzed at the Experiment Station. They were analyzed every month. We exercised the very best of care, and the best of the cattle in Camden county were selected for the purpose, and we found at certain times in the year that those herds fell below the legal standard of solids, twelve per cent.

It is entirely possible that at certain times in the year these gentle-

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men are liable under the law for having their milk below the standard, without any guilt on their part, taking the pasture at a time when it is wet and washy and flashy. At such times it is probable and possible that their milk will fall below the standard, with all the care they can exercise, and they would then be subject, under the law, to this penalty.

It would seem the gentlemen from the upper part of the State have better ground, or better cows, or a better manner of feeding, than those in Camden county, and in the lower sections of the State. There is a great diversity of opinion expressed as to this matter of solids. Here is a gentleman from Cumberland county who says their cows are fed on gravel and stones and sand and fence-rails and brush [laughter] and other trash, and yet they always produce the required twelve per cent. of solids. [Laughter.] I would like to negotiate for all the cattle of that kind that can be found, and will guarantee a big price for them.

At certain times of the year we can run the per cent. of solids up to fifteen and sixteen, and yet at certain times of the year some herds will fall below, if not all of them. Some of the herds in Camden have varied from 11.5 to 15.5 per cent. during the year.

Is that right that all the farmers should be compelled to feed heavily to reach the per cent. of solids? Will it pay them to do this—to feed high in order to increase the per cent. of solids up to fifteen and sixteen per cent. of solids? Will it pay them to do this, when they are only paid for twelve per cent.? I don't think it will pay them to do this. If they sell milk pure from the cow, why should they be compelled to pay a fine, as having sold an impure article? Such a law is not just. The manner in which this milk is tested is against the farmer every time. It should be tested in the presence of the farmer himself, or in the presence of some one representing the farmer's interests, his hired man or his agent.

The milk when it leaves the farm may be pure—it may be up to twelve or even fifteen per cent. of solids—yet you ship it on the railroads, perhaps from Haddonfield, to go a distance of forty miles, and it may be tampered with before it comes to the station at Atlantic City; I have known this to be done. I have known them to rob the cans in this way on the railroad. I have known them to rob the can of twelve quarts of cream and then fill up the can with water. Yet that milk when it was shipped might have been above the standard.

What protection has a farmer in such a case? He is entirely at the mercy of the Inspector, on account of the actions of people over whom he has no control. I think the farmer or his agent should always be present when the test is made.

The Chair—I think this subject has been thoroughly discussed, and do not believe any more conversions can be made this afternoon, one way or the other, and think we should now call for the question.

Mr. Rogers—I move we call for a rising vote on this question.

The question being on the adoption of the resolution of the Essex County Board, it was *not* agreed to, by a rising vote of thirty in the affirmative and seventy-seven in the negative.

The announcement of the result was followed by applause.

Mr. Conrow—I now move that this State Board of Agriculture petition the Legislature to have the milk law so changed that the words “knowingly or willfully” be inserted, so that the law will read: “That every person who shall *knowingly or willfully* violate any of the provisions of this act shall be liable to a penalty of \$50 for the first offense, and \$100 for a second or subsequent offense” [applause], and that the petition be referred to the Standing Committee on Legislation.

Mr. Forsythe—I move it be passed without reference to the committee.

Mr. Conrow—I will accept your amendment.

The question being on the adoption of the motion of Mr. Conrow, as amended by Mr. Forsythe, it was so ordered.

The Chair—The next topic on our order of business is the “Protection of our Forests from Fires,” by Dr. Cook. I take pleasure in introducing to this State Board Dr. George H. Cook, of the State College, who is well known to nearly all of you. He will now address you.

Dr. Cook—I have prepared a paper to read before you and will not occupy too much of your time. [Reads.]

[See paper.]

The Chair—We have with us this afternoon a gentleman who will address you on this same subject—the Hon. John B. Lyman, of New Hampshire—who will talk to you on the subject of “The Natural Supply and Perpetuity of our Forests.”

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I take great pleasure in introducing to you the Hon. John B. Lyman, of New Hampshire. [Applause.]

[See paper.]

Mr. Lippincott—How do you know the age of a tree?

Mr. Lyman—I think you can tell by counting the rings.

Mr. Lippincott—Are you sure?

Mr. Lyman—I am not sure, but I am about as sure of it as I am of any mortal thing. I do not say that there have been no exceptions, but take your white pine trees and test it, and you know that the white pine will send out a set of limbs every year and at no other time. Go and count the rows of limbs and you will find the rings will correspond. I think that is generally true. I know some people have counted them and I have never known anything different.

Mr. Dickenson—I move that a rising vote of thanks be extended to Prof. Lyman for his able, instructive and exceedingly interesting address.

The question being on the motion of Mr. Dickenson, it was unanimously agreed to.

The Chair—The next subject on our programme is "The Study in our Public Schools of the Care and Culture of Trees," by the Honorable E. O. Chapman, State Superintendent of Education.

I have the honor of introducing to you Mr. Chapman, who will now address you.

[See paper.]

The Chair—I have been present at the meetings of this State Board of Agriculture for several years, but I cannot recollect an instance where we have ever had a subject brought before us deserving of so much attention. We know but little in regard to the subject of forestry, though it has been presented ably by the gentlemen who have spoken. We have three separate and distinct lines of thought on the subject; each ably represented by the gentlemen who have spoken this afternoon. We will leave here with three separate and distinct steps on this question, to think about, and every one of you will carry something with you to reflect upon and profit; some truth that will do you good, as thinking men.

I think we should extend a vote of thanks to these gentlemen, where it has not already been done, who have given us such enter-

taining, interesting and instructive addresses, and I move that Dr. Cook and Professor Chapman be extended the thanks of this State Board.

The question being on the motion of the Chair, it was heartily carried.

The Chair—The Hon. Mr. Lyman has a word more to say, with the indulgence of the Board.

Mr. Lyman—The difference between Mr. Chapman and myself is simply this: He follows the teachings of Plato, while I follow those of Bacon. [Laughter.] That is the only difference in our philosophy. He is a poet and I am only a farmer. [Laughter.]

Let me say that I, too, am a great lover of trees, as well as he, and I agree with his poetry about them, and all that.

Years ago I was courting a girl, and intended to marry her, and she had acres and acres of beautiful pines, and they were so beautiful I went more miles to see those pines than to court the girl. [Laughter.]

I am a great lover of trees, as I have already said, and I have about four hundred acres I am cultivating and they are as handsome as any I have ever seen. If you will come up to New Hampshire and see them I think you will agree with me, and if any of you have ever seen handsomer it is more than I have, and I have travelled a good deal and have never seen anything to compare with them. The difference between us is this: I used to believe as he does, and now I don't. [Laughter.]

I examined the figures and I am convinced. In 1620 the Pilgrim Fathers—and they were a most prolific set of fathers—[laughter] wonderfully so from the number of their descendants—they settled at Plymouth, Massachusetts, and the fourth year they were nearly dried to death, and had to pray for relief. [Laughter.] This was their experience, and they were settled in the biggest piece of woods, perhaps, on the whole globe.

Let me say further than that, that at the Smithsonian Institution, at Washington, ever since that institution was started, fifty years ago, there has been kept a record of the rainfall, and at Lowell, Massachusetts, there has been such a record kept since 1863, and at Albany for about one hundred and twenty-five years, and out in Kansas for twenty-five years, and I have given a great deal of attention to those figures, and there is not a single instance where they show that the cut-

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ting off of the forests has diminished the rainfall. As I understand it, there is not a single instance of such diminution of rainfall.

Now as to the Ohio and other rivers, I understand from Mr. Roberts, the civil engineer I referred to this afternoon, and who has the figures from a great many rivers in Europe, that the increase in the freshets and the low water of the rivers has not been marked—that there has been no change. I do not go by guess in this matter; I take the figures as I find them, and I suppose they are pretty nearly correct. That is the difference between what I have said and what my friend, the Professor, has said, and with all my eloquence [laughter], and with all his poetry, and with all his love of trees, I heartily hail him as my brother. [Applause.]

The Chair—We will be glad to have you all with us to-night in the Assembly Chamber, to listen to Col. Fuller, whom we have secured to entertain you.

Mr. Shreve—I move we adjourn until 8 o'clock this evening.

So ordered.

EVENING SESSION.

Meeting called to order at 8 o'clock P. M. in the Assembly Chamber, by Hon. Edward Burrough, President.

Mr. Burrough—As we have had so much of agriculture, the Executive Committee thought something in the way of amusement might not come amiss, and we have therefore secured the aid of Col. Fuller, State Superintendent of Public Instruction, to talk to you on what he "*don't know* about farming," and I take great pleasure in introducing that gentleman to you. [Applause.]

Col. Fuller then entertained the audience by humorous recitations and readings until 9 o'clock, when the Board adjourned to meet at 10:30 o'clock, in the Supreme Court room, to-morrow, Friday morning, February 3d, 1888.

MORNING SESSION.

FRIDAY, February 3d, 1888.

Board called to order by Hon. Edward Burrough, President, at 10:30 A. M.

The Chair—The first business in order will be the reports of committees. Is the Committee on Credentials ready to report?

Mr. Williams (of Committee on Credentials)—We will report progress.

The Chair—I will call for the Committee on Legislation.

The Secretary—As that committee is to be a standing committee, Senator Roe requested me to forward all such bills to him. We have a bill for the Meteorological Bureau, and that in regard to weights and measures, and that in regard to the insertion of the words “knowingly or willfully,” in the milk law, and he has the bill in regard to pleuro-pneumonia. The Board has approved these, and they will be forwarded to the committee to take before the Legislature.

The Chair—Is the Committee on Reports of Officers ready to report?

Dr. Combs—Your committee beg leave to report that they have examined the report of the Executive Committee, the President’s address and the resolutions from the Committee on a National Board of Agriculture, from all of which it appears that the formation of a National Board would be desirable. We recommend that this matter be placed in the hands of the Executive Committee of this Board; that they, by correspondence with the Boards of Agriculture in other States, may ascertain the best way of getting before Congress a bill creating such a National Board.

We feel that the thanks of this Board are due the Executive Committee for the steps it has already taken to secure proper accommodations in the new building, and are confident that, by leaving the matter entirely in their hands, for such future action as seems best to them, the best interests of this Board will be promoted.

We also notice with pleasure that part of the President’s address which refers to the protection of our farm products. We hope this Board will take steps to memorialize our Senators and members of Congress that in making any changes in our revenue laws, they

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should *increase* rather than decrease the duties on all raw materials produced in this country.

(Signed)

W. S. COMBS.

H. TRISCH.

J. M. WHITE.

Mr. Shreve—I move that the report be concurred in as read.

So ordered.

Mr. De Cou—There has been considerable labor expended in getting ready for our report, to bring it in the condition it is now, although it may not seem so, and I think the committee should be authorized to take some definite action in the matter without delay. As it is now, that resolution offered by the committee is virtually destroyed.

The Secretary—This report of the Committee on Officers' Reports is favorable to your recommendation, and it simply goes into the hands of the Executive Committee, with the recommendations of the committee just reporting, and I would now move that the Executive Committee be instructed to take steps towards carrying out the recommendations of the President, the Executive Committee and the resolution as offered by the Committee on National Board of Agriculture appointed last year.

The question being on the motion of the Secretary, it was agreed to.

The Chair—We will hear from the Committee on Exhibits and Models, if they are ready to report.

Mr. Voorhees—We offer the following report :

Report of the committee on articles and samples of farm products, on exhibition at the State Board of Agriculture sessions, held at Trenton, February 1st, 2d and 3d, 1888.

Coffin's Automatic Milk Aerator and Cooler, a machine with a refrigerator attachment, which forces a constant stream of cold air through the milk, to remove the animal heat.

It is claimed that it will remove all the animal heat, all odors, and taste of garlic, rag weed and other foreign matters. The committee would recommend it for trial to the dairy farmers.

A fine sample of York Imperial apple, a variety we would recommend for general planting in orchards, exhibited by Charles B. Horner, of Mount Holly, N. J.

Also some fine white potatoes, called the Eastern Star, exhibited by same party.

A very fine, large sample of potato, called the "Grampian Seedling," exhibited by Maurice B. Elton, of Woodstown, N. J. Would especially recommend for trial.

A nice sample of greensand marl, exhibited by Kirkwood Marl Company, of Camden, N. J.

A sample of Crown Jewel potatoes, exhibited by Thomas D. Brown, of Clarksboro, N. J., grown from new potatoes planted July 15th. Very promising.

A nice sample of yellow seed corn. Exhibitor not named.

Col. A. W. Pierson, of Vineland, N. J., exhibits a number of photographs and description of a machine for spraying plants, an improvement on the French machine for applying poisonous liquids, &c., and the committee would recommend it as an appliance of especial value to farmers and fruit-growers.

(Signed)

THOS. BORTON.

WM. R. LIPPINCOTT.

D. C. VOORHEES.

Mr. Shreve—I move the report be accepted and the committee discharged.

So ordered.

The Chair—In regard to the last exhibit mentioned in the report of the Committee on Exhibits I desire to make a personal statement.

During a visit to the Cumberland County Board I had the pleasure of meeting Col. Pierson, to whom had been allotted by the Agricultural Department a sprayer for the spraying of vines and vegetation, or any vegetable product infested with insects injurious to growth. This sprayer was a novelty, and something not yet introduced in this country, there being but three of them in America at that time, one of which had been sent to Col. Pierson for trial. I suggested that he bring it before the State Board of Agriculture at this session, in order that the gentlemen present might see and examine the machine, and know if it might be of any use to the farmers and fruit-growers of this country. The machine is of French manufacture, and, as said before, is not in use in this country, except as an experimental machine.

On this account inventors have been asked to bring models of agricultural implements and machinery, to aid in field or other work, to this session, for examination. Mr. Coffin has also responded with his aerator, as has Col. Pierson with this sprayer.

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This French machine, when subjected to Yankee scrutiny, has been found susceptible of improvement in several ways, and this is the reason it has not been brought before the Board. I do not wish to rob Col. Pierson of what he may wish to tell you about the machine, as he is here to speak for himself and for the machine, and we will hear what he has to say.

I take pleasure in introducing to the Board Col. Pierson, of Vineland.

Col. Pierson—I am much obliged to the President for his preliminary introduction to what I want to say.

I have here a few photographs, which are a fair representation of the machine as imported for my use. I got it last spring, and after I got it in use Mr. Webber, of Vineland, a machinist, remarked that he could beat it all to death. I told him to do so as soon as possible. He has succeeded in making many improvements in it, and this new sprayer we call the “Eureka” sprayer. The principal difference between this machine of Mr. Webber’s and the French machine is that Mr. Webber has made his with a brass pump and a brass cylinder, and it is a regular double-acting air-pump. Mr. Webber guarantees it to last two or three years. The French machine is what is called a vacuum pump. The bottom of the valve is made of rubber, and I found that use had worn it out before the season was over. Both the iron cylinder and the rubber wore out, making the machine of no value.

[Col. Pierson then explained at length the working of the sprayer, describing its parts, &c.]

A Member—At what expense can the machine be made and sold?

Col. Pierson—We don’t know exactly; probably for \$12 or \$13.

A Member—Has he applied for a patent?

Col. Pierson—He has applied for a patent, and is informed that it will be granted. As soon as he gets his patent he will get capital and will manufacture the sprayers by machinery. I think he said this one machine cost him about \$100 to build. He is now making four or five on orders from grape-growers. Probably by next summer he will have the appliances ready for the manufacture of the sprayers in larger numbers.

A Member—How is it operated?

Col. Pierson—It is a hand-sprayer, having a couple of straps passing over the shoulders, and it is worked by a lever which passes

under the right arm. If you work the lever you have a pressure of air, and this forces the contents of the sprayer out in the form of spray. It makes twin sprays and it has a cyclone sprayer, though the single jet may also be used. With the cyclone nozzle the stuff can be thrown six or seven feet. It cannot be thrown much further, for it breaks it up into spray or fog. I also find it very useful in spraying potato vines with Paris green.

Mr. Forsythe—In putting Paris green on potato vines how do you manage where the vines are small or far apart, without wasting as much on the ground as you get on the plants themselves? The trouble would be that you would get ninety-nine per cent. on the ground, and the remainder only on the vines. [Laughter.]

Col. Pierson—That is one of the improvements made by Mr. Webber; it has a valve which stops it off until you get to the next hill.

A Member—I wish to offer a resolution:

“Resolved, That the State Board of Agriculture recommend that in the taking of the next State census the officers performing this duty be instructed to take account of the number of fruit trees, vines, &c., in order that they may be enabled to furnish official information on the inquiries contained in a recent circular of the Department of Agriculture of the United States.”

The Chair—If there is no objection offered, it will be received and referred to the Committee on Resolutions.

Is the Committee on County Board Reports ready to report?

Mr. Haines—Mr. Griffin was obliged to leave early this morning and he left the report with me to be signed, and I failed to find the balance of the committee. I will read the report if desired:

We, the committee appointed to examine the different County Board reports as presented, have done so as far as they have come before us, and we respectfully report that they appear to be full and concise, and we recommend their adoption as presented.

(Signed)

VAN BUREN GRIFFIN.
HENRY P. SIMMONS.
THOMAS ARMSTRONG.

Mr. Voorhees—I move that the report of the committee be concurred in.

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So ordered.

Mr. Bacon—If in order, the committee appointed to audit the Treasurer's report, would like to report.

We have audited the accounts and find them correct. The balance on hand is \$13.97 in the hands of the Treasurer, and we have vouchers for all bills paid by him. The receipts amount to \$4,158.34, and payments with vouchers attached were made to the amount of \$4,144.57, leaving a balance of \$13.97 in the hands of the Treasurer.

(Signed)

WM. R. WARD.

M. BACON.

The Chair—If there is no objection the report will be received and printed in our annual report. So ordered.

Mr. Ege—We have a further report to make as Committee on Resolutions. We would report favorably on the resolution in regard to the census of fruit trees and vines, and recommend its adoption.

A Member—I move the adoption of the resolution.

Carried.

The Chair—We are now ready for the discussion on changes in the road laws. We would like to have some one offer a resolution on the subject, to bring it in proper shape for discussion.

Mr. Haines—I will present the resolutions offered by the Camden County Board, on the road laws. These resolutions were adopted by two associations.

[See Camden county report.]

Mr. Meredith—I was a member of that association when the resolution was passed there. I look upon it this way: Most of our roads are for the travel of people other than ourselves, and I think we should have help in keeping them up. In our county we have eight road districts, and we appropriate from \$1,500 to \$2,000 a year to keep up our roads. This money is apportioned out in the different districts, and some of them are very thinly settled. In some districts they get several hundred dollars, and in others there is not more than \$50 or \$60 appropriated. The Roadmaster is elected in some townships by the township committee. Haddon township abolished the election of the Road Overseer. In Stockton township the Road Overseer is elected at the regular township meeting. In Chester I cannot say how it is. Neither can I say how it is in Evesham. In

my own township it is thrown into the hands of the Township Committee. In my judgment I think we had better let things alone as they are.

Mr. Forsythe—We have already a multiplicity of laws on this subject, and a multiplicity of ways of caring for the roads. In our township we raise from \$1,500 to \$2,000, and this is apportioned out and divided up among the different Roadmasters, and it goes here and there and everywhere, and very little of the money so appropriated ever gets where it was intended it should go—to the repairs of our roads. [Laughter.] It goes into the pockets of those handling it, and the roads derive but little benefit from the money appropriated. The work is done only here and there, and amounts to nothing. We should have but one Overseer, and the money should be concentrated, and the work done should be well done, and then next year another piece done, and so on. This way of doing a little patching here and a little patching there is of no account, and it is money virtually thrown away. If this plan of doing a piece of road each year well could be followed year after year, we would, eventually, have substantial and well-kept roads to travel over.

There should also be method employed in the election of suitable and proper men for the supervision of the work done on our highways in place of the incompetents who are now placed in charge. Under the present system the men who get the positions are those least calculated to improve the roads under their charge, and the money they expend is in great part wasted—in fact, they are not only the least qualified men to spend this money, but they are of the class who do least to pay the money. I know this from long experience.

These Overseers take a road scraper and three or four men and six or eight horses, and go up and down the roads when it will do the least good, and stop and get a drink, and do as they please, resting or loafing when they feel like it. What does the Road Overseer care, so they vote for him at the next election? That is the usual practice of improving the public highways. I say the entire matter should be placed in the hands of one individual in each township, and let him take one piece of road and spend the appropriation on that one piece of road, and make an impression, and then next year the next piece of road, and so on until the entire township road is covered—that is the only way you can get the worth of the money expended.

The Secretary—I think there are few subjects of more vital interest

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than this road question, and it is one that should have the most thoughtful and earnest consideration before we pass it.

At, I think, the first meeting of the State Board of Agriculture I attended, I was appointed, together with the President, on a committee to report the following year on the road laws, and we started in to see what the road laws were, and the more we looked and the more we read the less we were able to find out and the more confused we became, and we were finally obliged to report that we did not know what the present road laws were. Most of the laws were made in the days of special legislation, and others under no general law, and we found there was much variance in these laws throughout the State.

I presume there is no department of public work in the State in which more money is absolutely wasted than in this matter of the care of our roads. As Mr. Forsythe has just stated, it is generally expended in a very foolish manner, and without any regard for the benefits which might be obtained from the money thus expended. There appears to be but little benefit obtained, except for the man's political position, or something to cover that. In our township they have a law or a regulation, established by our town meeting, that where the inhabitants along a certain line of road contribute a certain sum of money for repairing the roads, the township will contribute an equal portion, as in the case of graveling a road. By this means we have been able to get over a good many of our roads with gravel, and have secured very fair roads throughout the township.

We have had some noble roads—as the Burlington and Jacksonville turnpike, for instance. It was piked by a company, but, at the request of many of the farmers, it was given up as a pike and made a public road. Immediately afterwards the inhabitants contributed a large sum of money and graveled the road throughout. It cost \$2,000 to give it a good coat of gravel. With proper care this would have lasted for many years, and would have been an excellent road always. The proper scraping should have been given it and the holes should have been kept filled up, but the care makes all the difference in the world. The road had the reputation of being one of the finest, if not the best in the county. Many people out for pleasure driving would take that road as a part of their drive on account of its excellent condition. During the last two or three years the road has been almost ruined through lack of proper care and attention. For instance, during this present year—that is, the year

just passed—there was no scraping done on the road until it got so dry that the scraper made no impression, and then the Overseer took his double team and ran over it, and did nothing but drag the stones to the surface to wrench the wheels; and then, during all the little rains we had he never went near it with the scraper, when it would have improved the road and saved it considerably. Then there was no more scraping done until the road froze up. The result was that the road got no good at all from the scraping. I mention this to show the lack of wisdom used in the care of our roads—the lack of common sense, I might say.

The material in different parts of the State is so different that it is a difficult matter to formulate a law that will cover all portions of the State. I am satisfied, however, that a law could be constructed that would be satisfactory to all parts of the State, and we should try to have such a law. There is no doubt but that much money could be saved in the construction and care of our roads.

We have an article in the Union county report, a very ably-written article, too, on the care and building of roads. It is not very lengthy, and if it is the wish of the Board I will read it to you.

[The Secretary here read an extract from the Union County Board's report (which see) on the care and construction of roads.]

The Secretary—I was much surprised to find recently that all the good roads on the outskirts of Philadelphia were made from stone coming from Jersey City. I refer to the new roads lately constructed. It is quarried in Jersey City, broken and brought to that point on cars. It is quarried in Bergen Hill, where it is also crushed. I supposed it all came from the immediate neighborhood, of course.

I might also add that these good roads along the line of the Pennsylvania railroad west of Philadelphia, are due to Mr. A. J. Cassatt.

Country roads were run originally by men totally incompetent, in many cases, and Mr. Cassatt accepted the position of Road Overseer and started a great reform in the road-making in that vicinity. I do not know whether he is still in the position, or how long he kept it, but he has made that whole region what it is to-day, and where all was farms a few years ago, which could be bought for low prices, to-day the prices received run into the thousands of dollars per acre. Good roads had a great deal to do with it.

I sincerely hope this Board will to-day take some action that will lead to a revival of the road interests.

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Mr. Haines—I would like to read an extract from the State report on page 231.

[The Secretary here reads from page 231 of the State report for 1886, as follows]:

[See report.]

The Secretary—That would meet the wants of our township as closely as anything that could be devised, I think. Whether it would answer in other parts of the State we would soon be able to find out in a gathering of this kind, where we have so many representative farmers from all parts of the State.

I have always contended that instead of electing Road Supervisors we should abolish them and apportion the road, as suggested by Mr. Lanning, to parties competent to take care of it. They are constantly traveling over it and know just what it wants in the way of repairs or improvements, and can repair a bridge, for instance, for \$1, that now, with the present arrangement, by the time the Supervisor, who lives in a remote corner of the township knows of it, and repairs it with his men, will cost a matter of \$10 or more to repair. I don't suppose our Road Overseer goes over the road more than once a year, unless it is when the holes get large enough to bury a wagon or horse almost, and then he fills them up.

A man repairing the road along which he lives can certainly save the township a great deal of money.

A Member—I would like to ask if it would not be better for the Township Committee to make that inspection instead of the Road Supervisors, and see what money should be expended, and not open the door for the Inspector or Supervisor to be dishonest.

Mr. Forsythe—In looking over this report of Mr. Lanning, in the third section I find something that I should certainly offer very grave objections to. I think when the matter is brought to the attention of farmers in this room who are taxpayers they will at once see the importance of this objection. In the third section [reads]: "It shall be decided by a plurality of the votes cast." In the township in which I live the amount of road tax must be raised by a plurality of the votes. Who casts these votes? Not the men with the money to pay it, but the men who don't pay one dollar. In this way they can vote \$10,000 or \$20,000 of road tax—no limit whatever to the amount they can vote—and those who have property

have got to pay it, not the voters who vote for it. There should be a limit placed to the amount which this plurality of votes cannot exceed, else we have no protection. These men who form the majority of voters don't care anything about the roads; they have no horses and wagons to drive over them, so what need they care? All they care for is to vote money to give them plenty of easy work.

The Secretary—Is not that regulation referred to the one in operation now?

Mr. Forsythe—Yes, sir; but it would be worse now. You would make of this Inspector of Roads a fine political power; you would give him unlimited political power under the proposed change. He could expend what money he liked on this class and buy them to vote for an unlimited appropriation each year, in order that they might have work which would pay them well. They would do about a quarter of a day's work and would be paid for a full one—would be paid for sitting under the fence. They could work when they saw fit, and the Inspector could not say a word. I want their work regulated, too. They draw money out of your pocket and into their own, for which they have not done half the work they should. Place some limit on the amount that plurality vote may amount to, or else we will be completely at the mercy of this class of men. The voting should be done by those who pay the taxes, and not by those who never pay a dollar of it. In the township in which I live there are more than four hundred floating votes out of a total of six hundred and fifty. In every town meeting there are twenty who do not pay their poll tax to one man who does. Think of the power you are giving this class of voters. They are always found deficient even in their poll tax. How nicely they can vote appropriations which they don't have to pay.

Take it at the town meetings when they vote for the appropriation to the poor. Who are the poor? They vote for appropriations for the poor and then they vote that "We are the poor," and they get the appropriation. [Laughter.] They get it, too. They are the poor, because they won't work. You can't hire them to work, and then when winter comes they come forward and ask for relief from the township, and they get it, too. The politicians usually give it to them, so they can have their votes when they want them.

These poor people will vote any amount of money they see fit, and

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it is well worth while considering this question carefully before you place this power in their hands.

The Secretary—Of course the object of bringing this up is that we shall discuss it thoroughly and a full expression of opinion had, and then it should be placed in the hands of some one to formulate. It is certainly not an easy question to solve. There are a multitude of questions to be considered. Simply because we have taken it up is no reason that it should be considered anywhere near perfect—not by any means.

I was simply referring to one section of the recommendation in relation to the care of the work, and Mr. Forsythe has made a very good point in regard to the third section, which really is a great drawback to our present system of town meetings. It is much abused now, as he says, and we should consider the matter very carefully and see that we do not make the mistake of recommending something even worse than the present system.

Mr. Lewis—Middlesex county came to this Board seeking redress from the Freeholder system. We learn, to our surprise, that in some parts of the State there is a very economical arrangement which they have with their Freeholders. I now learn from Mr. Forsythe that their great trouble is with their Road Overseers. I reside in a township which has lately been organized. We don't know what law we are electing Overseers under. Originally one township had one law and another another law. Our authority advises us to elect by township and not by road districts. We have made considerable advance in the improvement of our highways. In the last six or seven years we have adopted a system something like this: The Township Committee allows no filling material to be hauled on the roads after the first of July, except in case of emergency. We have commenced to turnpike our roads, and we take the roads that have the most travel on them and construct them first, and this is kept up until the district is improved, until now we have several districts nearly turnpiked. I am in favor of a general law on this subject, because I believe it would be for the benefit of our roads, and that if properly made much money could be saved to the taxpayers.

In section 10 there is, I think, quite an error in the matter of paying bills by the Township Treasurer. We now let our Collector pay the bills, and take it off the farmer who owes the tax, and his bill

against the township for work done on the road is allowed to be taken off the bill of his taxes.

Under section 10 he would have to pay his tax and then draw the money he had earned from the Township Treasurer. This would often be a serious inconvenience to the Collector and to the farmer as well. This is all the objection I see to Mr. Lanning's suggestion.

Mr. Voorhees—It seems to me this is a very important subject and one we should consider very carefully before taking any definite action. The farmers want to save themselves, their wagons and the traveling public. They reason this way: we pay this tax, we raise this money, and it is our money and we are going to work it out among ourselves. If we squander it, it is ours, and it's nobody's business. I know the money is generally squandered, you know it, we all know it. An Overseer is generally a farmer. He is selected from among the farmers, by the farmers, and he has his farm work to do and will do it in preference to working on the road. On days too wet to work on the farm he goes to work on the road, and the road is muddy and the ditches are muddy, and he plows up the road or the mud and does more harm than good. I have seen them working on the roads when there was as much water as dirt in the scoop; that road afterwards is as bad as before in two days' time.

The only way to get at this matter is by the enactment of a State law, which should be that each township should be provided with an Inspector of Roads, and that should be his business, his particular business, and he should attend to that and nothing else, and should receive a fair compensation for his work. I claim that this should be done, and I will tell you why. Because if you get a live man who understands his duty he will employ men to do the work thoroughly and at the right time—not only a common day's work, but a full, reliable day's work, and the work would be done at the time and in such manner as it should be done. He would make his men and teams do an honest day's work, just as a contractor on a railroad would do. He would get honest work and the money would count where it was spent. The roads now are divided up into three miles to a section—in Somerset county, at least.

In the township where I live we generally raise from about \$1,800 to \$2,000 for our roads. I do not believe that out of this money there is actually \$600 worth of honest work put on the roads in a year. I do not mean to say our township is any worse than others.

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This seems to be the trouble all over the State. If I had to make good roads I would have a competent man to look after them. Take a man who understands how to build roads, and he will soon show you good roads. Care must be taken, too, or you will make a political ring when you come to get into working order. There should not be any politics in the road question at all.

The only way you can do is to enact a State law compelling townships to have a Commissioner of Highways to look after the roads and give his whole time and attention to them, and I can assure you that less money will be squandered than now, and you will have better roads.

Now, so far as the political aspect is concerned. As the gentleman has said, people will vote a large amount of money for the roads. This change won't make any difference. The only thing is the people must turn out at the primaries. There is the trouble now ; many people say " I never saw such work as there is done in our township," but they won't attend the primaries. Those men who are looking after the politics of the township turn out in full force and run the whole caucus, and you who stay at home have got to foot the bill.

If you have this Commissioner of Roads he is under the control and under the watchful eye of the people, and he can't get clear of the responsibility of bad roads, and the result is your roads will be much improved.

Mr. Fowler—I think this matter a very important one, and also think there are many townships in the same condition as our road districts. Take the suburbs of our villages, and they really hold the balance of power among the voters. This class of people neither pay the taxes nor use the roads, and it is a continual put whether the Supervisor shall come from among that class of people or from among the farmers. I think the Township Committee should appoint a man who will make a good Supervisor. This would work well generally, and some one in the interest of the taxpayers should be appointed, one with the interest of the road in him, too. There are other districts of the same kind in the same difficulty. Many times we have had our Overseers appointed from the class of people who have no interest in the roads and who care nothing about them. They should be men who would not only repair the roads, but they should improve them as well.

I think the suggestions of Mr. Lanning are good ones and that they should be embodied in the law.

Mr. Nicholson—I think if the Overseers of the Roads were abolished entirely it would be a step in the right direction, in economy especially, and if the Township Committee then had charge of the roads, either by appointing the Road Overseer or letting it out by contract, it would be a much better and more economical way. Many of us here have seen the Overseers working with one cart and one man at the bank to shovel in the dirt and the driver to drive it away and level it off. Every one knows that that is not an economical way of working; it is a very expensive method and one which would not be followed by any one working for himself.

If the Township Committee had the right to district or lay off in sections that part of the township roads requiring particular care, and then let that part out by contract, and have some one look after the work and see it was well done afterwards, those persons living on that part of the road and using it most would see that the most work was done for the least money, and they would be likely to take the contract themselves for, perhaps, twenty-five per cent. less than it now costs by having the work done by the Road Overseer.

I know a great deal of money is wasted in our end of the State by work done in the wrong time of the year. The township committee should say when the work should be done, and whether by the nearest farmer, or some one else, and the work could be done well and properly in this way.

No money pays better than that invested on our roads, and with a little judicious management our roads could be put in proper shape, and kept so. Farmers would often contribute their teams without charge for working on the roads, the township committee paying for the loading of the wagons, and where such a disposition to have good roads is shown there is no danger that the township will be imposed upon, for every one would see that the Overseer did his work honestly and well, and with the least possible expense.

Mr. Duvall—A great many say that the law giving the Township Committee a stated amount to repair the roads should be enforced. I don't see how you can get at that, unless you do so by fixing it at a minimum of percentage of the taxes raised, otherwise you will force certain townships and counties to raise their appropriations; as Mr.

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Forsythe has well said, better than I can say it, unless some limit is fixed they will raise it far beyond their needs.

If the law were to fix a percentage that should be the proper amount of taxes to be raised I think that would be a fair way to do it. This would be about in the proper proportion in most districts. I don't see any other way you can get at it. A special law, even it were possible to have one, would botch this in some sections and would not fit in others. One advantage it has, it can easily be increased in any large territory where the road is not needed quite so good, or where the wealth and material are not there to make the roads. This Board should take this into consideration before deciding.

Mr. Crane—The matter before us, as has been well said, is one of great importance to us as farmers and taxpayers. This matter of appropriations has been very much abused in some townships. I will give my views in regard to the matter according to the workings in our township.

Three years ago a vote of the township authorized the acceptance of the law which provided they could elect the Overseers by districts instead of by township ticket. They availed themselves of that provision of the law to redistrict the township. We had fifteen districts in the township at that time for about forty miles of roads. The consequence was that it became a serious matter to select the Overseers for these different districts, and it became a matter of such moment that it was almost an Overseer for each man's farm in some instances.

I was one of the Township Committee at that time, and am still. We districted the roads off into three districts, instead of fifteen. It created quite a hubbub among those petty Overseers, as I may term them. After these Overseers were elected we appropriated the money to buy patent road scrapers, and I venture to say that since then more work has been done with the same money in these districts than for a number of years before that change.

So far as the appointment of Overseers by the Township Committee is concerned, as has been stated, there is some difficulty, but whether you have Supervisors or Overseers I am certainly of the opinion that roads can be much better and more cheaply worked in large districts than in small. In large districts the road scraper should be used, as an immense saving can be effected with these machines, as compared with the use of the scoop in the petty districts.

It had become an abuse in our township, so that people were unwilling to pay the taxes unless the money was properly expended.

I hope something will be done by which we may be able to attain a better system of road-making and repairing for the amount of money raised. It seems to me that so far as the appointment of the Road Overseers by the Township Committee is concerned, in some cases, I think, it would be a matter much more difficult to attend to to the satisfaction of the people in the districts.

Mr. Shreve—We are not very well satisfied, and have not been in our township for several years, with the manner in which the road management is carried on. We elect there two Overseers in two districts. Our township is small and pretty thickly settled. The present manner we would like to see changed, if possible. Almost every township is working under a different law. There appears to be some thirty or forty of these laws which govern the making of the roads in the State of New Jersey.

In my judgment the suggestions made here by Mr. Lanning for a new road law, covering the entire State, would come nearer to filling the bill than anything else we may be able to agree upon. We ought all to agree upon some line of action or some recommendations here before we leave this subject, for it certainly is one of vital importance to farmers in many ways. I have no doubt there could be a general law passed that would cover all the townships of the State, though there are many essential points of difference.

This third section, which Judge Forsythe took exception to, is, I think, one of the most important in the entire bill. I agree with him there should be a limit placed on the amount of money that can thus be raised by the plurality vote. I know in our township they can vote what they please and it must be paid. They can wrong the taxpayers whenever they feel so disposed, and it is often done.

This limit should be fixed by a certain percentage of the amount of taxable property, and this amount should not be exceeded. If something of this kind were adopted instead of the third section, as suggested by Mr. Lanning, I think it would be satisfactory throughout, and we could all agree upon the others. I feel sure there is not a man in our county but would be very well satisfied with such a law. The Township Committee should appoint the Supervisors and should have control of them and of their work.

Mr. Haines—The gentleman who last spoke has partly relieved

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my mind of what I wished to say, as he comes from the county or from the township where I formerly lived for fifteen years. During the greater part of the time I lived in the township the roads were under the care of the Township Committee by special legislation. Since I have left there I understand they are now elected by districts.

The township I live in at present, and where I have lived for the last seven years, gives the management to the Township Committee. They have no Road Overseers. This is thought the better way, and then the amount to be raised for road purposes is suggested by the Township Committee in whatever amount they deem necessary. This plan, I think, is quite satisfactory as having the amount decided by a plurality of votes, or a percentage of the tax raised. If the matter is left in charge of the Township Committee they can tell very nearly what amount will be necessary for the repairing of the roads the next year, and they are in a better position to judge what the proper amount will be.

Mr. Kelsey, Secretary of State—I have listened to this discussion with a great deal of interest.

The same difficulties which have been portrayed by the preceding speakers from different parts of the State exist in our county also. I have the honor to speak for one of our counties, although I do not now reside there—the county of Sussex. The question is a burning one, and has been one of the most difficult problems the people have had to encounter for years, and perhaps it never will be settled satisfactorily. It is a little like the tariff question—it will always be one for discussion.

The present road law is undoubtedly just about as bad as can be devised for the townships, and neither does it work much better in the cities. These difficulties exist in this city also; although they have a different law and are under different regulations, yet there are almost the exact conditions of affairs prevailing in this city, where the Superintendent of Streets employs his own men, at his own time, and does the work as he pleases and when he pleases. The law cripples the work of the city, and, to a very great extent, cripples the work in the country districts and in all parts of the State. In this city the Superintendent of Streets comes along and scrapes the filth out of the gutters into the middle of the streets, making them every time a little worse than before. He goes about the paved streets with his gang of men and has the accumulations of dirt shoveled and swept

up into piles and it lies there for days and days, to be scattered again by the wheels of wagons and by the feet of horses, in every direction.

We all know that the existing system might be remedied, but to my mind the proper system has not as yet been suggested by any of the speakers this morning.

The gentleman at my left, who spoke a few moments ago, criticises the third section of Mr. Lanning's proposition, and very properly, too, I think, and that is in regard to the amount of funds to be raised at the town meetings. That, however, can be very readily provided for by some fixed limit, as has been suggested by the last speaker, or the one preceding me. His suggestion was that the Township Committee should fix the maximum amount to be raised, or that the total amount of taxes raised should be considered and a maximum percentage of this amount taken and applied to the road work. That is, the total amount of the taxes raised should be the basis of the road appropriations.

The remarks of the gentleman from Somerset were pertinent, but I think he fell into the same error, or into the same difficulty, as some of the others. The same difficulty surrounds his suggestion in regard to the election of the Supervisor by the town meeting as upon the question of the raising of the road-money. The same element which would vote the road-moneys would elect the Road Supervisor, and they would undoubtedly elect a Supervisor from their own class, and therefore the remedy suggested would, I think, be no remedy at all. I think it would be entirely without avail as a relief.

It strikes me, Mr. President, that the true solution of the difficulty would be to leave the matter in the hands of the Township Committee. Let them look after these matters, and I feel sure they can see that the work is properly and economically looked after. Let them do the work by contract as much as possible. Let them advertise for proposals for the work, and let the work be given to the lowest, and best, and most responsible bidder. Divide the townships up into road districts, and then let them advertise for proposals for the work, either by the job or by the day or by the hour. Of course there would be a great deal of detail to be worked up by the proper committee, but it could be done, and the results, I think, would be much more satisfactory.

The committee of this Board could evolve a law which would, without doubt, meet with general satisfaction, and which would be

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acceptable to all parts of the State. Let the work be done by contract, by the hour or by the day, or as may be thought best, and let it be understood that it is to be done at the proper time of the year, and not on wet days, or as it suits the convenience of the Supervisor, but the work to be done promptly and properly and when it is needed and will do the most good. This should be guarded against, that the work may be beneficial when done, as suggested by the gentleman from Somerset. And just here let me say that it is unfortunate, for there are a great many of our farmers who, when they cannot work at home on the farms on account of the wet weather, are glad to get some outside work to do, because they think there is nothing they can do at home, not even at home in their barns. If they cannot get a job on the roads they spend their time at the village stores or at the country blacksmith shop, instead of doing plenty of work waiting to be done around their farm buildings and homes.

Now, in regard to this question of supervision, I think we should leave the matter in the hands of the Township Committee, as has been suggested.

Let them advertise for proposals for the work, to be done by the hour. If a farmer desired—and I think it is probable that many of the farmers would be bidders for the work—I think this plan would induce substantial farmers to take hold of the matter, and they would, with their own teams and with their own men, do the work, bidding for it at low and satisfactory prices. If the work was given to this class of men they would do it well and satisfactorily. If they did a job requiring only a few hours' work it would only be necessary to pay for the actual time worked, and they would not work a whole day on the job when a few hours' work would be all that was necessary. If it was necessary he could work a day, or a half a day, or a quarter of a day on some section of the road requiring repairs in his district, and before going to work he could let the Township Committee—a single member of the Township Committee would be sufficient—he could let him know he was going to work at a certain hour. Then let that member of the Township Committee see that he really did go to work, and then let him certify to the bill of the party who did the work. In this way there would be a check on unnecessary work, and there would be some reasonable guarantee to the taxpayers that the time they are paying for has really been worked. I can speak

from experience in regard to the willingness of farmers to do this road work, and as cheaply as it can be done. In my own case—and I have been a farmer all my life, and I say it with a great deal of gratification [applause]—there has not been a time in all the years I have owned a farm when I would not have been willing and glad to have made a bid for this kind of work, and bid lower than most people would for the work on the roads in my neighborhood, in my township.

I have suggested, and my farmer has suggested, to the authorities in my township in Sussex, repeatedly, that I would take charge of a section of road leading through my farm, and that I would do it at lower prices than they could do it. Of course there was no authority in law for a transaction of this sort in our township, and of course the authorities—the committee—could not entertain such a proposition. The present system should certainly be reformed.

In almost every community, there are plenty of farmers, or men living on small places—jobbers, we might call them, and who could not properly be classed as farmers, men who keep teams for hauling for themselves and others—in almost every community there are plenty of these men who would be glad to take the contract for doing the work on certain pieces of roads in their district, but I think, as a rule, the substantial farmers in a district should take these contracts, and keep the roads in their own township in good condition. The work necessary would amount to but little and could be done with much less expense than ordinarily. Under the present system there is an immense amount of waste, and I think much of this could be saved by the change suggested. If substantial farmers were to take these contracts they could oftentimes do all the work with their own men and teams, but if it was necessary to have a larger force than they themselves could muster, they could call on their neighbors and they could furnish additional men and teams to assist with the work.

I think the true solution of that troublesome and serious road question, which so much embarrasses us in all parts of the State, is, as I have suggested, by placing the matter in the hands of the different Township Committees. I, for one, would be very glad to co-operate in securing such amendment to the road laws—to secure a complete revision of them, doing away entirely with the multiplicity of laws now in effect in different parts of the State, and formulating one

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general law which, I think, could be made acceptable to all. There are very many laws now—I forget how many there really are, but they are very multitudinous. These are very embarrassing as they are. There is scarcely a man in this room, and scarcely a lawyer in this State, unless he has given the matter the most careful attention, as Mr. Lanning seems to have done, who can tell you exactly what the law is for different localities in regard to the maintenance and improvement of our roads in this State. The whole subject should have careful attention. That is the belief we have started on, and we should pursue it to some definite understanding of what will meet the wants of the community. I am very glad to see that this State Board is giving it such earnest attention.

The discussion here has taken a wide range and will certainly end in useful and satisfactory results.

Mr. Borton—We have had a general discussion on this subject for some time, and I think we should do something towards reaching a definite decision as to what we shall adopt. Can we not get down to work in some shape? Mr. Lanning has laid a plan before us that seems feasible, and which may be evolved into something satisfactory to farmers in general, and for the sake of economizing time, I move we proceed to consider the recommendations by sections, and see what we can adopt, and reject the others.

The question then being on the motion of Mr. Borton to consider by sections, it was agreed to.

[The Secretary here reads section 1.]

Mr. Shreve—I move its adoption.

Mr. Evans—I think that is just the section we want in the law. I think that is where it should be, this labor on our roads, in the hands of the Township Committee. Wherever the contract system has been used, as it has been in my section of the State for ten years—wherever that system has been in vogue we have had the best of roads. Whenever they have tried the contract system and changed for what they thought a better, they have come back again to the contract system. It creates a rivalry and farmers are anxious to secure the contracts for road repairs. In some cases they take these contracts at very low rates, sometimes at even less than cost, in order that they may have this opportunity of having their roads put in good condition—in some cases even taking the contracts at half their cost. It saves money and it does away with objectionable features of many kinds in

the majority of townships not using this system. In addition to this, those who have to pay the road taxes get the benefits of the money so paid.

A Member—I am from Union county. The laws with us are mostly special laws, covering the matter of road-making, and crushed stone is being used in several of our townships, as an improvement over the old dirt roads. Union county works under a special law, and our roads are in charge of Commissioners or Supervisors, who are elected at the township meetings in the spring. The townships each elect their own Overseers. The appropriation for the care of the roads is annually voted for by the entire population of voters at the township meetings, and if they want any more money in that district than what has been appropriated they raise it in that district by a vote of the inhabitants of the township or of the district. In some of these meetings they raise more money than at the township meeting, sometimes three times as much, and the consequence is we are improving our roads as much as any other county in the State, perhaps more than most counties, and as this has been going on for three years our roads are becoming better and better every year.

I am afraid if you abolish that law you will interfere with our workings in Union county.

Mr. Carhart—There is a provision in the other sections which will fix that, I think.

Mr. Collins—I will offer this as an amendment: That we adopt this down to and including the words "Road Commissioners." My reasons for this are these: I think this is exactly the place where we want to leave the responsibility of the care of the roads—in the hands of the Township Committee.

Mr. Carhart—I second Mr. Collins' motion.

The Secretary—I do not think we entirely comprehend the scope of this. Mr. Carhart is right in what he has said about the other sections. There are very many different laws which leave the matter in the hands of the Township Committee in different forms. What we want, as I understand it, is to repeal all the present laws on roads and formulate a general law, and this general law is to include, first, that the Township Committee shall have the care of the roads, and then the second suggestion, as I understand it, would be, from the general tone of what I have gathered in the remarks delivered here, that all the work be done, so far as practicable, by the contract system.

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Several of the gentlemen have spoken in that strain, and it seems to me that it is the general sentiment, or that is what you want to get at. Then you want to take up the methods as to which is best for obtaining the money to prosecute the work with and for maintaining these roads, and also as to a method of limiting the amount of said special road tax. You want to divide the matter into these divisions and act upon them, and then we can get through them.

Mr. Collins—As I understand it, we are now acting with the intention of instructing a committee that we propose to appoint hereafter. My idea would be to leave the matter in the hands of the Township Committees—let it stop there. The less we instruct them in this respect the better. The Township Committee are now held responsible by the voters, and this should remain as it is; the power should be left where it is—near the voter.

Mr. Ege—In one part of the State you find a law placing the care of the roads in the hands of the Township Committee, and in another in some one else's hands, all conflicting on this point. The idea, as expressed in that section, is simply to abolish all these laws which are in force at present—some fifty or sixty in number—and pass a general law which will cover all these points to the satisfaction of all parts of the State.

Section 4 will provide for this, as you will see as you go on further.

Mr. Collins—If it is the understanding that there shall be something in the other sections to cover this point, I will withdraw my amendment.

A Member—I think it will change the sense of the section if we leave it as it is down to the word “commissioners,” and then place in there after the word “commissioners” the words “be abolished,” and after that strike out “and all laws placing the management and care of roads,” and in place of it put “and that the management and care of the roads be placed,” and then strike out the words at the end of the line, “be abolished.” I think that would fill the bill, and would be the sense of this meeting. It would then read:

“1st. That all provisions of law authorizing the election of Road Overseers, either at township or district meetings, and all laws providing for the election of Road Commissioners, be abolished, and that the management and care of the roads be placed in the hands of the Township Committee.”

I think that is what we want, and move its adoption.

The question being on the adoption of section 1, as amended, it was so ordered.

[The Secretary reads the second section.]

Mr. Shreve—I move it be adopted.

The question being on the motion of Mr. Shreve, it was so ordered.

[The Secretary reads section 3.]

Mr. Pancoast—I move its adoption.

Mr. Haines—I would move to amend by adding, “not exceeding a certain amount, to be named hereafter.” You don’t want to have that sum raised to any unlimited amount.

Mr. Bacon—I would like to amend by adding, “and not to exceed one-fourth or one-half of one per cent. of the ratables of the township.”

Mr. Haines—I will accept that amendment.

Mr. Bacon—It seems to me perfectly right that the Township Committee should be limited in the amount of tax to be raised. Some of the counties are prohibited in the same way, Morris county being limited to three-fourths of one per cent. Why should not the townships be regulated in the same way?

Mr. Pancoast—It seems to me that that matter would be better if amended by saying “a sum not exceeding a maximum fixed by the Township Committee.” It seems to me if they needed a sum greater than the certain percentage of taxables would give them for work in the township, they could have some right then to increase it, if absolutely necessary.

I would offer that as an amendment to the section as read.

Mr. Duryea—I would suggest we have a similar plan to that in use in our township. We are working there under a special law, and the plan as suggested would cover this section. The Township Committee are required, at least thirty days before the town meeting, to fix the limit of the amount of road tax that may be voted for, and to publish it by posters, giving the amount so taxed. The voters at the town meeting are governed by this amount, as they may vote for any amount below that sum so advertised, but they cannot vote more than that amount. They may vote for as much less as they wish, but cannot exceed the amount.

A Member—What have we to do with this? Each township can fix this business for themselves.

Here one man says it should be one quarter or one-half of one per

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cent. The township fixes this amount by the plurality of the votes cast in that township. That is good enough, and we don't want any change or any amendment. It is perfectly clear. The plurality of votes cast should fix the amount. It is fixed that way in our town meeting, and that is the proper place to fix it. The way it is fixed in our township is, we have two tickets, and the amount is fixed by these tickets. On the tickets is put every year at the annual town or spring meeting the amount that shall be raised for this purpose, and that is fixed by the majority of votes cast at that time. The Township Committee has nothing whatever to do with that matter.

Mr. Kelsey—I am sorry I cannot agree with my friend who just spoke. It seems to me this provision would be a very dangerous one, indeed. It does not even provide for the amount that shall be raised, or what limit there shall be on the amount the plurality of votes shall fix. It does not even provide that the amount shall be fixed by the majority of votes, but it shall be fixed by the plurality of votes cast. I think this is a very dangerous thing, indeed, and we should avoid it if possible. With that plan, if one set of voters fixes the amount at \$5,000, and another at \$3,000, and still another at \$2,000, and the five-thousand-dollar voters are in the plurality they get it, for the highest number of votes for any one amount gets it. I am afraid under such a system the five-thousand-dollar appropriation would get the plurality every time.

I think you will all agree with me that this is a provision that should not be incorporated in any law in this or any other State.

Mr. Carhart—In our township we have a borough and we don't allow them to vote on the road question. If you cannot trust it to the township people to whom can you trust it. What would you do in such a case as that? I think it should be left with the Township Committee.

Mr. Borton—That Township Committee might act from selfish motives. We can trust the inhabitants themselves, the taxpayers, and then we are not going to get into any bad fix.

Mr. Evans—This is one of the weak points in the law. You cannot place this matter in the hands of the Township Committees, because it will go into the hands of the Supervisors, and they will be elected by the irresponsible voters. They don't have the money to pay. All they want is a lot of money to spend. I think they should have the work done by contract, and they will get four times as much

work done for the same money, and then there is no danger of this irresponsible vote controlling the amount to be raised each year.

The Secretary—It strikes me that it would be very well if the gentlemen would take the suggestions made by the gentleman from Hudson, that the amount be published thirty days before the town meeting, and that the amount, after being decided on, be posted in public places, as it is done in Hudson county. Then the voters could know what was being appropriated, and if necessary to stop an attempt at making a steal, or the appropriation of any extravagant amount, it could be headed off more effectually, because the people of the township would have notice of what was intended to be done in the matter.

Mr. Forsythe—The proposition made by Mr. Pancoast, to leave it in the hands of the Township Committee, comes near the matter. They are generally responsible gentlemen, and can be called to account by the voters, if they are not what they should be, in the performance of their duties. With this method of deciding on the amount to be raised by the plurality of votes cast, you cannot form any safeguards that will protect the taxpayers, owing to this irresponsible element always being in the majority. They will vote the money out of my pockets into their own, and you cannot stop them, unless there is some definite limit placed on the amount they may vote for. I don't want to give them the right to say how much of my property they may take. I would not like to live in a country where there was a law giving this element such power over my property. That law must have a limit, so that not more than a certain amount may be voted for and secured.

Mr. Williams—I think the same objection would apply in regard to the raising of any other public fund—for instance, for the raising of the poor fund in our townships. It is in the hands of these very people. They vote the sum of money that shall be appropriated to the poor.

A Member—I have served on Township Committees, and it seems to me that in taking this out of the hands of the voters it is like putting a gag rule on these voters. I think each township should say how much money they wish to raise. I do not see how this Board or any other body can place any certain limit, or say to any certain township how much they shall or shall not raise. It is a free country, and the voters can say how much they will raise. One will

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raise hundreds and another thousands—perhaps as high as \$5,000. You cannot say to them how much they shall raise, for you have no right to do so.

We have thirty-one voting districts, and I think, in many townships, there should be something done to have fewer Road Overseers than there are; our township needs a change of this kind, for we have too many.

I cannot see how we can change it, though, so that a certain amount shall be specified. I think each township should say, by a majority or plurality of votes, how much money shall be raised each year for the repairs to the roads, and I cannot see how you can pass a law that will regulate this.

Mr. Kelsey—I would like to say just a word. These suggestions in regard to restricting the amount that shall be expended seem to be a novelty to some of the gentlemen who have spoken on the subject.

It is not a novel thing by any means. It is a common thing, and nearly a universal thing, and the history of legislation in this State will bear me out in the statement I have made. Examine the records of this State in its Legislature, in this very session, and it will bear me out in the assertion. Even the Legislature appropriates money for special purposes, or for all purposes, and any money to be expended by certain officers is appropriated in a certain amount. The construction of this State building has been by money appropriated by the Legislature, and the history of all legislation in this country will bear me out in the statement that moneys for public purposes are first appropriated in stated amounts. They limit the amount that shall be expended for a certain purpose. They do not even trust the highest bodies in this State to expend an unlimited amount, and such laws should never be incorporated, giving any officers the power of unlimited expenditure. Moreover, this Board should hold itself aloof from recommending any law that would give such powers.

I think we should agree upon a law for the purposes now under consideration, and after it is agreed upon we can recommend it to the Legislature, and I have no doubt, if we ask it, it will be passed. I think the question a practicable one, and one that can be solved without serious difficulty, by this State Board. It is certainly one of the most important things that has come before this Board, and the Legislature will certainly do all in their power to forward your interests in this respect, though no matter what you ask them to do, it is not

probable they will be willing to forward any law looking to the appropriation of an unlimited amount of money for such purposes.

It has been suggested that if this Board pass upon a law of this kind, it would be similar to the action of the poor law. It might apply to school-money also, and to money raised for any other purpose. I think that is one of the questions which should be settled, and settled decidedly.

You do not want to give any such powers to any one, no matter how responsible or high in authority. It would be unwise to do so; the amount should be limited, the same as other amounts to be expended by public officers, no matter how trustworthy they may be, are limited by appropriations. I do not think you wish to ask the Legislature to give any such powers. It cannot be possible that this State Board of Agriculture would ask the Legislature for the passage of a law of that character, and with that scope.

Mr. Ege—This very dangerous doctrine has not worked very dangerously with us. We have two political associations or parties in our township, very nearly equally divided, and one party watches the other constantly. These parties meet in caucus and nominate their township officers, and at the same time nominate the amount of money to be expended for road repairs, and also the amount that shall be expended for the poor—that is, the amount that shall be raised for the support of the poor. These nominations are made and they go before the people, and sometimes one party wins and sometimes the other. It is decided by a majority of the votes cast, for either one party's nominations or the other, the same as other political elections are held.

We have here a plurality of votes, which means that any amount can be put on the tickets that the voter may desire. If we have \$3,000 or \$3,300 appropriated or named, the voters do not exceed that amount. They don't do it. We have never seen the amount raised in any case, no matter what the amount was being raised for. It is never done with us. There are two members of our Township Committee here, and I call on them to bear me out in the assertion. Each party places on the ticket the amount of money to be expended, and it is every man's privilege to raise it if he wishes, even up to \$10,000, or any amount, but it is never done.

I have never heard of a change of this kind being made, however, nor have I ever seen it done, and I have been in the election board for years.

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With us the parties watch each other very carefully, and there is no trouble of this kind, for each party is very careful to keep within bounds, because each party wants to win.

It works well with us, and has always worked well, and I believe it will continue to work to our satisfaction.

Mr. Butts—I do not see what good a limit could do in this matter. It seems to me it would be cutting the appropriation where it should not be.

The question being on the amendment of Mr. Pancoast, it was agreed to.

The question then being on the adoption of the motion as amended, it was agreed to, and the words “a sum not exceeding a maximum fixed by the Township Committee” are added to the section.

Mr. Ege—I ask the unanimous consent of the Board to submit the report of the Committee on Nomination of Officers.

No objection being offered, Mr. Ege reads :

The Nominating Committee of the New Jersey State Board of Agriculture report the following gentlemen as having been nominated for officers of this Board for the ensuing year :

PRESIDENT.

Hon. Edward Burrough, - - - Camden.

VICE-PRESIDENT.

William R. Ward, - - - Essex.

SECRETARY.

Franklin Dye, - - - Mercer.

TREASURER.

D. D. Denise, - - - Monmouth.

EXECUTIVE COMMITTEE.

Dr. George H. Cook, . - - - Middlesex.

Joseph B. Roe, - - - Gloucester.

Morris Bacon, - - - Cumberland.

All of which is respectfully submitted.

(Signed)

RALPH EGE,

Secretary of Committee.

The Chair—Will you elect these gentlemen separately, or the whole ticket?

Mr. Dickinson—I move that the report of the Nominating Committee be accepted, and that the gentlemen named be the officers of this State Board for the ensuing year.

The question being on the motion of Mr. Dickinson, it was agreed to, and the officers named by the Nominating Committee are declared elected for the ensuing year. [Announcement is followed by applause.]

The Chair—If I could consult my own personal interest and convenience, and my feelings or leisure and pleasure, I should certainly decline this honor you have again tendered me for the third time. I thank you most sincerely for the honor, and for your kindness.

It has been a pleasure for me to be associated in this connection with men who have given their unbiased and undivided attention to the business of this Board.

That you appreciate our efforts we are pleased to believe, for, with the single exception of the Secretary, whose wish it is to retire, you have re-elected the entire Board of old officers for another year, and I must say for myself, and I think I can also say it for my associates in the Board, that our efforts in the future shall be as strong as in the past, and we will endeavor to advance the interests of the Board of Agriculture to the best of our knowledge and understanding, and I hope that in our efforts to do this we shall be sustained by this Board collectively, and individually by the farmers of the entire State.

You have elected your officers, your machinery, your workingmen, to take charge of the operations of this State Board for another year, and we hope for your full and earnest support and co-operation. You know it is like running a steam engine; you cannot work it without fuel, and you, as members of this Board, should help to supply the fuel, the material, with which this machinery shall be run satisfactorily. You should help us in this, so your officers may be able to do good work in advancing our interests the ensuing year. We ask and shall expect, from the Directors at least, of the State Board of Agriculture, in attendance, to communicate at any and all times with your Executive Board—your Executive Committee—bringing to their notice any suggestions that may be deemed beneficial, and everything of interest to the members of the Board, not only in their own section of the State, but in the State at large.

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We ask you for your earnest support, and feel certain we will have this in the future, as we have had it in the past. [Applause.]

Mr. Dye (the Secretary)—I wish to express my thanks to this Board for the honor they have conferred upon me, for I assume it is an honor, than which there is no greater, to be associated with farmers in organizations for the advancement of their common interests. [Applause.]

I thank you, and can only say, as the President has said before me, that I will prove the estimation in which I hold this honor by continuing my efforts in the future as in the past.

I hope we will all be able to come here another year, in good health, and in good spirits every way, and make a better report from all our farms than we have been able to do this year. [Applause.]

The Chair—We will now continue our discussion of the road laws. [The Secretary here reads section 4 of the suggestions of Mr. Lanning.]

Mr. Shreve—I move its adoption.

Mr. Evans—I have an amendment here I wish to offer.

That the words “and that they then advertise for proposals for the work, and award the contract to the lowest and best bidder” be inserted in place of the words “and of appointing a competent Supervisor for each of the sections.” I think this work should be done by contract, and by the lowest and best bidder.

I move the adoption of the amendment.

Mr. Kelsey—In regard to these sections—the fourth and fifth; and also in the eleventh and twelfth—the whole idea is based upon the contemplation of the election of Supervisors, or the same officer by some other name, Commissioner, Road Overseer, or Board. In other words, the same officer, but under a different title.

It seems to me the proper way to present that to the Board is this—it is simply on the question as to whether the Supervisor, or Overseers, or Commissioner shall be selected or elected, and we should decide which of these plans this Board should indorse. That disposes substantially of the matters under discussion in the fourth section, and also in the fifth, eleventh and twelfth sections. If the Board decides to indorse the suggestions of Mr. Lanning, that the Supervisor be selected, then all these sections must come up for independent consideration. On the contrary, if the Board decides adversely, that disposes of all those sections, and this very much sim-

plifies the matter, and I therefore move that in order to get the sense of this Board on these two questions—(I am not here to impress my own views of the matter, for I was not aware that the matter was to be discussed this morning. On the contrary, I came here loaded up somewhat on the sheep question and not the road question, and still hope the discussion of the sheep question may come up while I can be with you, as I would like to offer a few suggestions)—I move that Mr. Lanning's suggestions on this subject of the road laws, as proposed in regard to the selection of Supervisors, be disapproved.

Mr. Pancoast—I want to ask a question. If that is passed, will it prevent the motion of the gentleman from Camden being acted upon?

The Chair—As I understand it, that virtually decides the whole question. The intention is, as I believe, that section four be not approved, so far as the Supervisor is concerned.

Mr. Kelsey—My motion is simply to take the sense of the Board in regard to the recommendations offered by Mr. Lanning, that the Supervisor be selected or elected by the Township Committee, one Supervisor or Overseer for each district so apportioned off by them. They say the township shall be apportioned off into districts and one Supervisor be selected for each district. I do not mean to strike out the entire section. I mean that wherever the idea of Supervisors is suggested in the sections as a natural sequence, that the provision for the roads shall be in the hands of the Township Committee, or in the hands of an officer designated by the Township Committee as a Supervisor, or whatever he may be, and that he shall be elected by the Township Committee, or be selected by the Township Committee. I refer to that part only, and I therefore moved that Mr. Lanning's suggestions in regard to the selection of Supervisors be disapproved of.

That leaves the matter, for recommendations of methods, to come before this Board for consideration, and we can then discuss those recommendations intelligently. I am decidedly opposed to this matter in regard to Supervisors, and I move we disapprove of it. I think we can incorporate the two ideas we have been discussing in one motion, that we disapprove of the suggestions offered by Mr. Lanning in regard to the selection or election of the Supervisors or Overseers to have charge of the care of the roads.

The Secretary—We have a section before us with amendments offered, and we are getting away from the subject. If that amendment is adopted, it will do away with the Supervisor question for the

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present. I think we should have some definite action on section four with amendments offered.

The question then being on the motion of Mr. Kelsey, it was so ordered.

Mr. Taylor—It strikes me that the balance of this is now pretty well done away with, by doing away with the Supervisors. We have spent a great deal of time on this matter, and I now move it be referred to a committee of three, with power to formulate a bill and report to the Executive Committee, and if, in their judgment, it is satisfactory, it then be laid before the Legislature.

Mr. Kelsey—I do not think the motion of my friend from Burlington is quite in order. There is a question before the Board for consideration, but I think if we wish to drop further consideration of this question a motion to that effect would be the proper thing.

I think, also, the committee he proposes should consist of more than three members. Would it not be better to have one from each Congressional District?

Mr. Taylor—If you make that as an amendment I will accept it. I think it would be in order to ask for postponement of further consideration, and then have it referred to this committee, to consist of one member from each Congressional District, as suggested by Mr. Kelsey.

Mr. Kelsey—I move that further consideration of this subject be postponed.

The question being on the motion of Mr. Kelsey, it was so ordered.

Mr. Taylor—And that such committee shall, when appointed, formulate a law and present it to the Executive Committee, and if satisfactory the Executive Committee will present it to the Legislature and recommend its passage.

The question being on the motion of Mr. Taylor, it was so ordered.

COMMITTEE ON ROADS.

First District.....	Elwood Evans.....	Marlton.
Second District.....	Charles Collins.....	Fellowship.
Third District.....	W. S. Combs.....	Freehold.
Fourth District.....	Henry C. Kelsey (<i>Chairman</i>)....	Trenton.
Fifth District.....	Aug. W. Cutler.....	Morristown.
Sixth District.....	Joseph B. Ward.....	Newark.
Seventh District.....	Abram W. Duryea.....	Jersey City.

The Chair desires to state, in connection with the Committee on Roads, a word or two. That committee, as you all know, is a very important one, and it is desirable that they get together before a great while in order that something definite may be done by them looking to a revision of the laws. I have been requested to designate a chairman for that committee and I will therefore designate Mr. Kelsey, of Sussex, and I presume he will call the members of that committee together at an early date. I hope he will do so, at least, on account of the importance of the work in their hands. As some of the members of that committee have probably gone home, I would request that members of the Board from the same counties as members of the committee inform them of their appointment, and of our wishes in the matter.

NOTE.—The accompanying article on “Roads and Road-Making,” is from the *Cultivator and Country Gentleman*. The article, with electrotypes, was donated for insertion in our annual report, by the editors, Messrs. Luther Tucker & Sons, at the request of Mr. William S. Taylor.

F. DYE, *Secretary*.

“ROAD-MAKING.—The common roads of the country at large, which in the United States are more than a million miles in aggregate length, and to which many million acres of land have been devoted, are very dimly appreciated in their entire importance. The five million farmers of the country travel over them a distance, on an average, more than five hundred times their whole length every year; and the

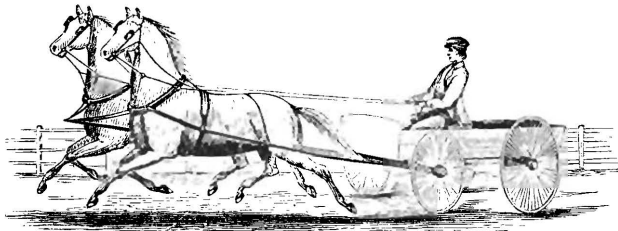


FIG. No. 1.

difference between driving on a hard and smooth surface, on one hand, or through stiff mud, deep ruts, and over jolting stones, on the other, would amount to a sum which could hardly be estimated in numbers. Take, for example, the satisfactory mode of moving six or eight miles an hour, exhibited in fig. 1, with uninjured horses, har-

ness and wagon on a well-made and well-repaired road, and contrast it with the wretched two-mile-an-hour work on the badly constructed and neglected highway represented by fig. 2, and repeat this difference



FIG. NO. 2.

every day, month and year, and it would prove an eloquent lecture to any thinking mind on the importance of the subject.

"We would not advise farmers generally to attempt the construction of costly Macadam lines through their broad farms, nor even the less expensive Telford roads, but to use the materials within their reach in the best manner, and with at least as much intelligence as they employ in raising fine crops and enriching their land. They may avoid the error, too often seen, of making the road-bed of sods and muck; of permitting loose stones to batter and injure every vehicle which passes; of permitting worse harm from every fixed or solid stone in the track, and of allowing the roadsides to become infested with masses of coarse weeds, and obstructions to a smooth side-track on snow in winter, when possibly the main passage may be obstructed by snow-banks.

"A common omission is in the neglect of proper drainage. The most that is done in some large districts of country, is in heaping up, with plow and scraper, the sods and muck from the roadsides into a central ridge, commonly denominated a 'highway' or 'turnpike,' for the passage of loaded wagons and light carriages. If these ridges have been carefully smoothed and leveled, they make fair traveling during the dry part of the summer; but for several weeks in spring, and whenever a heavy rain occurs in autumn, they are converted into a bed of deep mud. There are two remedies: First, in making the new road, or in mending the old one, reject the sods and muck, and employ them to enrich the adjacent fields, or to form a part of the compost heaps in the barnyard or elsewhere; and use the denuded and hard subsoil for the road-bed. We have seen a capital road made by simply scraping off the several inches of the mucky top-soil and leaving the hard-pan bare; but the Roadmaster did not intend so good a result, but, on the contrary, intended to form a high road of two feet of muck, which in muddy weather was cut into wheel-tracks a foot or more in depth, driving the teamsters and travelers into the broad ditch of denuded subsoil at the side, which, being too hard to be cut into ruts, formed an excellent track.

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"The other remedy against mud and deep ruts is ample drainage. This is commonly attempted in a very imperfect manner by means of shallow, open ditches on each side of the raised road, a cross section of which is shown in fig. 3, where *a a* are the ditches with water in

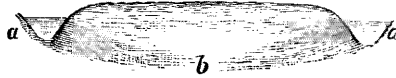


FIG. No. 3.

them. As soon as these are partly filled with the running water, the natural seams of the soil, which are mostly nearly horizontal, carry a portion of the water towards *b*, or under the raised track, soaking it and changing it to mud, and making it easy for the wagon wheels to cut down through the surface into the soft soil below. This result must be obvious to every land-owner who has seen the water of his fields flow readily through the horizontal strata a rod each way into his tile-drains. In the same way, the water from the open ditches flows freely under the road-bed, where it assists in working the road into mud. Fig. 4 shows how this harm may be prevented—by lay-



FIG. No. 4.

ing a pipe-tile two or three feet below the surface, and filling the ditch with broken stone and gravel, the finer gravel being at the surface. A more complete drainage is effected with two ditches, as represented in fig. 5. The course of drainage is shown by the shaded lines.



FIG. No. 5.

"A singular discordance in the respect shown to public roads by the inhabitants who live on them, is in facing the best side of their dwellings towards the roads, at the same time that all kinds of cast-off rubbish are thrown into the track, such as weeds, straw and house-cleanings, and burdocks and thistles are allowed to disfigure the borders. If the residents could be induced to make them objects of neatness, taste and ornament, they would feel more disposed to improve their condition for traveling, and both kinds of improvement would advance together."

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Mr. Ege—Before the noon recess I would like to offer a resolution, if in order :

“Resolved, That a rising vote of thanks be extended our retiring Secretary for the very efficient and satisfactory manner in which he has discharged his duties as Secretary of this State Board of Agriculture during his term of office.”

[The reading of the resolution is followed by applause.]

The Chair—I rise to second that motion.

I have been a member of this State Board of Agriculture almost since its formation. I remember when there were but a very few of us, only about a dozen in number, used to assemble here in the Chancery Chamber and did a very little work in a very short time and went home.

I remember when Burlington county sent here as a delegate to this Board a young man, full of energy and determination, and full of interest in all matters of importance to the agricultural pursuits. I refer to the gentleman who has just retired, our late Secretary, Mr. Taylor. [Applause.]

He, in common with other members of the Board, was not diverted from the work mapped out for it to do. Through his energy and perseverance much of the success of this Board has been attained.

I regret that we shall be deprived of his services and counsel in the official position which he held, but feel sure he will aid us as a member in the future as he has in the past. [Applause.]

I hope the motion will be unanimously adopted.

The Secretary—I would like to say, before the motion is put, that our associations together as members of the Executive Committee have been most pleasant, and the only ripple of regret, if there can be any, in taking this position, is that we are going to lose his counsel and presence with us in our deliberations. We have esteemed him as a brother, and hope the time may soon come again when he may be re-instated with us in the official work of the Board. His services have been most estimable, and we shall miss him exceedingly in the future.

The question being on the adoption of the resolution, it was unanimously agreed to.

Mr. Taylor—Mr. President and Secretary: I have fully appreciated your friendship in the past, as I fully appreciate the compliment

of the kind words you have said, most thoroughly. It has been a great pleasure and delight to me, as well as a duty, to advance the interests of agriculture in every way I could do so.

From the time I left college, and in fact before that time, when my health gave out at college and compelled me to go on the farm, my heart has been in the work, and it has always been a pleasure to give my time to the advancement of the farming interests; and I feel proud, and justly, I think, that the day has come when we can gather the farmers of New Jersey together in a three days' session, to receive and confer mutual aid, and be able to advance our calling, as I believe it has been advanced in this session. [Applause.] I feel very proud, also, that I can be one with you, with such a representative body of men. [Applause.] I believe that ten years ago this would have been impossible. Our meetings, when I first attended this State Board's sessions, were but slimly attended, and we met for only a short session, did a little business, and went home. Look at this State Board to-day, and the sessions we have held during these three days. I do not believe it would have been possible ten years ago. It would have been impossible to have gotten such a body of representative farmers together. *Fifteen* years ago I know it would have been impossible to have done so. I am glad our farmers are getting into a position to appreciate the benefits of such an organization. Then you were without influence, practically—now you can get almost anything in reason you may ask for, and your influence is felt as a body of intelligent men always will be. [Applause.] You have now gotten so far advanced as an organization, that if you ask anything from the Legislature that will advance your interests you will find there is no difficulty in securing cheerful response from our law-making bodies. This is as it should be. We have never asked for anything from the Legislature that has not been granted, and this is due to the fact, I think, that we have carefully weighed and considered everything we have asked, and have not asked for things that we should not have asked for. We have always put our wants in the proper form and have shown the Legislature why we asked these things of them, and they have responded cheerfully.

I hope the Board will continue to prosper, and to strengthen, and to grow in interest until they have succeeded in putting agriculture on the plane where it belongs—among the professional things of this

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life, among those at the head. [Applause.] It should be in its proper place among the leading interests of the country.

I thank you most heartily for your expressions of good feeling. [Applause].

On motion, adjourned to meet at 2 o'clock P. M.

AFTERNOON SESSION.

FRIDAY, February 3d, 1888.

Meeting called to order in the Supreme Court room at 2 o'clock P. M., by the President, Hon. Edward Burrough.

The Chair—Our first business will be the report of the Committee on Credentials. Is that committee ready to report?

Mr. Williams—Your committee beg leave to report that we have examined the credentials of the following gentlemen, and have their bills for expenses:

GEOLOGICAL SURVEY:

Charles E. Elmer.....Bridgeton.
Wm. M. Force.....Newark.

BOARD OF VISITORS:

Henry P. Simmons.....Passaic.
Caleb Wyckoff.....Belvidere.
A. W. Duryea.....New Durham.
David A. Shreve.....Haddonfield.

PRESIDENT EXPERIMENT STATION:

John De Mott.....Middlebush.

DIRECTOR EXPERIMENT STATION:

George H. Cook.....New Brunswick.

MASTER OF STATE GRANGE:

Richman Coles.....Woodstown.

SECRETARY OF STATE GRANGE:

M. D. Dickinson.....Woodstown.

STATE BOARD OF AGRICULTURE.

STATE AGRICULTURAL SOCIETY :

P. T. Quinn.....Newark.
E. A. Wilkinson.....Newark.

STATE HORTICULTURAL SOCIETY :

Wm. R. Ward.....Newark.
E. Williams.....Montclair.

CRANBERRY GROWERS' ASSOCIATION :

J. H. Brakeley.....Bordentown.
A. J. Rider.....Trenton.

ATLANTIC COUNTY BOARD :

Herman Trisch.....Egg Harbor City.
Charles Kraus.....Egg Harbor City.

BURLINGTON COUNTY BOARD :

Alfred Satterthwaite.....Crosswicks.
Joshua Forsythe.....Pemberton.

CAMDEN COUNTY BOARD :

John A. Meredith.....Haddonfield.
Van Buren Giffin.....Camden.

CUMBERLAND COUNTY BOARD :

Thomas E. Hunt.....Greenwich.
Q. O. Garrison.....Bridgeton.

ESSEX COUNTY BOARD :

Wm. Diecks.....Livingston.
O. E. Freeman.....Orange Valley.

GLOUCESTER COUNTY BOARD :

B. R. Black.....Mullica Hill.
Thomas Borton.....Mullica Hill.

HUNTERDON COUNTY BOARD :

Jos. Hagerman.....Sergeantsville.
H. F. Bodine.....Locktown.

MERCER COUNTY BOARD :

Franklin Dye.....Trenton.
J. M. Dalrymple.....Hopewell.

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MIDDLESEX COUNTY BOARD :

D. C. Lewis.....Cranbury.
J. M. White.....New Brunswick.

MONMOUTH COUNTY BOARD :

John C. Vandoren.....Manalapan.
Wm. S. Combs.....Freehold.

MORRIS COUNTY BOARD :

W. F. Ely.....Madison.
W. J. Meeker.....Hanover.

SALEM COUNTY BOARD :

J. Walter Pancoast.....Sharpstown.
J. W. Dickinson.....Woodstown.

SOMERSET COUNTY BOARD :

D. C. Voorhees.....Blawenburg.
Wm. S. Potter.....Somerville.

SUSSEX COUNTY BOARD :

Wm. A. Stiles.....Deckertown.
Thos. Armstrong.....Deckertown.

UNION COUNTY BOARD :

N. W. Parcell.....Elizabeth.
D. C. Crane.....Roselle.

BURLINGTON POMONA GRANGE :

James Lippincott.....Mount Holly.

GLOUCESTER POMONA GRANGE :

David S. Adams.....Mickleton.

HUNTERDON POMONA GRANGE :

John T. Cox.....Readington.

MERCER POMONA GRANGE :

Theo. Cubberley.....Hamilton Square.

SALEM POMONA GRANGE.

E. L. Borton.....Woodstown.

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The Chair—If there is no objection the report will be received, ordered printed in the annual report and the committee will be discharged with the thanks of the Board.

So ordered.

The Chair—We will now call for the report of the Committee on State Premiums.

Mr. Baker, of the Committee on State Premiums, reads :

TRENTON, February 1st, 1888.

We, the undersigned, members of the State Premium Committee, hereby certify the following to be a true return of the awards made to the several persons entitled thereto, as follows :

1st premium, John H. Denise, timothy grass, $3\frac{11}{1000}$ tons.....	\$25
1st premium, John H. Denise, clover hay, $2\frac{17}{1000}$ tons.....	25
1st premium, John H. Denise, corn, 87 bushels per acre.....	25
1st premium, John H. Denise, wheat, 39 bushels per acre.....	25
1st premium, Henry Jerolomon, raspberries, 2,411 quarts, \$337.54.....	25
2d premium, Josiah S. Robbins, raspberries, 2,102 quarts, \$184.91.....	15
1st premium, Henry Jerolomon, grapes, $5\frac{42}{1000}$, \$417.50.....	25
2d premium, Jacob W. Fisher, potatoes, 302 bushels, \$275.50.....	15
1st premium, Samuel Lippincott, potatoes, $418\frac{1}{4}$ bushels.....	25
2d premium, F. M. Carryl, mangels, 514 bushels.....	10
1st premium, H. D. Oliphant, mangels, 878 bushels.....	20
1st premium, F. W. Carryl, 10 cows, net \$775.	100
2d premium, W. B. Lippincott, 10 cows, net \$775.....	50
2d premium, W. B. Lippincott, cabbage, \$201.....	15
1st premium, Edward Braddock, cabbage, \$350.....	25
1st premium, Edward Braddock, cranberries, \$1,120.....	25
1st premium, W. B. Lippincott, tomatoes, \$210.....	20
1st premium, W. B. Oliphant, peaches, \$370.20.....	25
1st premium, Chas. S. Cooper, onions, \$404.....	20
2d premium, Abm. Synn, onions, \$315.....	10

ROBT. S. GREEN,
Governor.

HON. JOHN A. MCBRIDE,
THEO. F. BAKER,
P. T. QUINN,
WM. S. TOMPKINS,

Committee.

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The Chair—If there is no objection the report will be received, and will be printed in our annual report.

COMMITTEE ON SPECIAL STATE PREMIUMS.

Theo. F. Baker.....Cumberland.
Henry I. Budd.....Burlington.
I. W. Nicholson,.....Camden.

Mr. Lippincott—Last evening Mr. Rider, in the interests of the cranberry growers, asked this Board to memorialize Congress to give us a standard set of weights and measures, having been assured by our friend, Professor Cook, and our friend, Mr. Thomas H. Dudley, that we have no standard of weights and measures. As I said at the time, we have had such a set of weights and measures for many years, to all intents and purposes.

In response to the request of Mr. Rider the following resolution was adopted :

“WHEREAS, There exists at the present time no uniform standard of weights and measures throughout the several States of the Union ; and

“WHEREAS, The said lack of uniformity disturbs the freedom of interstate traffic, and renders inoperative many laws passed by the individual States for the protection of the public against frauds and impositions ; therefore, be it

“Resolved, That the New Jersey State Board of Agriculture respectfully recommend that the New Jersey State Legislature be requested to memorialize the Congress of the United States to appoint a Commission which shall be empowered to collect information on the subject of weights and measures, and their relations to each other, and duly consider and report the same, with recommendations for the action of the National Legislature.”

It appears from Appleton's Encyclopedia that there was a strong effort made several years ago to get up a standard based upon the length of a pendulum of a clock, and so on, but they could not get at satisfactory results, apparently. In fact, from what Professor Cook says, there was never anything further done in the matter. After describing these experiments, with results which were only satisfactory to scientists, on page 540, volume XVI., of his encyclopedia, Appleton says :

"The Senate, on May 29th, 1830, directed a new comparison of the weights and measures in use at the different custom-houses.

"This duty was intrusted to Professor Hassler, and though much discrepancy was found, the mean corresponded closely with the English standard, verified in 1776.

"Under Professor Hassler's supervision accurate copies of the revised standards of weights and measures were supplied to all the custom-houses.

"Meanwhile, by a Joint Resolution of Congress, June 14th, 1836, the Secretary of the Treasury was directed to cause a complete set of all the weights and measures adopted as standards to be delivered to the Governor of each State in the Union, for the use of the States of the Union, respectively.

"These, as well as accurate balances for adjusting the weights, have been supplied, and the statutory standards of every State have been made to conform to the standards so furnished.

"It is to be observed that Congress has never made any enactment in reference to the old English standards, which have come down to us, since the latter were necessarily in force as the national standards, unless changed by legislative enactment."

In the Statute Laws of Congress, passed in 1846, you find in the laws of that year, on page 133, the following :

"A Resolution for the distribution of weights and measures.

"*Resolved.* By the Senate and House of Representatives of the United States of America, in Congress assembled, That the Secretary of the Treasury be and is hereby directed to cause a complete set of all the weights and measures adopted as standard, and now either made or in progress of manufacture, for the use of the several custom-houses, and for other purposes, to be delivered to the Governor of each State in the Union, or to such person as he may appoint, for the use of the States respectively, to the end that a uniform standard of weights and measures may be established throughout the United States.

"Approved June 14th, 1836."

As we have a standard thus established by a law of Congress, and as it has been acted on by our own State, I don't think it is worth while for this State Board of Agriculture to begin looking into this thing again. I am sorry Mr. Rider is not here himself, for he promised to meet me here, but I have not seen him as yet.

I think we should reconsider our action in adopting the resolution offered by Mr. Rider, in view of all the facts.

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I therefore move that the resolution of Mr. Rider be withdrawn from the Committee on Legislation, and I offer in its stead another.

The Chair—I think it would be well, in view of these circumstances, to withdraw this resolution.

The question being on withdrawing the resolution from the Legislative Committee, it was agreed to.

Mr. Lippincott—I think the other resolution already adopted is sufficient.

The Chair—You refer to the resolution in regard to the committee to confer with the Produce Exchanges of New York and Philadelphia, offered by Mr. Idell, I think?

Mr. Lippincott—That is the one I refer to.

Dr. Cook—Do I understand that the resolution that has been withdrawn has anything to do with the one in regard to a conference with the Produce Exchanges of New York and Philadelphia, or is that which was offered by Mr. Idell, still in force?

The Secretary—It does not affect the resolution offered by Mr. Idell:

Dr. Cook—I think that is really what they are desirous of having—the means of weighing certain articles and calling the weight so many barrels or quarts.

Mr. Bacon—I desire to offer the following, which has been drafted from the law in force in the State of Pennsylvania, upon the destruction of our forest trees.

I ask for the immediate consideration of this bill, without reference to the Legislative Committee, so that some action may be taken, the committee not being present. [Reads]:

“BE IT ENACTED by the Senate and General Assembly of the State of New Jersey, That it shall be the duty of the Township Committee in each of the several townships of this Commonwealth, to appoint persons under oath, whose duty it shall be to ferret out and bring to punishment all persons who, either willfully or otherwise, cause the burning of timber lands, and to take measures to have such fires extinguished, where it can be done, the expenses thereof to be paid out of the township treasury; this act shall apply only to those townships whose woodland is equal to forty per cent. of the total acreage.”

I move that it be acted on by this Board at once.

The question being on the motion of Mr. Bacon, it was agreed to.

The Chair—It is now before the Board for discussion; what is your pleasure?

Mr. Williams—I do not know whether or not that would apply to my township. I do not know what area of woodland we have, but I know I have had plenty of experience in the way of burning forests myself.

I am so unfortunate as to have a piece of woodland adjoining my cleared land on the south, and we are constantly troubled with these fires. We are obliged to marshal our forces at least once a year to fight these fires, and every year for the last five years we have been compelled to turn out on Sunday to fight fire. We do not know when we are safe from these fires. Last summer we were compelled to fight fire four or five times, and I should never have waited for the action of the law if I had known who caused the fires. [Laughter.] We have no proof who did the mischief, though I have my own views in regard to the matter, and strong views they are.

I don't know whether this law will do any good, but I know it is a very serious thing from my standpoint.

Mr. Ege—I would like to hear the last part of that resolution read again. I refer to the clause in regard to the question of damages, which I think are mentioned in the latter part.

[The Secretary here reads last clause of first paragraph of law.]

Mr. Ege—I refer to the question of payment of damages and cost of putting out the fires, and that should include railroad companies, so they shall be obliged to pay for the fires they set. We all know that the greater part of the damage done in our State is by the railroads. More than one-half of these fires are started by sparks from the engines. They destroy more than they are worth; there has been enough property destroyed in the State during the last ten years to buy all the railroads in New Jersey. There is where the great damage comes from, and what little timber we have anywhere near the railroads is fast disappearing.

I had a piece burned over so often by these fires that I concluded to clear it all off and have done with it—it was so discouraging. I had expected to leave it stand, because it was a fine piece of timber and I was very proud of it. There are other farmers adjoining me that are served in the same way.

Now, this act proposes to have the fires extinguished and the expenses paid by the township, but I think the laws should be that

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those who set the fires should pay for them, but the difficulty with us, in getting damages from the railroad corporations, is to prove that they have been set by the railroads.

I would offer this amendment, that the damages shall be paid by those who cause them.

Dr. Cook—I think the law of New Jersey is sufficient, if we prove that the railroad companies did it, or that their locomotives did it. Our New Jersey laws are all that is needed in this direction. You can bring suit and compel them to pay the damages. This bill simply refers to the putting out of the fires—that is what it was intended for. We want to have these fires looked after, and have them out as soon as practicable.

Mr. Bacon—I move it be adopted as read, as being the sense of this meeting.

The question being on the motion of Mr. Bacon, it was so adopted.

Mr. Taylor—I move that the Committee on Legislation be made a permanent committee.

So ordered.

The Chair—We will now proceed with our order of business, beginning where we left off this morning.

The first subject is "Suggestions as to Amendments to our Present Laws for the Protection of Sheep and Poultry, &c."

Mr. Denise—The Monmouth County Board passed a supplement to the present laws, which I would like to see brought before this meeting. We thought that would cover the difficulties at present existing.

Under our present laws we can do nothing, and it is impossible to keep sheep or small stock, for the dogs kill them every time. We want some protection from the worthless curs that are running at large, and unless this is granted the raising of sheep and poultry must be entirely abandoned in many parts of the State.

I offer the amendment passed upon by the Monmouth County Board, as a resolution for the consideration of this Board.

[The Secretary here reads as follows]:

[See Monmouth County Board report.]

Mr. Denise—I would like to say, in reference to that matter, that this question of the damages done by dogs in our county has gotten

to be one of vital importance to us, and one that interests us very much indeed.

I have taken a little trouble during the last two months to find out the amount of damages that have been done to calves, sheep and poultry in our neighborhood, and I find it amounts to nearly four thousand dollars. I think you will agree with me that that is quite too large a sum of money to go for this, for it is really wasted, and unless some law is passed by which we can get rid of the dogs there will soon be no sheep left, and plenty of dogs, for I think the dogs are fast increasing, while the number of sheep and calves is fast decreasing, and under the present law I cannot see how we are to change this state of affairs. It is either all dogs and no sheep, or the dogs have got to go. [Laughter.]

People tell you you should not complain, for you get paid for your sheep when they are killed. I have no doubt you all know the law in regard to damages, and that you cannot get the full value of sheep killed by dogs. You can get but little more than the mutton value of them. I know that I, as a sheep grower for twenty-four years, have been greatly troubled by dogs, for there has been scarcely a year when I have not had sheep killed in this way, and yet I have never succeeded in getting much more than half the value of the animals—about what mutton prices would have been.

Some years ago I bought a lot of fine Southdowns, and the first year the dogs killed more than half of them, and when I was paid for them I was only allowed mutton price for them.

The way the law stands now there is no encouragement for the farmers to keep good stock, for they cannot get paid on the basis of the value of the animals.

The law as proposed would remedy some of the evil, we think, by ridding us of many of these worthless curs. The way the law is now we cannot kill a dog, unless we actually catch him in the act of killing or worrying the sheep. If we do kill a dog otherwise what is the consequence? We are compelled to pay damages to the owner of the dog, and far more than the dog is worth. I have twice paid bills for dogs I have killed, and I know how it goes. I don't think my neighbor has a right to keep a dog or a lot of dogs to kill my sheep, and I am to have but little redress, while if I kill his dog I must pay him a price for his dog far higher than the dog could possibly be worth.

We ask that these dogs be registered, because we think the number

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of dogs in the county would be greatly reduced, for the majority of the owners would never take the trouble of registering their dogs, and they would then, under the proposed law, become public property, and we could kill them without danger of having to pay a heavy bill of damages and costs.

This is the reason we ask to have them registered. I think the law will have a good effect, though I do not think it is right in one thing—the fee should be much higher, and then people would not incur the expense of registering other than valuable dogs, and the worthless curs would have to go.

I would like to hear the views of other gentlemen in regard to the matter.

Mr. Williams—In reading this law over I see the Clerk who is to attend to the registration gets 10 cents for his work, and this amount comes out of the pocket of the owner of the dog. Now, who is going to provide the Clerk with all the books and other necessary things he will need for this work?

I contend that this fee should be larger, and that it should go into the school fund of the township in which the fee is collected. As it is now the poorer the man the more dogs he has. [Laughter.] Put more penalty on his keeping so many dogs, and require him to pay a heavier fee for this registration, and the dogs that will be registered will be worth something, and the others will be at the mercy of those who wish to kill them. Make the fee higher, and let it go into the school fund.

Mr. Carhart—On the same principle as the high license? [Laughter.]

Mr. Pancoast—I think there is one weak point in that bill, and it is a vital one. It empowers no one to kill any dogs found running at large not registered. It seems to me an amendment should be introduced, designating some certain person to look after these dogs, and kill such of them as are found running at large off the owners' premises, without being registered.

Mr. Denise—I think, under the present law, when the Assessor comes round, he assesses these dogs, and if he found one without an owner, as he now does very frequently, [laughter], he should kill the dog, but I suppose he would be afraid to do this, for fear the man would not vote for him for the office another year. [Laughter.]

It is the duty of the Collectors to kill every dog of this kind, but he won't do it, for fear he will lose his little office.

Mr. Ege—That difficulty with a dog-killer might be remedied by making the office an appointive one, instead of elective.

Mr. Williams—For the purpose of getting the sense of this body, I would amend that, by having the owner pay a fee of \$1 for each registration by the Township Clerk.

Mr. Denise—That does not change the form of the law as it is at present, as I understand it, for we have a dog-tax in our county, also.

A Member—It seems to me that Mr. Williams has struck the right idea. If high license will work anywhere it ought to work with the dogs. [Laughter.] Make the fee \$1, or even \$1.50. The dogs should pay the value of the sheep killed. I would make this registration fee \$1 or \$1.50. People who cannot afford to pay this tax should be compelled to kill their dogs.

I second the motion of Mr. Williams.

Mr. Budd—Many poor people could not possibly afford to give \$1.50 to have a dog registered, and the dog may be just as good a one as yours or as any other man's. I think we should fix the fee lower, for it will accomplish the end, and those having good dogs will register them, while those having worthless dogs will not pay the expense of registration. If you fix the fee so high few dogs will be registered and people will take their chances.

Mr. Shreve—If you put the price up to \$1.50 it will aggravate the difficulty, especially if you don't appoint a man to make it his business to kill off the dogs not so registered. With a high registration fee there will be none registered except valuable dogs. We want people to see that their dogs are taken care of, and not allowed to be running about.

Mr. Taylor—The gentleman from Camden says that the high tax would be an aggravation to the men who had to pay the tax on the dogs. How about the aggravation of the farmers who are now having their sheep killed? [Laughter.]

Mr. Shreve—The men who own the dogs that do the damage should be compelled to pay it. They keep a half dozen or more, some of them, foraging on chickens, calves, lambs, and everything else they can get. The dogs must live and they take what they can get.

Mr. Ward—This law is very similar to the one now in existence

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in New York city. There the law is such that persons owning dogs have to take them down to the City Hall, where there is a proper officer appointed by the city, who has charge of registering these dogs. Upon the dog's neck a collar must be placed, upon which a certain number is engraved—a number assigned by the registering officer. The owners of the dogs are compelled to pay a fee for this registration, and this tax exempts the dogs from being killed.

Within the last two years I have had almost all my poultry killed by neighbors' dogs. At one time we saw the dogs doing the damage and knew whose dogs they were. I told the man who owned the dogs that they were killing our chickens, and the reply was—"What are you going to do about it?" What could I do? He was worth nothing and I could not sue him for damages, but if I had killed his dogs he would have gotten the price of them three times over, for the court and jury would have given him the damages he asked.

Under the change in the laws which is proposed here, if I see a dog in the act of killing my chickens, or calves, or lambs, I can kill him without being compelled to pay damages unjustly.

Mr. Nicholson—I would like to offer as an amendment to that law that the sum of "ten cents" be stricken out and "one dollar" be inserted in its place.

And further, that the money that is received shall go to the benefit of a fund to pay for animals, poultry, &c., killed by the dogs, where the owners are unknown.

Mr. Parcell—I would like to ask Mr. Nicholson if the law does not provide for that at present. I refer to the question, is the fund to be used for the purpose of paying for such animals as are killed by dogs?

Mr. Nicholson—The idea is to increase that amount as at present authorized.

The Chair—Are you ready for the question on the adoption of the amendment to the resolution?

The question being on the amendment to the resolution, it was so ordered.

Mr. Pancoast—I beg leave to offer an amendment. That the township committee be authorized to appoint a man who shall be empowered to kill any unregistered dogs he may find off the owners' premises, and that the township committee shall give for such services such compensation as they shall deem proper.

Mr. Denise—I would like to second that amendment, for we want to get rid of these many worthless dogs.

Mr. Diecks—How does this apply to cities? The bill does not say.

Mr. Parcell—The cities, as I understand it, are acting under a charter of their own, and the amendment as you have offered it would not apply to cities or wards of cities. In townships or boroughs it would be all right.

Mr. Rogers—I move to amend by striking out in the amendment “township or ward” and substitute “in any place in the State of New Jersey;” that would make it right for any part of the territory of New Jersey, and would cover any incorporated cities as well as townships and boroughs.

Mr. Ward—Suppose the township committee does not appoint this man to kill the dogs. I think it takes that power out of my hands entirely, and if the law is so constructed, it will take it out of the hands of every one except the officer thus appointed by the township committee, and the dogs will run at large as usual.

Mr. Denise—That is a matter I did not think of. I don't want that power taken away from me—the power to kill these dogs whenever I catch them doing damage on my farm. It has been suggested that the township committee may not act in the matter, and we will be no better off than before. If that is the case I am certainly most strongly opposed to the amendment providing for the appointment of such an officer.

Mr. Forsythe—I would move that these dogs be fed on skimmed milk, and they will get thin and die off. [Laughter.]

The Secretary—It seems to me that if you appoint this dog-killer, and the dog-killer is in one end of the township and the dog is killing sheep in the other, he will not get killed. [Laughter.] I prefer to have the power to dispose of the dogs myself. If the dog does the work and I see him, we will be together and will settle the matter right there without calling on the dog-killer. [Laughter.]

Mr. Shreve—If you pass the law that the township committee shall appoint a man to act as dog-killer, and they don't appoint him, you will not get any dogs killed. We have an immense number of dogs in our township, but there are only about one hundred out of the four hundred voters, who pay any tax for them, and I think that

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every one should have a right to kill the dogs wherever found when off the owners' premises and not registered as required.

Mr. Denise—I want to understand this thing thoroughly; if they do that, does it take out of our hands individually, the right to kill such dogs when found doing mischief, or wherever found, when off the owners' premises and not registered?

The Chair—I should say it did.

Mr. Denise—Then I don't want to be put into that hole. [Laughter.]

Mr. Ege—I understand it this way: This dog-killer appointed by the township committee, is empowered to kill the dogs running at large off the premises of the owner when not registered. We have as much right to kill a dog worrying our sheep, poultry or calves, under the proposed law, as we have to-day, but no right to kill a dog running at large with a collar on his neck, showing that he is registered.

Mr. Rogers—I find in the new law: "And it shall be lawful for any person to kill any dog or bitch found straying off the owner's premises without such collar upon its neck."

If you license them, you cannot kill them; you cannot kill the dog if he is protected by registration.

Mr. Taylor—I think it will be necessary for this matter to be very carefully digested, and if in order, I would move that it be referred to the Committee on Legislation, and that they be requested to put it in shape.

The question being on the motion of Mr. Taylor, it was so ordered.

Mr. Taylor—If you will allow me, there is one thing I would like to bring before the Board. I understand it has been decided, by the Building Commission, to move the library from its present quarters to the third story of the new building. I do not think there is a better situation for the headquarters of this Association than the room now occupied by the library. I understand that Professor Cook has some promises of having the Geological Survey located there, and I move that the Executive Committee lay before the Building Commission a request from this State Board, that we be allowed to occupy that room with the Geological Survey.

I make that as a motion, if in order.

The question being on the motion of Mr. Taylor, it was so ordered.

The Chair—The next business in order on our programme is "Insect Defoliators of our Shade and Fruit Trees."

Professor Reiley, from the Department at Washington, was to have been with us and talked to you on this subject, but as he is not here, I will call upon our friend from Burlington county, "Senator" Taylor. [Laughter.]

Mr. Taylor—Mr. President, that is all right. [Laughter.]

As we seem to be so far behind with our programme, and as we thought we would not be able to get through, Professor Reiley, who was to have been here, and explain to the Board the cuts which were sent by the Agricultural Department, as the Department did not specify which the different cuts were, and what they were called, as we were so much behind with our work on the programme, we telegraphed Professor Reiley not to come, and therefore the subject will have to be passed, and the matter will be published in our report in a shape that all our farmers can understand it.

Each insect will be represented separately, with a description of its appearance, habits, &c.

[NOTE.—The Executive Committee has decided to issue this work in pamphlet form, with the addition of the remedies for these pests, so far as it may be possible to determine what they are.—SEC'Y.]

The Chair—The next topic on our programme is "Our Experiment Station," by Dr. A. T. Neale, Chemist of the State Experiment Station.

As Dr. Neale is not here, we will ask Dr. Cook to address you on this subject.

Dr. Cook—I want to come forward for a moment only, to make an excuse for Dr. Neale.

Dr. Neale is the chemist of the Station, and was appointed by your Executive Committee to talk to you and explain the workings of our Experiment Station. He did not get an early notice, so he could get ready, and I must say for him that he is one of those people who do not talk at a venture. For this reason he did not feel prepared to handle this subject before the State Board, and he would not undertake to present a paper unless he was sure he was entirely correct, and that his figures were accurate and everything of that sort. He was not given sufficient time to prepare such a paper as he would have desired, and that is the reason he is not here to-day. He has a

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large amount of material on hand already worked, but was not entirely prepared to present the subject fully.

We have the statistics for considerable work that is now going on, and these statistics we are preparing to publish in the annual report. I think it is decidedly in his favor that he should have declined the favor conferred upon him by this Board, on account of his desire to give you an accurate report, for we want whatever is presented as the result of our methods which have given satisfaction, as nearly accurate as we can make it.

We want figures that can be depended on, and we want to have these figures absolutely true—this is the reason we make no report of that kind to-day.

I must say generally that the work of the Station is going on as fully and as liberally, and with as much satisfaction as can be expected with the provisions we have for carrying it on.

The most urgent work we have to do is that of analyzing fertilizers, for that has become one of the principal things for which the chemist is needed, on account of the amount of this material that is being used by our farmers. There is nothing else that requires as much care as that.

I heard some of the farmers say that they wanted to see us doing something else, and we should, too. But we know this is an important feature of our work on account of the protection it gives to the farmers of New Jersey. Those who are studying the subject know what is needed and they know what to buy. Another result of these analyses is, that from our reports, manufacturers know what you want and are endeavoring to furnish you with what you need.

The results of our tests are not always satisfactory to these manufacturers, because they say that we do not value their fertilizers high enough, and if our tests do not result as favorably as they claim, they are prompt in calling our attention to it. One of these fertilizers which we have analyzed—a fertilizer made for peach trees—we estimated its value at \$4.50 per ton, while he is selling it at \$45 a ton. We have had some difficulty about this one case, and have not felt warranted in giving the information to the public, as the gentleman who furnished the sample was not in a position to make a sworn statement in regard to it. I find a gentleman here who has bought two tons of it. If he had our bulletin report, I think he would not have bought it. The result of our work would have saved him from

paying an exorbitant price for this material. I feel sure that the majority of you, knowing the results of our tests of this material, would not have bought it.

Mr. Forsythe—Whose is it?

Dr. Cook—I do not like to say.

Mr. Forsythe—But I think you should tell.

Dr. Cook—I suppose I can tell you now, because we have taken the utmost pains in analyzing the sample sent us, and we had here this morning with us the gentleman who gave us the sample, and we will ask him if he is ready to be prosecuted. If you will refer to our bulletin, you will find it.

Mr. Forsythe—I cannot find the name of the fertilizer or the manufacturer in it, and I am surprised to hear it. I think the result of such analysis should be made public promptly, for the protection of the farmers.

Dr. Cook—The man who furnished the sample is now ready to stand for it.

The fertilizer referred to is that of Carey Brothers. It is made in Pennsylvania, and brought here to sell to the peach growers and others, and they want to sell it at the high price I mentioned to you. In fact, they have sold it to our New Jersey farmers.

Aside from that sample, I must say that all the fertilizers analyzed were fully up to the guarantee. I must also say that the analyses of these fertilizers have done much to put the manufacturers on their good behavior. They watch our reports very closely, and we get complaints if we only get one-tenth of one per cent. below their guarantee, and they claim that we have made a mistake, and we are obliged to prove to them that we have not erred in our analyses. Scarcely any of the fertilizers manufactured now, go below the guarantee. The best manufacturers are almost invariably up to the standard.

We are doing other things, however, besides the analysis of fertilizers. There is a great deal of other work we wish to do which will be of great value to farmers of this State.

The President has mentioned to you the subject of sorghum and the manufacture of sugar.

Our Station has just taken hold of that matter, and has undertaken to make examinations from year to year and see what is being done in this interest. They are doing a great deal in Kansas, but

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more in New Jersey than anywhere else, and have apparently proved this year the practicability of making this one of our New Jersey crops. Several farmers in Cape May county have raised sorghum this year, and turned it in for sugar, and they give it out that it is as cheap as Indian corn, because it requires about the same care and attention as corn. They have turned this sorghum in for sugar, and they got about eighteen hundred pounds of sugar, and about fifty gallons of syrup and from a half to two bushels of seed, as good as Indian corn, to the acre.

Count that up—reckoning the sugar at 4 cents per pound, molasses about 25 cents a gallon, and the seed at 50 cents a bushel—reckon it up, and it is a vastly better crop than Indian corn, and it will grow on the same ground that corn will, and is less liable to failure. Under these circumstances, I think you will agree with me that it is a subject well worthy of consideration. We want sugar as much as we want flour. The demand for it has been increased from time to time. Every citizen of our State, every man, woman and child, uses about fifty pounds of sugar in a year, and perhaps a little more, gaining from year to year. A staple crop of this kind is of great value to us, because of its adaptability to our lands. The subject is certainly one of great importance. The experiments made in Cape May county may be considered as having settled its adoption there as one of their crops. The thing, of course, is to raise the crop economically, and to get the full value of the crop after raising. The great thing is to get all the sugar out of the cane. When they only got about two-thirds of the sugar, as formerly, it hardly paid for raising it. Under the new process they undertake to get the greater part of it, if not nearly all of the valuable matter contained in the cane. Under this process they cut it up fine and then soak it in water; by this means they can draw out the greater part of the sugar from the cane, if they do not use too much water, and care must be exercised there or else they will have to try it down. Dr. Neale has been experimenting with that until they have succeeded in getting the fluid with the water in it, almost as strong as the juice itself. First they dip it in clean water, and then they take that which is taken off and put it in the same quantity of water again, when it will take out perhaps one-fourth more, and then another quantity of fresh cane is put into it, and that strengthens it a little more, and so they go on until these waters become almost as strong as the juice itself. In that way they are able to extract almost

everything of value from the cane, and then they are learning how to evaporate this strong juice properly to procure the sugar, so that I think we have done very much for the agriculture of the nation—perhaps more than any other Station of its kind in the whole country up to this time. [Applause.]

There are other points we have been investigating, one of them in relation to lucern. This is a grand crop, and I think the results will show that it is a very valuable one. We think it will be one of the best crops ever grown for feeding cows.

Ever since the days of Livingstone, who brought it from France, it has been tested. I think it has now been tested for ninety years. It may be raised right in New Jersey. It will yield from fifteen to twenty tons of the very best kind of fodder that can be fed to cattle.

And so there are many other points that I could bring up here had I the time. I give you these, as instances of the work we are doing for the farmers of New Jersey, and hope to do still more in our Station that will be of value to the farmers of this State.

We expect to add to it, if possible, something in the way of a report in regard to the destruction that is going on from insect depredations, which is becoming a question of very great moment to all who are engaged in farming or in fruit-growing.

I understand the farmers of West Jersey have lost almost half of their cabbage crop on account of the cabbage-worm. In East Jersey they do not undertake to raise late cabbage on account of the ravages of the worm.

These experiments are also being carried on as thoroughly as possible, and we hope before long to be able to report something in this connection.

The reports we are issuing on these matters we endeavor to distribute throughout the State to all interested in agriculture and horticulture, and we would like to reach them all. I think we have about seventy-five hundred farmers in New Jersey, who are on the list, and to whom we undertake to send these copies. If any of you know of others who do not see these reports, if you will send us the names, I will be very glad to see that they are furnished with the information arrived at, so far as it can be furnished. Any members of the Board who have important questions of interest to the agriculture of the State, we will be glad to hear from, and will do the best we can to solve them. We cannot do everything, but we do the

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best we can with matters which are brought before us, especially those of the most importance.

Mr. Forsythe—Which do you think the most advantageous, the Alsace or the alfalfa clover at the present time?

Dr. Cook—I think the alfalfa would be altogether the best.

Mr. Forsythe—Would it do as well in this climate?

Dr. Cook—It has grown well in the neighborhood of New Brunswick for six or seven years. I think that will answer the question in regard to the climate.

Mr. Forsythe—How much will it yield per acre when cured dry?

Dr. Cook—We have dried it, and I should think it would not lose more than 30 per cent. Perhaps when thoroughly dried it would lose 50 per cent.

Mr. Forsythe—How much hay, then, would it yield?

Dr. Cook—If it lost 50 per cent., I should say the yield of hay would be about eight or ten tons, perhaps six or seven tons to the acre, cutting it three times. It can be preserved in the form of ensilage without drying at all. Alsace clover should be used where the ground is a little heavy. It grows better on a wetter ground than the red clover will, or the alfalfa. It thrives there, and it ought to be wherever you are afraid of the wet, heavy soil.

Mr. Forsythe—Will it grow on a low meadow?

Dr. Cook—Not on black ground, but on clayey soil, where the red clover will grow.

The Chair—I am much gratified to hear the Professor make the remarks he has, but I want to ask him a question or two before he takes his seat.

He has told us it is the design of the Experiment Station to investigate the operations of the cabbage-worm, and to report upon any remedies to be used against its destructiveness.

Is it feasible to institute in connection with the Experiment Station a Department of Entomology, where different kinds of insects so destructive to vegetable life may be studied carefully and thoroughly, and accurate descriptions of their appearance and habits may be given, so that the farmers of New Jersey can keep up their knowledge in regard to these new insects?

There have been two new insects brought to my notice within the past year, and before we leave I hope some one will tell us how far their ravages have been noticed throughout the State.

Mr. Forsythe—I don't know which you have reference to. There is another insect in New Jersey which has lately made its appearance in the cranberry bogs. It is a new miller, which lays an egg and hatches a small green worm. It cannot be destroyed. Flooding of the cranberry bogs during the entire winter does not destroy it, and the cranberry growers have thus far been unable to do anything with it. It originated, I think, in the cranberry regions in Massachusetts, and it has been very destructive to the cranberry interests of New Jersey. It is one of the most destructive insects I have yet seen in our cranberry bogs.

Dr. Cook—I am glad you have brought that up. I have written to Mr. A. S. Fuller, in the upper part of the State, an excellent entomologist, and the editor of the *Entomological Journal*, in regard to the insect.

We want to know the facts in regard to this insect, as to its appearance and general habits and growth, and how to diminish its ravages. We propose to do this as thoroughly as we can, and to get the best man that can be found for the purpose.

Mr. Forsythe—Have you an acquaintance with Dr. Leidy?

Dr. Cook—I have known him. He is one of the most thoroughly scientific men in the country, and I shall be very glad to consult him, and am glad you have mentioned his name. I would also be glad to hear the names of any others in the State. This is what we want, for in this way you can help us materially.

Mr. Williams—I would suggest that New Jersey has an able representative, Mrs. Street, of Vineland, who has published a work on this subject, if I am not mistaken.

Dr. Cook—What is the title.

Mr. Williams—I think it is "Insects Injurious to Vegetation."

Dr. Cook—We shall be very glad indeed to get any information that farmers can give us, and we would like to have the names of such men as would be thoroughly fitted for this work.

The Chair—In connection with that subject, while we are talking about these insects, I see we have here with us a gentleman from our own county who gave me the information in regard to the fly I mentioned as being so troublesome to cattle at night.

I think it would be of interest to the Board if he would state briefly, if he will do so, all he knows about this pestiferous insect.

I refer to Mr. Nicholson, of Camden.

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Mr. Nicholson—They were a species of fly, apparently unknown both to myself and a number of gentlemen whom I met with from different parts of Pennsylvania and New Jersey, and it appeared to make its presence known in different localities about the same time, that is, in the early morning before daylight. It is about half the length of an ordinary fly, and is very troublesome and annoying. I should say it belonged to the same family of insects as the common fly, as it is articulated much the same way. It is particularly fond of fastening itself on the udders of the cows, or where the skin of the animal is the thinnest. When the animal is lying down they settle on the thin skin behind the shoulder blades. It also collects very frequently around the horns, and I have frequently noticed that this spot is covered with the excreta of the little insect. I should judge it was about the same size as the ox-fly, which has been so troublesome at times. But little seems to be known of this insect that is now troubling cattle, except that it is very annoying to the animals at night.

Mr. Forsythe—Is it poisonous?

Mr. Nicholson—Oh, no; I should say not. It follows the cattle into the stall, and annoys them very much both in the morning and in the evening. It is, of course, very annoying while milking, and there seems to be so little known of it that we do not know what to do to prevent it from working on the animals.

We have sent specimens to the Department at Washington, and the Entomologist said he had seen nothing of it, but he would consult the authorities in this country and Europe, and also stated to what family of insects it belonged.

Mr. Forsythe—Is it troublesome to horses?

Mr. Nicholson—So far I have never seen it settle on horses or on mules. It is confined, as far as I know, to cattle only.

Probably there are others of you who have seen it, and if your observation does not correspond with mine, I hope to hear from you, as the insect is something new, seemingly, and we all ought to know as much about its habits as it is possible for us to find out, and think it would be wise to send all the information we can gather to Washington. If any of you know of any difference in its habits—anything different from what I have said—I think we should hear from you here, as it will interest the Board.

A Member—How does the color correspond?

Mr. Nicholson—It is nearly black.

Mr. Denise—I don't know anything about the insect Mr. Nicholson has been speaking of, and have never noticed any of them on my place, but we had something with us last year, about two or three weeks before harvest, which was very injurious to our grain crop. This is an insect of some kind that cut the heads off the wheat, cutting through the straw about half an inch from the head. I am curious to know whether any of you suffered in the same way.

The ravages in my field were very serious, as also in one or two other fields in my neighborhood. I think they destroyed about five per cent. of my crop.

A Member—When was this damage done?

Mr. Denise—About two or three weeks before harvest time, and it was cut off about half an inch, or so, below the head.

Mr. Voorhees—A gentleman on my right suggests that it may be due to the sparrows. [Laughter.]

Mr. Denise—I beg to differ with him in my case. The sparrows generally light on the outside of the fields, and generally take the grain out of the heads. There is quite a difference between the workings of the two, I can assure you.

Mr. Nicholson—There are a number of complaints of the same nature as that of the gentleman from Monmouth county. The worm in some cases has destroyed about twenty per cent. of the crop, by cutting the straw off an inch or two from the head, a short time before harvest, and it was impossible to have gathered it with any machinery we now have on the farm, for the heads fall, and are lost on the ground. Where this trouble occurs you may not observe it until it is almost ripe, and then you will see the straws sticking up over your wheat fields, showing where they have been cut off. If you cannot tell before, you can then, as to the extent of the damage done.

So far as I am able to say, the damage was about twenty per cent. in my fields. I know but little of the habits of the insect, nor anything about its going into its chrysalis state, nor can I tell whether it is a moth or a beetle. That must be determined by getting a specimen and putting it into a case, feeding it and awaiting its transformation.

A Member—Is it in the form of a worm?

Mr. Nicholson—No, sir.

The Secretary—The last report we have here (Union County) asks

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whether the Experiment Station can do anything towards the extermination of the elm-tree beetle, &c., and give us rules for the work.

Dr. Cook—I have stated already that we will do all we can to find methods for the extermination of these beetles; they are certainly doing a great deal of damage, and we want to do something to counteract their effects. In many places they have almost completely destroyed the elm trees. It is noticeable that a great many of these beautiful trees are dying off rapidly.

The Chair—I would like to state that I received a communication from Washington in reference to the defoliators of our shade trees, and also in reference to other things of interest. Among these there was a recommendation for the destruction of this elm-tree beetle. The remedy given is easily applied, and I give you the statement as I got it. The recommendation is, that there is a time in the life of the beetle when it is obliged to return to the ground to hibernate, and it is at that time we are to look after it, and we can stop its depredations. Many of you have probably noticed the fact that they do leave the trees at one time, and you have probably noticed them on the sides of your houses and on the boards around.

The idea is to build a box around the foot of the tree, say a foot high, and inside of that laying a coating of cement, or something entirely tight, that the insect cannot bury itself, or where it cannot burrow, and then in this box place kerosene oil, or pour hot water on them to exterminate them, and in this way it is claimed the numbers may be greatly diminished.

I give you the recommendation as I got it from the Department at Washington.

Mr. Taylor—I have a message from General Hatch which I should have communicated to the Board before. I called on him on last Monday in the room of the Agricultural Department, and had a very pleasant little chat with him, and he was very anxious to have been with us here at this session. He was very much pleased with his visit last year, so much so that had his business permitted, he would have been with us again at a part of this session at least. He also asked particularly that he might have a copy of our report for this year, and that it be sent him as soon as practicable; he also expressed particular interest in the weather service.

He told me he had a bill looking towards the extension of the Signal Service. His idea is that by having districts in the State sup-

plied with this information it will be of great benefit to the farmers especially. He mentioned an experience of his own last Christmas. He said he was at home and had no idea of any probable change in the weather, but in going into the city he noticed the Signal Service flags indicating a cold wave. Returning home he ordered all his cattle to be housed that night, as this cold wave was predicted. His farmer thought he was mistaken, as the weather was very mild and pleasant, but he insisted most emphatically that everything on his farm should be housed that night. He said that night it started in to drizzle and rain and this ended in a sleet and snow, which was one of the coldest nights of the winter, in some places the thermometer indicating below zero. Those farmers not having this information left their stock out, and they were in a miserable condition the next morning, wet with the rain and ice, they had certainly suffered from the cold, and had lost more flesh in that one night of exposure than could be put back on them in a week, while his cattle were perfectly comfortable, and in a few days were turned out again, and had not suffered at all by the sudden change in the weather.

That convinced him of the necessity of these Signal Service Stations. He also stated that there were thousands of farmers who would be benefited by the information, who now never knew anything about these weather predictions unless they happened to get into town. He wishes to secure an appropriation by which Stations can be located in prominent positions in the country, and he hopes to have the farmers co-operate and pass these signals on to the other Stations.

He wished to be remembered to the farmers of New Jersey, and sends his regrets that he could not be with us in this session.

It was the same with some of our members of Congress whom I saw. Mr. Hires and Mr. Buchanan and others said they wanted to be with us if it was possible for them to do so.

Dr. Cook—Would it not be well to pass a resolution asking members of Congress to pass this law, in order that these Stations may be established as soon as possible?

Mr. Taylor—I do not know what shape the bill is in now, but we might possibly recommend something indefinitely in that way. The idea is all right, but whether or not the bill is all right, is the question. I would like to pass a resolution favoring such legislation if it could be done.

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The Chair—We will be glad to hear any other new business that may be brought before the Board at this time.

Mr. Taylor—Will some one here please explain why it is that the farmers sell to the handlers of milk by dry measure, and these dealers in milk then sell it by liquid measure? They gain by that difference, of course, and the farmer is the loser. Why should the farmer give this additional profit to the dealer—a profit of nearly twenty per cent., for the dealer gains just about twenty per cent. in measure.

At the prices milk is now selling for, the farmer should not be required to do this. Cannot some remedy be devised for the relief of the farmers from this oppression?

The Chair—This is certainly well worth considering, for, judging from the immense amount of milk now being produced and sold in New Jersey, it would make a great difference to the farmer in the course of a month or a year. There is no other way to get at this matter, except by discussion, and I think it should be discussed fully and freely, especially by the farmers in the lower part of the State. Let us hear from those who understand the subject.

Mr. Shreve—I think that matter rests partly with the milk producer himself. The dealer requires him to give four quarts more milk in every forty-quart can of milk. I should think the milk producers ought to combine, and arrange and agree between themselves that they would not give this extra four quarts in every forty they furnish the dealers. There is no necessity for it at all. There is no law compelling the producer to furnish milk in this way. It is not right that this should be so, but the farmers are at fault themselves. Farmers, as a class, don't pull together. They are not thoroughly organized in their own interests. Let them stick together and there is no trouble about getting what they want. We cannot expect our law-makers to help us if we don't show them what we want. If the farmers cannot help to regulate their own prices and their own measure, how can they expect assistance to compel such action as they ask. If we are not as one in these matters we cannot expect to demand, with any show of success, that which we have the right to demand. Other bodies and other interests organize, and why do not the milk producers? They have the remedy in their own hands, if they have backbone enough to work together and demand their rights. Let them say we are not going to give you these extra

four quarts. Let them say this and let them stick to it, all of them. If one does it, or one or two or three farmers do it, just so long the others are compelled to do the same.

Mr. Ward—I would like to ask one question in reference to the small fly that affected the strawberry plants so much last year, in some sections of the country.

It is a small fly, about the size of the cabbage-fly, which ate off the leaves of the strawberry plants. The Sharpless were particularly troubled. We lost six or seven acres of the Sharpless plants, eaten off by this fly. Can anyone tell us whether it is something new, or not? With us there were immense numbers of them, they would fly up in clouds, when disturbed, and they damaged six or seven acres so badly that they were almost a total loss, the Sharpless suffering the worst.

A Member—How do you explain their preference for the Sharpless?

Mr. Ward—I don't know, unless the growth was a little more tender, perhaps, or whether there was some taste about the leaf of the Sharpless they liked. I only know they damaged the Sharpless worse than any of the others. The Downings, right alongside of them, did not seem to be much affected, but it is something very destructive to our plants, whatever it may be. We were not the only farmers troubled with it, for there were other patches injured in the same way.

I spoke to Mr. Quinn about it he said he had noticed them, and that by dusting with dry lime they were partially removed—that is, with air-slaked lime.

Mr. Haines—What time in the year was that fly noticed?

Mr. Ward—It was in the latter part of July or in August. We had run the mower through this field and it was this second growth of the leaf they seemed to eat the most. From this second growth they spread to the older growth that had not been cut off, and ate those off. The bed was a young one of a year only, and they destroyed this, though had it not been so damaged we had intended leaving it go over for the next year. As it was we had to plow it up. The vines were thoroughly and completely destroyed.

If this insect is going to be a regular thing with the strawberry grower it is going to do him a great deal of damage, and will be a serious matter for him.

A Member—I beg leave to offer the following resolution and move its adoption :

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“Resolved, That this State Board of Agriculture memorialize the Legislature of the State of New Jersey, and ask that they equip all Weather Stations with a set of standard instruments, such as one barometer, two thermometers and one rain gauge.”

The question being on the adoption of the resolution, it was agreed to.

The Chair—Has any one anything to offer on any other subject of interest to this Board? If not, I suppose we might as well bring our labors to a close, and a motion to adjourn will be in order.

Mr. Denise—I move we adjourn.

The question being on the motion of Mr. Denise, it was agreed to, and the State Board adjourned at 4:30 P. M., *sine die*.

REPORT OF EXECUTIVE COMMITTEE.

EXECUTIVE COMMITTEE'S REPORT.

To the State Board of Agriculture:

GENTLEMEN—While the past year has been discouraging to those engaged in agriculture, not only in our State and nation, but apparently in most foreign countries, still there are many bright spots to look back upon with pleasure and pride, and amongst these perhaps nothing is more encouraging than the great interest manifested by our farmers in their distinctive organization—the State Board of Agriculture.

Under our new law, which so far has accomplished its object, our County Boards have shown much greater activity, many new members have been added, and we trust the good work has been fairly inaugurated by and through which the farmer may look after his own calling and administer to its wants as none other can.

In preparing our programme this year we have taken a new departure, by omitting as far as possible lengthy papers, and in their places have substituted discussions, by which we hope to obtain a more accurate knowledge of the needs of agriculture in this State, and decide upon such measures as may encourage and revive this important industry.

During the past year the Executive Committee has held seven meetings, which were attended by all of the members. The following were the most important matters acted upon, viz.:

The President was directed to procure from the Agricultural Department at Washington cuts of various insects that are helpful or hurtful to the farmer, and which cuts will be printed in our report this year, that by the eye we may be able to recognize the insects, which by description alone we cannot.

Over five thousand copies of our annual report were distributed by mail to our farmers, which, although expensive, we believed to be the surest way of reaching those who would value them most highly. To overcome this expense we have requested the Representative in

Congress from this District, Hon. James Buchanan, to introduce a bill allowing such reports, and of our Agricultural College, to be sent through the mails at the same rate as newspapers, and we take pleasure in adding, such a bill has been introduced.

At the request of Governor Green the following gentlemen were selected (and appointed by him) to attend the Farmers' Congress at Chicago, November 1st to 5th, 1887 :

At Large—Hon. Edward Burrough, Hon. Augustus W. Cutler.

Alternates—Hon. Isaac M. Smalley, James Neilson, Esq.

First District, Hon. John W. Dickinson ; Second District, Isaac W. Fennimore ; Third District, David D. Denise ; Fourth District, Hon. John A. McBride ; Fifth District, General Francis Price ; Sixth District, William R. Ward ; Seventh District, Elbert S. Carman.

The committee reported through the chairman, that while the gentlemen appreciated the honor conferred upon them by His Excellency the Governor, finding the meeting was not to be held under the auspices of any regular agricultural organizations they did not attend, but recommended that our State Board instruct the incoming officers to communicate with the Agricultural Boards of other States, and with the Commissioner of Agriculture, with a view to establishing a National Board of Agriculture, to meet annually in Washington, and to be composed of delegates from the State Boards, as they believe such intercourse would be productive of good results.

To make this effective, legislation by Congress would be required, and a sufficient sum appropriated to meet the expenses.

The New York College of Veterinary Surgeons having offered a free scholarship to our Board, Robert E. Stanwood, of Freehold, Monmouth county, was appointed.

At the request of the Commissioner of Agriculture a quantity of Bragden's Hog Cholera Specific was sent for a thorough test, the results of which will be reported by the special committee appointed last year.

Believing the paper read before this Board last year on the "Care of our Roads," contained much that would be of value to our township officers, we had a number printed separately, and hope, after a thorough discussion of this important subject at this session, they may be distributed to advantage.

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At the request of many of our members we have again laid before you the "Milk Question," probably the leading agricultural interest of the State, and one needing your careful attention. The duties of our Secretary being such that he could not devote as much time as formerly to the office, at the request of the committee he continued his position, and our Treasurer, Franklin Dye, was appointed his Assistant.

We have worked at great disadvantage in the past, owing to our not having an office at the State House, where our documents and letters could be filed, our distribution of reports made, and valuable exchanges placed, where the farmers of the State could have access to them. It is for you to say whether the time has yet arrived when our Board should be recognized as the head of the Agricultural Department of the State, and the salary of our Secretary made such that he could devote all of his time to the interests of the farmers, and be located in the State House. Most of the other States in the Union honor agriculture in this way, as she deserves to be, for we outnumber all the callings; they are all dependent upon our industry, and without success on the farm they cannot continue.

We furnish the bread and meat, and there is no industry that it behooves the State to care for and nourish before ours.

We have prepared a brief synopsis of the salient points in our County Board reports, and which being before you, we hope will create an interest in the topics set forth.

We would again remind those present that all are entitled to participate in the discussions, and to bring forward any new business that they may desire to discuss or to have discussed, but to avoid confusion, and also that we arrive at definite conclusions, we would ask that all subjects be introduced by a regular motion, and that where practicable, these be reduced to writing.

For the State Board of Agriculture of New Jersey this has been a year of progress; our advance has been gradual year by year, but nevertheless preceptible to all who have felt sufficient interest to watch its growth. In your hands rests its future. We are far off yet from the zenith we should aspire to, but your committee believe that the interest now awakened will not slumber, but that you will carry it forward to success.

CRANBERRY GROWERS' ASSOCIATION.

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180 STATE BOARD OF AGRICULTURE.

CORRESPONDING SECRETARY FOR MICHIGAN.

S. H. COMINGS.....St. Joe, Michigan.

CORRESPONDING SECRETARY FOR WISCONSIN.

L. G. KNIFFIN.....Milwaukee, Wisconsin.

STANDING COMMITTEES.

STANDARD MEASURE.

CRANE, RIDER, SATTERTHWAITE, COLLINGS, CHEW.

FOREIGN TRADE.

FRENCH, RIDER, S. H. COMINGS.

SCIENTIFIC INVESTIGATIONS.

BRAKELEY (J. H.), DR. GOODELL, PROF. GEORGE H. COOK.

INSECTS.

BRAKELEY (J. H.), HOLMAN, APPLGATE.

CRANBERRY GROWERS' ASSOCIATION.

MR. PRESIDENT AND GENTLEMEN OF THE NEW JERSEY STATE BOARD OF AGRICULTURE—It seems proper in presenting the report of the American Cranberry Growers' Association, formerly the New Jersey Cranberry Growers' Association, that I should preface the same with a sort of apology—apology for the cheek which permits us to hold on to membership and representation in your body, notwithstanding the national character which our association has taken on. Our explanation is this: The New Jersey Cranberry Growers' Association became too big for its clothes, it being the only organization of the kind in the country, and becoming famous the country over for its valuable statistics and other information, growers of this fruit from all parts of the country sought membership in it, and so large and so numerous did this foreign membership become that the name "New Jersey Association" became a misnomer. Besides, it was found necessary in order to make its statistical information more complete and valuable that it should embrace all the cranberry-growing sections of the country. The invitations to membership in these sections were so promptly accepted and were so general that the membership is now about equally divided between the three cranberry-growing sections of the country, and nothing but the name "American Cranberry Growers' Association" was large enough to fit this expansive body, hence the change. It is proper to say, however, that the offices of the association are all held by Jerseymen, and are likely to so continue, as the annual meeting is held each year in the city of Trenton. Thus much of an apology for our existence and representation here.

The past year may properly be said to have been one of the most successful in the history of cranberry culture; taking it the country over, the crop was the largest but two on record, and the prices have been uniformly good from the beginning, so that probably more money has been received and distributed for the last year's crop than for any crop on record. It does not add to our pleasure or comfort to state,

however, that New Jersey has not come in for her full share of these returns, on account principally of a short crop, which was due to a variety of causes, principal among which, however, was the excessive rainfall during the months of July and August. Many plantations were completely submerged and remained so sufficiently long to destroy the crops thereon. The New Jersey crop already marketed amounts to one hundred and twenty thousand seven hundred and ninety-nine bushels, and it is estimated that about fifteen thousand bushels remain in the hands of growers waiting for a more favorable market. It has come to be a prevailing custom with New Jersey growers to hold on to their fruit for the later market, possibly not so much from choice as from necessity. From some natural causes, which are not satisfactorily explained, the eastern people are able to raise a more highly colored fruit, which captures the eye of the early-market man, and New Jersey and western berries must, for the time being, take a back seat. If a market is found at all for Jersey fruit, it is at a considerable discount from eastern or Cape Cod berries. New Jersey, however, is not always a loser by this seeming prejudice against her fruit on account of color. It is a known fact that the Jersey fruit, though not so highly colored before cooking, has a brighter and clearer appearance after, and is decidedly superior to the darker-colored fruit in its delicacy of taste and flavor. It also surpasses all others in its keeping qualities, hence the apparent disadvantage is turned greatly to its favor and credit when a steadily advancing market usually gives them more substantial returns as the season advances. There are of course exceptions to this when an overproduction of berries in the West has overstocked the market, and berries have gone out in the spring lower than they opened in the fall. But this has not occurred often, neither is it likely to occur often, as the region over which cranberries are grown in the West is extremely susceptible to frost, and experience has proven that at least two favorable seasons must follow each other in succession in order to secure a crop there. On the whole, I think we may safely say that New Jersey is more than able to hold her own with her other two rivals in cranberry-growing—Massachusetts and Wisconsin. She may lose something each year at the start, but she always comes in ahead on the home-stretch. I present the following tables compiled from the late reports of our Statistician, as giving information of the growth and progress of this

CRANBERRY GROWERS' ASSOCIATION. 183

industry, not only in New Jersey, but throughout the country, during the last five years :

	1883.	1884.	1885.	1886.	1887.
New Jersey.....	118,524	124,648	198,125	234,254	135,799
New England.....	141,964	130,583	280,879	274,799	278,894
Wisconsin.....	135,507	24,783	264,432	31,396	105,504
Totals	395,995	280,014	743,436	540,449	520,197

I wish to call the attention of this Board to a matter which occupied a goodly portion of the time at our last annual meeting, and which seems to me to be one of great importance, viz., that of standard measure for cranberries. It is probably known to most of you that the New Jersey Cranberry Growers' Association, many years ago, secured the enactment of a law making packages of a certain size for crates and barrels to be the standard measure for New Jersey. These packages were, for some time following the enactment, generally adhered to, but of late years, owing to failure in the law to provide any practical method, or rather means for its enforcement, the law is gradually becoming ignored, and not only are packages becoming again irregular in size and capacity, but a class of men called middlemen are yearly reaping rich harvests by transferring cranberries from original to small or pony packages, so that the objects and aims of the promoters of this law, namely, to protect the consumer and retail dealer, are not being realized, and the law is not only becoming inoperative, but is actually becoming an instrument for unprincipled and dishonest persons to profit by. Massachusetts has also a standard-measure law, which never has been and never will be so effective as was ours, because of a failure to specify any particular dimensions or size for a crate or barrel. It simply says that a bushel shall be thirty-two quarts and a barrel one hundred quarts. This, of course, may be as varied in quantity as the will of the measurer may be varied, from level to heaped measure, shaken up or shaken down.

At the last meeting of our association there were present delegates representing two large organizations, who came at the appointment of their respective bodies to ask our organization to secure a standard for the sale and purchase of cranberries by weight instead of measure. After a thorough discussion of the matter, pro and con, it was thought desirable that whatever legislation was sought in this direction in the future, to be made practical and operative should be of a national character, and while the association was not clear as to the practica-

bility of a standard of weight for cranberries, it appointed a committee to make a thorough investigation of the matter and report at the next meeting of the association. If found practical they are to prepare a bill to be presented for the enactment of a law. If weight is found impracticable they are still to prepare a standard-measure law, giving definite size and capacity for cranberry packages throughout the whole country. If the New Jersey Board of Agriculture favor such action, as we believe you will, we ask your indorsement and assistance in securing the necessary legislation.

Very respectfully yours,

A. J. RIDER.

NEW JERSEY
STATE AGRICULTURAL SOCIETY.

STATE AGRICULTURAL SOCIETY.

The annual meeting of the stockholders of the State Agricultural Society was held in Trenton, on January 18th, 1888. The following officers and directors were elected for the ensuing year, and the reports of the officers were read. The annual exhibition of the society for 1888 will be held on the society's grounds at Waverly Park, on September 17th, 18th, 19th, 20th and 21st. The premium list will be ready for distribution on April 15th, and will be sent on application to the Recording or Corresponding Secretary. The entry-books will be open one month before the opening, at the office of the society, 764 Broad street, Newark.

OFFICERS FOR THE YEAR 1888.

PRESIDENT.

Hon. E. A. WILKINSON.....NewarkEssex county.

VICE-PRESIDENTS.

Hon. AMOS CLARK, Jr.....ElizabethUnion county.
 Hon. N. S. RUE.....Cream Ridge.....Monmouth county.
 Gen. JOHN S. IRICK.....VincentownBurlington county.
 Hon. GEO. A. HALSEY.....NewarkEssex county.
 Hon. WILLIAM J. SEWELL.....CamdenCamden county.

TREASURER.

CHAS. F. KILBURN.....NewarkEssex county.

RECORDING SECRETARY.

WM. M. FORCE.....Newark.....Essex county.

CORRESPONDING SECRETARY.

P. T. QUINN.....NewarkEssex county.

BOARD OF DIRECTORS

Hon. N. S. RUE.....Cream Ridge.....Monmouth county.
 WILLIAM M. FORCENewarkEssex county.
 JOHN BOYLAN.....NewarkEssex county.
 Hon. AMOS CLARK, Jr.....Elizabeth.....Union county.
 P. T. QUINN.....NewarkEssex county.
 Gen. JOHN S. IRICKVincentown.....Burlington county.
 FERDINAND BLANKE.....Linden.....Union county.

STATE BOARD OF AGRICULTURE.

JOSEPH COLYER.....	Newark.....	Essex county.
Col. WM. A. MORRELL.....	Asbury Park.....	Monmouth county.
Hon. E. A. WILKINSON.....	Newark.....	Essex county.
Hon. GEO. A. HALSEY.....	Newark.....	Essex county.
Hon. HENRY C. KELSEY.....	Trenton.....	Mercer county.
JOHN I. BISHOP.....	Columbus.....	Burlington county.
THOS. T. KINNEY.....	Newark.....	Essex county.
WM. MCKINLEY.....	Elizabeth.....	Union county.
HON. T. H. DUDLEY.....	Camden.....	Camden county.
E. B. GADDIS.....	Newark.....	Essex county.
A. V. SARGEANT.....	Newark.....	Essex county.
ROBERT THATCHER.....	Flemington.....	Hunterdon county.
WM. L. TOMPKINS.....	Newark.....	Essex county.
Gen. WM. J. SEWELL.....	Camden.....	Camden county.
CHAS. F. KILBURN.....	Newark.....	Essex county.
HENRY P. JONES.....	Newark.....	Essex county.
FRANKLIN MURPHY.....	Newark.....	Essex county.
GEO. B. JENKINSON.....	Newark.....	Essex county.
S. S. BATTIN.....	Newark.....	Essex county.
CHAS. B. THURSTON.....	Jersey City.....	Hudson county.
H. H. ISHAM.....	Elizabeth.....	Union county.
JAMES SMITH, Jr.....	Newark.....	Essex county.
P. SANFORD ROSS.....	Newark.....	Essex county.

EXECUTIVE COMMITTEE.

WM. L. TOMPKINS,	Jos. COLYER,	H. H. ISHAM,
HENRY P. JONES,	GEO. B. JENKINSON.	

DELEGATES TO STATE BOARD OF AGRICULTURE.

P. T. QUINN.....	Newark.....	Essex county.
E. A. WILKINSON.....	Newark.....	Essex county.

SECRETARY'S ANNUAL REPORT.

To the Stockholders of the State Agricultural Society :

GENTLEMEN—It is with pleasure, as well as it is in the line of my duty as an officer of this society to address you at the close of each year, at the annual meeting of stockholders, and submit in this address, for your information and consideration, a brief outline of the work accomplished and the results attained at the close of the year. Before giving you these facts I desire to digress for a few moments, in calling your attention to some matters of interest to all those who are interested in the welfare and prosperity of our State from an agricultural standpoint. The year just closed has been more favorable for the growth and early maturity of agricultural and horticultural products than the preceding one. According to the crop reports furnished monthly by the Agricultural Department of Washington, D. C., the acreage under cultivation in this State, for all crops, did not exceed the number of acres planted in 1886. The season of 1887, as a whole, was far more favorable from planting-time to the date of harvesting, than it was the year previous. This not only increased the yield of the different crops, but also improved the quality of the products. The season proved favorable for the growth and maturity of corn, wheat, oats, rye and the hay crop, which is a very important one in our State. The bulk of the hay crop was cured before the heavy rains set in, during the last of July and all through August. These rains did serious damage to late-planted potatoes, causing more loss from rotting in wide sections, than there has been for several years past, and consequently reduced the average yield of this important crop at least twenty-five per cent. But this loss was partly made up by an advance in the market price, owing to the short supply, not only in our own State, but in other potato-producing districts.

There is a large area of the best land in the State devoted to the growth of large and small fruits, which, as a rule, heretofore have

paid a fair profit on the capital invested. These crops did not pay as well as usual the past year, in fact the yield of both large and small fruits was far below the average, and while the prices were somewhat higher than they were in 1886, this increase in price did not compensate for the very short yield of these crops in 1887.

Market gardening, which for years flourished in this State as one of the most profitable branches of industry, has been growing less profitable for the last twelve or fifteen years, until now the business is reduced to the growth of say half a dozen crops, which are still grown with profit. The competition from points south has virtually destroyed general market gardening in New Jersey. There are still grown a few crops which would come under this heading, and which yield a fair profit when grown and marketed under intelligent direction. They would include asparagus, cabbage (early and late), celery, turnips and potatoes. These half dozen crops still pay when the proper selection of the soil is made, and liberal doses of fertilizers are applied and generous cultivation is given the crops during the growing season. In many of the crops grown in our State we have not only to stand against the competition of points farther south, giving six to twelve weeks the advantage in climate, but we are also open to competition from Canada, England, Scotland and Holland, with potatoes, cabbage and other crops, which, sooner or later to remedy, our farmers will be compelled to take some concerted action for protection against this foreign supply.

Of course it goes without saying, for you all know it, that the prices of all kinds of farm produce have been low the past year. The farmer who has paid his current expenses, and made four or five per cent. on the capital he has invested, may consider himself a fortunate being at the close of the year. But from information derived from various and reliable sources, there are many farmers in our State who, when they close their accounts for the year, will find the balance on the wrong side of the ledger. With labor high, the price of products low, and a minimum yield, the profits must necessarily be trifling, if any at all. Of course it may be said that this condition of affairs is largely the fault of the farmer himself, in not adopting better methods of culture, heavier manuring, and adapting his crops to the wants of the nearest and best local markets, and by this means not only increasing very largely the acreage product, but at the same

time devote part of his arable land to certain crops which have, when well grown, a higher money value than the ordinary staples.

This change is being gradually made in many counties lying near our large towns and cities, and I have no doubt that during the next decade, the shrewd husbandman in New Jersey will not lose any advantage that location and closeness to market may give him. The fact is, with the large production and outside competition a farmer in our State who wishes success must avail himself of every natural as well as artificial advantage that is practical and within his reach, both in farming, gardening and fruit-growing.

As an illustration of this point I would state that in pear and grape-growing a dozen of years ago, the fruit was sent to market when ripened in the natural way, and it paid a fair profit. Now things are very different. Those who grow these fruits on a large scale are provided with retention-houses, where the fruit can be kept without loss until the scarcity in market, and better prices may be obtained. Holding the fruit back by this means for four or six weeks not infrequently makes a difference of from fifty to seventy-five per cent. of advance in the prices, and this can be done at a comparatively small outlay in construction of a retention-house. I mention this fact in order to show the importance of keeping abreast of the times in all the walks of agriculture and horticulture, as well as other branches of the husbandman's calling.

He who would be successful must be up and doing. Brains and thought must take the place of physical force, for in an agricultural calling, victory is not always given to the strong, nor success to physical force. There are comparatively few farmers in our State who have reached the maximum product of an acre of ground properly tilled, and judiciously fertilized, and carefully seeded. In former reports as I could in this give, statement after statement verified where by good culture the acreage yield was three and four times greater than the average yield of the same crop in the State; and this, too, on five and ten-acre plots. This condition of indifferent and slovenly culture is not confined within the borders of New Jersey, but unfortunately extends east and west in the best agricultural districts of the country.

Since the organization of this society, thirty years ago, up to the present time, the main object of its Board of Directors and executive officers has been to encourage and foster better methods of culture of

the soil, the introduction of purer strains of blood in the raising of neat cattle, horses, sheep and swine, as well as substituting labor-saving machinery to take the place of hand labor. Backed up in our efforts by the local and county societies, there has been a fair amount of success achieved in raising the standard in all the departments pertaining to the husbandman's calling. The friendliness of feeling which has always existed between the many societies of the State with our own society, has tended to promote and elevate the science of agriculture, and it is earnestly hoped that this friendly spirit with our kindred societies will be maintained and strengthened in the future, for in unity there is strength, and with the combined efforts working in the same direction, good results are most likely to follow.

The State Board of Agriculture and State Horticultural Society have both wide, varied and important tasks to perform in holding winter sessions and discussing practical topics by practical men, and publishing these discussions in their annual reports for distribution throughout the State.

The State Agricultural Society has another and equally important field to work in. Its annual exhibitions held at Waverly, bring together in a compact space, accessible to all, the best horses for all purposes raised in the State, also the different breeds of neat cattle from the best herds in the State, the best sheep, swine and poultry, and the choicest products of the farm, garden and orchard raised by the best cultivators.

In another part of the grounds may be found grouped together the best and most modern improved labor-saving machinery and farm implements, the results of the inventive genius of the whole country. Looking at this brief summary of the exhibition, it must be clear to any one that a day or two spent on the grounds by any intelligent man will be time and money well invested, for he will see and learn enough to more than pay him for his trouble, and he must leave the ground a wiser man.

The policy of the society has been in the past, and it is hoped to continue so in the future, to offer liberal premiums for all stocks, goods and products raised in our State, so that the visitor can see the best of everything raised or produced in our State. This policy has met the hearty approval of our people, as may be seen by the steady increase in our entries from year to year, as well as the steady increase

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in the visitors, and, what is still more, the visitors leave the grounds satisfied with what they have seen.

At the annual meeting a year ago the Hon. Amos Clark, Jr., retired as President, a position which he held and filled with ability for many years, and as a recognition of his valuable services this society presented him with a testimonial of rare beauty and value. At the same meeting the Hon. E. A. Wilkinson was elected President, and during the year he has been earnest and assiduous in the discharge of his duties, and his first year as President the society has been unusually successful. During the year the President had the aid, advice and generous co-operation of the Executive Committee, in laying out and carrying out the multiplicity of preliminary work necessary to insure the greatest measure of success. To do this the Executive Committee held eighteen meetings during the year, and these averaged from two to four hours each. This gives only a small proportion of the time spent by the President and Executive Committee, for a large part of the work was done under the direct charge of subcommittees, who assumed the work and responsibility. Although the work to be done required constant attention on the part of the different committees, there was not a jar or ruffle from the beginning to the end of the year.

The work of making permanent improvements was commenced early in the season, and they were all completed long before the fair opened. The Building Committee had one hundred and twenty-five large, well-arranged cattle sheds constructed on the north side of the grounds. These gave perfect satisfaction to our best breeders of fine stock. There was also twenty-five new horse stables built, and the society should erect twice as many more this year, for they are needed to give better accommodations to one of the most paying departments connected with the exhibition. The poultry-house is always overcrowded, and an addition is sadly needed to give more room and better facilities for this popular and growing department. I need hardly repeat in this report what I have urged for a number of years past, that is, a permanent and commodious building for the agricultural and horticultural products, instead of the big tent on the hill. This much-needed improvement I am sure will come before long, as the committee of last year were convinced of the importance of such a building. The "State Kennel Club" have terminated their contract with the society, and this building may be

turned to a good account in relieving the overtaxed ladies' building for miscellaneous articles. Of the improvements made outside of the grounds, the most important is the construction of the Newark and Elizabeth Horse Railroad, which was completed before the opening of the fair, and they carried thousands of passengers to and from Newark, and now the road is completed to Elizabeth and cars running regularly between Newark and Elizabeth, passing the fair grounds both ways. This road will enable the society to rent its grounds during the summer months to different associations, and thus increase the receipts very largely. In connection with this the society should take active steps in turning the eighty acres of swamp land in the rear of the fair grounds into a beautiful lake, which would be an improvement worthy of the name. I hope the new Board of Directors will take some definite action to-day towards reaching that end.

The printing and advertising were attended to early in the season. An edition of the schedule of premiums was distributed in June, and another in the first week in September, to the patrons of the society. In July, hand-bills announcing the dates of the fair were distributed all over the State. In August, one and two-sheet bills were sent out in every direction by special agents, in fact every city and town of any size in the State was well billed by our large and small posters. In fact there was nothing left undone that would give publicity to the time of the exhibition. The third week in August the society gave a lunch on the grounds to the press of the State, and it proved without doubt one of the most successful ever attempted by the society, both for pleasure and profit. It should be the policy of the society to give the press-lunch each year.

It will be seen by this brief outline that the preliminary work was studiously attended to in every detail, and through every available channel. The result as shown by the Treasurer's report is the best evidence of success that I can offer at this time.

The entry-books were opened at the office in Newark one month before the opening of the exhibition.

I herewith append a table which shows the number of entries in each department from 1874 to 1887, inclusive. This table shows the steady growth for the past thirteen years :

STATE AGRICULTURAL SOCIETY.

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TABLE OF ENTRIES FROM 1874 TO 1887.

DEPARTM'T	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	EXHIBITS.
Spec'l State	59	70	106	106	148	124	170	146	149	106	155	140	129	126	{ Horses, cattle, sheep, swine.
Speed.....	52	98	105	99	98	149	.....	103	126	107	66	107	104	175	Speed.
Dep'tm't A.	107	72	68	73	76	78	109	62	75	46	.....	74	78	88	Horses.
" B.	392	431	633	715	818	757	950	963	837	845	984	972	1187	1160	{ Cattle, sheep, swine, poultry
" C.	817	961	1005	1456	1140	1763	1697	1492	1467	1913	1998	2027	1832	1595	Farm products.
" D.	548	701	705	1416	946	702	1122	1091	1021	1182	1268	1113	1258	1296	{ Ladies' needle- work, &c.
" F.	164	182	233	256	291	415	540	793	521	477	639	729	818	715	Canned goods, honey, &c.
" F.	32	154	139	207	192	263	275	232	207	338	219	321	324	176	Farm machines, tools, &c.
" G.	69	72	16	40	47	28	49	50	50	57	83	94	64	8	Carriages, wag- ons, &c.
" H.	29	52	36	37	.....	211	204	86	64	52	57	34	59	35	{ Household fur- niture, woollen goods.
" I..															Manufactured goods.
" K.	97	114	116	136	214	142	177	183	255	300	219	355	380	412	Fine arts, &c.
" L.	81	97	88	140	159	15	34	72	77	35	60	49	40	39	{ Sanitary appli- ances.
" M.	.....	.....	.....	.....	.....	.....	.....	.....	35	16	24	37	39	31	Dairy goods.
Total.....	2447	3004	3249	4681	4129	4687	5491	5394	4967	5559	5885	6184	6296	6063	

The total number of entries in all the departments in 1874 was 2,447, and in 1887 they reached 6,063.

The cattle exhibit at the twenty-ninth exhibition compares well with any preceding one. The Jerseys were well represented, and the show of Guernseys, Holsteins and Ayrshires was unusually large, numbering among the animals shown some of the leading strains in the country.

In numbers the sheep and swine entries were slightly below that of last year; this was owing to the sharp competition at that time, and the exhibitors made entries of, and exhibited their choicest animals only, making the show one of the best ever seen at Waverly.

The entries in the poultry department will exceed the number recorded for any of our past fairs; it might be said that our books of entry for poultry had to be closed before the date named, because of the limited accommodation.

The subjoined table will show the number of herds and single animals shown for the premiums offered by the State Committee, and also the number of animals of the various breeds entered in competition for the premiums offered by the society.

SPECIAL STATE CLASSES.

HERDS.

Jerseys.....6	Ayrshires.....3	Grades.....1
Guernseys.....3	Short Horns2	

State Premiums.

Jerseys	Bulls, 5	Cows, 9
Ayrshires.....	" 2	" 4
Holsteins	" 2	" ...
Short Horns.....	" 1	" 3

No State prize offered.....

GradesCows, 4

Society Premiums.

Jerseys	Bulls, 10	Cows, 25
Ayrshires.....	" 15	" 24
Holsteins.....	" 13	" 20
Short Horns.....	" 3	" 6
Guernseys.....	" 13	" 23
Devons	" 4	" 8
Dutch Belted.....	" 2	" 7
Herefords	" 2	" 4
Swiss	" 3	" 3
Grades.....	... ..	" 11

SHEEP AND SWINE.

State Classes.

Cotswolds.....	Rams, 2	Pens, 1
Hampshires.....	" 2	" 2
Leicesters.....	" 3	" 3
Merinos.....	" 2	" 2
Oxforddowns.....	" 2	" 2
Southdowns.....	" 4	" 2
Large White.....	Boars, 4	
Small White	" 2	
Poland Chinas.....	" 3	
Jersey Reds.....	" 3	
Sweepstake	" 3	

Society Classes.

Cotswolds.....	Rams, 6	Pens, 3
Hampshires.....	" 7	" 4
Leicesters.....	" 11	" 9
Merinos.....	" 21	" 15
Oxforddowns.....	" 7	" 4
Southdowns.....	" 17	" 11
Chester and Cheshire White.....	Boars, 8	Sows, 13
Small White and Yorkshires.....		
Poland China.....	" 5	" 6
Jersey Reds.....	" 5	" 9
Essex.....	" 4	" 4
Berkshires.....	" 1	" 2
Sweepstake.....	" 5	Herds, 3

The number of herds shown was fifteen, making seventy-five head of stock ; added to the number of single animals would make a total exhibit of neat thoroughbred cattle of two hundred and ninety-seven head.

The sheep exhibit, counting all, was three hundred and sixteen head ; of these, two hundred and thirty-two were ewes and eighty-four rams.

Of swine, we had some forty-nine boars and fifty-five sows, or a total of one hundred and four head.

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The aggregate total of the three divisions of Department B would make a grand total of seven hundred and seventeen head of stock, or almost double the number on exhibition three years ago.

In the speed department there were, in 1886, one hundred and four entries, and in 1887 the number had increased to one hundred and seventy-five.

Since 1874 the entries in the different departments have increased nearly three hundred per cent., and each of the fourteen departments shows a steady increase during the time named. These facts, coupled with another one, that is, that the society has had a prosperous year, should be gratifying and encouraging alike to the stockholders and officers of the State society. Such success and encouraging results should be an incentive to the directors and officers to continue the same liberal policy, to promote, foster and aid in developing our agricultural resources. By doing this you add to the prosperity of our State, improve the condition of our homes, and help make our rural population thrifty, contented and happy.

P. T. QUINN,
Cor. Secretary.

TREASURER'S ANNUAL STATEMENT.

NEWARK, N. J., January 18th, 1888.

RECEIPTS.

Balance in treasury, January 19th, 1887.....	\$3,236 73
General account.....	900 28
Fair account.....	28,246 98
Premium account.....	5,095 00
Interest account.....	47 18
	<hr/>
	\$37,526 17

DISBURSEMENTS.

General account.....	\$3,352 98
Fair account.....	5,149 16
Ground account.....	743 84
Improvement account.....	3,732 19
Premium account.....	14,888 60

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Speed programmes.....	\$125 00
Society entries.....	502 83
Stall rents during fair.....	5 00
Rebate, advertising.....	7 00
Special privilege.....	2,000 00
Coat and parcel-room.....	17 40
Hostlers' privilege.....	56 25
	<hr/>
	\$28,246 98

DISBURSEMENTS.

Advertising, printing and posting.....	\$1,867 00
Judges, Superintendents and Assistants	933 42
Sundry help and expenses.....	1,447 54
Police.....	339 00
Refectory.....	268 95
Band	293 25
Balance.....	23,097 82
	<hr/>
	\$28,246 98

GROUND ACCOUNT.

RECEIPTS.

Balance.....	\$743 84
	<hr/>
	\$743 84

DISBURSEMENTS.

Salary to Overseer.....	\$500 04
Help to Overseer.....	73 21
Feed and horseshoeing.....	106 64
Haying.....	63 95
	<hr/>
	\$743 84

IMPROVEMENT ACCOUNT.

RECEIPTS.

Balance.....	\$3,732 19
	<hr/>
	\$3,732 19

DISBURSEMENTS.

Bell and water-tank.....	\$16 00
New sheds and repairs.....	2,995 24
General repairs.....	422 82
Architect's fees.....	74 75
Grading and extra help.....	156 88
Whitewashing	66 50
	<hr/>
	\$3,732 19

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STATE BOARD OF AGRICULTURE.

PREMIUM ACCOUNT.

RECEIPTS.

State premiums, 1885.....	\$320 00
State premiums, 1886.....	2,495 00
State premiums, 1887.....	1,970 00
Speed premiums, not trotted for or won.....	310 00
Balance.....	9,793 60
	<u>\$14,888 60</u>

DISBURSEMENTS.

State premiums, 1886.....	\$2,495 00
State premiums, 1887.....	1,970 00
Society premiums, account 1886.....	15 00
Society premiums, account 1887.....	5,751 10
Speed premiums.....	4,400 00
Diplomas and medals.....	257 50
	<u>\$14,888 60</u>

INTEREST ACCOUNT.

RECEIPTS.

Discounts, sundry bills.....	\$43 64
Balance.....	16 36
	<u>\$60 00</u>

DISBURSEMENTS.

Interest upon bond and mortgage.....	\$60 00
	<u>\$60 00</u>

DIVIDEND ACCOUNT.

RECEIPTS.

Balance.....	\$5,467 50
	<u>\$5,467 50</u>

DISBURSEMENTS.

Dividend, six per cent., capital stock.....	\$5,400 00
Dividend account, 1884 and 1885.....	67 50
	<u>\$5,467 50</u>

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STATE PREMIUM AWARDS.

State premium awards at the Twenty-ninth Annual Fair of the New Jersey State Agricultural Society, held at Waverly Park, September 19th to 23d, 1887:

HORSES.

	First Premium.	Second Premium.
Thomas H. Smith, Elizabeth, Union county.		
Brood mare "Maud Almont," with three colts.....	\$100 00	
S. F. Blanchard, Newark, Essex county.		
Brood mare "Laura B.," with three colts.....		\$50 00
A. B. Darling, Ramsey's, Bergen county.		
Stallion "Starlight," with three of his get.....	100 00	
R. Cadugan, Bayonne, Hudson county.		
Stallion "Bayonne Prince," with three of his get.....		50 00
R. Cadugan, Bayonne, Hudson county.		
Stallion "Valdine," four years and over.....	50 00	
A. B. Darling, Ramsey's, Bergen county.		
Stallion "Hero of Darlington," four years and over.....		25 00
J. C. Shaw, Finderne, Somerset county.		
Stallion "Lafayette," for breeding coach horses.....	50 00	
Charles Rosselle, Bordentown, Burlington county.		
Stallion "Francois," for breeding coach horses.....		25 00

CATTLE.

J. O. Magie & Son, Elizabeth, Union county.		
Herd of Ayrshires (Bull "Stanley," 4064; Cows, "Jenny Gray," 4828; "Lady Clarinda 2d," 7480; "Dolly Gray," 4817; "Mary Gold," 7479).....	100 00	
Wm. Lindsay, Elizabeth, Union county.		
Herd of Ayrshires (Bull "Augustus Douglas," 4115; Cows, "Miss Pender," 3688; "Queen of Avon," 7346; "Maud Murray," 6619; "Ayrshire Drummond," 8071).....		50 00
J. T. Fields, Red Bank, Monmouth county.		
Herd of Short Horns (Bull "2d Duke of Onondaga;" Cows, "Moll Pitcher," "Kate Pitcher," "Loretta," "Swamp Maid").....	100 00	
J. T. Fields, Red Bank, Monmouth county.		
Herd of Short Horns (Bull "Johnson;" Cows, "Aggie B.," "Betsey," "Hattie Pitcher," "Beckie").....		50 00
Wm. Burgess, Trenton, Mercer county.		
Herd of Jerseys (Bull "Tristian," 4825; Cows, "Tibetta," 17877; "Bright's Grisette," 27458; "Lady Elga," 25413; "Lizzie Ann," 27387).....	100 00	

	First Premium.	Second Premium.
A. G. Atkins, Orange, Essex county. Herd of Jerseys (Bull "Brie," 6591; Cows, "Cassarea 3d," 22588; "Village Lassie," 27283; "Lassie of Upholme," "Anna Alpha," 19589).....		\$50 00
D. T. Magie, Elizabeth, Union county. Herd of Grades (Holstein Bull "Waldemar," 2879, and four cows over two years old).....		50 00

BULLS.

J. O. Magie & Sons, Elizabeth, Union county. Ayrshire Bull "Stanley," 4064.....	\$50 00	
J. T. Fields, Red Bank, Monmouth county. Short Horn Bull "2d Duke of Onondaga".....	50 00	
Henry C. Kelsey, Newton, Sussex county. Jersey Bull "Riker," 12742.....	50 00	
Edward Bodee, Freehold, Monmouth county. Jersey Bull "Prince of Monmouth," 14171.....		25 00
C. D. B. Forman, Freehold, Monmouth county. Holstein Bull "Prince Imp. of Monmouth," 236.....	50 00	
D. T. Magie, Elizabeth, Union county. Holstein Bull "Waldemar" 2879.....		25 00

COWS.

J. O. Magie, Elizabeth, Union county. Ayrshire Cow "Jenny Gray," 4828.....	50 00	
Wm. Lindsay, Elizabeth, Union county. Ayrshire Cow "Miss Pender," 3688.....		25 00
J. T. Fields, Red Bank, Monmouth county. Short Horn Cow "Moll Pitcher".....	50 00	
J. T. Fields, Red Bank, Monmouth county. Short Horn Cow "Swamp Maid".....		25 00
Wm. Burgess, Trenton, Mercer county. Jersey Cow "Bright's Grisette," 27458.....	50 00	
F. C. Farley, Millburn, Essex county. Jersey Cow "Belle Esperanza," 12053.....		25 00
D. T. Magie, Elizabeth, Union county. Grade Cow "Jennie," over two years.....	50 00	
John Greenwald, Waverly, Union county. Grade Cow "Waverly Girl," over two years.....		25 00

SWINE.

Martin Dennis, Stillwater, Sussex county. Sweepstake Poland China Boar.....	20 00	
Albert Silverthorne, Delaware, Warren county. Sweepstake Jersey Red Boar.....		10 00

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	First Premium.	Second Premium.
Martin Dennis, Stillwater, Sussex county.		
Best Poland China Boar.....	\$20 00	
Chas. R. Hoff, Centreville, Hunterdon county.		
Second Best Poland China Boar.....		\$10 00
Benj. Hulse, Allentown, Monmouth county.		
Best Small White Boar.....	20 00	
Benj. Hulse, Allentown, Monmouth county.		
Second Best Small White Boar.....		10 00
Wm. C. Addis, Delaware, Warren county.		
Best Jersey Red Boar.....	20 00	
Benj. Hulse, Allentown, Monmouth county.		
Second Best Large White Boar.....		10 00
Benj. Hulse, Allentown, Monmouth county.		
Best Essex Boar.....	20 00	

SHEEP.

Martin Dennis, Stillwater, Sussex county.		
Hampshire Ram.....	20 00	
Benjamin Hulse, Allentown, Monmouth county.		
Hampshire Ram.....		10 00
Benjamin Hulse, Allentown, Monmouth county.		
Pen Hampshires, one ram, two ewes.....	20 00	
Martin Dennis, Stillwater, Sussex county.		
Pen Hampshires, one ram, two ewes.....		10 00
Jeremiah McCain, Mt. Hermon, Warren county.		
Southdown Ram.....	20 00	
Benjamin Hulse, Allentown, Monmouth county.		
Southdown Ram.....		10 00
Benjamin Hulse, Allentown, Monmouth county.		
Pen Southdowns, one ram, two ewes.....	20 00	
J. McCain, Mt. Hermon, Warren county.		
Pen Southdowns, one ram, two ewes.....		10 00
J. McCain, Mt. Hermon, Warren county.		
Leicester Ram.....	20 00	
Benjamin Hulse, Allentown, Monmouth county.		
Leicester Ram.....		10 00
Benjamin Hulse, Allentown, Monmouth county.		
Merino Ram.....	20 00	
Jeremiah McCain, Mt. Hermon, Warren county.		
Merino Ram.....		10 00
Benjamin Hulse, Allentown, Monmouth county.		
Pen Merinos, one ram, two ewes.....	20 00	
Jeremiah McCain, Mt. Hermon, Warren county.		
Oxforddown Ram.....	20 00	
Jeremiah McCain, Mt. Hermon, Warren county.		
Pen of Oxforddowns.....	20 00	

	First Premium.	Second Premium.
Jeremiah McCain, Mt. Hermon, Warren county.		
Cotswold Ram	\$20	00
Jeremiah McCain, Mt. Hermon, Warren county.		
Shropshire ram.....	20	00
Jeremiah McCain, Mt. Hermon, Warren county.		
Pen Shropshires, one ram, two ewes.....	20	00

POULTRY.

Charles A. Reid, Englishtown, Monmouth county.		
Display of poultry	20	00
Dr. J. C. Maple, Trenton, Mercer county.		
Display of poultry		\$10 00

We hereby certify we have examined the above list of awards and compared them with the premiums offered by the State and find them correct.

ROBT. S. GREEN, Chairman,
HENRY I. BUDD,
THEO. F. BAKER,
WM. L. TOMPKINS,
WM. M. FORCE, Sec'y of Committee,
State Premium Committee.

State House, Trenton, Tuesday, November 14th, 1887.

NOTE.—The special State awards on farm and dairy products, will be found in the report of Mr. Theodore F. Baker, of Bridgeton, Chairman *pro tem.* of the Committee on Examination and Awards.

NEW JERSEY
STATE HORTICULTURAL SOCIETY.

NEW JERSEY STATE HORTICULTURAL SOCIETY

OFFICERS FOR 1888.

PRESIDENT.

DAVID BAIRD.....Manalapan.

VICE-PRESIDENT.

C. W. IDELL.....Hoboken.

SECRETARY.

E. WILLIAMS.....Montclair.

TREASURER.

C. L. JONES.....Newark.

EXECUTIVE COMMITTEE.

WM. R. WARD.....Newark.

C. W. IDELL.....Hoboken.

J. C. VAN DOREN.....Manalapan.

J. M. WHITE.....New Brunswick.

E. P. BEEBE.....Elizabeth.

FRUIT COMMITTEE.

J. B. ROGERS.....Newark.

W. H. GOLDSMITH.....Newark.

ELI MINCH.....Shiloh.

D. A. VANDERVEER.....Manalapan.

J. B. WARD.....Newark.

VEGETABLE COMMITTEE.

FRANKLIN DYE.....Trenton.

D. C. VOORHEES.....Blawenburgh.

D. V. CARHART.....Hightstown.

FLOWER COMMITTEE.

GEO. C. WOOLSTON.....Passaic.

CHAS. B. HORNOR.....Mt. Holly.

HENRY I. BUDD.....Mt. Holly.

DIRECTOR TO STATE BOARD OF AGRICULTURE.

WM. R. WARD.....Newark.

[For report of New Jersey State Horticultural Society complete,
send to E. Williams, Secretary, Montclair, Essex county.]

STATE GRANGE OF NEW JERSEY
PATRONS OF HUSBANDRY.

STATE GRANGE OF NEW JERSEY.

MR. PRESIDENT AND GENTLEMEN OF THE NEW JERSEY STATE BOARD OF AGRICULTURE—The fifteenth annual session of the New Jersey State Grange, recently held in this building, was composed of delegates from thirty-eight (38) of the forty-four (44) Subordinate Granges that are established throughout the different sections of the State.

The delegates to a State Grange consist of the Master of each Subordinate Grange and his wife (if a member).

Never did this State Grange meet under more favorable auspices : and never has one of its meetings been more harmonious, or attended with better results.

And since its adjournment cheering reports come to us from many sections of the brightening prospect of Grange work.

Our annual sessions mark the progress of time, and are as milestones in the pathway of our order, in their labors for the benefit, not alone of the class they represent, but for the general good of society.

The Grange stands on record as being the earliest advocate of many of the important laws recently enacted, as well as forcing important decisions from our highest tribunals of justice. It has become a historical fact that the first organized effort made in this country to regulate and restrain unjust discriminations of transportation companies, had its origin in and chief support from the order of Patrons of Husbandry.

Having remained faithful to its principles, it has known a law to be enacted, although somewhat imperfect in some of its provisions, yet it is a step in the right direction of that control so greatly needed.

The decision so recently reached on the driven-well patent, was a measure brought to successful issue by the combined action of the members of our order.

The Oleomargarine Law, and the present Hatch Bill, in principle,

were the creatures of the Grange, and received their strongest organized support from its members.

You may say the Grange has not accomplished all this of itself. That may be true, yet in various ways the Grange has been instrumental in teaching these lessons to the people—by our Grange lectures; by their being advocated in Grange papers; by their being discussed in each of the twenty-five thousand Subordinate Granges located in every State, and nearly every Territory within the Union, and by each of these Subordinate Granges sending their representatives to their respective State Granges, and from there to the National Grange; each with instructions to advocate their adoption by these bodies.

They are also asking that the Commissioner of Agriculture may be made a member of the President's Cabinet; that there may be a change made in the Patent Laws, making the manufacturer alone responsible for an infringement; that we may have cheaper rates of postage on all fourth-class matter sent through the mails; that our National Constitution may be so changed as to elect our United States Senators by a direct vote of the people; that all agricultural products grown in this country shall be protected equally with our manufactured articles.

The exact language of a resolution unanimously adopted at the last session of our State Grange reads as follows:

"Resolved, By the New Jersey State Grange, in fifteenth annual session assembled, That we re-affirm our previous record; that we are opposed to the admission, free of duty, of all raw materials that can be produced in this country, while the present high tariff remains on our manufactured articles."

We would also advocate that more money be expended on our Experimental Stations, or otherwise, in promoting the various useful industries of the country, and less on our military seaside encampments.

We advocate and encourage advanced agriculture, and, by frequently meeting together and talking over questions of interest that are brought before us, we become more conversant with all the affairs of life.

We advocate a higher and nobler manhood and womanhood by throwing open our gates to woman and bidding her welcome to our

STATE GRANGE OF NEW JERSEY.

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meetings, and in them making her our equal we are only obeying the divine injunction, that it is not good for man to be alone, and are thereby the promoters of more pleasant homes and happier firesides.

We are not simply Patrons of Husbandry, but patrons of moral and intellectual improvement, cultivating a taste for all that will tend to make our rural homes the abode of intelligence, refinement, comfort and happiness. The great objects of our organization are for the advancement of the American farmer, and to make him more intelligent, more social and more benevolent; to make us better and more successful farmers and to give us pleasanter homes. In a word, it is to enable the farmer to discharge the great duties of life in a more satisfactory manner. The great needs of the farmer to-day are education and concert of action. We must continue to labor for its accomplishment.

RICHMAN COLES,

Master of New Jersey State Grange.

ADDRESS
OF
Hon. Edward Burrough,
PRESIDENT OF THE
NEW JERSEY STATE BOARD OF AGRICULTURE
DELIVERED AT THE
Fifteenth Annual Session, at Trenton,
FEBRUARY 3, 1888.

PRESIDENT'S ADDRESS.

GENTLEMEN OF THE NEW JERSEY STATE BOARD OF AGRICULTURE—We have met here, according to our annual custom, to exchange a friendly greeting and renew acquaintances ; to confer upon, and discuss topics of interest to the agriculturists of our State ; and to convey the information thus gained to our respective localities, and disseminate it among those with whom we come in contact in our daily associations, thus extending the object for which the Board was organized, and expanding its influence. It therefore becomes our duty to endeavor to solve the questions arising at these meetings, in a practical manner, avoiding mere theory as much as possible.

The past season brought its usual rounds of success and encouragement, failures and disappointments ; yet, upon the whole, I am inclined to think that the condition of the farmers of the State has improved somewhat, and that they will enter upon the work of the coming year with a better feeling than they have had for the past few years ; and this feeling of confidence would be considerably enhanced if we were assured that we should be free from foreign competition in our home markets.

The work of the Board for the last year has attracted greater attention than formerly, and if we are to judge of its influence by the demand for the reports, we should be pardoned if we felt in a small degree that our labors are appreciated. The requests for these reports are no longer confined to the State of New Jersey, or the States of the Union—a large demand having to be met from foreign countries.

The business recommended by the Executive Committee for your consideration will, I trust, be the means of developing sources of information beneficial to all of us, and it devolves upon you to make the best possible use of the opportunities presented, and to get the most information in the briefest manner.

The work for the Board is expanding, and the necessity for a permanent location for its headquarters is imperative. We long for the

completion of the new portion of our capitol, in order to get properly to work, and keep the records and exchanges of the Board in an easy and accessible condition for all who may choose to examine them, as well as for those whose duty it becomes to make frequent references. By some it is urged that the State Board be merged into a State Department of Agriculture, with a resident Commissioner. Whether or not the time has arrived for such a movement is a subject worthy of your attention, and I leave the matter for your consideration.

The labors of the Secretary are annually increasing, and, ere long, will demand his entire time and attention.

The continued increase in numbers and varieties of injurious and destructive insects, in my judgment, calls for the appointment of a State Entomologist, who should submit his discoveries and remedies to the Executive Committee every month, in order that the information obtained might be furnished to the public in a practical form as soon as possible.

In this connection I will mention that several new insects have made their appearance in the State during the year, among them a worm that has been found depredating upon the wheat plant. In some instances it is estimated that it has caused a loss of about one-fifth of the crop, by cutting off the heads and letting them fall to the ground. Its presence is likely to escape notice until the headless straw attracts attention. So far but little is known of its habits, and still less of anything that will destroy or prevent its ravages. They are reported as being found in Monmouth and Camden counties.

Another insect of peculiar habits is a fly that attacks cattle on the thinnest part of the skin, and its favorite time for operating is at night—consequently all the more annoying. It has not yet been observed troubling horses or mules. This fly is described as being about half the size of the common ox fly, with which you are familiar, and it is nearly black. It was entirely unknown to the United States Entomological Department, and is supposed to be an imported species. Its annoyances have not been observed since the first frost.

You will readily understand the advantages that would result, should an efficient remedy be discovered to destroy or counteract its attacks.

Another matter that I deem of sufficient importance to mention at this time, is the sending of delegates to such meetings of Agricultural Associations, in the neighboring States, as the Executive Com-

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mittee should consider of sufficient importance to warrant the outlay necessary for the actual traveling and hotel expenses of such delegates. There should be no compensation allowed for time or services.

The sending of such representatives might be confined to such gatherings as are recognized by State or national authority. The delegates for these meetings should be required to note carefully the topics discussed, and also any new items of interest, as well as matters introduced in regard to farm implements or machinery, and, in all cases, submit a written report to the Executive Committee, who, in turn, can embody such portions of these reports and investigations in their annual report to this Board as they may consider of sufficient importance, and act upon any subject demanding their immediate attention.

In this connection, I am inclined to believe that a national organization of agriculturists should be chartered by Congress, giving the Commissioner of Agriculture the power to convene such a body at the National Capital, to be composed of two delegates from each legally-chartered State Board of Agriculture, and thus create a medium of conference throughout the entire sisterhood of States. Aside from the actual advantages that would result to the farmers of the country, it would have a tendency to crystallize the numerous bodies that pretend to be congresses and national organizations, which not only embarrass the State Boards, but also the State Executives. An example of this kind is referred to in the Executive Committee's report.

Should this suggestion meet with your approval, some action should be taken towards giving your Executive Committee authority in this connection before you conclude your labors.

The competition we are forced to meet in the sale of our products, has led to the invention and application of many labor-saving devices and home economies that are practiced in almost every neighborhood, and which, if generally known, would be more thoroughly developed. By way of illustration, I will mention one that has recently attracted my attention, and that has been brought to a successful stage by a gentleman residing in my own neighborhood. I refer to the utilization of waste heat from our kitchen and dining-room fires. It is a well-known fact that heated air, being lighter than cold air, rises, and the ceilings of our rooms are always the warmest, and also that a large amount of heated air escapes. In order to utilize this waste

heat, the gentleman above referred to has constructed a roof of glass and iron over the kitchen part of his dwelling-house, the third story of which he has constructed into a propagating-room, where enough early vegetables are raised to supply the table through the winter and early spring months, and where plants are raised for his transplanting beds. I visited the room on January 28th, and noticed there radishes and salads ready for the table, and tomatoes and strawberry plants nearly in bloom. The temperature, which was shown by a thermometer hanging to the rafters within a few inches of the glass roof, indicated sixty degrees, while, at the same time, the temperature outside was but a few degrees above zero.

Another subject worthy of attention is the sugar industry of Cape May county. The large sums of money paid by the State as a bounty to develop this industry, seem at last to have borne fruit, by stimulating experiments which give promise of great success. A company has been organized during the past year, and has secured letters-patent on a plant, the cost of which is about four thousand dollars. By this plant it is claimed that nearly all the saccharine matter from sorghum-cane can be extracted, and that, by so doing, they can produce one ton of sugar from one acre of cane. If another year proves this to be a certainty, we will have developed an immense industry, as it is well known the sorghum can be raised wherever Indian corn can be grown, and, with a plant costing only about four or five thousand dollars, you can imagine the result.

The question of dealing with the contagious diseases of animals has been, in a great measure, assumed by the National Government, and only needs a little State legislation to place it on a proper basis so that the expenses would be borne by the National Government. For a more definite explanation of this subject, I must refer you to the report of the State Board of Health on this subject, when presented for your consideration.

The County Boards, in most instances, are beginning to assume their proper positions as auxiliaries to the State Board, and it is earnestly desired that members should bestir themselves to develop these Boards into live Farmers' Institutes, similar to those in New York and many of the Western States. If information is wanted in any locality, on any subject of importance to the agricultural industry, in any of its branches, these County Boards furnish the opportunity of procuring and disseminating it. When the information sought for

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cannot be obtained from residents in that particular locality, then you should correspond with the Executive Committee of the State Board, or, if you know from whom to obtain it, open a correspondence direct, and endeavor to secure a lecture on the subject regarding which you desire information. A lecture on a subject, from one who is familiar with the topic, impresses upon those who are in attendance the fact that these meetings are for business, and that an active, energetic farmer cannot afford to be absent. Get the County Boards firmly established and you will find that the farmers of New Jersey are as alive to their interests as those of any of our sister States, and there will be a demand for more frequent meetings.

The newspaper press of the country exerts a great influence upon the general public, and one or more of these papers may now be found in almost every home. Nearly every publisher devotes some portion of his paper to agriculture, and a large proportion of the articles published are taken from the strictly agricultural papers that contain the views, not alone of practical farmers, but also those of professional agricultural writers, who theorize upon some topic until they believe it to be practicable; then induce farmers to try these experiments, and, if any degree of success is secured, the result of the experiment is announced, through the columns of the press, to the world.

Farmers read these essays and comment upon them, think the matter over, jump at a conclusion, rush into the projects and lose money. These phases in the career of a farmer are periodically epidemic, and are, I think, properly termed fevers. Many of you will readily recognize them as the subsoil, muck, root-crop, cooking-food, soiling, ensilage, fancy-stock, hen and other fevers, all of which have, in some instances, proven a partial success, but, as a rule, they have been tried and found wanting. When these epidemics arrive, go slow, bring the question before your County Board, get some one interested to send you an essay, or to address the Board upon the subject, discuss it thoroughly, and if a committee to investigate the subject can do good, have one appointed, and when they report consider that report thoroughly from every point. In this way you will most likely gain a favorable or unfavorable impression, and, in either case, you will be repaid for your investigation, and develop the utility of your County Board organization. I have dwelt longer on this subject than I otherwise should, were it not that I am firmly impressed with the necessity of a thorough

ORGANIZATION.

Among farmers the system of the Grange organization is certainly a practical one, and should be revived, so as to become what it was originally intended that it should be—the motive power necessary to lift farmers from despondency to a full appreciation of their usefulness to the body politic. The Patrons of Husbandry could and should extend a hearty support to the Boards of Agriculture, both State and county. The training in the Grange would be and is already manifested in the work of all other agricultural associations, and its influence should be extended. There is nothing wrong in its closed doors; they insure entire freedom of discussion of any subject, without fear of public criticism. Agriculture at present is

THE MOST POORLY-PAID INDUSTRY

in the country. In this connection, an editorial appeared in the Camden *Daily Courier* a short time ago, commenting on the Report of the Commissioner of Agriculture. This editorial tells the story so fully that I venture to reproduce it here. It is as follows:

“The Report of the Commissioner of Agriculture gives a great deal of information about the condition of this important branch of the country’s industry, but it does not disclose why agriculture, which is the foundation of all national wealth and prosperity, brings less returns to those engaged in it than any other department of human effort. Even the most casual observer cannot disguise the fact that very little of the country’s prosperity touches the farmer. Nor can it be denied that the gains of the farmers are much below those who dwell in the cities. So much is this so that even the fairly prosperous of the former class cannot indulge in the comforts and even the luxuries that come to the average clerk in the cities, who has no capital except the clothes upon his back and the ability to write a round hand, while the expenditures of the smallest business man in the cities for the pleasures and comforts of life astonish the dweller in the country whose business it is to till the soil.

“Viewing it from an impartial standpoint, the tiller of the soil has more cause for discontent and dissatisfaction than any other class. There is no other class of men engaged in production who toil so hard and deny themselves so much, with so small a measure of success. Of course there are rich farmers and contented farmers, but it is an admitted fact that as a rule the business does not yield half the

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returns that it should, whatever may be the reason. Of the vast amount of wealth he annually produces, but a small percentage remains in the farmer's hands. The bulk of it goes to swell the bank accounts of those who transport and distribute, and who sell to him those necessities of life which he does not produce himself. At present the disproportion between the city and the country appears to be growing with the growth of the country. How long this inequality shall continue is a problem that should engage the attention of the Commissioner and Congress."

I think you will agree with me that this editorial portrays the situation very clearly, and how to change this condition of affairs should engage your closest attention, and be discussed in the meetings of your societies, until a definite and practical method is agreed upon. This is evidently what the law-making powers, both National and State, are waiting for. The majority of the members of Congress and State Legislatures are not practical farmers, and while they recognize the depressed condition of agriculture, they are at a loss to know just how to relieve this industry, and are virtually waiting for the farmers to come forward and make their wants known.

I am not inclined to be an alarmist, but I feel that I shall fail in my duty if I do not urge this matter upon you.

The mechanical, mining, manufacturing, and, in fact, every other industry, is thoroughly organized, and they are prepared to maintain and defend their institutions. And, while the farmers outnumber in membership that of any other industry, they remain unorganized, and practically allow others to think and make laws for them.

STRENGTH OF THE FARMERS.

The census of 1880 shows that 7,670,493 persons were engaged in agriculture, or who earn wages and live by work in that industry. And now, to follow the usual rates of increase, there are to-day about 9,000,000 people employed in agriculture. The agriculture of the United States is as intelligently carried on as that of any other country, yet the farmers have not attained that degree of prosperity and happiness that the capital invested and labor employed justly entitle them to enjoy. The primary cause of this is the want of a good and steady market for the surplus products of their farms and gardens, which surplus is to the farmer what the manufactured product is to the manufacturer—unless he can sell at remunerative prices there is

no incentive to produce more than he can consume, and if he has nothing to sell, of course he has nothing to buy manufactured goods with. All classes are naturally dependent upon the farmer, and history, both ancient and modern, chronicles the fact that no nation can remain prosperous with a depressed agriculture. The farmers must be protected, encouraged and supported, or the whole superstructure, of necessity, will fall.

A NATIONAL POLICY,

That protects and develops the mechanical and manufacturing industries, naturally creates an increased consumption in the actual necessities of life and opens a home market for the products of the farmer ; it is, therefore, imperative that he should be encouraged to develop his resources by protecting him in the markets where he sells his produce. This is an absolute necessity if the present flourishing condition of the mechanical and manufacturing industries is to continue.

Under the present system of taxing importations of manufactured articles, our home industries are fostered and protected from an unequal competition in our markets. This competition applies alike to the artisan, miner and manufacturer of every class.

There have been some efforts made to protect the farmers of the United States by imposing a series of duties on some of the articles they produce and that are now being so largely imported. These duties, while proving a solace for the average statesman and political economist, by no means amount to a protection to this greatest of American industries. They are simply a tax, and afford but slight relief to the hard-working producers.

There is a duty of twenty per cent. imposed on live animals, except those for breeding purposes ; of one cent per pound on beef and pork ; of twenty per cent. on mutton ; of two cents per pound on hams, bacon and lard ; of four cents per pound on butter and cheese ; of twenty cents per bushel on wheat ; of ten cents per bushel on corn, rye, oats and barley ; of fifteen cents per bushel on potatoes ; of two dollars per ton on hay ; of eight cents per pound on hops ; of seven and one-half cents per gallon on vinegar ; of twenty cents per gallon on honey ; of one cent per pound on tallow ; of from fifteen cents per pound for tobacco stems up to one dollar per pound for leaf, stemmed ; and a duty on all wool, rice, orchard-fruits, &c.

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These figures sound like protection, but they are delusive ; they are not high enough to keep out foreign competition, and hence are not a protection, for a protective tariff, to be of direct advantage to the farmers of this country, must be high enough to be practically prohibitory.

The statistics of imports of farm products for the fiscal year ending June 30th, 1886, show that we imported agricultural products and live animals amounting to over \$54,000,000, and again, during the year ending June 30th, 1887, agricultural products and live animals amounting to over \$57,000,000, showing an increase during the year of at least \$3,000,000. Of this amount, in the year 1886, \$2,552,179 was sent abroad for vegetables ; 92,118 tons of hay were bought, valued at \$1,035,533 ; 2,672,762 pounds of hops, valued at \$444,989, and 16,092,583 dozen of eggs, valued at \$2,173,454.

Why should it be necessary to import into this country more than \$2,500,000 worth of vegetables, including cabbage from Holland ; 317,156 bushels of potatoes from Scotland, 1,441,466 bushels of potatoes and 608,283 bushels of beans and peas, from Nova Scotia, &c.? Why was it necessary in 1886, when every section of the country reported over an average crop, to import over \$1,000,000 worth of hay, and nearly \$8,000,000 worth of breadstuffs, and over 16,000,000 dozen of eggs, some of which came from Denmark, Norway and Sweden ?

I am indebted to Hon. Thomas H. Dudley for these figures. Having examined the records, I find they do not exceed the statements of the Treasury Department, and may be relied upon as correct. Let us examine these statements more closely.

The productions of the market-garden vegetables are far greater than is generally supposed. I regret that I have not figures to show the quantities of these products for the last decade, but the following will show the increase in the last twenty years. The number of bushels grown in 1859 and 1879 is as follows :

	1859.	1879.	
White Potatoes.....	111,148,867	169,458,539	58,309,672 Increase.
Sweet Potatoes.....	42,095,026	33,378,693	8,716,333 Decrease.
Hay (tons).....	19,083,896	35,150,711	16,066,815 Increase.
Peas and Beans.....	15,061,995	9,590,027	25,471,968 Decrease.
Hops (pounds).....	10,991,996	26,546,378	15,554,382 Increase.
	198,381,780	274,124,348	55,742,568 Increase.

In addition to these staples, the garden vegetables amounted in value to \$16,159,498 in 1859, and in 1879 to \$21,761,250. At a proportionate rate of increase the value of these productions would amount to about \$25,000,000 at this time. And yet, notwithstanding the rotundity of these figures, we annually import enormous quantities of these products, the proof of which is manifested by the duty collected under the present tariff rates, which amounts to over \$2,000,000 annually.

This is no visionary statement, as the following statistics compiled from the files of the Treasury Department are official, and verify me in this particular :

IMPORTS, FOR CONSUMPTION, OF MARKET-GARDEN VEGETABLES.

ARTICLES.	RATE OF DUTY.		IMPORTS IN YEARS ENDING JUNE 30TH.						DUTY COLLECTED THEREON IN YEARS ENDING JUNE 30TH.					
	Formerly.	Under tariff of 1883.	1882.	1883.	1884.	1885.	1886.	1887.	1882.	1883.	1884.	1885.	1886.	1887.
Peas, and other leguminous seeds— <i>Bushels</i>	10 p. c.....	10 p. c.....	852,715	700,876	602,776	35,121	319,744	478,205	\$128,762	\$111,263	\$87,384	\$4,058	\$33,970	\$49,275
Peas, split— <i>Bushels</i>	20 p. c.....	20 p. c.....	55,587	34,869	39,818	126,151	58,753	53,076	13,483	8,861	9,465	23,609	10,342	8,121
Pea seeds—\$.	20 p. c.....	20 p. c.....	479,656	537,945	286,685	445,351	212,909	149,876	95,931	107,589	57,373	89,070	42,582	29,975
Peas— <i>Tons</i>	10 and 20 p. c.	\$2 per ton.....	86,226	97,739	118,752	160,910	92,175	78,722	152,765	95,486	237,505	321,821	184,350	157,444
Peas— <i>Lbs</i>	8c. per lb.....	8c. per lb.....	874,558	1,977,715	696,897	1,638,427	2,723,971	16,618,829	69,964	158,217	55,751	131,074	217,917	1,329,506
Peas and Sauces—\$.	35 p. c.....	35 p. c.....	350,444	369,919	351,493	311,329	321,709	382,495	122,655	129,471	123,022	108,965	112,598	133,873
Peas— <i>Bushels</i>	15c. per bush.	15c. per bush.	8,788,308	2,356,965	421,939	658,847	1,945,028	1,430,918	1,318,246	353,544	63,290	98,827	291,754	214,637
Peas in natural state, or in salt or brine, not otherwise provided for—\$.	10 and 35 p. c.	10 p. c.....	1,182,203	894,232	979,581	1,019,805	977,574	818,212	222,827	176,032	184,723	191,484	188,879	141,601
Peas—\$.	Free.....	Free.....	1,869	4,603	4,093	2,627	3,349	3,003	.....	.....	.....	.....	.....	.....
Grand total of duty.....									\$2,124,633	\$1,140,463	\$758,513	\$968,908	\$1,082,392	\$2,062,432

The yearly average for the past five years, ending June 30th, 1887, is \$1,202,541.60.

The consideration of these statistics should be sufficient to convince the most sceptical that something must be done to direct these large sums into the hands of our own producers. As the matter now stands, our importations are yearly augmented, while our home productions are but slowly increasing, and, in some staples, actually diminishing. A few years ago, the State of Michigan was a large producer and exporter of potatoes; to-day there are hardly enough raised in that State for the immediate consumption of its people. There is scarcely a farm in the New England and Middle States, the occupant of which would not gladly double his production if sufficient inducement were guaranteed that he should receive remunerative prices for his products and his labor.

This condition of our most important industry cannot longer exist without serious results to the body politic. The remedy is manifest, and one of two results must eventually follow; the present tariff on all manufactured goods must be reduced to a revenue basis only, or the duties on farm products must be increased to afford an equal protection to the producer. I am in favor of building up American industry, and consequently I think the American farmer cannot afford to risk the destruction of our manufactures, for by so doing our markets at home are likewise destroyed, and the competition to supply the foreign demand is too great to warrant a steady market for our products if our home markets are weakened. It is therefore incumbent upon us to increase the demand for our commodities at home as well as abroad, and while we sustain the protective duties on manufactured articles, we must demand the same protection for ourselves. The duties on all farm products should be increased. Everything that the American farmer can produce should be subject to a duty. There must be no free list of products of any branch of the farming industry.

The tariff on beans, peas and other leguminous seeds should be raised from ten per cent. to twenty-five per cent.; on split beans, from twenty per cent. to twenty-five per cent.; garden seeds, from twenty per cent. to twenty-five per cent.; on hay, from two dollars per ton to three dollars; hops, from eight cents per pound to ten cents per pound; pickles and sauces, from thirty-five per cent. to forty per cent.; potatoes, from fifteen cents per bushel to twenty-five cents.; on cabbage the duty should be one dollar per hundred; on onions, twenty-five cents per bushel, and on all other vegetables it should be not less than twenty-five per cent. These duties are imperative, and

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should be demanded by every farmer and farmers' organization in the land. We are abundantly able and willing to feed all our people, at prices but little, if anything, higher than are now paid for vast quantities of imported products.

Compare the prices you now have to pay for your clothing, your groceries, with but few exceptions, and for your agricultural implements and machinery, and almost everything else for your well-being, and you find that there never was a period when they could be purchased cheaper than at present. There never was a time when the toiling masses of the people were so well fed, well dressed, or enjoyed so many comforts of life as they at present do, under the protection afforded them by import duties. The only depressed industry is that of agriculture, and this state of affairs will continue as long as the present duties on our products remain. I repeat, an increase in these duties is imperative, and I appeal to my brother farmers to come forward and demand their rights, and let there be no uncertain sound in this demand.

Another feature that demands our attention is the importations of market-garden vegetables, and other like commodities, that are brought into our ports as ballast.

I am informed that vessel-owners that fail in getting return freights from Europe and the islands of the Gulf of St. Lawrence often load their vessels with potatoes, which they can purchase almost as cheaply as ballast, bring them into our ports, pay the duty of fifteen cents per bushel on them, and place them in the hands of the wholesale dealers at about forty-five cents per bushel. At these ruinously low prices we cannot bring the crops of any of our Western States into the markets of the seaboard.

That I speak advisedly on this topic is confirmed by the importations received in New York, January 3d, 4th, 5th and 6th, 1888. The following are the figures showing the importations for these four days, viz.:

From Liverpool.....	39,189 bushels, in three shipments.
From Glasgow.....	36,993 bushels, in one shipment.
From Dundee.....	31,302 bushels, in one shipment.
From Hamburg.....	7,116 bushels, in one shipment.
From Antwerp.....	2,583 bushels, in one shipment.
From Rotterdam.....	2,187 bushels, in one shipment.
From Copenhagen.....	1,581 bushels, in one shipment.
From Nova Scotia.....	28,398 bushels, in one shipment.
Aggregating.....	149,349 bushels, in four days.

The duties on these amounted to \$22,402.35, which helps to swell that great "bugaboo" of a surplus now accumulating in the Treasury. Can this benefit the farmers of America, while it is profitable and possible for these producers to pour their products into the markets of this country, despite the present import tax, and kill off the American farmer as a competitor?

The imports of potatoes at our ports are out of all proportion to the receipts of the domestic crop.

As a further confirmation of this statement, I clip the following from the *Daily State Gazette*, a paper printed in this city, on January 18th, 1888, viz.:

"HALIFAX, N. S., January 17.—Large quantities of potatoes are still being shipped from Halifax to the United States. Five cargoes of 250,000 bushels are now ice-bound in the basin of Minas bay, but it is expected they will get clear in a few days. Over \$50,000 worth of potatoes were shipped from Halifax to the United States during the last quarter of 1887."

A writer in the *Country Gentleman* quotes the following prices of these potatoes in Washington City, of December 17th, 1887. On this date they sold for eighty-five cents per bushel, and he estimates the expenses of importing them from Scotland, per bushel, as follows:

	Cents Per Bushel.
Transportation to ship, and sack	11
From Glasgow to New York	15
Duty	15
New York Commission	5
Cartage	4
Glasgow Commission	5
Commission in Washington	10
Cartage	2
Total	67

"The above table reveals the fact that the Scotch farmer receives eighteen cents per bushel. Now, if the foreign farmer undertakes at present to furnish us with potatoes, realizing himself eighteen cents, he will most certainly double the supply when the duty of fifteen cents is removed, and which goes into his pocket."

According to this statement a bushel of Scotch potatoes landed in New York costs forty-one cents—a few cents less than my estimate.

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I have illustrated this single product because of its being so readily understood, and if you share my feelings you are far from pleased at the exhibit.

What is true of the potato trade is also true of the cabbage and hay trade, and that of other farm products that go to swell up the \$57,000,000 worth of importations.

Some of you will doubtless be astonished at the magnitude of these importations, and to the extent they supplant your crops. I was as much surprised as any of you when I examined the official statistics and found the figures given substantially correct.

I at once came to the conclusion that it was time the true state of affairs was made known to our farmers, and I have presented it to you as concisely as possible.

It may be argued that by increasing the duties on these products it will add to the surplus revenue. But it does not of necessity follow that the revenue will be increased by a higher tariff on these articles ; the contrary is more likely to be the case. Importations will decrease to such an extent that, instead of adding to the surplus, there will be an actual diminution of the amount of duty collected. But suppose this surplus should be slightly augmented, will there be any harm done to the people? Have we not all been benefited, indirectly, by this accumulation, and is not a full treasury preferable to an empty one? Why is this \$150,000,000 called a surplus, when the Government is over \$1,000,000,000 in debt? Can no way be devised to use this \$150,000,000 towards paying off the debt? It is hard for the farmer to understand, while he may chance to have \$150 in bank, and a mortgage for \$1,000 on his farm, that he has a surplus of \$150. But if it be true that the bonded indebtedness of the Government cannot be reduced any more rapidly than is being done, and that the Sinking Fund is in such a healthy condition as not to need this so-called surplus, and that it is not needed for internal improvements, or coast defenses, that our navy is being rebuilt rapidly enough without using this fund, there is still a use for this surplus, and a noble use, too. Let it be set aside as a National School Fund, and appropriated to each of the States for the purpose of fostering the free public school system, and thus relieve the tax-paying citizens of a portion of their heavy burdens, and bring the opportunity for free education to all sections. This, to my mind, is the most practicable method of disposing of this surplus. I would not abolish the tax on

whiskey, tobacco or oleomargarine. These taxes should remain and revert to the States wherein they are collected. They should be collected by the State and local authorities, supported by the United States marshals, and thus abolish the internal revenue collection offices entirely, which change alone would increase the amount reverting to the State nearly \$4,000,000.

Thus would the agriculturists and house-owners of the country receive a direct benefit by having their tax assessments reduced.

It is this kind of property that cannot escape the tax assessors, and thus houses and farms bear an unjust proportion of the burdens of taxation. That something must be done to relieve the depressed condition of our agricultural community is patent to all, and the subject is engaging the attention of statesmen and legislators. I repeat, it is incumbent upon agriculturists of every branch to organize and let their wishes be known. It is only by organization that they can agree upon measures that will relieve them from the oppressions they are now laboring under.

The census shows that the value of the products of agriculture for 1880 was \$2,213,000,000, while the value of the manufactured products was \$5,369,000,000; yet the farm capital was \$10,197,000,000, and the manufacturing capital only \$2,790,000,000. Although the value of manufactured articles is more than double the value of agricultural products, yet the capital employed in agriculture is nearly four times larger than the capital employed in manufactures.

There should be no hesitancy in this matter. Decide upon the legislation needed, and then demand it in such tones as your numbers and capital invested warrant you in expressing.

Give us a prosperous agriculture and all other industries are bound to flourish. In it lies the stability of our government.

I believe it right for the American people to be clothed with American goods, and to be supplied with furniture and implements of American manufacture, and I insist that the people of America shall be fed by American farmers with the products of the American soil. I do not ask for exorbitant prices (and there is but little danger of such being obtained by our farmers, as the competition will be too strong), but I do ask for a steady and active home and export trade, and that foreign agriculturists be restrained from competing with the American farmers in the American home market.

In conclusion, I ask you to consider this question from your own

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standpoint. A National Congress is to be elected the coming autumn; you still have the right of the elective franchise; use it in your own defense, and when your chosen Representatives assemble at Washington, they should be reminded of their duty; write to them, and let the white-winged messengers of peace descend upon them as flakes of the driven snow, from every section of the land, bearing within their silent folds emphatic reminders of promised protection to the agricultural interests of this country.

Let us organize for this purpose.

I know of no better motto for us to place upon our banners than "Organization, Education and Protection." Under this, let us go forward.

ADDRESS.

BY HON. EDWARD BURNETT, MEMBER OF CONGRESS FROM
MASSACHUSETTS.

ADDRESS.

BY HON. EDWARD BURNETT.

ASSEMBLY CHAMBER,
TRENTON, N. J., February 1st, 1888,
8 o'clock P. M. }

Hon. Edward Burrough (President)—I take great pleasure in announcing to this State Board of Agriculture that we have with us to-night His Excellency Governor Green, of New Jersey, who has kindly consented to preside over your deliberations for this evening.

I have the pleasure of introducing you to His Excellency Governor Green. [Applause.]

Governor Green—Gentlemen of the State Board of Agriculture, it gives me great pleasure to welcome you at your annual meeting, to the capital of the State, and it will also give me great pleasure to meet you all in the Executive Chamber after your session of this evening is concluded, and afford me an opportunity, and to afford you an opportunity of being personally introduced to the distinguished guest of the evening.

Without occupying any of your valuable time in the effort to give you any novel ideas on the subject of agriculture, I would say that we have with us to-night a gentleman who has devoted much of his time to your industry, and whose efforts in your behalf have given him what might be called a national reputation. I refer to the Hon. Edward Burnett.

I have the pleasure of introducing to you the Hon. Edward Burnett, member of Congress from the State of Massachusetts, who will now address you. [Applause.]

Mr. Burnett—GOVERNOR, GENTLEMEN AND FELLOW-FARMERS—It gives me a great deal of pleasure to be here with you to-night, especially after my pleasant recollections of an evening spent with you a year

ago, when I accepted your invitation to address you under the same conditions, that I should come here and give you a sort of fireside talk.

Consequently, I have not prepared a lecture for to-night, and have been asked to announce my own subject.

I shall talk to you on the subject I always speak upon when I get a chance, and that is upon dairy cattle, and I shall give you a simple outline of the breeding and rearing of dairy cattle, touching upon feed, and then, perhaps, I may give you a short description of the visit I made within a few months to a celebrated farm in England.

I shall consider it a favor—and it often helps me—if you will kindly interrupt, and ask any further information on subjects of special interest to you, and I am always very glad to answer such questions asked, or to say I am not able to answer them.

In speaking about dairy cattle, of course I appreciate the fact that many farmers look upon thoroughbred cattle with a good deal of distrust, and well they may. I do not believe in thoroughbred cattle for the farmer living on the ordinary farm, who is producing large quantities of butter or large quantities of milk. He cannot afford to buy the best. But I do believe in farmers owning a thoroughbred bull, and hope to see the day when thoroughbred bulls won't go begging, as they do now. The thoroughbred cattle of to-day are generally in the hands of a few wealthy men in this country, and they can be numbered by hundreds. In this connection, I want to say a few good words for these men. You owe your advancement of all dairy stock, of all thoroughbred stock, whether cows, horses, sheep, or pigs, to those men of wealth, to those men of brains, who have given a lifetime to the breeding and establishing of these breeds of thoroughbred cattle. You all realize that thoroughbred cattle require the most exquisite care. It must be distinctly remembered that thoroughbred stock are not the result of breeding, any more than the result of great care and attention. Take the Arabian horse, for instance, and what was it, originally? Take its early history, and you will find that the Arabian horse was a cross between a pony and a species of broncho. Look at it now. Look what a change has been brought about by careful breeding, care and attention. Most of the result is due to exquisite care. I suppose that most of you realize that, with the Arabian, his beloved horse always has the softest corner in the tent, and is looked after even better than the children.

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This exquisite care has had fully as much to do with the development of that superb animal—yes, more—than the breeding.

It is just as true, and even more true, with thoroughbred cattle.

You may take two farmers, and let them start with a pair of twin heifers, under the same conditions, with equally fine cattle, and what will be the result? The careless farmer, who thinks that his young stock can get along with fodder that is not good enough for his milch cows, and which, in fact, his milch cows will not eat, and who thinks that any poor pasture is good enough for his young heifers, and that he can carry them along in this way until it is time to house them in the winter, and what is the result of such treatment of young and growing cattle? You get an animal which, no matter how well bred, is always inferior.

The other twin heifer, in the hands of a good farmer, who takes a personal interest in his stock, attains a far different result. At the end of three or four years—for I think it takes from three to four years to develop the strong points of a dairy cow—that typical animal which we recognize in all breeds, the typical dairy cow, no matter whether Jersey, Guernsey, Ayreshire or Holstein. The dairy cow, which we all love to see in each of these classes, is exactly the same. Their milk may vary in quality or in quantity, but in the grand dairy cow, such as you would pick out, she has the same, the identical points. Those points are not only bred, but they are developed. I think all of you old and experienced farmers will agree with me that young stock on the farm that is carefully looked after and cared for develops; all your dairy cows with good records come from that class of men who care particularly for their cattle. It is very seldom that the farmer who neglects his young stock makes “a ten-strike,” *i. e.* breeds a grand cow. This is true, not only of dairy cows, but it is also true in the breeding of horses, of pigs and of sheep.

These “gentleman farmers,” as you term them, instead of finding fault with them, and laughing at them, and ridiculing them for their notions, as farmers generally do, for paying extravagant prices for animals characteristic of the breed they want, you ought to thank them. They are doing a great deal of good. These men pay extravagant prices for their animals for breeding purposes. Why should you ridicule them? There are plenty of farmers who, if they can afford it, will pay extravagant prices for horses with a good

record—in fact, farmers like to own horses able to distance the horses of their neighbors on the road. And yet you do not call the man who is a lover of good horses “a fool.” You do not think him foolish for paying big money, fancy prices, for horses that can trot inside of 2.40. In fact, most farmers have a leaning that way themselves, and perhaps most of them would do this if they could afford to. Of course you do not buy such horses for ordinary farm use. The breeding of those horses, of all thoroughbred horses, and the care and attention given them by those able to care for them, has, to-day, given you horses for less money—horses with good records for speed—has given you these horses for prices they could not have been bought for twenty-five years ago. It has given you horses that will walk faster and draw more of a load than before these men went into the developing of this stock.

The extravagant prices paid for dairy cows has helped you all. That the stock of most farmers is not of better grade, is your own fault in a measure, for you do not take advantage of the efforts made by others, to make up your own herds. You can all form your own opinions as to which family, or as to which breed it is best for you to buy. In doing this, it should be remembered that locality makes a great difference. On your soil here in New Jersey, for making milk, you will find the Holsteins will do well. In other parts of the State, where cows must browse over a great deal of ground, I would recommend the Ayreshires as the best. For butter cows, I would recommend the Jerseys and Guernseys.

Many of our farmers make the mistake of trying to breed a dairy animal and a beef animal in the same beast. They do not belong to the same family. They are no more alike than the thoroughbred horse and the Percheron horse. You cannot make a Percheron horse run a mile in two minutes. Neither can you make an English thoroughbred horse pull a ton of coal or heavy cart. You would not think of putting an English thoroughbred horse in front of a heavy load. It is impossible to breed a horse with the traits of these two animals, neither can you breed a cow that is a good dairy cow and a good beef animal at the same time. The explanation of this is simple; the dairy animal is a machine, a machine that is made; not only bred, but made. She is kept up by a great deal of care, and by a great deal of regular attention. You cannot have a good dairy cow without you take the best of care of her. You can start with

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the very best animal in the world, and you all know, from your own experience, how that cow will run down, and how the best breeds, with lack of care, become scrubs. You must watch them constantly. You must watch them just as you would a member of your own family. I will tell you what was said to me by a western gentleman—I forget the name—a man who has taken four first prizes with his cattle in four years, a man who is so particular about his herd of dairy cows, that he employs in his stable, in caring for his cattle, half men and half women. He does this because he says the men won't dare to use profane language or speak abusively to the cattle, and because the women set a good example. He thinks one-half of his success is due as much to the management and care of his cattle, as to the feed he gives them, and I have no doubt he is right. You are all familiar with that wonderful machine—the most wonderful machine among domestic animals—the dairy cow. Take a cow coming home from pasture, and let a dog bark at her heels, and what is the result? The flow of milk, at milking-time that night, is checked from twenty to fifty per cent., just because she has been excited by a strange dog. You would not wonder if you examined her anatomy. Why, it is one of the most delicate things conceivable. It is fully equal to the workings of a watch. She takes her food, digests and assimilates it, passing it through her veins, until it reaches the udder, from whence it is drawn into the pail.

On the other hand, look at the beef creature. Big, good natured, hearty-dispositioned animal, that simply takes that food into the stomach, assimilates and distributes it on the inside of the carcass, and lays it on in nice layers of fat here and there, spreading it evenly throughout the entire carcass. The better the breed of the cow the more easily is that animal excited. If a boy were to throw a bunch of crackers behind a dairy cow the result would be disastrous, and the cow would be terribly excited; but let that same boy fire a bunch of crackers behind the beef creature, and in three minutes afterwards she would have forgotten all about it, apparently, and would be browsing leisurely, or chewing her cud, as if nothing had happened. Men who treat their dairy cattle like beef creatures are laboring under a mistake. This is one of the most important factors in being a successful dairyman—the care and attention given the cattle.

It is also very necessary, in bringing up a dairy herd, to get and to feed the best of food, and to feed that regularly.

I won't talk to you much about that, because I think last year I talked most of my time, while with you here, on this subject of feed, and fear now I shall repeat myself—but I wish to bring up a few of the strongest points.

You are all aware of the importance of clover. You are all more or less interested in the subject of ensilage, and many of you, no doubt, have experimented in this line.

You are all interested, of course, in the subject of feeding cheap grain—that is, any grain that will produce the best results for the least money. I can give you the results of three experiments I tried last year on my own farm.

I am a Jersey breeder, and very careful of my cattle, as you may well suppose. In making these experiments I was very careful in selecting the cows, seeing that the distinction between the milks was as light as possible, and I took the three cows selected and fed them for thirty days.

The first cow I fed on glucose meal. We farmers in Massachusetts, within a few years, have had glucose meal poured in upon us, and we have been induced to buy it in large quantities. I wished to show the farmers in my neighborhood that this was rather an extravagant feed, and felt sure that my experiments would show it to be such.

Mr. Lippincott—What is this glucose meal you refer to?

Mr. Burnett—Glucose meal is the refuse of the corn after it is ground up in the factories in the West, coming mostly from Joliet, Illinois, and around and about Chicago.

It is sold from \$1.50 to \$2 a ton less than Indian meal. I have no silo on my place, and perhaps I am unfortunate in this—I am considered so in my part of the country. [Laughter.] I am very fond of roots, and I raise from five thousand to seven thousand bushels of Yellow Globe mangels every year, so that I feed my cows with them daily during the winter, when housed.

I wanted to experiment more with the grain than anything else, and I fed these mangels with the glucose meal to the first cow as a daily ration. The first cow had her Yellow Globe mangels (the usual quantity fed to every animal in the herd, one-third of a bushel), the regular ration of hay and three quarts of glucose meal and three quarts of shorts.

I then took the next cow, giving her roots and good English hay, three quarts of common western meal, such as we buy and have sent us by

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the car-load, made from western Dent corn, and three quarts of bran. I then took my cow I thought would produce the best results, and fed her roots, and, instead of English hay, the choicest clover I cut on my place. I fed her, in addition to the clover hay, six quarts of good old-fashioned cob meal. You know what that is. It is very largely used in New England, and it produced the very best results. Here let me add that I think the shorts and middlings as now produced under the present system of double back-action rollers, used in making flour, take everything but the hulls, and very little good is left in them.

The result of these experiments carried on for thirty days was most remarkable. The three samples of butter which I had taken previous to the experiment did not vary at all before the experiment was begun. The difference in the samples of butter made from these three cows in this experiment was so marked that a child blindfolded could have picked out the poorest and best butter from among the samples made. The butter made from the cow fed with clover hay and cob meal, was as sweet and as nutty as any butter made in June—in fact, better than some of it.

A Member—In what month was the experiment made?

Mr. Burnett—This experiment was made in the month of February, just a year ago.

The butter made from the cow fed with the western meal and shorts was good butter—first-rate butter—but it was not the exquisite butter the other was.

The butter made from the cow fed with the glucose meal was a negative butter, most decidedly. It had no bad taste and was not rancid, but it had no quality, no stamina, no backbone, no consistency. Its melting point might have been two or three degrees—it was considerably below that of the butter made from the clover-fed cow. Any one who was a judge of butter would pick that butter out and say, “that man is on the wrong track.” Of course you may say that I am a crank on clover, and naturally make a good deal of this result. But this butter had no flavor and no character, and the farmers in my neighborhood were at once convinced that the feeding of glucose meal was not a paying experiment. I talked to them about the preparation of milk and butter for market, and gave them the results of my experiments, and they gave up glucose meal.

Of course you who make butter all appreciate how many little things enter into the making of the best butter, any one of which,

omitted, would not make any difference perhaps; but it is these many little things that go to make up the result. You will all acknowledge, I think, that exquisite care of your cows produces exquisite butter.

I know a man who makes the best of butter, Mr. George B. Williams, of New Hampshire, who is so particular about this one thing, of having fresh cob meal, which he and I have both decided is about the best butter producer of any of the grains—he is so particular that he has his cob meal ground twice a week for his cattle, and says if he had a mill on his place he would grind it every day. And why? Simply because Mrs. Williams is one of those old-fashioned housekeepers who thinks there is no meal for Johnny cakes as good as that which comes directly from the mill, and she sends Mr. Williams to the mill and says: “George, bring me some meal, and be sure to get it fresh ground. Don’t go to the country store, but go to the mill.” The Johnny cake is superlative. He says he has found out the difference in his butter, and believes that fresh-ground meal is just as important for his cattle as for his Johnny cake. Of course it is a very small difference, but these little things make a difference in the price of butter. The difference between thirty-five-cent butter and fifty-cent butter is very slight.

A Member—Is there any difference in the feeding value of the old-process bran and that of the new-process bran?

Mr. Burnett—I think there is—I know there is. You mean, I suppose, the difference between the bran we used to get twenty-five years ago and the bran we buy to-day?

A Member—Yes, sir; the difference between the bran from the old process of grinding grain, and the bran made by the present process.

Mr. Burnett—I should say that there was a difference of thirty-three per cent. at least—that the old-process bran was worth thirty-three per cent. more in value than the bran of to-day, and I think I could be supported in that assertion by every old and experienced farmer here. There is no comparison between the two when we consider their value as butter producers.

Another thing that is of the greatest importance in the making of milk and the making of butter is in the water given the cattle to drink. It is more essential than a great many men think, that during winter and on cold nights, the water given the cattle to drink

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should have the chill taken off it. You would be astonished—I confess to you I have not tried it—but I will predict that this method of watering your cattle will make a difference of fifteen or twenty per cent. in the flow of milk, and you know that means a handsome profit in your business as dairymen.

In Vermont, I have talked a great deal before meetings of dairymen. The majority of them agree with me in the statement I have made to you, and they have invented a stove which they put into the watering-trough, at a cost of about \$5, and with a hatful of shavings they build a fire in it, and in a few minutes they will heat their water to a proper temperature for the cattle. They claim it is the biggest investment they have ever made. I think you will agree with me, in view of these facts, that this is a very important point in dairying.

About ensilage, I am quite often taken to account as a non-believer. I have had very little experience with it myself, but I have watched the experiments of others, and I do believe in the value of ensilage. Fed in certain quantities, it is a capital feed for cows. The feeding of ensilage to thoroughbred stock is something that I have never cared to experiment with, until the system was more thoroughly established. I was afraid it might cause abortion, or that it might cause other trouble in my herd, and so, having been a strong advocate of roots, and my father before me, for thirty years, I have stuck to roots. Perhaps, if I had to start again, and had a deficiency of feed that I was obliged to make up in some way as cheaply as possible, I would put in a silo, and would feed a certain quantity of ensilage, and that would be in the neighborhood of twenty pounds per head. That is, I should feed about one-third ensilage. Of course I do not mean I feed my cows forty pounds of hay a day, but you know that ensilage is increased very much in weight by the water it contains, while hay, of course, is dry. My rations of hay are from eighteen to twenty-one pounds of hay by actual measurement. That would make, of ensilage, something in the neighborhood of sixty to sixty-five pounds. Besides this, I would supplement my rations of ensilage with a great deal of grain. You must supplement your ensilage, and I think it should be with grain. I am a high-feeder. I think more farmers under-feed than over-feed. I think if they gave the same quantity of grain to ten cows that they are now giving to fifteen, for instance, they would produce just as good results from

the ten cows so fed. By selling half their herd and filling in with a smaller number of first-class cows, the result from the entire herd would be far more satisfactory. I do not think there is difference enough to-day in our stock markets between the first-class cow and the ordinary cow. The difference in dollars and cents in a man's herd amounts, by a very low estimate, to from \$12 to \$18 a year. Very few men buy cows they do not keep from three to five years. The difference between the ordinary cow and the first-class cow is only from \$10 to \$12 per head in our markets, while the difference in production in favor of the first-class cow will more than pay the difference in cost the first year. You will see by this if you keep that cow three years you will make a handsome profit.

I do not believe in a dairyman keeping a cow in his herd, or in keeping a herd of cattle, which will not average yearly five thousand pounds of milk per head. The average for the State of New York is only about three thousand five hundred pounds, or twenty to twenty-five per cent. below what it should be.

Now, gentlemen, you cannot afford to run a dairy just for the fun of the thing. You might just as well as to not get the profit out of it. I know how it is with every farmer; he looks at his own herd and cannot see anything wrong with it. [Laughter.] It is easier to go into a neighbor's herd and pick out the poor cattle than to do so in your own. I appreciate that fact; I have been there myself. [Laughter.]

I know it would pay every farmer to dispose of the tail end of his herd, even if he had to give them away. They are a dead weight for the rest of his herd to carry, and reduce the general value of the whole herd.

This subject of feeding I will not talk upon further, but will go to the subject of milk. I hope I shall not tread on anybody's toes, in regard to this milk question, for I hear you are going to have some discussion on subjects of vital importance to the milk producer to-morrow. I did not know this, however, until I got here to-night.

The milk, after it is taken from the cow, if it is intended for transportation—if it is to be sent to the city or any point at a distance—should be cooled instantly, and I am more and more convinced of that statement every day. I know it is a statement founded on solid facts, and that to-day, in England, you could not sell your milk to any reputable person without it, either by themselves or by their agents.

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I am going to tell you about a visit I made to the Aylesbury Dairy Farm, at Horsham. Horsham is about forty miles from London, on the South Eastern railroad. It is one of those old towns on the edge of the Southdown country, where Southdowns have been bred for two hundred years.

The Aylesbury Dairy Company is under the management of Col. Allender, and was founded by a number of prominent Englishmen in 1862 or 1863—twenty-five years ago—when it was discovered that the work-house and the poor people were being served, for milk, a combination that was composed of a small quantity of milk, a moderate quantity of chalk, a few calves' brains and a great deal of water. [Laughter.] As a result of this discovery, such an astounding report was made that these same wealthy gentlemen, who have developed the wonderful horses and cattle we have talked about, took hold of this thing for the best interests of the country, and they established this company and delivered pure milk to the citizens of London, and to do this raised a capital of £125,000, or about \$750,000 of our money.

Their enterprise has been a success from the start. Some years their dividends have been as high as twenty per cent., made by handling pure milk, pure butter and pure cream cheeses.

They have been so successful that Col. Allender has decided to try an experiment, and he has bought one thousand five hundred acres of land in the town of Horsham, and it is called the Aylesbury Dairy Company's Farms. It is a most wonderful situation—that rolling country so pleasant to the eye, with more or less fine oaks on it. The place he bought was formerly an old estate. One of the houses on this place was built by Southey, the poet, and the house, it is said, was built in 1500. It is a very charming old place and is well watered, with a most luxuriant growth of grass, and the soil is of a splendid quality. He has grouped together a series of buildings, which, taken together, make a hollow square.

He feeds there a great deal of oil cake and a great many roots, &c. Last year he tried, for the first time, the experiment of stacking ensilage, and I assure you it created quite a sensation. The process under which this is stacked is patented. I saw there, under this patent process, but lately introduced, stacks of ensilage, and I saw it cut into, and it was very good, as good as any I have ever seen. The cows are arranged eighty in a stable (twice as many as should be, in my

opinion), arranged in four stables, or three hundred and twenty cows in all. They are in charge of one man, who acts as foreman, and he has ten or twelve men under him all the time, though when milking-time comes he has ten or twelve supplementary men, who come in to help milk. All the employes are under military discipline. When the cows are being fed, these stables are locked, and no one can go in without an order. No man is allowed to speak above a whisper. The stables were exquisitely neat, and everything was as quiet as a cathedral. In front of each cow was a trough in which the prepared food was placed, and then water is let on, and the temperature raised, so as to stand at from seventy to eighty degrees. The cows are turned out into the yard for exercise once a day. These stables are really as neat and clean as a Quaker's kitchen. Before they began to milk you could see nothing, no dirt nor anything else. In fact, I hardly realized I was in a stable. As the milk is drawn they have small boys with their neck-yokes, ready to carry it away. The boys in carrying the milk, go down a covered passageway, covered with glass, to the dairy.

This is a large room, about the size of this Assembly chamber, and one corner of it drops down, I should think, for perhaps one-quarter of the distance, so that it is eight or ten feet below the level of the main room. There is a large galvanized or tinned steel tank—and I want to speak to you about this tinned steel later on—a large tinned steel tank into which the milk was poured, a half dozen coming in at the same time and thoroughly mixing it, and from that tank it ran directly on to the cooling apparatus—the Lawrence and the Bott coolers. (These are the two makers of these coolers in London.) I stood the thermometer in the milk and found that it indicated eighty-seven degrees. Coming from the cow it is at blood heat, or ninety-seven degrees, and it had lost about ten degrees while being carried from the stable to the dairy. It came out of that tank and on to the coolers at eighty-seven degrees, and the water in the coolers was flowing through at a rate about four times as fast as the milk went over them. I will describe it to you, although I think I described it to you last year. It looks very much like an old-fashioned, zinc, corrugated washboard. The water goes in at the bottom and goes this way, and this way, and this way, across and across, until it goes out at the top, and the milk drops down over this galvanized zinc, a distance of about twenty inches, and by capillary

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attraction comes down in a smooth sheet. Starting at eighty-seven degrees, and falling twenty inches over that surface, through which the water was flowing four times as fast as the milk was flowing over it, it dropped into the pail below at a temperature of forty-eight degrees. By this arrangement, as you will see, in dropping a distance of twenty inches, its temperature was reduced nearly forty degrees. As it ran over the cooler it seemed just like a mad brook in the early spring-time.

That milk is then put into churns or large cans, which were made of tinned steel. I want to call your attention to that.

The actual life of the milk can in England, made out of tin—old-fashioned, heavy four-cross tin—was only about three years. Col. Allender showed me cans, made out of tinned steel, that had been in use for seven years. Of course they were not so bright as they were; in fact, they were not bright at all. He said they were to be re-dipped, and he did not know how long they would last after that. In England to-day, every prominent dairy company, in buying cans, demands that they be made of this tinned steel, as they are the best cans, or “churns,” as they call them, that can be had for the purpose.

That dairy itself was a most attractive place on account of its simplicity. There was this immense room, with the rafters going up to the roof, so arranged that a good supply of air could be had, and the moment they were through with the milking a hose was taken and everything in the room was washed down—walls and floors—and hot steam let into the tank after it was scrubbed, for scalding. Two men finally mopped the floors with rubber “squillgees”—I don’t know whether you know what that is or not [laughter]—I will tell you; it is a rubber mop. And it is a very useful article in the dairy. It is not as important as some other matters, but it is a very useful thing. It is simply a broad board with a strip of rubber fastened on to it, with a handle—a rubber mop. I buy them by the dozen, and find them very useful in my dairy.

These coolers in the dairy were hung in such a way that with a little brushing, a good supply of water, cold at first, then hot, and then steam thrown on them, they were polished and cleansed in the twinkling of an eye.

I want to say a word, in this connection, in regard to the use of steam for dairy uses. If a man has but twenty cows he should have steam for his dairy purposes, as it is almost invaluable. It will scour

and it will cleanse instantly, and save an immense amount of labor and elbow grease. [Laughter.] As you all know, it kills any germs that may be in the milk, or anything that may be foreign to it. Milk is so susceptible that if it is not instantly cooled decomposition sets in almost immediately. I think Wanklyn's description of milk is the simplest and best I have ever read. He says the milk comes from the mammary glands, that there are held in a state of fine subdivision small particles of fat, and this fat is what is called, when gathered together, cream. That is the A, B, C of milk. That is all it is. It is simply a watery solution, and it holds in a simple state of subdivision these little particles of fat, and the most important thing is to get that fat out with the least trouble and by the best possible method.

Returning again to the stable I was speaking of, in twenty minutes after the last cow was milked the stable was in apple-pie order—nothing at all there that could be criticised; everything clean and neat.

Col. Allender took me all over his farm. He showed me his stacks of ensilage, which interested me very much. Now, many of you farmers here in New Jersey realize and appreciate the value of ensilage, and this method of Col. Allender's does away with the expensive pits. This ensilage of Col. Allender's had been stacked for fourteen months, and I should say the stacks were twenty feet across at the bottom and fifty feet long, and about fifteen to twenty feet high. The ensilage was drawn up and thrown on a platform, which was not more than fifteen or twenty inches from the ground.

Mr. Forsythe—What was it composed of?

Mr. Burnett—The ensilage, you mean? Why, of Indian corn, or what they call "maize."

Mr. Forsythe—Was it cut up?

Mr. Burnett—It was not cut up, but it was built up there on the platform. It was piled up over this platform, and after it was piled it dropped to about one-quarter of the distance, and then it was replaced, and then it dropped again until it would not go any further, when he covered it with straw—putting on some six or eight inches, not making a regular thatch, but throwing it on loosely, and then, by means of chains, the stack was pulled down to the height of twenty feet, or as much as he could, and with this straw acting as a cushion for the chains, he drew these chains over this about every three feet.

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I think he dropped it just about one-third, and there it remained ever since. He cuts it down just the same as you would cut your hay, with an old-fashioned hay-knife. The result is most satisfactory. He told me it had been very largely tried in England and that he had no doubt it would ultimately supersede the silo. You who began with ensilage know how expensive it is to build a first-class silo, and you can easily see the advantage of this method over the old way.

I spent the day most pleasantly on this farm with Col. Allender. He is the most energetic Englishman, a man who reminds you of—it is rather a vulgar expression, perhaps—but he reminds you of a live Yankee. [Laughter.] He is, however, a thoroughbred Englishman, a full-fledged Englishman. [Laughter.] You can see that in many of his ways, and you notice it in his conversation. He certainly has as much push, pluck and ambition as any Englishman I have ever seen. He did, I think, what occasioned more surprise in that part of the country than anything that could be done. He built a house and moved into it inside of six weeks. He got it started and finished and moved into it within that time, and it was a very good house, too. I spent the night there with him. An ordinary Englishman would have started it and would have thought it all right if the house was finished inside of twelve months.

Col. Allender is a very ambitious man. He has tried the experiment of keeping different herds on different farms. He had, while I was there, four or five different varieties. His idea was that people coming to England from South America and from the colonies, after having made money there and coming back to the old country to see their people, and buy thoroughbred stock—that they would come down and pick out just what they wanted, and he has all kinds and can give them any kind they want. I told him he would never make a success of it, and he has tried it a year, and I think he is convinced I was right in my prediction. No man can do more than one thing well. He cannot breed all kinds of cattle, any more than he can breed all kinds of pigs or sheep.

Speaking of pigs—I found a most curious breed of pigs in England while there. I think a description of them would interest you; they were, in color, not unlike the Jersey Reds, and they call them the Tamworth breed, and they are noted for their bacon sides. In England they cure the whole side of the pig for bacon. In these pigs

there is an immense amount of waste, because thirty-three per cent. of their length is nothing but snout. [Laughter.] Of course, I can well understand that, for they are a grazing pig, and rooting will cause the length of the snout to increase in any pig. I have seen some of the handsomest pigs—the prettiest young Yorkshires—turned out into a lot, and the third generation of them had snouts just about like these Tamworth pigs. You breed them with short noses, but they will always return to their original long snouts if allowed to get their living by grazing; nor is this strange, for they must have long snouts to enable them to root successfully. They root for a living and their snouts naturally grow of a much greater length than the stall-fed pigs. The pigs can't help it. [Laughter.] These Tamworth pigs are very cross, and have fearfully bad tempers.

For myself I like a pig of the roly-poly kind and I grow that kind, and most of their noses look as though they had been run against a stone wall. [Laughter.]

I may have exaggerated somewhat in regard to the proportion of snout in the Tamworth pig, but you look at him sideways, and you think, what an enormous pig, and you might take him for one of those scrub Jerseys, as they have the red dun color. I am a Jersey breeder myself, as some of you perhaps know, so this is not much of a compliment to my own breed, but on looking at the Tamworth pigs you could not help thinking that the size was something simply enormous. The moment you moved, or the moment the pig moved, and you looked at him edgeways or endways, you would not think he would cast a shadow, so thin do they appear. They are raised for their enormous sides of bacon, of half-lean meat. I much regret to say that these Tamworth pigs have become quite fashionable, and you will find them on many of the "swell" places in England. I hope the fashion will soon die out, for it is a most objectionable breed of pigs, to my mind, for the ordinary farmer.

I have now talked to you for an hour. My talk has been very informal, as I told you it would be, but if I have given you any new points, or if I have given you anything to think about and improve upon, I shall be amply repaid and well satisfied.

You will see by what I have said that I am a great lover of the dairy cow, and that there is as much due to care and feeding as to anything else, in the production of that typical dairy cow, and that a great deal is due to both, and in conclusion I will say, as I said

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before, that I hope the time will soon come when every farmer, no matter how small his farm, no matter how small his herd, and no matter what he is breeding, will find it a necessity to own or breed to a good thoroughbred bull. It will pay you to do this.

A Member—Would you recommend the practice of curing ensilage, now followed in England, which you have told us of?

Mr. Burnett—I do not know why it should not do as well here as there. I have a report at home on this subject, and if I had that with me it would be of interest to you. It is on this subject of curing ensilage for stock. It was made by the committee appointed by the Royal Agricultural Society of England, which, as you all know, stands at the head of all agricultural shows of the world. It is a very good report on the stackage of ensilage, and the committee are all strongly in its favor, but, at the same time, being conservative men, they were not satisfied with the experiments of one or two years, and before they made a final report, wanted to look into the matter still further.

Mr. Forsythe—Does it keep good on the outside?

Mr. Burnett—Yes; it cures perfectly dry. It is of rather a dark color, and cures perfectly dry for about three inches into the stack.

Mr. Forsythe—It does not rot?

Mr. Burnett—No; not at all.

Mr. Forsythe—Will you tell us what “tinned steel” is?

Mr. Burnett—Yes; instead of using, as all ordinary tin is made, what we call sheet-tin, which is simply sheet-iron dipped in tin—instead of using iron sheets they use sheets of steel, rolled out very thin and then dipped in tin. It is much more tenacious, and will not dent as readily as the tin cans or tinned-iron cans. I think the sample of the two cans shown me, the tinned-steel can and the ordinary can, showed a marked difference. One looked as if used for six months and the other, the ordinary can, looked as if it was on its last legs. They were both bought at the same time and put together for a test as to their lasting qualities.

Mr. Forsythe—How about cheeses in England?

Mr. Burnett—There is not much attention paid to cheese where I was.

London uses an immense amount of butter and milk. She takes forty millions sterling from France in the shape of butter and eggs.

The farmers there are in rather a difficult position, as there is a tremendous agricultural depression in England.

Farmers must be alive to the changes going on around them, if they would succeed in their business. Take in our own States, for instance. Many years ago the best beef, the best butter, and a great many of the best things, came from New England. Where do they come from to-day? Way from the north and from the west, fifteen hundred miles west of us. Look at the wheat fields; gone from the valley of the Mohawk, skipped on to Ohio, and across Indiana and Illinois. Fifteen years ago the center was in Iowa, to-day it is way out on the plains. What is the result to-day? Iowa, fifteen years ago, was probably the greatest wheat State in the Union, and to-day it is the foremost among the butter-producing States. They are quick in appreciating the change in the condition of soil and market, and are quick to adapt themselves to circumstances. In England they are slow in adapting themselves to these changes. Of course, they gain in some ways, but they lose in others, and I think people of quick, snappy judgment more often go on to victory than to defeat.

Mr. Forsythe—Do you know anything about the larding of cheese?

Mr. Burnett—I know something about it. At the London Dairy Show I found a little machine used in this process, and sold openly, without regard to any secrecy in the matter. It consisted of two little copper cylinders, and between these there was a small retort, and under that a lamp. You could have almost carried the whole thing in your pocket. The milk was put in on one side, and cotton-seed oil or lard oil was put in on the other, and then with this little retort and the alcohol lamp under it, this emulsion all ran through one common tube into a small vessel, and you got from the whole mixture an emulsion which you could sell as cream, or put it into your skimmed milk, or put it in your skimmed-milk cheese, and get something that would go for a first-class article.

Mr. Forsythe—Are there any full-cream cheeses made in this country?

Mr. Burnett—I can tell you where you can get one—in Winthrop, Maine.

Mr. Forsythe—You can't get them in Philadelphia.

Mr. Burnett—No; most of the cheeses you find, I am sorry to say, are made of this emulsion.

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Mr. Forsythe—I am speaking of large cheeses, weighing as high as sixty pounds.

Mr. Burnett—When I speak of the cheese made in Winthrop, they run from twenty to thirty pounds, and are pure cream cheeses, made from Jersey milk. They are very rich, full-cream cheeses, and very fine and very good.

I did not mean to speak of any of my congressional duties at all, but I think you will all agree with me in what I would say. We are getting special acts passed in regard to the adulteration of different articles of food, but what we want are laws stringent enough on the adulteration of food; such laws as would make it impossible to sell anything in this country unless it was strictly pure. In my opinion, if we could do that, and have such laws enforced, it would give us a market for our products all over the world. I do not think, then, it would make much difference to the farmers whether there was a tariff or not. If we should establish a reputation as manufacturers of pure butter and pure cheese and pure lard, the world would furnish us a market for them, and we could get our own prices for our products, certainly way above the prices we can now get for them. We could get prices that would give us a handsome profit, too. In my opinion, that is the way, and the best way, to improve our prices, and put on the market our surplus products with a certainty of finding a ready market.

Mr. Lippincott—Do you analyze your milk?

Mr. Burnett—No, sir; I do not, except, perhaps, three or four times a year. I test it every week by one of those oil-test churns. That oil-testing churn contains about fifty vials or testing tubes. These are put in this churn, and then they are moved rapidly backwards and forwards until the butter comes, and then they are placed in warm water and the butter is melted at the top, and is then chilled again, and we gauge the quality of the milk by the melted fat on top of the tubes.

A Member—What portion of solids are you required to have?

Mr. Burnett—In Massachusetts, thirteen per cent. I do not believe that milk ought to go below that per cent. of solids. I stand on thirteen per cent. I believe it is simply a matter of feed. I think that those men who get milk below thirteen per cent. of solids are men who feed a great deal of slops. I know that the feed makes all the difference in the world. Why, gentlemen, in the making of but-

ter—and I am familiar with the entire business, for I made my own butter with my own hands for three or four years—in the making of butter, if I have got to choose between the cow and the feed, I will take the feed every time, and I will give you first-class results every time, too. Give me the best cow in the world, and if I have not good feed I cannot make good milk or butter.

A Member—Will your herd average thirteen per cent.?

Mr. Burnett—I know it will. I buy milk from fifty farmers. My own dairy being a Jersey herd, runs between fourteen and fifteen and one-half per cent. Of course you all understand that I am a very good feeder. I feed the very best of grain, and I feed liberally, so *that* is not anything to boast of. I will send samples of my dairy milk to any chemist in the State of New Jersey, and I will guarantee that my milk will run from fourteen to fifteen and one-half per cent. of solids. This statement is not out of the way for Jerseys. If any of the farmers of whom I buy milk allow their milk to run below thirteen per cent. of solids I first notify him, and if there is no improvement, I drop him from the list at once.

A Member—How do you test?

Mr. Burnett—By the oil test. It is rather a crude test, but we treat all alike, and the per cent. is shown by the gauge on the side of the tube.

Mr. Lippincott—It is a fat test?

Mr. Burnett—Yes, sir. We only get the actual solids by estimation. It is in the hands of one of my men, who has become very expert in testing milk in this way. I have verified his tests by sending milk to Dr. Davenport, who was formerly our Milk Inspector in Boston.

Mr. Abbott—Is it not a fact that at Amherst the solids have fallen below thirteen per cent.?

Mr. Burnett—I have heard it so said, but the Major denied that up and down. He said the experiment was made with cattle poorly fed, and that the test was made in the most crude way.

Mr. Abbott—The tests extend over a considerable length of time, I understand?

Mr. Burnett—I have only the Major's statement. I know nothing of the test, except what I saw in the papers. Where a great deal of grain is fed we have no trouble in getting thirteen per cent. of solids. I do not think the amount of percentage of solids should be decreased

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—I think it should be raised. If you do not you cannot prevent the adulteration of your milk. Just as soon as you lower the percentage of solids you open the door for adulteration. Control your milk-supply, feed better and deliver to the examiner better samples of milk.

Mr. Abbott—Does that mean that there is no trouble to secure an average of thirteen per cent.?

Mr. Burnett—For the whole herd. Yes, my whole herd will average over thirteen per cent. I also test the milk as it comes in from the farmers in forty-quart cans.

Mr. Abbott—Is it not the experience that the maximum and minimum vary quite widely? In getting milk from these farmers does it not vary considerably in maximum and minimum per cent.?

Mr. Burnett—Yes, it will vary in different cows.

Mr. Abbott—But at different seasons of the year. Will not the same cow vary at different seasons of the year?

Mr. Burnett—Yes, I have had in the full flush of the spring feed, hard work to hold my average milk at just the required thirteen per cent. In Massachusetts we have eased it a little for the spring months.

Mr. Abbott—Don't you find it is twelve per cent. in the flush feed of the spring?

Mr. Burnett—I think it is. We have let up on the milk in the months of May and June.

Mr. Abbott—How does the Inspector look after the milk?

Mr. Burnett—He follows it up very closely. I know in Boston we have had a more stringent enforcement of our laws, and a great many convictions. I think it was at the suggestion of the Inspector that this law was changed so that the per cent. of solids was reduced during the months of May and June.

Mr. Abbott.—Was that change made recently?

Mr. Burnett—I think it was last winter—just about a year ago.

Mr. Forsythe—Did you ever know a cow to vary in different teats?

Mr. Burnett—Yes; I have seen that tried. The same cow will often vary in the same teats, and in different teats.

A Member—In speaking of this class of cows, are you not referring almost exclusively to Jerseys?

Mr. Burnett—I have been referring to my own herd, principally.

A Member—Do you think that thirteen per cent. of solids is right, as a general thing?

Mr. Burnett—Thirteen per cent. of solids is the law of our State. The farmers who supply me may have some grade Jerseys, but not all, by any means. I know there are a great many nonsensical statements made about not being able to produce thirteen per cent. of solids from the average cow. It is entirely dependent upon the way in which the cows are fed, in my opinion, and nothing else. Cows vary, of course, but I will take any herd of cows in this State, and if you will let me feed them for thirty days, I will guarantee that they will produce the thirteen per cent. required.

A Member—Do you think that your location, being further north, makes your per cent. of solids greater?

Mr. Burnett—No; I don't think so. I think in a moist climate, where you have a superabundance of grain, and where you have a luxuriant growth of vegetation, you get a smaller per cent. of solids. In England, the law is less than it ought to be in New Jersey. You have about the same conditions of climate we have in Massachusetts.

Mr. Abbott—They have no legal standard in England, as I understand it. Parliament has always refused to fix a standard.

Mr. Burnett—The English standard I have quoted is for the large companies I have referred to. They buy all their milk as you buy your cotton cloth, and that is the way it should be bought here. The day is coming when this milk business will go into the hands of large companies, who can afford to employ chemists. Just as your wife, or sister, or mother goes into the store to buy a piece of cotton cloth—she has to pay more for Wamsutta or New York Mills than for ordinary makes of poorer quality.

Mr. Abbott—I was told that they do not sell at the same price.

Mr. Burnett—Who told you?

Mr. Abbott—Mr. Barrum.

Mr. Burnett—That is the case, for his own little herd of Guernseys down near London.

Mr. Abbott—He gets a difference in price, I think, does he not?

Mr. Burnett—They have a certain standard, I think. I do not know so much about the chemical work in this company as in the Aylesbury Company.

Mr. Abbott—They are just as careful?

Mr. Burnett—I thought they were. I spent a good many hours

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with the Aylesbury Dairy Company's chemist, and have watched him very carefully.

Mr. Abbott—The society in England agrees among its members what the standard shall be. Parliament has always positively refused to fix any percentage of solids.

Mr. Burnett—I would like to ask you one question. Do you believe if milk was bought by quality there would be any difficulty about having it come up to the standard? Do you think then there would be any difficulty about getting the required thirteen per cent. of solids? I mean in the State of New Jersey?

Mr. Abbott—The facts are that in the State of New Jersey, where I buy the milk of some forty herds, it will run fourteen and fifteen per cent. The graded herds have run about thirteen and seventy-five hundredths, and good cows have run an average of about twelve and ninety-hundredths per cent., or a little more, perhaps about twelve and ninety-eight hundredths per cent. But the same herds in some instances fall way below the average, and sometimes even below twelve per cent. And yet this milk was certified to as being pure by the shippers.

The trouble is simply that there is too much difference between the maximum and minimum averages. They vary considerably, I find.

Mr. Burnett—You think that in the spring the thoroughbred Guernseys and Jerseys are better fed than the ordinary stock?

Mr. Abbott—I cannot say that as a rule. They seem to be afraid to feed them.

Mr. Burnett—They are fed with the overplus of everything on the majority of farms.

Mr. Abbott—But in less quantities.

Mr. Burnett—Less quantities of grain, perhaps. The average quality of the thoroughbred herd is much higher than with ordinary herds, with us.

A Member—I would like to ask you one question. Might not the difference in location of farms, and the soil, make a difference in the quality of the milk?

Mr. Burnett—Undoubtedly.

A Member—Has a farmer whose soil is not adapted to milk-producing, any business to go into the dairy business? [Laughter.]

Mr. Burnett—I look at it like this: our dairy cows are more or less artificial animals, and while a man, even to a great disadvantage,

can raise provender enough on a farm almost anywhere to obtain good results from dairy animals, it is all right, although to do this may be much more expensive on some farms than on others. I think, on easily-tilled soil, near a large market, a man would be foolish—a man who could raise small fruits, or early vegetables, would be foolish to leave this and go into dairy farming, to supply milk at the present prices.

A Member—In raising this class of cows you speak of what would be the feed you would give for the first six months?

Mr. Burnett—Speaking from my own experience, skimmed milk. Those who sell milk could not do this, perhaps. If you make butter you can. The best food for that animal, up to the age of seven or eight months, or perhaps longer, is skimmed milk. It is the natural food of the calf. Feeding calves is an art by itself. Every one does not know how. Some men whom I have employed in my dairy never could learn how, while others understand it and become proficient in it.

A Member—Could you not get better results from fresh milk?

Mr. Burnett—Not as far as dollars and cents are concerned.

A Member—Outside of that?

Mr. Burnett—With new milk you are apt to start the beef qualities in the animal. You want to start and train the animal for a butter animal, or for a dairy animal. You begin with your colts when you raise horses, and you must begin with the calves when you raise dairy cows. You have got to take a dairy animal, and you have got to make it a machine for consuming a large amount of provender, and turning it into milk, and to do that the milk has to be condensed. The new-milk food for the early stages of the life of the dairy animal is the best food, undoubtedly. I feed new milk at first, but I only feed it for a few days. I take then skimmed milk, and supplement it with oil cake, and feed my calves three or four times a day. It is a great mistake in raising young animals to feed them but twice a day. They require constant feeding, and in small quantities. A great many calves die because they are allowed to gorge themselves to death. They get to be perfect gluttons. They act like a big syringe, stick their heads in the bucket into the milk, give one breath, and everything goes right into them. [Laughter.] The calf gorges itself and dies, and if you were to open that calf you would find its stomach full of coagulated milk.

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I am sorry you got me started on this subject, for I will tire you out, I am afraid.

For six weeks I give my calves a little oat meal, for I consider oat meal the best grain I can give my calves in the early stages of their growth. It supplies the phosphates, the material for making the bone, which you want to get to make a good dairy animal.

You will frequently find that when you have taken good care of a calf, and it has grown to be a yearling, it has developed into an animal not so beautiful as you would like to see, and when it develops into a two-year-old you have got something rather coarse, rather thick over the shoulders, and something that looks a little bit beefy, and, if she has been well brought up, has a good deep paunch, and a good digestion. Afterwards the high shoulders will draw down into the udder, and she will begin to look as if she had been trimmed off with a knife, and she will make one of your typical dairy cows. In buying my dairy cows I like to see a little bit of thickness through there on the shoulders, especially if you find with that thickness a loose joint. She should have ribs broad and flat, and far apart, just the opposite from a horse. I put my fingers and thumb in between her hips and her last ribs, and in the space between the shoulder blades, and if I can get deep down there I am almost sure I have a good, loose-jointed dairy animal. Then again, if she is thick through the shoulders I know she has a good constitution. That is a great satisfaction to all Jersey breeders, to know their cattle have good constitutions. We must have belly and constitution to make good dairy animals, and as I have said before, that coarseness and thickness generally all goes down into the belly and into the udder.

A Member—Have the Holsteins more constitutional vigor than the Jerseys?

Mr. Burnett—I think they have, in a certain way. They are a more gross and larger-boned animal than the Jerseys. Under other circumstances they are no better, I think. With Guernseys and Jerseys, from a series of importations extending over seven or eight years, I find the Jerseys more quickly acclimated, and they do better than the Guernseys. One swallow does not make a spring, though [laughter], and my experience may not be exactly the same as that of others.

A Member—Referring again to that ensilage, what was the condition of that hay before stacking for ensilage; nearly ripe or green?

Mr. Burnett—Nearly ripe. Not a dry ripe, of course, but ripening. It was full grown.

They over there have watched our experiments in this direction with a great deal of interest, and they have reached the same conclusion—that is, that you would want to cut your corn when the ears are well formed, when you have almost the full growth of the grain.

Mr. Lippincott—Does the corn mature well in England?

Mr. Burnett—No; they can get about as far as ensilage fodder, and no farther.

Mr. Lippincott—Was this stack of ensilage entirely exposed to the weather?

Mr. Burnett—Entirely. A gentleman, Dr. E. L. Sturtevant, was talking to me the other day about this. The inventor had sent to New York one of these appliances, this apparatus for drawing down the stack, and the Doctor had tried a small stack very successfully. He had opened it at the end of two or three months, and found it first-class. I think he put this in in September, and opened it in December, or the latter part of November, after being in the stack over two months.

A Member—How much do they add to the stack?

Mr. Burnett—I was not there when built, and I could give you nothing on that but guesswork. Colonel Allender told me it shrunk from twenty-five to thirty-three per cent. Dr. Sturtevant thought its own weight in the stack would be sufficient to cure it.

A Member—How fine was it cut?

Mr. Burnett—Into about two-inch lengths. It was cut down in the stack with a sharp hay-knife.

A Member—Cutting up all the large butts, too?

Mr. Burnett—I didn't see it fed. They only fed it there twice a day.

A Member—Could it be made in this climate, as well as there?

Mr. Burnett—I should think better. This is a very dry climate. Their climate is very moist, as you all know. The green vegetation in England is something poetic; the pastures are delightful, the color is so bright. You can appreciate this fact from the number of fogs, and the ease with which it rains, and the regularity with which you are obliged to raise your umbrella. [Laughter.]

A Member—Is that oil-test churn you spoke of entirely satisfactory?

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Mr. Burnett—Yes.

A Member—Is there more than one pattern made?

Mr. Burnett—I think there are several.

A Member—Where can they be procured?

Mr. Burnett—I think there is an agent in New York, though I am not sure. Cornish & Green, of Fort Atkinson, Wis., will furnish them.

Mr. Lippincott—What do you call English hay?

Mr. Burnett—We have cow hay and horse hay; I call that English hay which is common, clean hay, with timothy and with some red-top.

A Member—Hay from old sod?

Mr. Burnett—The old sod grows more red-top and less timothy. The fresher the sod the more timothy, and the coarser hay you get. In speaking of English hay I mean those varieties with very little clover, perhaps. In speaking of orchard grass, or of blue-joint hay, in our meadows, I always speak of that as different from this English hay.

I thank you for your patience and kind attention, gentlemen.

President Burrough—I move that a vote of thanks be extended to the speaker for the very able, interesting and instructive address delivered to us this evening.

The question being on the motion of President Burrough, it was unanimously agreed to.

At this time the Board adjourned to meet in the Supreme Court room to-morrow (Thursday) morning, at 9 o'clock.

EXTRACTS FROM THE
REPORT OF THE DAIRY COMMISSIONER.

EXTRACTS FROM THE REPORT OF THE DAIRY COMMISSIONER.

All the laws relating to the prevention of the sale of fraudulent and adulterated foods and drugs have been placed in my charge. Each of these laws has a different object, and provides separate and distinct methods of enforcement, but the one great object, common to all, is the protection of our people from the dangers and ill effects due to impure articles of food.

OLEOMARGARINE.

The provisions and objects of the law regulating the sale of oleo-margarine and other imitations of dairy products were clearly, and somewhat extensively, outlined in my last report, hence it does not appear necessary to refer to that branch of the topic again. The law was amended in April, 1887, by altering the reading of a few sections and the insertion of a form of conviction, but the main parts of the act were not changed.

In my last report it was stated that several cases had been taken to the Supreme Court by defendants in order to test the constitutionality of the act, and decisions have been given on nearly all of the doubtful points. Only two matters are now undecided, and these will be referred to later. In the case of *Hoeberg v. Newton*, Supreme Court, June term, 1887, it was decided that the trial under the law was summary, and that no jury was allowed. In another case, *Carter Brothers v. Camden District Court*, Supreme Court, June term, 1887, the same decision was rendered. It had been previously decided that proof of guilty knowledge was not required by the law. Thus, the principal points in the act, and those about which doubt existed, have been settled, so that only one or two sections may be considered as not adjudicated upon. This successful settlement of the standing of the law has had much to do with the falling off in the number of

cases tried this year ; the law having been found to be sound in principle, very little opposition is now offered to its enforcement.

At the present time there are twelve cases in the courts untried, these having been carried up by the defendants on account of errors in magistrates' rulings or papers. Twenty cases await trial by justices, and some fourteen cases are in the hands of my attorneys for trial.

In my former report I stated that section 4 of the act was selected to be enforced in order that the character and extent of the trade in fraudulent butter might be tested. This section requires that imitations of butter shall be sold for what they are ; the law insisting that the seller shall inform the purchaser and, at the same time, present a printed notice bearing the name of the article. The section relating to the branding of packages was also enforced. After some six months' trial of these sections it was ascertained that a rigid enforcement served merely to check the sale of the fraudulent article to a limited extent, as dealers informed the purchaser and complied with the act only when they suspected that he was an Inspector, hence another and a more radical method of management was required on the part of the State officers. By the methods tried, as mentioned above and in the former report, the following results were obtained : First, when the State and National laws were first enacted all those dealing in oleomargarine were thoroughly informed that an honest business must be done, and all dealers not willing to sell the article for what it was must retire from the trade ; that result naturally followed, for soon a great number ceased to sell the imitation article, and many were glad of the opportunity to abandon a trade that savored of fraud. Second, when it became known that the law was to be strictly carried out, and that conviction was almost certain to follow any violation, a larger number gave up the business, especially after being convicted and fined. This process of elimination left only those who were willing, on account of the large profits that were in the trade, to run the risk of detection, hence to-day those transacting this interdicted business are the ones the officers of the law have to deal with.

Prior to the enactment of the State law, in April, 1886, at least eighty per cent. of all the grocery stores in the State sold a greater or less amount of oleomargarine. Six months after the law went into effect and was rigidly enforced, only one hundred and forty-nine

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dealers remained in the State, and after the warfare of 1887 only thirty licensed dealers continued in the business, seven of whom have discontinued the sale of oleomargarine since November, 1887. These figures graphically show the results of the rigid and careful management of the State law.

After the enforcement of the sections of the law requiring honesty on the part of dealers it was soon ascertained that the other portions of the act would have to be made operative before restriction was placed on the fraudulent trade, for the false color of oleomargarine enabled the men selling the article to force it on the public as pure butter, hence it was deemed necessary to require obedience to all the provisions of the statute. In June all dealers were notified that the section prohibiting the sale of substances colored in imitation of butter would be enforced and cases were soon made against many persons. This action was resisted and able counsel was retained to attempt to defeat the law by appealing to the higher courts for the purpose of testing its constitutionality. Test cases have been made against persons for selling oleomargarine colored with annatto, for selling a substance colored in imitation of butter, and one for selling an article in imitation of natural butter, and these cases have been taken to the Supreme Court. It is hoped that a decision will be rendered in February, and then every section of the act will have been settled. These decisions are vital to our work, for if it be decided that a grease colored so as to imitate butter can be sold in this State, it will be almost impossible to prevent the fraud, but if the courts hold that fraudulent imitations cannot be sold, then the traffic in bogus butter will be checked.

The above statement will indicate the amount and character of work done under the law. Penalties to the amount of three thousand and one hundred dollars have been paid into the State treasury, while four hundred dollars are in the hands of the courts and will be paid to the State when the cases are finally decided.

MILK.

The act to prevent the adulteration and to regulate the sale of milk has been under my charge for the past eight years. For full particulars of the work done during the previous seven years reference

may be had to the fourth, fifth, sixth, seventh, eighth, ninth and tenth annual reports of the State Board of Health.

During the past year the work of inspection has been carried on with increased vigor and the supply in nearly all of our cities and towns has been investigated. Complaints for violations of this law have been made as follows: In Atlantic county, one case; Burlington county, three cases; Camden county, two cases; Morris county, two cases; Middlesex county, six cases; Warren county, four cases; Gloucester county, nine cases; Essex county, thirteen cases; Mercer county, three cases; Sussex county, one case; Union county, one case; Somerset county, one case; Hunterdon county, five cases; Hudson county, thirty-seven cases. Penalties to the amount of three thousand and nine hundred dollars have been paid to the State Treasurer for violations of this act. Three hundred dollars are in the hands of the courts until the cases in dispute are decided.

FOODS AND DRUGS.

The act to prevent the adulteration of food and drugs has been on the statute-book since 1881, but little or no work has been done under its provisions, except in the way of investigation. The State Board of Health heretofore had charge of this law, and an annual appropriation was made to that Board for the purpose of enforcing the provisions of the act. That Board, having other and important matters to attend to, was not in the position to devote much time to the consideration of the requirements of the act, but a number of important investigations are noted in the later reports of the Board. In 1887 I was directed to aid in the enforcement of the law, and I was authorized to pay the necessary expenses out of the regular appropriation made under the oleomargarine law. As the provisions of the food and drug act are very comprehensive and exacting, and as all dealers in foods and medicines would be affected by its enforcement, I thought it best at first to acquaint all those interested with the terms of the law. To that end publicity was given to the provisions of the law and every opportunity was offered to dealers to have the articles in which they dealt tested. A systematic method of testing the more common articles was instituted, and, when found adulterated, dealers were notified of the fact and warned that subsequent sale of that article would be followed by prosecution. This course was deemed

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proper rather than an immediate enforcement of the provisions of the act. In the case of many articles of food and drugs the methods of analysis as laid down in books were found defective and inexact, hence more reliable processes had to be worked out. This consumed much time, but we are now able to detect adulteration in most substances with precision and rapidity.

LARD.

That lard is an article of food commonly adulterated is a well-known fact, but it is only recently that the practice has been carried on to such an extent as to call for legislative interference. In 1883 the methods of manufacture employed by the large western packers were thoroughly exposed by the evidence offered in the case of *McGeoch, Everingham & Co. v. Fowler Brothers*, tried before the Board of Trade of Chicago. Prior to that time books treating on the subject of food adulteration had very little to say concerning the impurities of lard, and the addition of water was considered the only method of adulteration. But about the time of that trial, and for a few years before, chemists interested in the chemistry of lard and other fats had begun to discover new adulterants in that article; and, as was said, this evidence offered to the Board of Trade showed conclusively that lard was frequently adulterated by the addition of beef fat and cotton-seed oil. The term "leaf lard" was also shown to be a thing of the past, for it no longer indicated that this article was made exclusively from the leaf fat, but that all portions of the hog were used in its preparation. Evidence has also been offered to prove that salt and borax, and sometimes nitric acid, have been employed to bleach lard or to give it a better appearance.

The adulteration of lard with beef fat and cotton-seed oil is a practice now very common, and the manufacture of this fraudulent article is parallel with the preparation of imitation butter, for the two articles are generally made by the same persons, the large packers of beef and hog products in the West. It is a remarkable and lamentable condition of affairs when the food products of this country are manipulated by speculators. The anxiety of the holders of so-called Cotton-Seed Oil Trust stock to make the investment profitable, has led them to foist the oil on the public in the guise of lard and oleomargarine, and as the holders of this stock are also large lard packers, the combina-

tion works to their satisfaction, but the public do not gain anything. The fact that over 200,000 barrels of cotton-seed oil were used in the city of Chicago alone last year in the adulteration of lard and oleo-margarine, will indicate the extent of the fraud.

During the month of June, 1887, one of our State papers contained an article, undoubtedly inspired by large packers in one of our cities, explaining what adulterated lard was and asking for State protection from that article. I was at the same time requested to investigate the matter and ascertain what could be done. Soon after the publication of the article above referred to, an advertisement appeared in the same paper, signed by five of the largest packers of pure lard, calling attention to the subject and asking for the interference of the State authorities. An investigation was immediately begun, and I soon ascertained that large quantities of adulterated lard were being sold in our cities. Samples were obtained and submitted to analysis, but the chemistry of the subject was not thoroughly understood and the evidence was not conclusive enough to submit to our courts; hence, suits were delayed. As soon as the chemists were prepared with improved methods for the detection of the adulterants, new samples were bought, analyzed and when found adulterated the seller was notified that if the sale of the substance was continued prosecution would be begun. The result of this action was to drive out of the market much of the impure article.

CONDENSED MILK.

A cursory examination of several cans of preserved milk that were offered for sale in this State at prices below the actual cost of manufacture revealed the fact that much was of poor quality, while some was unfit for use. In the early part of the year samples of all the brands for sale in the State were obtained and sent to Prof. H. B. Cornwall, of Princeton, with the request that he should have them analyzed. Especial attention is called to that portion of his report relating to the use of canned milk as a substitute for natural cow's milk in the feeding of infants.

There are two kinds of condensed milk in the market, one being simply milk condensed *in vacuo*, that is, deprived of a portion of its water; the other variety is condensed milk to which at least 35 per cent. of cane-sugar has been added. The former is intended for

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immediate use and is sold by measure. The latter is always sold in hermetically-sealed cans, and, as was said, contains large quantities of cane-sugar added for the purpose of preserving it. It should be called preserved milk. This is used largely as a food for infants and as a substitute for ordinary milk. Several attempts have been made to preserve this without sugar, but as it does not keep well and rapidly ferments, the experiment has not been successful. A few cans of this kind were opened and in every case the material was found to be in bad condition.

Many manufacturers put two grades of canned milk on the market, one of good quality, bearing their name, the other of inferior grade, and, as a rule, without any firm name on the label. The second quality is never uniform, and is often in poor condition, being the spoiled or imperfect out-put of the factory. Hence the public is not advised to purchase any canned milk without the package bears the name of the maker, for there is no guarantee that the article is fit for use as food.

HONEY.

At the request of gentlemen largely interested in bee-keeping, in this State, a large number of samples of strained honey were examined. These were bought in different parts of the State. It was ascertained that the strained honey put up by our farmers was pure, and that the chief adulterators were the packers in New York and Philadelphia.

STRAINED HONEY.

Office No.	Where purchased.	Name on Label.	Result of Analysis.
57	Paterson.....	Wm. Thompson, Wayne county, N. Y., "choice comb honey"	Adulterated.
58	".....	McCaul & Hildreth Bros., N. Y. City, "white comb honey"....	Adulterated.
59	".....	Same as 58.	Adulterated.
56	Hoboken.....	Ritter, Philadelphia; no label.	Adulterated.
60	".....	Wm. Collins, Worcester, N. Y., "choice comb"	Adulterated.
61	Jersey City.....	J. V. Sharp Canning Co., Williamstown, N. J., "clover honey"	Adulterated.
62	".....	{ Wardell & Watson, Brooklyn, N. Y., "white clover honey"	Adulterated.
76	Newark.....	{ from the apiaries of Central N. Y.; warranted pure"....	Adulterated.
77	".....	{ J. T. Dunham, "superior quality of clover honey".....	Adulterated.
78	Hoboken.....	{ Thurber, Whyland & Co., New York, "pure California"	Pure.
79	Jersey City.....	{ white sage".....	Adulterated.
80	Hoboken.....	{ E. A. Walker, Greenpoint, L. I., "superior XXX honey;"	Adulterated.
81	Newark.....	{ warranted pure".....	Adulterated.
82	".....	Wm. Collins, Worcester, N. Y., "choice honey".....	Adulterated.
83	".....	{ E. A. Walker & Bro., 135 Oakland St., Brooklyn, N. Y.,	Adulterated.
84	Hoboken.....	{ "choice honey".....	Adulterated.
85	Newark.....	{ Chas. Israel & Bro., N. Y., "choice California honey".....	Adulterated.
86	Hoboken.....	{ C. G. Leslie & Son, Pittsfield, Mass., "choice extra clover"	Adulterated.
87	Paterson.....	{ honey".....	Adulterated.
88	".....	{ "No name;" said to be Ritter.....	Adulterated.
89	".....	{ Geo. D. Powell, "choice extracted Northern".....	Adulterated.
90	".....	{ Wm. Thompson, Wayne Co., N. Y., "choice golden rod honey"	Adulterated.
91	".....	{ E. F. Watson, Brooklyn, N. Y., "pure California honey"	Adulterated.
92	".....	{ from groves of San Diego; there is none better".....	Adulterated.
1416	Burlington.....	{ McCaul & Hildreth, New York, "choice extra honey".....	Adulterated.
1417	".....	{ Code, Elfelt & Co., San Francisco, "extra choice Los Angeles"....	Pure.
1418	".....	{ Frank Charters, New York, "white clover honey".....	Adulterated.
1419	".....	{ F. G. Strohmeyer & Co., New York, "pure orange blos-"	Adulterated.
1420	".....	{ som honey; is absolutely pure, no glucose".....	Adulterated.
1421	".....	{ Wm. Thompson, Wayne Co., N. Y., "choice golden rod".....	Adulterated.
1422	".....	{ Andrew Jackson, Deposit, N. Y., "pure honey".....	Pure.
1423	".....	{ R. J. Dutton.....	Pure.
1424	".....	{ Sleeper, Wells & Aldrich.....	Adulterated.
1425	".....	{ Arthur Todd, Philadelphia.....	Pure.
1426	".....	{ Arthur Todd, Philadelphia.....	Pure.
1427	Bordentown.....	{ Western honey.....	Adulterated.
1428	".....	{ R. K. Allen, farm honey.....	Pure.
1429	".....	{ Wm. Collins, Worcester, N. Y., ..	Adulterated.
1430	".....	{ Shippo & Sons, farm honey.....	Pure.
1431	".....	{ S. Garrison, farm honey.....	Pure.
1432	Trenton.....	{ Wm. E. Johnson, Moorestown, N. J.	Pure.
1433	".....	{ S. E. Robinson, farm honey.....	Pure.
1434	".....	{ S. Holcomb, farm honey.....	Pure.
1435	".....	{ F. E. Arends, Deutzville.....	Pure.
1436	".....	{ Brown & Bros., State honey.....	Pure.
1437	".....	{ Arthur Todd, Philadelphia.....	Pure.
1438	Camden.....	{ Wm. Collins, Worcester, N. Y., ..	Adulterated.
1439	".....	{ Gifford & Stiles, State honey.....	Pure.
1440	".....	{ Philadelphia Pickling Co., "virgin honey".....	Adulterated.

The chief adulterant detected was glucose. A few samples were mixed with cane-sugar syrup, and some contained this syrup mixed with glucose. Some of the jars contained pieces of comb floating in liquid glucose.

VINEGAR.

Vinegar was formerly sold adulterated with mineral acids, especially sulphuric, but the modern methods of manufacture enable the makers to turn out a very pure acetic acid at a low price, hence there

is no inducement to adulterate. Much of the cider vinegar sold in this State is really made from alcohol, or "white wine," and cider plays no part in the process of manufacture. Some States have laws regulating the sale of this article, and penalties are inflicted on persons who sell imitations of cider vinegar without informing the purchaser.

DRUGS.

The food and drug law regulates the sale of drugs and medicines, and in order to test the quality of these articles, as sold in this State, many specimens have been examined. The requirements of this law are so plain, and the standards of purity so accurate and easily attained, that there should be no difficulty in obtaining absolutely reliable and pure drugs. The act states that all articles mentioned in the United States Pharmacopœia shall conform to the tests laid down therein, and if an article is not referred to in that authority, any standard work on *materia medica* shall be taken as the guide. Now, the business of preparing and dealing in medicines, being one that requires accuracy and a certain amount of scientific training, may be considered a profession; hence, a man practicing in that branch of medicine should be well acquainted with the articles he deals in, and thoroughly skilled in the application of tests for the detection of adulteration of drugs. In this respect the druggist differs from the grocer, for the former, being presumably an educated man, is supposed to be trained in analytical chemistry far enough to be able to apply the necessary tests for proving the quality of the articles he sells; the grocer, on the other hand, is not scientifically educated, and has not the skill or ability to test the purity of the things he deals in. There can be no valid excuse, therefore, for the existence of impure drugs, and it is only through ignorance or indifference that the pharmacist has any adulterated or inert drugs in his place of business. That the druggists do not commonly test the drugs on sale by them is amply proven by the great number of articles below the standard found in the drug stores.

The suppression of the trade in adulterated or inert drugs is far more important than the regulation of the traffic in fraudulent foods, because the latter are rarely harmful, while life may depend on the purity or strength of a drug administered by the physician. Uniformity in the preparation of medicines is also of importance, for if

of uncertain potency harm may result. The State has considered this matter, and has not only said that none but competent men shall dispense drugs, but it has also decreed that these drugs shall be pure.

[NOTE.—For papers and notes on the following subjects: On oleo-margarine and methods for detecting added color; on lard adulteration and its detection; on honey adulteration; on vinegar; analyses of foods for invalids and infants; report on the condensed milk on sale in our markets; on the assay of opium and on the present condition of the trade in drugs in this State; also short notes on investigations made during the year, see report of Dairy Commissioner for 1887.]

OUR STATE WEATHER SERVICE.

BY

DR. E. M. HUNT, DR. GEO. H. COOK AND MR. McCANN.

OUR STATE WEATHER SERVICE.

ADDRESS BY DR. E. M. HUNT.

During the past few years a great deal of attention has been given to this matter of climatology, and now the United States government has sent to New Jersey a gentleman to act as Observer. This gentleman comes from the Signal Service at Washington, and it is his duty to collect the records from all parts of the State. Some of the States have recognized the importance of this Weather Service, and are doing everything possible to advance the establishment of proper Stations for taking observations, and if we can adjust our State properly into districts it is desirable we should do so. The great trouble in this State is just this: While the United States government has provided an Observer, and is willing to do everything possible to aid us in the establishment of Stations, we have no funds with which to endow such Stations, in order that they may be supplied with the instruments necessary for making correct and reliable observations, and therefore the work is much hampered in this State, on account of this want of instruments. We are hampered for the want of about eight hundred or a thousand dollars, which amount would be necessary to provide these instruments. We think this amount would be sufficient for the purpose, and if it could be appropriated it would greatly aid the work. With this amount we could give to the different Stations already established the barometers and thermometers needed, and this would enable those in charge of the different Stations to make the desired reports, necessary for a complete and satisfactory system of working.

This matter should command the attention of the farmers of this State, without exception, as the benefits to be derived are of immense importance to farmers as a class. This is the case not only for convenience, but health itself is affected, as those of you who give the matter the thought it deserves must know. There are some very

interesting problems as to the question of locality and its bearing upon the health of those living in such locality. How far this question is of interest to the agricultural community I leave to you to judge, for you are better able to judge of such effects than myself.

I will give you a single instance in my own experience. I had occasion recently to look over the record of barometric pressure in one of our valleys, and think that the question of humidity has much to do with this question of health. The humidity caused by the mill-dams in the valley I refer to certainly affected the health of the people of that valley. A series of experiments which might be made by this proposed department would show, in a series of years, what effect these matters have upon the health of people in the different neighborhoods. It would show the conditions of undue moisture, the results of bad drainage, and their general effect upon the population, and on the industries of the population.

So far as I am able to judge, I think it commends itself to the people of New Jersey, as it has commended itself to my attention, and to the extent it has commended itself to me I think it should commend itself to all of you.

It seems to me that if a few Stations could be provided with these standard instruments I have mentioned, at a cost of only about \$1,000—for the appropriation would not have to be repeated year after year—it seems to me if these Stations could thus be furnished with what they need, it would be a great advantage to this State, both as to the matter of health and of agriculture.

I see that Prof. Cook is here, as well as the gentleman who was sent here to take charge of our department of the Weather Service, and I need not hold your attention longer.

The Chair—As Dr. Cook is now present, we will be glad to hear from him.

ADDRESS BY DR. GEORGE H. COOK.

I presume that Dr. Hunt has said all that is necessary. I rise merely for a word of explanation. My name has been connected with the Weather Service in this way: The United States government sent a man here to take charge of the observations, and to take charge of the management of the affairs of the Weather Service Station, and they wanted this Station located at New Brunswick, on account of the Agricultural College being there.

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When this gentleman, who was sent by the government, came, he wanted me to assume the name of Director, and while I have really not so much to do with the service, I was willing enough to indorse such a measure as they proposed. I do indorse that measure most heartily. They have gone on with it, and the gentleman in charge is paid by the general government, and I am very much interested in the whole subject. The progress we are making is very encouraging, and when these Stations are established all over the State, I think all our agricultural population will be interested as much as I have been, especially when they see the results, and the way in which the records are kept.

We heard, yesterday morning, I think, that the United States government was willing to send every day to at least twenty-five Stations in New Jersey, at points distant from points where such information is generally secured, and in localities where the daily papers are not delivered so early, daily information in regard to the probable changes in the weather. This information they are willing to send by telegraph, giving the probable changes for the following twenty-four hours. They are willing to do this, if we will pick out the locations for these Stations, and the information will be sent free of charge. These Stations would be located at points distant from New York or Philadelphia, as people residing near those cities get their news through the daily papers. The government will do this, and they will do a great deal more than this; they are willing to furnish all the necessary blanks for making out these reports daily, and they will furnish envelopes which are ready stamped, so they will be carried through the mails free, but they are not willing to furnish the necessary instruments for the equipment of these Stations. They cannot do that.

I have a fellow-feeling for those of our people who are willing to take the trouble of making these observations. Any one willing to do this work wishes to be as well equipped for the work as others doing the same work. If this cannot be done the work will not be accurate, necessarily. They want a barometer, a thermometer, a wind-gauge, a wind-vane, and rain-gauge, and these should be furnished them so they can make the necessary observations with accuracy. Otherwise they cannot do the work. Some are willing to pay for these instruments themselves, and they can get an entire set for about \$30, short of the barometer, which alone will cost from \$30 to \$35 more. There are many, however, who cannot afford this expense,

many who would be good Observers, too. In selecting these Observers you will, out of perhaps twenty or thirty, pick out eight or ten who are all right, and who will make excellent Observers, while the others may be a little careless, or they don't think of the matter in time to make the required records. Of course such records are not reliable, as accuracy is essential. We have a number who will make excellent Observers, and we want to get more of them of the same kind. To make the matter a success we must have money with which to purchase these instruments, and then we will lend them to the Observers, the understanding being they are to be returned when demanded by the department.

We bring the subject up before you, and hope there is some one here who can devise a plan to get this money for us.

We have twenty-one counties, and we think that eleven or twelve hundred dollars would be ample for the purpose, to place a set of instruments in each of these Stations.

The instruments are all we need, as we don't pay the Observers anything; we give them the necessary printed matter, and there is a little weather report circulated each month. We have these records kept carefully, every rain by itself, and when we look over the record we can see where the wet weather and dry weather in any one season was, and all about it. As it is ordinarily kept you don't know whether it came all at once, or through the entire month. We also propose to keep a careful record of the temperatures. I had a record kept in one place where I thought they had a great deal more water than anywhere else. This place was in a valley which was not well drained, and we found that the percentage of rain was greater there than in any other portion of the State of New Jersey. We can show you that, in keeping the observations with the thermometer, you can see whether your residences are kept at the temperature they should be, and there are many other advantages in connection with these observations. If your house is not as it should be you may be able to improve it by drainage, or otherwise, decreasing the amount of sickness, &c.

We ask you for the encouragement of this Board, and if you can suggest a method for getting the necessary means to furnish these Stations, I will be very glad to have you do so.

Mr. McCann, the representative of the United States Signal Service

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in New Jersey, is here, and he is ready to make such statements as you may think best.

The Chair—We will be glad to hear from Mr. McCann.

ADDRESS BY MR. McCANN.

Both Dr. Hunt and Dr. Cook have explained the usefulness and the necessity of these measures, and Dr. Cook hoped some one here would be able to recommend a means or method whereby we might be able to obtain the necessary funds for these instruments we are so much in need of, for the equipment of the Stations it is proposed to establish.

Now, the climate of New Jersey, so far as I have gone with my experiments and examinations, is a most excellent one, and to give you an idea of the advantages which will accrue to you from a thorough knowledge of your climate, I will give you an experience I had some years since.

Ten years ago I was in charge of the observatory at Atlantic City. After being there one year I commenced to notice the various phenomena of climate there, and made a statement of it to a physician, and he said, "let us go to work and tabulate your temperatures, and the force and direction of the winds, and give us all the information you possibly can in regard to the sea coast of New Jersey, and compare these data with those of other resorts, and see what benefits will accrue to Atlantic City by doing so." I did so, spending a great deal of time at the work, comparing Atlantic City with other resorts, such as Fortress Monroe and Mentone, and popular resorts in Europe, and I showed that the climate of New Jersey was more favorable for invalids than any of these other places. There was, at that time, nothing done at Atlantic City for the greater part of the year, and now there are between twenty-five and thirty trains over the main trunk lines, and the greatest railroads run special trains to accommodate the travel.

I believe that similar data in regard to the whole State of New Jersey would greatly aid in developing other portions of it. There are already portions of it that are being recognized as resorts for invalids, and many similar places would be found were we able to give the data in regard to them.

We have Stations in some parts of the State already established.

We have one in the northern part of the State, among the pines ; and there are many places among these pines and in the mountainous portions of the State that would make excellent resorts, but we have no data in regard to them. We want to establish these Stations, and we want in each Station a maximum and minimum self-registering thermometer and other instruments necessary for accurate observations. We want a place to put these thermometers in ; they should be exposed so that the incidents of reflection and refraction will not interfere with the recording of the temperature. We should have a rain-gauge, and must have a snow-gauge, as it is of vast importance to the farmer to know, during the winter months, how much of a blanket we get on our ground from the snow necessary to protect our winter crops. This is my presumption, for I believe you have winter crops, if I mistake not.

We publish at the end of each month the amount of snowfall—a little paper is published monthly—and show the mean temperature of every county in the State, or in nearly every county, and we show the range of temperature in nearly every county ; that is, the difference between the highest and lowest temperature, and the difference between the highest and lowest every twenty-four hours, and the day on which they occurred. We also show the rainfall for each day, and we also show the excessive rainfall. Last summer I found that in the town of Matawan more rain fell than in any other portion of the State. We have Stations in the State that did not report two inches, while in Matawan there was a record of fourteen inches of rainfall. Think of it, a difference of a foot. These were the extremes, of course.

We can get these Stations readily enough, but we want the money to furnish the proper instruments, and then we want money to see that they are properly placed in the observatories, and to see that the Observers are properly instructed in the use of the instruments, and in keeping the records, and making the reports. We have between thirty-five and forty of these Stations, and, as Dr. Cook has told you, they are in a very incomplete state, indeed.

In this matter of choosing Observers there is an immense difference. In those we have selected I do not suppose there are ten out of the lot who made, during the entire year, a continuous record of the temperature.

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So far as the matter of humidity is concerned we have no data, as the Observers are not supplied with the requisite instruments.

Now, from Cape May Point, on the extreme southern edge of the State, to Clinton, and from Clinton to Toms River, on the east, we have no Stations. The central part of the State is amply supplied with Stations and with Observers, if we have instruments—these are all we want there. North from Hanover to the extreme northern part of the State we have no Stations, so that part of the State is not covered at all. We do have a very excellent Observer at Newton, and he made a most valuable and correct record of the temperature at that place.

I believe you will all realize the benefits you will derive from a proper organization in carrying out the aims of the State Weather Service.

I hope you will see that your State Legislature takes action so that the bill which calls for \$1,000 will become a law. I think that amount will answer our needs, and will do a great deal towards the work. I will be glad to see this done, for the advantages to be derived will fully repay the expense entailed. [Applause.]

OUR FORESTS.

BY

DR. GEORGE H. COOK, PROF. JOHN B. LYMAN AND
HON. E. O. CHAPMAN.

THE PROTECTION OF OUR FORESTS FROM FIRES.

ADDRESS BY GEORGE H. COOK.

Forest-fires are familiar occurrences in New Jersey. But it is doubtful whether our citizens have any correct ideas of the amount of damage they do. They destroy valuable fuel, timber, lumber and other products of the forest. They consume the leaves and mould which protect the soil in which new growth can be advantageously started. They leave the ground bare, so that rains run off rapidly, leaving the soil to suffer from drouth and the streams to run in floods at some times, and to almost dry up at others. And they destroy those wind-breaks which are needed to save us from the sweeping winds of the prairies. And the uncertainty and discredit which they thus bring to forest property is such that its selling price is reduced by a large percentage, in some cases as much as fifty per cent. of what it would bring if the investment were sure.

The recent completion of our topographical survey, has enabled us to make a much closer estimate of the woodlands of the State than has been possible heretofore. And we here submit a tabular statement by townships of the area of the State, and also the area that is still in forest, and the percentage of forest area :

Total area.....	7,795.197 square miles.
Area in woodland.....	3,234.103 " "
Percentage of forest area.....	41.5
Area of woodland.....	2,069.865 acres.

The percentage of woodland by counties is—

Atlantic.....	69	per cent.
Bergen.....	38	" "
Burlington.....	56	" "
Camden.....	46	" "
Cape May.....	42	" "
Cumberland.....	52	" "

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Essex	29	per cent.
Gloucester	34	" "
Hudson	1.8	" "
Hunterdon.....	14	" "
Mercer.....	11	" "
Middlesex	29	" "
Monmouth.....	28	" "
Morris	45	" "
Ocean.....	68	" "
Passaic.....	59	" "
Salem.....	22	" "
Somerset.....	14	" "
Sussex.....	40	" "
Union	21	" "
Warren	26	" "

ATLANTIC COUNTY.

Name of Township.	Total Area, Square Miles.	Wooded Area, Square Miles.	Percentage.
Absecon.....	5.299	2.079	39
Atlantic City.....	2.620	.....	...
Buena Vista.....	57.974	50.255	87
Egg Harbor.....	111.678	53.177	48
Egg Harbor City.....	10.624	8.299	78
Galloway	135.949	58.127	43
Hamilton	113.857	111.707	98
Hammonton.....	45.008	33.849	75
Mullica	54.818	51.278	94
Weymouth.....	75.663	55.665	74
Total in county	613.490	424.436	69

BERGEN COUNTY.

Englewood	11.319	3.674	32
Franklin	29.011	13.195	45
Harrington.....	26.764	13.346	50
Hohokus	30.274	16.654	55
Lodi.....	15.077	3.464	23
Midland.....	16.035	4.740	30
New Barbadoes.....	3.857	0.399	10
Orvil.....	17.260	5.908	34
Palisade	16.269	6.735	41
Ridgefield.....	18.595	3.804	20
Ridgewood.....	6.921	1.801	26
Saddle River.....	14.883	3.531	24
Union.....	13.995	1.773	13
Washington.....	24.398	9.454	39
Total in county.....	244.658	88.478	36

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BURLINGTON COUNTY.

Name of Township.	Total Area, Square Miles.	Wooded Area, Square Miles.	Percentage.
Bass River.....	79.623	67.596	85
Beverly City.....	0.544	.....	...
Beverly	6.250	0.330	5
Bordentown.....	9.140	0.634	7
Burlington	18.830	1.467	8
Chester	18.904	1.434	7
Chesterfield.....	22.123	0.519	2
Cinnaminson	11.610	0.509	4
Delran	9.050	1.591	17
Easthampton.....	5.766	0.141	3
Evesham	29.604	13.960	47
Florence	10.153	0.469	5
Little Egg Harbor.....	75.305	28.000	37
Lumberton.....	20.820	2.676	13
Mansfield	23.204	1 380	6
Medford	42.001	26.966	64
Mount Laurel	22.128	1.822	8
New Hanover.....	40.913	11.363	28
Northampton	2.356	0.072	3
Pemberton	64.899	44.723	69
Randolph	61.685	54.233	88
Shamong	70.321	58.052	83
Southampton	47.194	24.411	52
Springfield	29.576	0 870	3
Washington	41.515	40.536	98
Westhampton	11.242	1.418	13
Willingboro	7.238	1.316	18
Woodland	116.792	116.163	99
Total in county.....	898.786	502.651	56

CAMDEN COUNTY.

Camden City.....	5.241	.....	...
Centre.....	12.995	1.504	12
Delaware.....	24.395	2.935	12
Gloucester	36.667	12.893	35
Gloucester City	1.732	.....	...
Haddon	12.344	0.200	2
Merchantville.....	0.632	0.055	9
Stockton.....	15.394	0.439	3
Waterford	57.325	41.664	73
Winslow	59 233	44 352	75
Total in county.....	225.958	104.042	46

CAPE MAY COUNTY.

Name of Township.	Total Area, Square Miles.	Wooded Area, Square Miles.	Percentage.
Cape May City.....	2.056	.....	...
Dennis and Sea Isle.....	68.044	40.121	59
Lower and Cape May Point and Holly Beach.....	35.641	10.484	29
Middle and Anglesea.....	93.057	29.849	32
Upper and Ocean City.....	79.316	37.316	47
Total in county.....	278.114	117.770	42

CUMBERLAND COUNTY.

Bridgeton.....	12.870	4.883	38
Commercial.....	35.096	14.136	40
Deerfield.....	41.416	18.137	44
Downe.....	57.023	25.228	44
Fairfield.....	42.065	15.186	36
Greenwich.....	19.361	2.659	14
Hopewell.....	33.926	3.739	11
Landis.....	69.946	41.737	64
Lawrence.....	36.093	17.328	48
Maurice River.....	104.837	82.906	79
Millville.....	45.529	38.032	83
Stow Creek.....	19.271	3.307	17
Total in county.....	517.433	270.278	52

ESSEX COUNTY.

Belleville.....	2.926	0.615	21
Bloomfield.....	6.732	1.148	17
Caldwell.....	28.428	11.895	42
Clinton.....	6.870	0.165	2
East Orange.....	3.903	0.250	6
Franklin.....	3.492	0.560	16
Livingston.....	17.419	7.852	45
Millburn.....	10.194	4.540	44
Montclair.....	6.180	1.366	22
Newark.....	20.997	0.661	3
Orange.....	2.144	0.063	3
South Orange.....	8.364	2.269	27
West Orange.....	12.075	6.491	54
Total in county.....	129.724	37.875	29

PROTECTION OF FORESTS FROM FIRES. 293

GLOUCESTER COUNTY.

Name of Township.	Total Area, Square Miles.	Wooded Area, Square Miles.	Percentage.
Clayton	21.645	10.058	46
Deptford.....	20.362	4.674	23
East Greenwich.....	14.190	2.045	14
Franklin.....	57.875	39.893	69
Glassboro.....	11.366	4.071	36
Greenwich.....	14.959	0.220	1
Harrison.....	19.405	1.600	8
Logan.....	28.101	3.223	11
Mantua.....	18.869	3.101	16
Monroe.....	45.837	33.612	73
South Harrison.....	20.292	4.605	23
Washington.....	22.575	6.038	27
West Deptford.....	20.172	1.286	6
Woodbury.....	1.687	0.010	1
Woolwich	21.945	0.539	2
Total in county.....	339.280	114.975	34

HUDSON COUNTY.

Bayonne.....	11.533	.....	...
Guttenberg.....	0.208	.....	...
Harrison	1.309	.....	...
Hoboken	1.907	.....	...
Jersey City.....	19.199	0.036	...
Kearney.....	10.283	0.375	4
North Bergen.....	11.949	0.569	5
Union (Town of).....	0.425	.....	...
Union	1.329	0.015	1
Weehawken.....	1.472	0.119	8
West Hoboken.....	0.869	.....	...
Total in county.....	60.483	1.114	1.8

HUNTERDON COUNTY.

Alexandria.....	27.381	3.682	13
Bethlehem	23.645	8.352	35
Clinton (Town of).....	1.128	.....	...
Clinton	28.010	2.974	11
Delaware	43.107	3.632	8
East Amwell.....	24.577	5.338	22
Franklin.....	22.861	2.026	9
Frenchtown.....	0.439

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Name of Township.	Total Area, Square Miles.	Wooded Area, Square Miles.	Percentage.
High Bridge.....	17.731	4.480	25
Holland.....	24.886	4.798	19
Kingwood	36.940	4.020	11
Lambertville	1.178	.....	...
Lebanon	26.396	7.156	27
Raritan	39.663	2.084	5
Readington.....	48.734	2.144	4
Tewksbury	32.281	6.044	19
Union	19.897	1.287	6
West Amwell.....	20.266	3.672	18
Total in county.....	439.120	61.689	14

MERCER COUNTY.

Chambersburg.....	1.225	.....	...
East Windsor.....	16.956	2.731	16
Ewing	17.748	0.924	5
Hamilton	41.075	3.056	7
Hopewell	60.242	5.342	9
Lawrence.....	21.660	1.500	7
Millham.....	0.628	.....	...
Princeton	18.331	2.783	15
Trenton	2.908	.....	...
Washington	20.796	3.637	17
West Windsor.....	26.334	4.760	18
Total in county.....	227.903	24.733	11

MIDDLESEX COUNTY.

Cranbury	17.713	2.266	13
East Brunswick.....	29.162	12.854	44
Madison	37.496	21.297	57
Monroe	44.159	11.308	26
New Brunswick.....	4.351	0.090	2
North Brunswick.....	14.024	2.963	21
Perth Amboy.....	6.245	1.163	19
Piscataway.....	32.212	2.118	7
Raritan	35.688	8.332	23
Sayreville.....	17.161	10.274	59
South Amboy.....	1.122	0.140	12
South Brunswick.....	48.971	15.158	31
Woodbridge	29.536	6.040	20
Total in county.....	317.840	94.008	29

PROTECTION OF FORESTS FROM FIRES. 295

MONMOUTH COUNTY.

Name of Township.	Total Area, Square Miles.	Wooded Area, Square Miles.	Percentage.
Atlantic.....	31.662	9.650	30
Eatontown.....	12.000	2.876	24
Freehold.....	40.577	14.106	35
Holmdel.....	17.968	2.027	11
Howell.....	65.951	40.413	61
Manalapan.....	31.276	5.096	16
Marlboro.....	30.575	7.356	24
Matawan.....	8.455	0.917	11
Middletown.....	43.132	7.770	18
Millstone.....	39.616	9.459	24
Neptune.....	12.756	6.082	48
Ocean.....	25.237	4.540	18
Raritan.....	9.410	1.611	17
Shrewsbury.....	32.882	8.207	25
Upper Freehold.....	47.997	1.825	4
Wall.....	40.994	18.238	44
Total in county.....	490.488	140.173	28

MORRIS COUNTY.

Boonton.....	6.875	3.765	54
Chatham.....	22.913	6.333	27
Chester.....	30.200	9.748	32
Hanover.....	51.587	17.637	34
Jefferson.....	44.258	31.166	70
Mendham.....	24.355	7.216	29
Montville.....	18.850	8.710	46
Morris.....	18.870	5.950	31
Mount Olive.....	32.066	13.679	43
Passaic.....	33.315	8.065	24
Pequannock.....	36.777	21.969	60
Randolph.....	27.854	12.844	46
Rockaway.....	63.339	45.022	71
Roxbury.....	24.244	12.212	50
Washington.....	44.682	14.592	33
Total in county.....	480.185	218.908	45

OCEAN COUNTY.

Name of Township.	Total Area, Square Miles.	Wooded Area, Square Miles.	Percentage.
Berkeley.....	58.563	38.649	66
Brick.....	62.127	41.300	66
Dover.....	55.732	28.187	50
Eagleswood.....	35.308	8.148	23
Jackson.....	93.431	83.005	84
Lacey.....	107.511	83.982	73
Manchester.....	83.239	80.337	96
Ocean.....	33.936	14.391	42
Plumstead.....	40.191	27.308	68
Stafford.....	55.749	31.255	56
Union.....	44.821	24.637	55
Total in county.....	675.608	461.199	68

PASSAIC COUNTY.

Acquackanonck.....	11.338	1.346	12
Little Falls.....	5.804	1.885	32
Manchester.....	10.934	3.816	35
Passaic.....	3.241	0.080	2
Paterson.....	8.472	0.454	5
Pompton.....	53.394	41.301	77
Wayne.....	26.729	11.754	44
West Milford.....	80.244	59.380	73
Total in county.....	200.156	119.016	59

SALEM COUNTY.

Elsinboro.....	13.242	0.114	8
Lower Alloways Creek.....	45.787	4.267	9
Lower Penns Neck.....	24.075	0.938	4
Mannington.....	38.321	2.583	7
Oldmans.....	21.266	4.378	20
Pilesgrove.....	37.044	2.022	5
Pittsgrove.....	49.874	32.548	65
Quinton.....	24.798	11.363	46
Salem.....	2.863	.....	...
Upper Alloways Creek.....	34.046	12.121	35
Upper Penns Neck.....	18.707	3.825	20
Upper Pittsgrove.....	36.016	4.056	11
Total in county.....	346.039	78.215	22

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SOMERSET COUNTY.

Name of Township.	Total Area, Square Miles.	Wooded Area, Square Miles.	Percentage.
Bedminster	27.018	0.640	2
Bernards	41.402	9.472	23
Branchburg	20.362	0.258	1
Bridgewater.....	44.395	7.210	16
Franklin	47.107	3.895	8
Hillsboro.....	58.232	6.315	11
Montgomery	33.075	1.710	5
North Plainfield.....	14.051	6.868	49
Warren.....	19.378	8.340	43
Total in county.....	305.020	44.708	14

SUSSEX COUNTY.

Andover.....	24.599	7.380	30
Byram	36.249	26.506	73
Frankford	36.509	9.318	25
Green	20.969	4.392	21
Hampton.....	29.765	7.338	25
Hardiston	38.741	17.744	46
Lafayette	18.245	2.080	11
Montague.....	44.565	29.449	66
Newton.....	2.750	0.270	10
Sandyston.....	42.527	22.158	52
Sparta.....	42.233	19.688	46
Stillwater	37.614	9.766	26
Vernon	69.045	36.964	53
Wallpack	23.337	11.625	50
Wantage.....	68.169	8.664	13
Total in county.....	535.317	213.342	40

UNION COUNTY.

Clark	4.743	0.360	8
Cranford.....	5.838	1.576	27
Elizabeth	12.961	0.623	5
Fanwood	10.451	3.157	30
Linden	14.008	1.930	14
New Providence.....	9.919	4.133	42
Plainfield.....	5.923	0.560	9
Rahway.....	4.035	0.083	2
Springfield	4.958	1.886	38
Summit	6.012	2.540	42
Union.....	15.274	2.286	15
Westfield	10.822	3.288	30
Total in county.....	104.944	22.422	21

WARREN COUNTY.

Name of Township.	Total Area, Square Miles.	Wooded Area, Square Miles.	Percentage.
Allamuchy	20.572	6.980	34
Belvidere.....	1.349	0.020	1
Blairstown	31.817	8.868	28
Franklin	23.927	4.488	19
Frelinghuysen.....	23.759	5.004	21
Greenwich.....	11.087	0.968	9
Hackettstown	2.964	0.072	2
Hardwick.....	17.662	6.260	35
Harmony	24.323	5.616	23
Hope	30.850	7.392	24
Independence	20.164	5.868	29
Knowlton.....	25.651	4.818	19
Lopatcong.....	9.387	0.580	6
Mansfield	30.335	9.084	30
Oxford.....	34.057	7.860	23
Pahaquarry	21.155	15.501	73
Phillipsburg.....	1.186	.....	...
Pohatcong.....	14.807	1.796	12
Washington (Borough).....	1.823	0.040	2
Washington	17.796	2.856	16
Total in county.....	364.651	94.071	26
Total in State.....	7,795.197	3,234.103	41.5

VALUE OF THE PRODUCTS FROM THE FOREST AS FOUND IN
SEVERAL UNITED STATES CENSUS REPORTS.

	1880.	1870.	1860.	1850.
Total value of products.....	\$1,627,640	\$2,745,317	\$1,602,319	\$1,123,052
Lumber, number of feet.....	109,679,000	101,829,000		
Lath, number.....	8,948,000	3,167,000		
Shingles, number.....	10,717,000	3,624,000		
Capital employed.....	1,657,395	2,238,900		
Wages paid.....	179,693	369,835		
Hands employed.....	768	1,145		

The shrinkage in value of products between 1870 and 1880, while the amount of products increased, was due to a falling off in prices. In the whole United States, in the same period, while the production increased 42 per cent. for lumber and 70 per cent. for shingles, the value of products increased only 11 per cent. The State is thirty-second in value of lumber products.

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The above, however, does not fully represent the value of the forest products of the State, for the census shows the following consumption of wood which is supplied by the forests of the State:

	Cords.	Value.
Fuel for domestic consumption	642,598	\$2,787,216
Fuel for brick and tile manufacture.....	14,683	55,722
Fuel for glass manufacture.....	29,144	110,747
Total	686,425	\$2,953,685
This, added to the above value of lumber products, amount- ing to		1,627,640
Gives a grand total of.....		\$4,581,325

Yet this has not included the fuel sold outside of the State, in the neighboring large cities, and to brick and tile works; nor does it take account of the production of railroad ties, telegraph and telephone poles and fencing, which is considerable. The value of the annual product of our forests cannot be less than \$5,000,000.

But the value of this product, whose destruction we are to speak of, may perhaps be better stated in another way: At a moderate estimate, 1,000,000 ties are annually consumed by the railroads of the State for construction and renewal. At fifty cents each the value of these would be \$500,000. Here is a market which lies at our very doors, and should be wholly supplied with chestnut timber from the untillable land of Northern New Jersey.

The value of chestnut timber in the Highlands and Kittatinny valley depends much on the quality of the soil and the location. The stump land sells at from \$1 to \$5 per acre; a growth of thirty years at from \$10 to \$30; of fifty years, from \$25 to \$50; but in many instances good growths, accessible to markets, have sold at figures three or four-fold greater than the above. The time required to grow railroad ties and telegraph poles is from twenty-five to forty years, and will probably average thirty years. Chestnut grows naturally and brings the quickest and best returns, although oak is more valuable when grown.

The possibility of growing locust timber on the two hundred and fifty thousand acres of waste land of the cretaceous formation, is fully shown by Professor John C. Smock, in an article on the subject in the report of the State Board of Agriculture for 1874. He estimates that it is possible to raise on good land a crop of thirty years' growth

worth \$3,000 per acre; and states that returns at the rate of \$2,000 per acre are not uncommon in Monmouth county. An ample market always awaits this valuable timber, and its cultivation should be encouraged, for it may properly take the place of other crops and prove more profitable, even on some of the land now cultivated. In this connection it may be well to call attention to the fact, that when timber culture has been placed on a secure footing, and becomes a recognized occupation, it will not be necessary to wait the full period of growth in order to realize a profit, for the value of the forest will become commensurate with its age and growth.

The growing of cedar timber is generally recognized as profitable. The value of stump land is from \$5 to \$10; of twenty years' growth of timber, from \$5 to \$50; of thirty-five years' growth, from \$15 to \$200; of fifty years' growth, \$75 to \$400; location and the size of timber having much to do with the price. A swamp of seventy years' growth sold recently for \$800 per acre.

The common pine attains a size suitable for fire-wood in from fifteen to twenty years, and it is commonly estimated that it will produce as many cords per acre as it has been years in growing. The present value of pine wood per cord, standing, ranges from \$0.75 to \$1.50, and \$1 is probably a fair estimate of the average. When the timber becomes larger its value per cord increases, as it then finds a market for lumber and lath, for piling and other purposes. The following figures are from estimates of men familiar with the pine forests in various sections, and the wide range is due to difference in accessibility to market and in producing powers of the land. Value of pine stump land per acre, \$0.10 to \$5 (this does not include the figures from localities where the land has a value of from \$10 to \$25 for cultivation); of thirty years' growth of timber, \$5 to \$25; of fifty years' growth, \$10 to \$100. Taking figures pertaining to the average of the better two-thirds of pine land as a guide, the present conditions would give about the following results in raising pine of thirty years' growth;

Cost of stump land per one hundred acres.....	\$250
Taxes on average value, thirty years.....	448
Policing and protection, thirty years.....	120
Interest, at six per cent.....	450
Total expenditure.....	<u>\$1,268</u>

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Value of a thirty years' growth for one hundred acres.....	\$2,500
Value of stump land.....	250
Total value.....	<u>\$2,750</u>
Profit.....	\$1,482

The interest on annually-paid expenses is supposed to be offset by increase in value of stump land.

It is not to be supposed that proper protection and attention will not greatly increase the above profit. These figures represent the present values, depreciated by the results of neglect and the uncertainty and loss caused by fires.

Other and important advantages would also accrue to the State should timber culture be successfully inaugurated. The solution of the water-supply problems, which become yearly more important and serious, would be materially aided by the preservation and regulation of the flow of the fine streams of the Archæan Highlands, and in this way, also, the many valuable water-powers of the State would be improved; the healthful climatic conditions of Southern New Jersey, an element which has been largely conducive to the development of that section, may be unfavorably affected should the destruction of the pine forests by fire and neglect continue.

The disastrous effects of forest fires are felt throughout the United States, and our State is among those suffering most severely. These fires occur to some extent throughout Northern New Jersey, but usually on rather limited areas, not often exceeding three or four square miles, but the most serious trouble is in the pine forests of the southern part. Any one who has witnessed a fire under full headway in this country must have been impressed with its grandeur, its irresistible fury and its disastrous effects. A few notes of remarkable fires are at hand. In 1866 a fire burned over ten thousand acres, extending seven miles inland from Tuckerton and West Creek. In 1870-71 nearly the whole wooded portion of Bass River township, Burlington county, was burned over. In 1871 two fires in Ocean county burned over thirty thousand acres. In 1872 a fire burned over from fifteen to twenty square miles, worth before the fire from \$10 to \$30 per acre, and after from \$2 to \$4. In a paper on forest fires, by Mr. Charles E. Elmer, in the Report of State Board of Agriculture for 1874, he says of the year 1872: "To assume that one hundred thousand acres have been burned over, at a money loss in timber of

\$1,000,000, would surely be within the bounds of truth." From the census of 1880, we have for that year an area burned over of seventy-one thousand and seventy-four acres, with an estimated loss of \$252,240, which is certainly a very moderate estimate and can scarcely include any allowance for loss of cedar swamps. During the past summer some very large fires occurred in the district under survey, and the areas covered were noted by the topographers. One burned over an area of sixty square miles, near Atsion, in Burlington county; another, near Friendship, in the same county, covered ten square miles; and another, in Ocean county, burned over not less than seventy-five square miles north of Barnegat. The total of these three fires is, therefore, one hundred and forty-five square miles, but several other fires occurred farther south in the State, the extent of which was not observed. It may be safely estimated that the whole area burned over this year has reached two hundred square miles or one hundred and twenty-eight thousand acres. A large amount of cedar swamp was destroyed by these fires, and \$10 per acre would not more than cover the direct damage to timber, making the loss for this year \$1,128,000, nearly equal to the total value of the annual lumber production of the State. On the whole, the loss in timber from forest fires in the State, on a low estimate, has averaged \$1,000,000 per year for the last fifteen or twenty years. The loss is much more than the mere value of the wood, however. The soil is so impoverished by these periodical burnings, which deprive it of all vegetable matter, that its capacity for producing timber is much diminished. There is also a great depreciation in the value of the land, because of the danger of fires, whether it be as timber land or for occupation and improvement, and a considerable damage is done to the many valuable cranberry bogs which are scattered through the forest, not to speak of the danger to buildings, habitations, and even to human life.

The causes of these fires are various; those given for the fifty-four fires of the census year are as follows: Clearing land, seven; locomotives, twenty-eight; hunters, six; malice, seven; coal-pits, six. It will be noticed that more than half were caused by railroads. Neither of the two great fires of this year was caused by locomotives; that at Barnegat starting six or seven miles from any railroad, and that at Atsion in a meadow, also far from a railroad, either from the carelessness of hunters or berry-pickers, or through malice. Mr. Elmer attributes many of the fires to carelessness in clearing up land.

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Many fires no doubt start from coalings, and it is common to hear the belief expressed that some of these are started intentionally, in order to keep the coalers and wood-choppers at work, since timber burned over must be cut at once, whereas it would otherwise be left to grow and increase in value. Those caused through malice often are the result of punishing or holding under surveillance of timber thieves, by no means uncommon in the pine forests.

The prevention of these fires is to be sought (1) by proper regulations, assumed and carried out, and (2) by judiciously framed laws, faithfully enforced.

1. It is found that roads traversing the forests are frequently the means of stopping the spreading of fires. The pine forest is traversed by numerous roads, which are used as a means of access to the timber, or of passing through the forest to the various settlements. Most of these roads are at present only just wide enough to allow a wagon to pass through, not unfrequently by grazing the trunks of the trees on either side. It is invariably the practice, when a fire is to be fought, to make a stand along one of these roads and, by firing back, to stop its progress by depriving it of food. Not unfrequently, narrow as they are, these roads alone stop the progress of the flames. It seems, then, that it would be feasible to have all these roads recorded as regularly-laid highways, with a uniform width of four rods, and to clear away all timber and brush for this width, and fire the space in the autumn, annually. It is believed that this would create a gap which the flames would rarely leap, and that they would usually be confined to a few hundred acres at most. Probably about two acres to a hundred would have to be cut off in this way to protect the rest, and in case it was seen that, because of high winds, the flames would leap this barrier, it could be rendered effectual by a little back firing. If this could be supplemented by a forest police of perhaps one mounted man to each thirty thousand acres, making the whole annual cost not more than four cents per acre, much would be accomplished toward preventing forest fires, which now cause an average loss of sixty-seven cents per acre for the whole of the pine country. But it must also be remembered that a large amount is now annually expended in fruitlessly fighting fires, after they have become irresistible from the extent of their front.

In Northern New Jersey the expense of keeping clear avenues through the forests would not be necessary, but it would probably be

best to double the police force because of the larger population. If the railroads used proper precautions the police would be needed in but a few of the townships of this part of the State, as the areas in danger from fires are not large.

Extensive fires have been started by sparks from locomotives, but the danger from these has been greatly diminished by the use of improved forms of spark-catchers, and by greater care in keeping the way clear of combustible matters. The following are the instructions given to those in charge of the tracks of the West Jersey and other of the Pennsylvania lines of railroad, which traverse the pine region of Southern New Jersey. Under the faithful carrying out of these, fires have become very rare along these lines :

“DEAR SIR—Noting yours of 24th inst., relative to prevention of forest fires along the lines of our roads, I would state, for your information, that all of our employes who are required to be upon the road are instructed to report at once, by telegraph, any evidences of fires, and the men engaged in repairing tracks are instructed to watch carefully for fires, and seeing any evidences of same, to abandon all other work, in order that every possible effort may be made to extinguish same.

“There has been, in recent years, a very decided improvement in the arrangement upon locomotives for the prevention of the escape of sparks ; the present plan (now very generally used) being an extension of the smoke-box of about three feet beyond the smoke-stack, which results in the sparks, which are drawn through the tubes by the strong draft, passing, by their momentum, beyond the range of the current of gases passing upward and through the smoke-stack. There is also arranged in the smoke-stack a deflector-plate and wire netting, which assist in preventing the escape of sparks; and if this arrangement is properly arranged and looked after, there is but small chance of any sparks escaping that may cause fire to adjoining property.

“My observation and experience lead me to feel very sure that fires from locomotives are not nearly so numerous as they were a few years ago. This must necessarily be the case, particularly on our lines, on account of the greater care exercised in clearing our right of way and property adjoining same, and also the very much approved spark-arresting appliances on all of our locomotives.

“Our present rule and practice, in the matter of clearing roadway and adjoining property, is that, on all parts of our lines, our own right of way shall be carefully cleared of underbrush each year, and on that portion of the line between Millville and Rio Grande, thirty-four miles, the company each year clears a total width of one hundred feet on each side of the track, and also has six furrows plowed on the outer edges of same.

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"With relation to the matter of fires from careless burning of brush, &c., I cannot say, as we do not necessarily hear of fires that are not caused by our locomotives. It is a fact, however, that in all forests the ground is covered with very inflammable material, easily ignited and of a character to spread a fire rapidly. Therefore, the slightest possible cause in the shape of a spark can produce, of course, a very damaging fire.

"There can be no doubt, I think, that fires from locomotives are now far less frequent than ever before, and necessarily will become less frequent each year on account of the fact that railroad companies find it to their advantage to use every possible precaution to prevent same. This being, notwithstanding the fact, that Supreme Court decisions in a number of States have established the fact that a railroad company is not liable for damage produced by sparks from its locomotives, if it can be proven that such locomotives were fitted with the most approved spark-arresting appliances, and such appliances had been properly inspected and were in good order at the time of the fire.

"I cannot offer any suggestion as to new laws or methods that would have any tendency to reduce the number of fires from locomotive sparks. But it seems to me that the best and most proper method is the one now practiced in some cases, of recognizing the fact that to positively prevent fires there must be a certain distance of cleared land between a railroad track and a forest, and that when property is sold for the right of way of a railroad through a forest, the owners of the land should recognize the fact of this cleared land, and either stipulate that the railroad company shall clear, and keep clear, same, or the owner make provision for doing so in the price he asks for his property.

"Yours truly,
(Signed),

Superintendent."

The following are the instructions given to the trackmen on the Delaware, Lackawanna and Western railroad lines, and they are found to answer the purpose for protection :

"[COPY.]

"THE DELAWARE, LACKAWANNA AND WESTERN RAILROAD CO.

"HOBOKEN, N. J., January 30th, 1888.

"Geo. H. Cook, Esq., State Geologist :

"DEAR SIR—Your letter to Mr. F. F. Chambers, our Secretary and Auditor, bearing date 28th inst., referring to the extinguishing and preventing of forest fires along the line of our road, has been handed by him to me for the purpose of giving you the desired information.

"Our track foremen in charge of the different gangs of track laborers on sections of this road have standing orders to immediately, upon discovering a fire, either within our right of way or on property adjoining, which they have reason to believe was caused by sparks from locomotives, &c., take any method which the exigencies of the occasion may require to subdue the fire. The method most used is to smother the fire, when among leaves or grass, with earth thrown on with shovels, and when among trees, either by felling or digging a trench of sufficient depth and breadth to prevent the flames spreading.

"In the spring and early fall of each year the different section gangs are employed for some time in clearing out the ditches alongside the road-bed of all leaves, &c., that may have collected, also in cutting and removing all grass and weeds on our right of way, and when necessary turning up the soil so as to prevent the growth of grass or weeds. This last method we find to be the best to prevent fires, as it keeps the ground open and susceptible to moisture, thereby giving no chance for fires to originate.

"With the modern appliances now in use on our locomotives (spark arresters, &c.) we have been remarkably free from any serious fires on the line of our road for some time.

"To correctly tell what would be the *best* method for preventing fires would be impossible—circumstances and situations would have to be taken into account—but, as before remarked, we find the best method is to keep the right of way clear from all leaves and grass, and in case there is a fire to smother it with earth when possible.

"Very truly yours,

(Signed)

"A. REASONER,
"Superintendent."

A letter upon this subject, addressed to the Forestry Division of the United States Department of Agriculture, in Washington, brought the following very excellent reply from the chief of that department:

"[COPY.]

"U. S. DEPARTMENT OF AGRICULTURE,

"WASHINGTON, D. C., November 5th, 1887.

"*Prof. Geo. H. Cook, New Brunswick, N. J.:*

"DEAR SIR—In reply to your inquiry of November 4th, regarding forest fires, I would say that forest fires, as we have them in this country, are almost unknown in Germany, France and Switzerland. This is due—

- "1. To the higher appreciation in which forest property is held ;
- "2. To superior legislation ;

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- " 3. To superior police in enforcing the law ;
- " 4. To denser population, which makes enforcement of the laws easier ;
- " 5. To the fact that government forests, though representing only a small part of the total forest area, are well officered and protected ; the officers being also interested in the prevention of fires in neighboring districts.

" Perfect road systems in the mountains, and a special block system in the plain, into which the forest area is divided by openings of six to fifteen feet wide, forming rectangular parcels of sixty to seventy-five acres each, the protection and, in case of need, the confinement of the fires to small areas is facilitated.

" Railroads are obliged to keep their right of way cleared ; safety strips next to the right of way are planted with thin-leaved trees like the birches. Spark arresters are obligatory.

" As regards fire legislation in this country, I refer you to a full report on the subject in Forestry Report, Vol. III., by F. B. Hough, in 1882, which you will find in your library, our supply being exhausted. I refer you also to Bulletin I. of this division in regard to spark arresters, and to my Annual Report (1886), pp. 179-80, chapter on legislation, where the Canada plan is explained.

" Altogether, it is not the lack of laws from which we suffer, but the lack of their application and proper officers for their enforcement.

" I may state, by way of example, that I had charge of a forest property in Pennsylvania fifteen miles in length, which was constantly being fired. I found a law, made in 1872, which provided for fire-wardens and the extinction of forest fires at the cost of the county. I had to enforce the appointment of such officers in 1880, as the county commissioners were unwilling to comply with the law. The result has been, during the seven years past, one fire, costing eight dollars to extinguish, and no more.

" I enclose you transcript of the laws of Pennsylvania on the subject. I also call your attention to the papers on the subject in the Reports of the American Forestry Congress, St. Paul proceedings (1883), pp. 32 and 38 ; Boston proceedings, p. 63. If I can aid you any further, please call upon me again. I should prefer that when you do so, you will ask specific questions in regard to what has remained unanswered by the references made, as the subject is large enough to write a volume upon—this bane of American forestry.

" Yours, very respectfully,

(Signed)

" B. E. FERNOW,
Chief of Forestry Division."

The following are the laws of New Jersey upon forest fires, and also those of New York and Pennsylvania :

[Laws of New Jersey, 1794, passed November 24th ; Revision, 1877, p. 422.]

"An Act to prevent the burning of woods, marshes and meadows.

"1. That if any person shall willfully set fire to, or burn, or procure, or cause to be burnt his or her own woods, marshes or meadows in his or her tenure or possession, by means whereof any other person shall be damnified in his or her houses, buildings, fences, woods, or other property whatsoever, or shall willfully set fire to or burn, or procure or cause to be burnt any woods, marshes or meadows of another, whether the same shall be enclosed or not, such person so offending in any of the premises shall be deemed to be guilty of a misdemeanor, and, on conviction, shall be punished by fine not exceeding one hundred dollars, or imprisonment at hard labor not exceeding twelve months, or both; and also shall yield and pay double damages to the party injured thereby, to be recovered, by action on the case, with costs of suit, in any court having cognizance thereof; *provided*, nothing in this act contained shall be construed to prohibit the owners of salt and fresh marshes and meadows, and their tenants, from burning such marshes and meadows in the usual manner in which the same have been heretofore burnt in the several counties of this state."

[Section 2 superseded by supplement of March 3d, 1875.]

[Laws of New Jersey, 1875, approved March 3d ; Revision, 1877, p. 422.]

Supplement.

[Approved March 3d, 1875.]

"2. SEC. 1. That when the woods, marshes or meadows in any part of this state shall be on fire, the justices of the peace, the constables and the overseers of the highways residing in the vicinity of said fire, and the owner or owners of such woods, marshes and meadows, and their tenants, agents, superintendents, watchmen and person or persons in charge of the same, shall and are hereby severally authorized, required and empowered, forthwith, to order such and so many of the inhabitants within their respective jurisdictions, or residing in the vicinity of said fire as they shall severally deem necessary to repair to the place where such fire shall prevail, and there to assist in extinguishing or stopping the progress of the same; and if any person so ordered to assist in manner aforesaid, by either of the persons above named, shall refuse or neglect to comply with such order, he shall forfeit and pay five dollars for every refusal or neglect to obey such order, to be recovered by action of debt with costs of suit by the owner or owners of such woods, marshes or meadows, before any justice of the peace of the county where such order or notice has been given, and the oath or affirmation of the person who shall

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give such order or notice shall be sufficient evidence whereon to convict such offender, and the forfeiture so recovered shall be applied as a reward to such person or persons as the officers aforesaid, or the major part of them, shall deem best entitled thereto for superior exertion at the extinguishment or in stopping the progress of such fires."

[Laws of New Jersey, 1875, approved March 24th ; Revision, 1877, p. 423.]

Supplement.

[Approved March 24th, 1875.]

"3. SEC. 1. That if any person or persons shall burn or smoke out, or attempt to burn or smoke out, any squirrel or squirrels, or any animal or species of game whatsoever, in any woods, forests, marshes or meadows, or other lands in this state, belonging to any other person or corporation, or if fire originates from any such burning or smoking as aforesaid, by any person whatsoever, by means of which any other person or corporation shall be damnified in his or her houses, buildings, fences, woods or other property whatsoever, whether the same be enclosed or not, such person or persons so offending in any of the premises aforesaid shall be deemed to be guilty of a misdemeanor, and on conviction thereof shall be punished by fine not exceeding one hundred dollars, or imprisonment at hard labor not exceeding twelve months, or both, at the discretion of the court having jurisdiction thereof (one-half of said fine to be paid to the person or persons entering the complaint), and also shall yield and pay double damage to the party injured thereby, to be recovered by action on the case, with costs of suit, in any court having cognizance thereof."

[Laws of New Jersey, 1874, approved March 27th ; Revision, 1877, p. 911, secs. 13-15.]

"13. It shall be the duty of every railroad company in this state, and of every company or person operating or using any railroad in this state, with a locomotive engine or locomotive engines, to take and use all practicable means to prevent the communication of fire from any locomotive engine used or employed by them on any railroad in this state, in passing along or being upon any such railroad, to any property of whatever description of any owner or occupant of any land adjacent or near to such railroad.

"14. When any injury is done to any building, grain, hay, crops, or other property of any person or corporation, by fire communicated by a locomotive engine of any person or railroad corporation, in violation of the foregoing section of this act, said person or corporation shall be held responsible in damages to the person or corporation so injured ; and it shall be lawful for any railroad corporation to make an agreement for insurance of any such property on which an insurance may be practicable, and such corporation shall have an insurance

interest therein accordingly, and may effect insurance thereon in its own behalf.

"15. It shall be the duty of every railroad company in this state, and of every company or person operating or using any railroad in this state with a locomotive engine or locomotive engines, to provide such engine or engines with a screen or screens, or cover or covers, on the smoke-stack or smoke-pipe of such engine or engines, so as to prevent as much as practicable the escape of fire, either from wood, soft coal or hard coal, from the smoke-stack or smoke-stacks, smoke-pipe or smoke-pipes of said engine or engines."

STATUTE OF NEW YORK AGAINST THE SETTING OF FOREST FIRES.

[Revised Statutes of New York (6th Ed.), Vol 2, p. 985.]

"SEC. 1. Every person negligently setting fire to his own woods or negligently suffering a fire kindled upon his own wood or fallow land to extend beyond his own land, shall forfeit treble damages to the party injured thereby. Every person so offending shall also be deemed guilty of a misdemeanor, and on conviction shall be punished by a fine or imprisonment, or both, at the discretion of the court, such fine not to exceed one thousand dollars, and such imprisonment not to exceed one year.

SEC. 2. Whenever the woods in any town shall be on fire, it shall be the duty of the justices of the peace, the supervisor, and the commissioners of highways of such towns, and each of them, to order such and so many of the inhabitants of such town liable to work on the highways and residing in the vicinity of the place where such fire shall be as they shall severally deem necessary, to repair to the place where such fire shall prevail, and there to assist in extinguishing the same or in stopping its progress.

"SEC. 3. If any person so ordered to repair to and assist in manner aforesaid, shall refuse or neglect to comply with any such order, he shall forfeit and pay the sum of fifty dollars, and shall also be deemed guilty of a misdemeanor, and on conviction, shall be punished by fine or imprisonment, or both, at the discretion of the court, such fine not to exceed one hundred dollars, and such imprisonment not to exceed sixty days.

"SEC. 4. Every forfeiture recovered under the last section shall be applied as a reward to such person or persons as the officers above mentioned, or a majority of them, shall deem best entitled thereto for superior exertions in extinguishing or stopping the progress of such fire.

"SEC. 5. No person shall hereafter set fire to or burn any coal kiln in the county of Suffolk except during the months of December, January and February; any person offending against the provisions of this section shall be deemed guilty of a misdemeanor, and on con-

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viction shall be punished by imprisonment in a county jail for a term not exceeding one year, or by a fine not exceeding one thousand dollars, or by both such fine and imprisonment.

"SEC. 6. Any person or persons who shall set fire to or burn any coal kiln, or shall permit or suffer the same to be done on his land, except at the times above mentioned, shall be liable in twice the amount of any damage occasioned thereby, to be sued for and recovered with costs of suit in any court having cognizance of the same, by the party injured thereby, against the owner of the land on which the said coal kiln shall be burned."

LAWS OF PENNSYLVANIA IN REFERENCE TO FOREST FIRES AND FOR THE ENCOURAGEMENT OF TREE PLANTING.

"An Act to consolidate, revise and amend the penal laws of this commonwealth.

[Approved March 31st, 1860.]

"SEC. 140. If any person shall willfully set on fire, or cause to be set on fire, any woods, lands or marshes within this commonwealth, so as thereby to occasion loss, damage or injury to any other person, he or she shall be guilty of a misdemeanor, and, on conviction, be sentenced to pay a fine not exceeding one hundred dollars, and to undergo an imprisonment not exceeding twelve months.

"Pamphlet Laws, 1860, page 416."

"An Act to prevent the firing of mountains and other wild lands in the county of Union.

[Approved April 9th, 1869.]

"WHEREAS, There being certain mountain and other wild lands in the county of Union, which are fired from year to year, thereby destroying the young timber and causing the land to be worthless for the purpose of timber; and *whereas*, should such young timber not be destroyed it would add to the value of the land, in course of twenty years, from fifty to one hundred dollars per acre, thus increasing the wealth of the county to thousands of dollars; therefore,

"SEC. 1. BE IT ENACTED *by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same*, That any person or persons who shall intentionally set fire to said lands shall forfeit and pay a sum not exceeding five hundred dollars nor less than fifty dollars, or shall be confined in the county prison for a term not exceeding one year nor less than thirty days, or both, at the discretion of the court, on conviction at any of the courts of this commonwealth; one-

half of said fine to be paid to the person or persons who make the information, and the other half to be paid into the county treasury.

"Pamphlet Laws, 1869, page 786."

"An Act to protect timber lands from fire.

[Approved June 2d, 1870.]

"WHEREAS, It is important to the people of the state that timber lands should be protected from fire, which, owing to malicious conduct and carelessness of individuals, is causing vast havoc to the young growing timber, especially upon our mountains; therefore,

"SEC. 1. BE IT ENACTED *by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same,* That it shall be the duty of the commissioners of the several counties of this commonwealth to appoint persons under oath, whose duty it shall be to ferret out and bring to punishment all persons who either willfully or otherwise cause the burning of timber lands, and to take measures to have such fires extinguished where it can be done; the expenses thereof to be paid out of the county treasury, the unseated land tax to be first applied to such expenses.

"SEC. 2. That the provisions of the act of ninth of April, one thousand eight hundred and sixty-nine, entitled 'An act to prevent the firing of mountains and other wild lands in the county of Union,' and of this act, be and the same is hereby extended to the counties of Schuylkill, Lehigh, Berks, Lycoming, Centre, Snyder, Luzerne and Union.

"Pamphlet Laws, 1870, page 1316.

"By act approved May 19th, 1871, the county of Lycoming is exempted from the provisions of the act of June 2d, 1870.

"Pamphlet Laws, 1871, page 950."

"An Act to prevent the burning of woods in any of the counties of this commonwealth.

[Approved June 11th, 1879.]

"SEC. 1. BE IT ENACTED, &c., That any person or persons who shall wantonly and willfully kindle any fire on the lands of another, so as to set on fire any woodlands, barrens or moors, within the limits of this commonwealth, shall be guilty of a misdemeanor, and, on conviction thereof, shall be sentenced to pay a fine not exceeding three hundred dollars, and undergo an imprisonment not exceeding twelve months, or either or both, at the discretion of the court; and prosecutions for such offenses may be commenced at any time within two years from the commission thereof.

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"SEC. 2. Upon the conviction of any person or persons from any of the offenses aforesaid, the commissioners of the county in which such conviction is had, shall *pay to the prosecutor* in every such case the sum of *fifty dollars* out of the county treasury as a reward for the apprehension and conviction of the offender, and the defendant or defendants shall pay the same, with the costs, as in other cases, into the hands of the sheriff for the use of the county, and nothing herein contained shall prevent the prosecutor from being a competent witness in the prosecution aforesaid.

"Pamphlet Laws, 1879, page 162."

The enactment of a law similar to that of Pennsylvania, in regard to the appointment by the chosen freeholders of persons whose duty it shall be to look to the prevention and extinguishing of fires and to the punishment of those who start them, would be a useful subject of legislation, and is herewith recommended.

NATURAL SUPPLY AND PERPETUITY OF OUR FORESTS.

ADDRESS BY HON. JOHN B. LYMAN.

MR. CHAIRMAN AND GENTLEMEN—For the first time in my life I have stopped at Trenton to-day, and if I were able to go around and shake each of you by the hand and call you by name, I should think that I was in the New Hampshire Legislature, where I always have been in the habit of meeting the best-looking set of men I have ever seen. [Applause and laughter.] Though I once looked in on our Congress at Washington. [Laughter.]

I propose to say a few words in relation to our forests (and I am very sorry to say it has been my misfortune to disagree with almost every person I ever met in my life in regard to this subject), and yet I have an abiding faith I am in that straight and narrow way which leads to proper conclusions, and only the other day I was extremely gratified to find a committee of gentlemen who agreed with me [laughter], the first, I think, I have ever found. [Laughter.]

I was born and brought up very near the woods indeed [laughter], and I have no doubt you would think so any time when meeting me. [Laughter.] I am not ashamed to be called a rustic or a granger, or anything of that nature you are pleased to apply to me. [Applause.]

My grandfather died in 1863 at the age of ninety-three years. He lived and died in the faith that our forests would soon be extinguished. I have an old uncle over eighty years of age, and when he went to school the people in the district furnished the wood for the school-house fire for the sake of prolonging the school, and they never furnished anything but old and fallen wood, because they were so fearful the wood would be all burned up very soon. [Laughter.] My father lived and died of that faith, and I was brought up in it, but now I don't believe a word of it. [Laughter.] I am entirely free from that belief.

The ancients believed that the sky overhead—the blue—was solid, and they were afraid this would fall and crack everything it fell upon. [Laughter.] This was their belief, but finally one man said, "Let justice be done though the heavens fall." [Laughter.] Let us have truth, whether we get out of wood or not. [Laughter.]

I am glad to find here my friend, Dr. Cook; and, by the way, in early life I was under the tuition of a gentleman by the name of Cook [laughter], and of all the woods that I know of, of all the different kinds of trees ever grown, he had more faith in the birch than in any other kind. [Laughter.] Even the great Webster, climbing one of the wooded mountain peaks, turned around as he saw the birch growing and said, "Please let me introduce you to Madame Birch, an old acquaintance, to whom I was introduced in early life by a school marm." [Laughter.]

I was extremely pleased as I sat there, to hear that my friend Cook knows how much land there is in one place on the American Continent. [Laughter.] I hope he will stick to it whether he knows it is the truth or the other thing. [Laughter.]

In looking at the official reports coming from the Department at Washington, I found one which says we have between three and four hundred million acres of forests in the United States. There were about three hundred and eighty million acres, they thought. Looking at the next report—I think it was the next succeeding report—I found that they said we have four hundred and fifty million acres of forest in this country. Of course I thought that was the latest, but in looking at the Agricultural Report of 1885, which I believe is the latest one out, I find they have extended the woods again [laughter], and now they report there are about four hundred and eighty-six million acres of woods in this country, always omitting Alaska, of course, which my friend Cook has not measured. [Laughter.]

At the session of the American Congress, in Boston, I was much surprised to hear the head of the Department of Forestry of the Bureau of Forestry for the United States Government, read a paper, in which he dealt with the quantity of forest we have and the yearly consumption of those forests. It was a paper of exceeding interest to me. These things he treated of were just the things I wanted to know. I wanted to know how big a piece of woods Uncle Sam's boys had and how fast they were cutting it. I spoke to him afterward and asked him about the figures he had given in his report.

I told him it was the most interesting paper I had ever listened to, and I asked him for the figures he had given, and he very kindly gave them to me. I added them up—Cook taught me to add when I was a boy [laughter]—I added up his figures and found out how much timber there was for railroad uses and how much for fuel and for building purposes, and for this, that and the other thing, as he gave them to me, and divided the whole of the forests of the United States, according to his figures, by that amount. I wanted to find out how many years they would last, and, if I recollect aright, the entire forests of the United States would have lasted about eight years and nine months [laughter], and already three or four years of that time were gone. [Laughter.] I asked the gentleman if he had seen what this was leading to—if he had noticed what his figures led to, logically or arithmetically. He appeared surprised when I showed him my figures. He said the boys in the office must have made a mistake [laughter], and he referred me to another paper, where he said I could get the correct figures. I figured that up in the same manner, and found that, according to the figures there, the forests would last about seventeen years [laughter], and I was extremely gratified for the extension. [Laughter.]

Now, the truth of it is, gentlemen, I believe there is no child yet born upon the face of God's earth that will live long enough in this mortal life to ever see a scarcity of wood or timber in the United States. I don't say but that in some sections there may be a scarcity, perhaps, caused by fire—I don't say but that there is a scarcity now in some portions of the West. Some twenty years ago I got it into my head to visit in Central Iowa, and I found wood there as cheap as in my own village. I found them burning coal there in the winter and corn-cobs in the summer. In Kansas, the wood can be had for \$3.50 to \$4 a cord for burning brick. They care nothing for it at any time in the year. I went out to see a grain field belonging to a gentleman, and I said to him, "You have set out some trees, and I suppose you will set out more." He said, "No, I shan't." I said to him, "Don't you need them for firewood?" He said, "No, I would not cut it if I had it." "Why so?" He said, "You cannot possibly have better fuel in warm weather than corn-cobs." And I believe it; and so will you. He said, "In winter I can harness up my team and go and get all the coal I want for"—I think he said—

"\$1.50 or \$2 a ton; who wants to cut down trees and make them fit for firewood?" And I think he was right.

As I said, I do not believe there is any danger of a scarcity of wood or timber in the United States.

Now, I suppose every one will admit the acreage of land in the United States, which carries the forests, would average at least five thousand feet of timber to the acre, considered as being already grown. Now, away up in the White Mountain regions, and pretty near the heavens [laughter], you will find that the spruce which grows there will average about five thousand feet to the acre, fit to cut, and we expect it will average very much more here. In Washington Territory, as I figure it, the latest statistics show the average of about thirty-five thousand feet to the acre. Call it five thousand feet to the acre straight through. Figure it up, and we have a sum that is too much for my head, but I will give you the figures as I have them. There are two trillion four hundred and thirty billion feet of timber already grown and fit to cut. [Laughter.] This would give to each man, woman and child in the United States—reckoning the population at fifty millions, according to the census of 1880, and at sixty millions now, allowing for the probable increase since 1880—it would give, of timber already fit to cut, forty thousand five hundred feet of timber to every man, woman and child. It would give to each family in the United States, timber already fit to cut to-day, two hundred and twenty-two thousand seven hundred feet. [Laughter.]

Now, I take it that there is nobody that doubts that throughout the forest regions of the United States, omitting Alaska, of course, which my friend Cook has not measured [laughter], the lands would grow at least four hundred and fifty feet of board measure to the acre on the average each year. Why, up in New Hampshire, I can show you an acre of pines that I am growing that will increase at the rate of a thousand feet of timber of board measure per year. There is no doubt in my mind that there is hardly an acre of forest land in this country but what will average at least four hundred feet of growth per acre each year. I refer to board measure, of course. Now this would give each year to every man, woman and child in the United States, of the timber grown that year, taking the same basis of population as before—it would give each person in the United States, three thousand two hundred and forty feet, and if this is not enough

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to clap-board your houses, I don't know anything about it. [Laughter.] It would give to each family each year in the United States, seventeen thousand four hundred and ninety-six feet.

Now, with these figures before us, and they are official figures, I ask you, gentlemen, if there is any possibility, except by an act of Providence you cannot control—is there any possibility or any probability that there should be any scarcity of wood or timber in the United States within the present or the next century?

Again, sirs, I saw an estimate officially made, and sent to me by some friend of mine in the United States government, on the time that the forests in certain States would last, and it certainly appeared very comical to me. They had figured it up in one of the States, that the timber would last three hundred years. [Laughter.] Mind you, gentlemen, that the timber they have grown—already grown at the time of this report—would last in some States, three hundred years. I should like to know by what process that wood could possibly be preserved for that length of time. [Laughter.] I never yet saw a tree three hundred years old. I have never been to California, where those large trees grow. I have cut a good many acres of timber growth, but I have never yet cut a tree two hundred years old, though I have cut some about one hundred and seventy-five years old. Just think of the idea, that the timber already grown, would last to cut from, three hundred years. [Laughter.] Why, there is probably not a tree outside of those few exceptions, west of the Rocky Mountains, three hundred years old.

There is no grown tree to-day, that people who shall live three hundred years hence shall be able to find a particle of, unless it is taken and housed from the weather or immersed in water.

Then again, supposing there was this remarkable danger of the speedy extinction of our forests, I ask you, would not the price of lumber be increased, and particularly in some parts of the United States? From 1854, for thirteen years, the average price was over \$18 per thousand, and for the next twelve years the price was less than \$18 per thousand, showing that the price is actually decreasing.

New Hampshire was settled two hundred and sixty-five years ago, and is to-day probably more than one-half covered with forest trees, and that State, about ten, or perhaps fifteen years ago, sold thousands and tens of thousands of acres for, I think, from four to six and one-half cents per acre.

Again, one of the theories in regard to the result that will arise from cutting off our forest trees, is, that as trees are cut, the rainfall decreases. I believe God sends the rain, not only upon the righteous, but unrighteous, and upon the trees and the plants; and the trees always grow where there is rain enough and soil enough, and not too much fire.

I make that as a general remark.

I am thoroughly convinced that the whole valley of the Mississippi would have been covered the same as anywhere in this country if it had not been for the constant fires. This is my conviction about it.

I suppose, taking it from the northern part of the State of Missouri, including three or four sections north of Missouri, there has been during the last forty years the greatest amount of re-forestry that has ever occurred on the face of the earth.

Again, as a Tennessee paper said a few days ago, there are a million acres in the Southern States that have been cut off for cultivation, have been cultivated and abandoned, and are now producing a second growth of trees. It is so all over the country, so far as I have gone. Take it in my own State of New Hampshire; there are eighty-six townships there that have actually diminished in population. A man riding through that State, starting from Dover, and going about thirty miles, found about one-third of the old deserted farms growing up to woods, and when you stop the fires in the West the growth will come in there too.

Go out in Wisconsin and Iowa and you will find whole groups of young trees which have come up from the seed of the old trees which have been cut off.

The best thing you can do with a growth of trees that are fully matured is to cut them. Take our State of New Hampshire, settled in 1623—now, was there a single cord of wood that year, or a single foot of timber that year, more than at any preceding time since the period of the flood—or as soon as it had time to grow after the flood? I say no, for the decay equaled the growth for a certain period. It was the same thing throughout the country.

I take it that this four hundred and fifty or four hundred and eighty-six millions of acres covered with the growth of timber in our country, if it has never been cut off, most of it is not growing any more. It does not grow any more during one period of fifty years than during a different period of the same length of time. O, what

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a misnomer people tell about! [Laughter.] Adam saw the first growth, and that has been gone a good many years. [Laughter.] Trees are like men. They grow, mature and die, and another generation succeeds them, and upon an average, the life of the tree is only about twice that of the human family.

I said that I did not believe that the rainfall is affected by the trees. I did believe it had been affected by the trees until I went out to Kansas and fell in company with the first man who had settled in Cloud county. He had kept a record of the rainfall from July, 1860, to July, 1885, when I was there, and he showed me the record, and though it varies, of course, somewhat, as it varies here, there is no particle of proof that the rainfall had increased by one single drop in Kansas, on account of the increase in the growth of trees there or from any other cause.

I have no doubt the growth of trees is the same as of corn or of any other vegetation. I have no doubt it takes a great deal of moisture out of the earth and puts it into the air and makes the atmosphere a little more moist, and that it makes the temperature somewhat lower. I suppose this is a fact, but I am not a scientific man. My friend Cook knows more than I do. [Laughter.] I suppose if you should collect all this plant growth in Kansas, or in any other State, in any one year—collect everything that grows, both animal and vegetable, and dry it and consume it in the fire—I have no doubt that the heat produced by the combustion would represent the amount of heat that had been taken from the atmosphere during the period of its growth; and it would make a very hot fire. [Laughter.]

The buffalo grass grows two or three inches high, and in June it becomes dry and falls down, lying upon this clayey, baked plain almost like a thatch upon a roof; the sun falling upon that dry material is reflected, as a matter of course, and it would almost burn your feet to walk on it.

One acre of ground produces thirty or forty thousand pounds of corn, and a great deal of heat is used up in its growth; the roots run down deep into the earth and absorb the moisture, which, thrown off into the atmosphere, makes it a little cooler. Thus, when a little moisture is thrown off, the tendency is to produce a little more rain. So far as I know, there is not a single instance where it has increased the amount of rain so it could be measured. Of course it is true, philosophically, that every time you tread upon the ground you shake

the center of the earth [laughter], but no man has yet been able to measure the amount of that shaking; and, while it is true, philosophically, that this throwing off of moisture from plant-life somewhat increases the rainfall, the amount of increase is so small as to be practically immeasurable. Neither do I believe that the cutting off of our forests has produced any irregularity in the flow of our streams. I expect I am heretical there [laughter], but Mr. Roberts, a civil engineer who has been employed by the government, published a very interesting article in the *Science* a few months ago, where he quoted from his own observations of the Monongahela and Alleghany rivers, and he states that he could not find a single instance where the floods had been increased or where their low state had caused a low state of water in the gulf [laughter]—he could not find that they had been diminished in the least.

I believe a great deal in forests. According to the statement made in one of the United States reports, the value of the forest productions in 1880—I think that is the year—was \$700,000,000. That it was of a great deal more value than our corn crop; that it was two and one-half times the value of our cotton crop, and that there were employed twenty-five thousand seven hundred and eight mills, and one hundred and forty-eight thousand men in the lumber industry.

Where you have trees fit to cut, cut them, the same as you would cut your corn when ready, and let a new crop grow, because that crop of trees when ripe, may stand there for seventy-five years, and prevent other trees from growing, and all the time becoming worse themselves.

I am very much obliged to you for listening to me so long, for I know it is late. And I hope you will never have such fears of anything from the forest-canes as I had when I attended school to Master Cook. [Prolonged applause.]

THE STUDY IN OUR PUBLIC SCHOOLS OF THE CARE AND CULTURE OF TREES.

ADDRESS BY HON. E. O. CHAPMAN.

MR. PRESIDENT AND GENTLEMEN OF THE STATE BOARD OF AGRICULTURE—I accepted the invitation to say something to you upon this subject, at this your annual session, because I am interested in the subject itself.

I did not know at the time I accepted the invitation that the present week would be such a busy one as it has been, as it has been not only a busy day, but rather an eventful one for me, and I therefore must apologize to you for not preparing a formal paper, and beg your indulgence while I address you very briefly in an informal manner.

Farmers, I know, are a plain-spoken people, and School Superintendents ought to say what they have to say in the most direct way.

In what I wish to say I shall differ very much from the distinguished speaker who preceded me.

I believe in the care and culture of trees, not necessarily massed into forests, but in the economy of nature, the trees supplement the life of vegetation and of man, and I think if I had the time I could show you even great danger in the disproportion of animal life to the vegetable life that originally covered this earth. There was a time when the trees had it all to themselves and they got along very well without man, but we are coming to a time, or we have already reached the time, when some portions of that earth have become valueless—when the destruction of trees has made that country and that region absolutely uninhabitable for man, or any other living animal. You know the tree in its breathing gives off what man and other animals live upon. On the other hand, men and other animals give off what is necessary to sustain the life of the tree, and sustain vegetable life, but I am speaking of trees in particular, because they are the giants in our vegetable life.

When man came on earth he began to clear away the forests and reclaim the ground for the purpose of raising his crops. Of course, this was necessary to a considerable extent. This work has gone on so far that a few years ago a few men, with more discernment than many of their fellows, raised a note of warning that has gone around the earth, and we have been obliged to listen to that warning. There are men in all classes, among farmers and in all industrial pursuits, that are always a few steps in advance of other men, and these gentlemen were of that class. Sometimes we say such people are in advance of their times, but sometimes we go even further than that and call them "cranks." These men have pointed out to us the danger of the total extinction of our forests. They have been studying the subject of trees—the study of forestry. They have gathered facts that are incontrovertible.

I believe the greatest example the world has ever seen of the calamitous effects of destroying tree-life is presented to us to-day in China. Less than five years ago—you know China is densely populated and they have been obliged to live upon the vegetation of the country, upon rice principally, but their principal agricultural industry being the production of silk, or the raising of silk worms, which must be fed—on this account they have encroached upon the trees and cut them off as the people multiplied, and this has gone on during the past centuries until the rainfall has so much decreased that they have been obliged, finally, to irrigate their soil by digging canals for the purpose, until China is to-day one vast network of these canals, bringing the water down from the mountain streams, led about in every direction, criss-cross through their lands.

Less than five years ago there was a great flood. The rain fell, and the water came pouring down and overflowed the canals, and miles upon miles of the territory were flooded, drowning upwards of ten thousand people and destroying even more than that afterwards by famine. There were miles upon miles of rice crops destroyed. This was less than five years ago. Only three or four months ago there was another flood in China, almost, if not quite, as bad as the first. This is the result, I think, of their cutting off their trees and destroying them indiscriminately.

In the second decade of the present century, Blanche, a member of the French Academy, visited the French side of the Alps and found the most beautiful country covered with fertile farms and

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beautiful villages. He was most hospitably entertained by the happy population there. He found there plenty of wide, bubbling streams and springs in abundance upon every hand and the people living happily and contentedly, successfully and prosperously. In the year 1844 he visited that region again, and his report to the French Academy was something appalling. He says that in that entire region there was not a tree, not even a scrub. There was no living animal to be seen, hardly the buzzing of an insect to be heard, and silence and desolation resting over that entire land. What was the cause of it? They had cut off the trees to meet the utilitarian demands, and in their greediness had converted forest after forest into fertile fields, until nature took her revenge and absolutely drove man out of it.

Where is the Euphrates river that figured so largely in ancient history? There the trees have been cut off until its banks have crumbled into the channel, filling it up so that the flow of the stream was decreased little by little until, from a river that would float the largest boat, there is nothing left of that channel except barely enough to float the small native boats up and down, below Babylon. That channel is all gone and no boats of any size can be found on that section of the river. If this keeps on the sands of the desert will swallow it up completely.

Where are the tall cedars of Lebanon, which were cut off for Hiram, King of Tyre? Where is all that powerful nation which existed at that time? All gone, only a scattered population of half savages, living on the scantiest of provisions, gathered from the almost barren soil.

If this is the experience of these countries, what possible cause can there be for such rashness on our part? We might find some cause, though, in my judgment, it would be inadequate.

We know whole sections of Europe have been made inhabitable by the planting of trees. This is on account of the economy of nature eating out the malarial gases from the soil. This may be seen in the island of Sardinia, which has been made inhabitable by the planting of trees. Certain sections of Italy, outside of the mountain regions, which, at one time, in the not remote past, supported an immense population, are now so malarious that no man can live in them.

I do believe, notwithstanding the opinion of Prof. Lyman, we have abundant evidence in this country that the cutting off of the trees

does reduce the rainfall in certain regions. Intelligent men take the entire surface of the earth, and they know that water evaporated must come down again when taken up, and must go up somewhere after coming down. Taking it as a law, it will not make any difference, but I do believe that there are considerable sections of country which have secured rainfall—considerable rainfall—by the planting of trees alone.

And when I am on this subject, let me refer to one remark made by Prof. Lyman in regard to robbing our Creator of his power. We are not robbing the Creator of his power. We are simply putting ourselves in such a position that we shall not interfere with the laws of nature. In some of the countries of Europe they have found it necessary to pass laws to preserve their forests so as to secure equitable rainfall over a considerable area. In Prussia, in Italy, in France, and in almost every European country, they have been obliged to stop the destruction of the forests by force of law, in order that they might be protected so that the future generations might find a country as fit for habitation as the present generation.

In our own country we have but to take the Schuylkill river as an instance of the decreased flow of water in our rivers. A few years ago the flow of water in the Schuylkill amounted to five hundred million gallons per day. About four years ago it was measured again and found to be reduced in flow just one-half, and the past summer the flow was two hundred and fifty million gallons daily. All this trouble is due to the cutting off of the forests adjacent to the banks of the river, so that the rainfall is not gathered and stored in the earth along the streams, at the head of this river, but is permitted to flow off when it falls, and hence we have two results, the lack of a steady flow in the summer and an overflow in the spring freshets.

Take the Ohio river, draining a basin of two hundred and fourteen thousand square miles, an area twenty-five times as large as the State of New Jersey. All along the upper waters of that river they have been denuding the hills of their forests. They have been cutting off the trees that were formerly so plentiful along their banks, and what is the result? The result is that the Ohio river is lower in summer year by year, and each series of years, as compared with the former series of years of the same length, and then they have those terrible freshets. In 1884 the water came pouring down from the hills over the surface where it should have been stored in the

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soil to feed the springs, and it carried away barns and houses, and stacks of hay and corn, and cattle and live stock, and people, and the loss of property alone was reported at upwards of \$60,000,000, and although this immense amount represented the loss reported, it is probable that this was not all, and that there was a considerable percentage of the loss which was not reported and which cannot be estimated. At that time the river rose five feet higher than in the previous freshet.

I have not at hand the accounts of the freshets that have occurred in that river since that time, but that was a most remarkable freshet.

Now, what do the trees do in the economy of nature? What is the law of nature we want to permit to have its own way? The trees are here for a purpose. They are necessary in the life of man. Let us see why. In the first place, they induce rainfall; that is my belief. I state it as my belief. Even if we had never seen the tree do it, we know that in the economy of nature we see one of its best uses. What are the conditions of the rainfall? They are the condensation of the atmosphere. Put a pitcher of water in the moist air and you get a deposit on the outside of the pitcher. If that be cold enough and the air be moist enough you would get precipitation. When the water is evaporated, these fine particles of it float along over the surface of the earth during the nights of summer, if there be nothing to prevent it, and in the daytime that moist air will pass over until it meets some cold obstruction, such as the top of a mountain, or the tops of the trees in the forest. It must be precipitated; that is the law—that is the law of nature. The presence of trees not only induces rainfall, but the presence of trees helps to distribute equitably the rainfall of any considerable region. I need not explain how this is. You will see if these warm clouds—that is, the air saturated with moisture—are permitted to pass over any number of miles of hot territory or heated land and are not permitted to cool off, when they reach the tops of the beautiful groups of forest trees, condensation takes place and the moisture is precipitated on the land. We cannot prevent this, neither can we cause this unless some body of this kind is interposed, for it all comes under the law of nature. If this moisture is not precipitated at one point it is at another, of course. In its passage, it moves on until it meets with some obstruction, and, finally, it is precipitated all at once instead of being precipitated over an area of, perhaps, many hundred miles. If we could

get more rain on the plains and less rain on the mountain tops, then by just so much could we prevent the danger of freshets and floods.

But here in New Jersey we need have but little fear at the present time. Up in the northern part of the State we find many fine chestnut and other trees, and we need not fear in the cyclone in summer and the blizzard in the winter. They stand there and protect you from the cold blasts of winter and the heat of summer.

It is undoubtedly true that those cold northers which come down through Texas by reason of another natural law, by reason of evaporation going on from the gulf and inviting the cold air to come down, are growing more frequent and more dangerous, so that almost in our northern tropic our cattle freeze to death, and all because we have cut off the protection, at least, of the forests that stood between those people and these northern winds, which sweep over the prairies and gain velocity at every moment until they sweep down over the State and do a vast amount of damage.

I know there are men who believe nature should have her own way, and that we should not bother our heads about it at all; that if the will of the Almighty is that we shall have the small-pox, we should have it. [Laughter.] Of course that is all right, but I will not listen to this and increase the danger by exposing myself to a case of small-pox. I believe that farmers and that all people should fully appreciate the value of trees in the economy of nature, and that while we are doing our work they are doing theirs in their own way, and we should at least not interfere with the process.

A whole essay might be written upon this subject, and it might prove very interesting, even though we have different views on this point, but I will not weary you by referring to any more of the advantages accruing to us from the preservation of trees, except by a little sentimentality.

I believe that farmers can afford to have beautiful things; I believe that trees beautify a farm and beautify a country. I am not speaking now particularly, gentlemen, of forests alone, although trees in forests and trees outside live in the same way and, to some extent, perform the same functions. I believe that trees should be preserved, to some extent, because they are beautiful. We all know this, and we all recognize and appreciate the effect of beautiful trees.

We all know of the officer in command of the troops during the Revolutionary war, near Hartford, and that, while camping there

with plenty of idle time on their hands, he said, "Now we will show these Yankees a bit of French taste." And so they planted trees along the roadway near their camp, and all those who have since lived in that region have blessed those troops for that work. My grandfather was very fond of planting trees, and one day while planting a tree one of the neighbors said to him, "You will never live to enjoy that tree." My grandfather replied, "If I don't, somebody else will." We are too apt to forget we are not living merely for the present. We should live for the future as well. We have received the blessing of those who thought for us, and worked for us, and sacrificed comforts for us. Let us do as much for the future generation, and hand down to them this beautiful country in as good condition as we received it, if not in a better. So live that people may bless you for having lived. Let the planting of trees be just as important to you as the planting of your crops, and do not think it too much trouble to care for them after they are planted. It is the law of nature that after this life comes the future. Even the trees give us a noble example of this. See the gigantic oak that rises and spreads itself in its noble form year after year, standing placidly during the mild breezes of summer and the gales of winter, performing all its functions, whether in producing or conducting to rains, or whether protecting us with its shade, or whether giving protection to the birds—so important to the farmer in most regions, and which cannot live unless we furnish them with trees to live in. By and by the oak is laid low and crumbles together, but is it forgotten? Has it forgotten its function of providing for the future life? No. It has stored a crop of rich mould and has stored in this mould its seed, and these seeds spring to life and reproduce the parent tree. It, too, has lived for the future, and we also should look to the future and not alone to the present in all we are doing.

What has all this to do with the subject? Excuse me for this; my subject lengthens out. What has this to do with the subject of schools? Whatever it has to do with the question of the prosperity and the progress of the next generation or of this generation, no better place can be found for it than in our schools. What are our schools for? For the preparation and for the development and for the equipment of the future citizens. And let me say to you farmers—and I am glad to say it—that the hope of this country lies in the big-hearted, strong-limbed and sturdy boys and girls being brought up to know nature's

laws and nature's beauties. [Applause.] Follow them into the city and you see them taking charge of affairs. Go to Washington and there find them making our laws. The nearer to nature the nearer to God and the better we live.

These boys may be taught that the tree is something that is placed upon earth to perform certain functions, a certain good in its relation to animal life, that it belongs to man, and that it should live side by side with man and that there is danger in the reckless destruction of these trees. They can be taught to plant them and to care for them, and although not a farmer, to my mind the planting of trees or of other things and seeing them grow under our care, gives us pleasure next to the pleasure the Creator felt in creation. [Applause.] They can be brought into close sympathy with good things; they can become patriotic because they are doing something for their country, because they are doing something for somebody else that is to enjoy it after them. Many lessons they can learn in our schools in relation to the care of trees, that are not taught in the splendid schools of forestry established in the Old World for merely utilitarian purposes.

I do not wish to become sentimental, but there is sentiment in trees. Holmes said he had written many verses, but the best poems were those of the trees which looked down over the fertile valleys of the Housatonic. Byron said in his beautiful poem on the Indian chief at the grave of his fathers—and none of our poets loved trees better than, or as well as Byron—

“ But I behold a fearful sight,
To which the white man's eyes are blind;
Before these hills were shorn and tilled,
Full to the brim our rivers flowed.
The melody of waters filled
The fresh and boundless wood,
And torrents dashed and rivulets played,
And fountains sported in the shade.
These grateful sounds are heard no more,
The springs are silent in the sun,
The rivers, by the blackened shore,
With lessening currents run;
The realm our tribes are crushed to get
May be a barren desert yet.”

That has been the history of more than one country other than ours, and, I think, through the destruction of the trees. God grant

that that fate may never be New Jersey's! But in the history of the times and of places, and of lands, I believe that it would be a desert were we to permit our streams to dwindle and our springs to dry up, and we were to take away this process which nature has preserved and given us, this beautiful process by which the trees first call down the rains from the clouds, and preparing a sponge that shall take it and prevent its running off, and sending those roots down into the subsoil, deep into the earth, making conduits to enable the water to make its way beneath the surface of the ground to the reservoirs which supply the bubbling springs, perhaps miles and miles away, and they will never feel the summer's heat or the winter's frosts. This is the process of nature. Let us see that we do not interfere with it too far. I know streams, and have used water from them, that formerly ran through the hottest days of summer, and now they are running dry.

The upper waters of the Alleghany, through the southern tiers of counties of New York, were at one time among the finest trout streams in the country. I remember distinctly going there and catching trout and having the finest sport. At that time there was an abundance of water there, and now it is only a succession of dirty pools, not sustaining the life of any kind of fish. All is changed, and I believe this change is due to the cutting off of the trees. That certainly must be the fate of any country that recklessly destroys its trees.

We should live—I repeat it—we should live not only for the present, not only for the empty present happiness, and present comfort, and present wealth, but we should live for the future.

Who that has ever been in New Haven does not remember the beautiful elms in that city. The people would as lief part with their houses as part with those beautiful elms. They add immensely to the value of all the property in that city. They were started more than eighty or ninety years ago—in 1799, I believe—by an enterprising citizen for the purpose of beautifying the village of New Haven.

Trees are always beautiful and always add to the attractiveness of the regions where they are grown.

Two Englishmen once made a wager with each other that they could point out the most beautiful spot in England. They selected an umpire and put up their money, agreeing to refer to him to decide, and then they wrote on pieces of paper what they considered the

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most beautiful spot, and when the umpire opened the papers he found that one of them had written the strip of road from Killingsworth to Charing Hill, and the other had written the same thing, only in opposite directions.

We all know how much trees add to the value of property in streets beautified by them. He who does not nourish and care for them does not give the trees their just dues. They should be cultivated and protected for future generations as well as for our own comfort and happiness.

Prof. Lyman said that trees very much resemble human beings, they grow up and die much the same as human beings, and that they seldom outlive two generations. I know some older than two generations. I know some I love to think my grandfather rested beneath their shade, and it makes me better and stronger because I know he was there. [Applause.]

1887.

CONTAGIOUS ANIMAL DISEASES.

BY E. M. HUNT, M.D.

1887.

CONTAGIOUS ANIMAL DISEASES.

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The last report as to contagious diseases of animals, made by the State Board of Health to the Board of Agriculture, carried the account thereof into the month of January. Several herds in Burlington county in which pleuro-pneumonia had occurred, or which had been exposed to the lot of infected calves brought from New York City, were released from quarantine. We were thus able to release all but the herd of Mr. Stackhouse, near Medford, in which some fresh cases had occurred. In this part of the State the herd of Mr. Kirby, near Woodstown, and that of Mr. Taylor, near Wrightstown, were also still retained in quarantine. Considering that so many herds had been exposed by the distribution of calves in Burlington county, the farmers had great reason to rejoice that so few farms were invaded and that there was no more diffused extension of the disease.

During February the only new herd reported as affected was that of Mr. English, near Pemberton. Here, too, the disease had arisen from the purchase of a lot of coughing calves. Some of the cattle were killed, others inoculated and the herd held in quarantine. We were able to release the herd of Mr. Kirby at the end of February.

Some cases that occurred near Woodstown were very suspicious, but proved to be a bronchial instead of a pneumonic inflammation.

Our veterinarians are frequently called upon to see cases that do not prove to be contagious pleuro-pneumonia.

As to valuations of slaughtered stock we have had no difficulty, except in one case, as the farmers are generally willing to have a fair valuation made. But when an owner is willing to have a common yearling calf valued at \$30, and appraisers are found willing thus to value it, when it cost but \$11 just before, it shows the necessity of

some limitation upon valuations. We are glad, however, to say that no parallel case has occurred in any other county.

In March there were several cases reported, but none proved to be pleuro-pneumonia except in Hudson county. Here reports were received from Jersey City and from North Bergen township and three centers of infection were discovered. Afterward a single herd in Union county was found affected. The herds were promptly quarantined and some of the cattle destroyed.

Some examinations of herds were continued in Burlington and Camden counties. It has been satisfactory that the precautions taken under the direction of the general government have much diminished the invasions of infection from the South. But New York State, and especially New York City, seems to have had much less restraint. We have been enabled to trace most of the cases occurring the past year directly to the New York stock-yards. At the date of April 1st five herds remained in quarantine.

Our experience for the last seven years in dealing with pleuro-pneumonia has made it highly probable that we should always be able by prompt measures to prevent this epizootic from becoming widespread in the State, but that we should never be able to eradicate the disease fully.

The contagion is not a very diffusive one and does not travel long distances. It seems to cling to localities more than to the cattle themselves. It is also transferred by cases called chronic. But by careful and early quarantine, it does not generally extend to adjacent herds. Also by means of inoculations in affected herds we have been able to limit the disease. But because of our relation to the larger cities, the frequent transportation of cattle through the State and the tendency of our farmers to purchase in the neighboring cities, we are sure to continue to have immigrations of the contagion from time to time, if it exists in adjacent States. For this reason the Board has long felt that either there must be interstate alliance for its prevention, or that the general government must take the matter in hand.

Because such views obtained in other States, provisions were made by the last Congress for the more perfect eradication of the disease. The new law provided for the exercise of certain powers by the general government, and for the purchase or slaughter of infected cattle and exposed herds where the Governors of the States and the persons in oversight of the contagious diseases of animals would accept the

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rules and regulations proposed by the United States Commissioner of Agriculture. The whole subject was presented to his Excellency the Governor of this State, and afterward to the Attorney-General and to the member of the Board who had been placed in special charge of the contagious diseases of animals, and to the entire Board at a meeting held in April last. Personal conference was also had with D. E. Salmon, D.V.S., the Veterinary Chief of the United States Bureau of Animal Industry.

The letters which passed between this Board and the Bureau, as also directly between his Excellency the Governor and the United States Bureau of Animal Industry, as also the understanding arrived at under the law of this State and that of the United States, are on file in this office.

By this arrangement the expenses to the State will be diminished. As to other contagious diseases of animals, they will continue, even more fully, perhaps, to demand our attention.

Tuberculosis among cattle needs careful guard on the part of the State. It is the cause of many losses to farmers, and of poor meat and poor milk to a much greater extent than is apprehended.

The swine plague, in its results, is even more formidable than pleuro-pneumonia. Our farmers have come to understand it better, and we shall be disappointed if there is not some diminution of the disease in districts where it has prevailed.

Early in May a serious outbreak of pleuro-pneumonia occurred on the farm of Job Winans, between Linden and Elizabeth. One animal was killed, and the herd, consisting mostly of yearling and two-year-old calves, was quarantined. A case reported soon after by Mr. McCandlish, a neighbor, proved to be tuberculosis. The herds of S. Gilbert, near Wrightstown, and the herd of Walter Bird were reported by Dr. Miller as having pleuro-pneumonia. Both were quarantined, and the latter herd inoculated.

On June 1st seven herds were in quarantine, viz., three in Hudson county, one in Union county and three in Burlington county. All acute cases had been destroyed and two of the herds were about ready for discharge. Having perfected the arrangement for co-operation with the United States government, the responsibility of arranging as to slaughter of appraised cattle was transferred to the veterinarian designated by the Bureau of Animal Industry, who had been directed to report at Trenton. The rules and regulations of the department

were formally accepted by his Excellency the Governor to the degree specified by him in his communication to the Commissioner of Agriculture. No exposed animals in herds are killed without the consent of the owners. It was arranged that there should be constant communication between the representative of the government and the member of the Board in charge of the contagious diseases of animals. The advantages anticipated by the arrangement are a prevention of the present transfer of diseased animals to this State from other States, the securing of better compensation for slaughtered animals and the hopeful and complete eradication of this contagion from the State and the country. •

While it is well known that this Board has believed and thinks it has proven that pleuro-pneumonia could be stamped out in this State by our present system of slaughter, quarantine and inoculation, if only the general government would protect us by some system of interstate inspection from cases arriving from other States in the absence of any law based on such a plan, and with a United States law providing another method, vindicated by good authorities, it thus seemed best to us to co-operate therewith.

Dr. Dimond was sent to this State in June last to gain knowledge of the work to be done and to begin inspections. The following report has been made to us by him of the work done and of the oversight and disposals made, including such herds as were in quarantine at the time of his coming :

REPORT OF HERDS IN QUARANTINE TO JANUARY, 1888, BY WM. DIMOND, UNITED STATES VETERINARY INSPECTOR.

OWNER'S NAME.	ADDRESS.	Number in herd.	Number sick.	Number killed.	When killed.	Appraised amount for killed.	When inspected.	When quarantined.	INSPECTOR.
Job N. Winans.....	Linden, N. J.....	26	{ 2 ac. 12 ch. }	26	June 22.....	\$780 00	June 3...	June 3...	Dimond.
Stacy B. Taylor.....	Wrightstown.....	11	{ 2 ch.....	11	Aug. 12.....	382 00	June 15...	.....	Dimond.
L. Kaloskey.....	Seacaucus, Hudson Co.....	7	{ 2 ch.....	.....	.....	.....	.....	.....	H. W. Rowland.
Geo. W. Rolfe.....	New Brunswick.....	17	{ 3 ac. 5 ch. }	17	July 29.....	500 00	July 16...	July 16...	Dimond.
Hugh Sutherland.....	Jersey City.....	2	{ 1 ac. 1 ch. }	2	Aug. 30.....	50 00	Aug. 30...	Aug. 30...	Dimond.
Geo. Such.....	South Amboy.....	26	{ 4 ac. 6 ch. }	1	.....	.....	Sept. 20...	Sept. 30...	Dimond.
Jas. Finegan.....	New Brunswick.....	17	{ 1 ac. 4 ch. }	17	Oct. 24.....	480 00	Sept. 21...	Sept. 21...	Dimond.
Robt. Armstrong.....	Jamesburg.....	22	{ 3 ac. 6 ch. }	22	Oct. 17.....	830 00	Sept. 23...	Sept. 23...	Dimond.
Robt. Armstrong.....	South River.....	11	{ 1 ac. 3 ch. }	11	Oct. 20.....				
Geo. Blissell.....	Jersey City.....	12	{ 3 ac. 2 ch. }	12	Oct. 26.....	360 00	Sept. 27...	Sept. 27...	Rowland and Dimond.
M. Donovan.....	Jersey City.....	15	{ 3 ch.....	.....	.....	.....	Sept. 27...	Sept. 27...	Rowland and Dimond.
M. Connors.....	Jersey City.....	1 Ex.	.....	.....	.....	.....	Sept. 27...	Sept. 27...	Rowland and Dimond.
John Patterson.....	Union Hill, Hudson Co.....	1	1 ac.....	Died..	Oct. 3.....	.....	Sept. 30...	.....	H. W. Rowland.
John Haliday.....	Jersey City Heights.....	1	1 ac.....	Died..	Oct. 3.....	.....	Sept. 30...	.....	H. W. Rowland.
Wm. Jacobs.....	South River.....	18	{ 1 ac. 8 ch. }	18	Oct. 18.....	252 00	Oct. 4...	Oct. 4...	Dimond.
John J. Lynch.....	Jersey City.....	12	{ 2 ac. 7 ch. }	12	Oct. 19.....	335 00	Oct. 11...	Oct. 11...	Rowland and Dimond.
Thos. Carey.....	West Bergen, Hudson Co.....	8	{ 1 ch.....	.....	.....	.....	Oct. 4.....	.....	H. W. Rowland.
Paul Babcock.....	Jersey City.....	2	1 ac.....	2	Oct. 22.....	65 00	Oct. 19...	Oct. 19...	Rowland and Dimond.
Joseph Blacker.....	West Bergen, Hudson Co.....	10	2 ch.....	.....	.....	.....	Oct. 21...	.....	H. W. Rowland.
Mrs. J. C. Wilbur.....	New Brunswick.....	4	2 ch.....	4	Oct. 24.....	130 00	Oct. 24...	Oct. 24...	Dimond.
H. Feinberg.....	Seacaucus.....	138	{ 10 ac. 20 ch. }	10	{ From Oct. 28 to Dec. 24... }	250 00	Oct. 28...	Oct. 28...	Rowland and Dimond.

REPORT OF HERDS IN QUARANTINE TO JANUARY, 1888, BY WM. DIMOND, UNITED STATES
VETERINARY INSPECTOR—Continued.

OWNER'S NAME.	ADDRESS.	Number in herd.	Number sick.	Number killed.	When killed.	Appraised amount for killed.	When inspected.	When quarantined.	INSPECTOR.
Frank Wooleon.....	Pamrapo, Hudson Co.....	23	7 ac. 6 ch.	7	Dec. 21.....	\$140 00	Oct. 28...	Oct. 28...	Rowland and Dimond.
Mary Hanan.....	Pamrapo, Hudson Co.....	9	1 ac. 5 ch.	1	Dec. 21.....	20 00	Oct. 28...	Oct. 28...	Rowland and Dimond.
Elwood Monahan.....	Rhode Hall, Middlesex Co.	9	2 ac. 2 ch.	9	Oct. 29.....	270 00	Oct. 29...	Oct. 29...	Dimond.
John Dailey.....	South River.....	1	1 ch.	1	Nov. 11.....	20 00	Nov. 1...	Nov. 1...	Dimond.
John B. Tuttle.....	South River.....	16	1 ac. 6 ch.	16	Nov. 12.....	400 00	Nov. 1...	Nov. 1...	Dimond.
Samuel McClure.....	South River.....	3	1 ac. 1 ch.	3	Nov. 16.....	80 00	Nov. 14...	Nov. 14...	Dimond.
John Newmeyer.....	South River.....	6	1 ac. 1 ch.	6	Nov. 16.....	140 00	Nov. 14...	Nov. 14...	Dimond.
W. Schmedes.....	North Bergen, Hudson Co.....	13	1 ac. 1 ch.						H. W. Rowland.
John Corcoran.....	Old Bridge.....	18	1 ac. 7 ch.	18	Dec. 14.....	490 00	Dec. 9...	Dec. 9...	Dimond.
Terry Clancy.....	Raritan Island, Middlesex Co..	12	4 ch....	12	Dec. 10.....	360 00	Dec. 10...	Dec. 10...	Dimond.
James Marity.....	West Side, Hudson Co.....	5	2 ch....				Dec. 22...		H. W. Rowland.
P. Mulcahey.....	Bayonne, Hudson Co.....	22	6 ch....				Dec. 22...		H. W. Rowland.
John Lynch, Sr.....	West Side, Hudson Co.....	16	1 ac. 5 ch.				Nov. 9...		H. W. Rowland.
Stephen Casey.....	Pamrapo, Hudson Co.....	9	2 ch....				Nov. 10...		H. W. Rowland.
John Murray.....	Pamrapo, Hudson Co.....	13	4 ch....				Nov. 11...		H. W. Rowland.
Mrs. M. Carr.....	Pamrapo, Hudson Co.....	2	1 ch....				Nov. 11...		H. W. Rowland.

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Appended to this report will be found the statements of some of the Veterinary Inspectors who have served this Board. Much of the success which has attended our dealings with the contagious diseases of animals is due to their active and efficient co-operation.

Early in July, we were able to release from quarantine all the herds that had been held in Burlington county. The herd of Job Winans, in Union county, was slaughtered under the direction of the United States Veterinary Inspector, Dr. Dimond. The number killed was twenty-six, of which sixteen were found diseased. All the appraisals and expenses were paid for by the United States authorities.

Two animals we had held in temporary quarantine, belonging to H. Sutherland, of Jersey City. One was found to be an acute and one a chronic case of pleuro-pneumonia. The acute case was slaughtered.

During the month, one case was reported to us in Somerset county, which proved to be tuberculosis, and one herd in Middlesex county, which Dr. Dimond was requested to examine.

During August, there was no increase of cases of pleuro-pneumonia in the State, except that a herd near New Brunswick was reported to us as being diseased. It was promptly attended to by the resident United States Inspector and several of the cattle slaughtered.

Cases of glanders occasionally occur in various parts of the State. We are generally informed thereof through local veterinarians. So soon as owners are satisfied as to the character of the disease and are referred to the law on the subject, they kill the diseased animals. Where there is any hesitation, correspondence or the visit of one of our veterinarians secures attention.

Early in September, a herd near Washington, South River, Middlesex county, was reported to us as having pleuro-pneumonia. This herd had been afflicted previously, and was handed over to the government authorities. Later in the month, three other outbreaks were reported in Middlesex county, and due attention given thereto. Some increase of the disease was also reported in Hudson county, and it became necessary to quarantine some herds.

During October, the cases multiplied in these two counties. Some delay occurring in dealing with these herds, the Bureau of Animal Industry was urged to more prompt action in the disposal of cases, and a prompt reply was received. At the close of October, nine herds were in quarantine, being more than for several months past.

From time to time, notifications of cases are received which prove to be tuberculosis, Texas cattle fever or some other affection. A peculiar series of cases occurred on the farm of Mr. Blanké, in Linden township, Union county, and several cattle were lost. We satisfied ourselves that the disease was not a contagious one. Although the cases were seen by veterinarians of prominence, there is still some doubt in diagnosis.

Several cases reported from Blairstown, Warren county, occurring in a car-load of cattle just arrived from Buffalo, required investigation, but proved to be Texas cattle fever.

During July and August, many reports reached us as to a peculiar form of horse disease, prevailing especially in Cape May and Atlantic counties. Some similar cases had previously been reported in Delaware.

The suddenness and fatality of seizure and the number of cases led to fears that the disease might spread as an epizootic, and gave rise to some exaggerated statements in the public prints. The disease was locally serious. The Board ordered such examination as the law provides for, but as it soon proved that the disease was not a contagion such as was intended to be included in the law, we were not warranted in making such pathological investigations as might have been desirable. We have no report of any post-mortems made by veterinarians, but have a valuable report made by Dr. D. B. Ingersoll, of May's Landing, which shows exactness and value.

We transcribe as follows :

"For general information, allow me to say that I have examined two horses to-day (Wednesday) that have died of the disease pronounced epidemic here, the so-called cerebro-spinal meningitis. The one was owned by Mr. John Pomelear.

"Mr. Pomelear states that the horse seemed dull on the 25th inst., more so on the 26th, yet both of these days it was worked in the team. On the morning of the 27th it seemed quite sick, and had a staggering gait, and frequently threw the head—slightly—around towards the left side and seemed inclined to rest its head on the manger, or lean against the side of the stall. It ate its food on the morning, noon and night of the 27th, and drank freely of water. On the morning of the 28th it was found lying in the stall, its head and neck stretched to its full length, with frequent striking out with all the feet, and throwing the head around towards the side, too weak to get on its feet without assistance. It continued in this condition until the 30th, when it died.

"I made a post-mortem examination of the horse six hours after its death, as follows:

"First examined the brain and found it entirely normal in structure. Of the meninges of the brain, the dura-mater presented no evidence of congestion, but the pia-mater was slightly—and very slightly, too—congested, and no evidences at all of inflammation. The spinal cord was found in the same normal condition.

"The heart was found entirely healthy in structure. A large coagulum of blood was found in the right ventricle, extending far into the pulmonary artery. The left ventricle and the aorta were completely filled with coagulated blood. The lungs were healthy. The right somewhat passively congested. The stomach contained a large amount of yellowish fluid of a decided acid reaction. The mucous lining of the stomach, near the pyloric end, was greatly disorganized, in fact this part of the stomach was entirely denuded of this lining, except near the pyloric orifice, or lower opening of the stomach, where it was not so seriously affected. The cardiac, or upper end of the stomach, was apparently healthy, and what is worthy of particular notice the line of demarcation between the healthy and unhealthy parts was so very distinctly marked, as much as we would find it in gangrene or mortification. The pharynx and œsophagus—the passage from the mouth to the stomach—was healthy; but the larynx—or opening from the mouth into the windpipe—was considerably congested and swollen. In other words, there was but little throat disease. The liver and the kidneys were entirely normal. So with the intestines, except a small portion of the small intestine, which seemed slightly congested.

"Mr. Joseph Wilson's horse died of the same disease, or of a disease having the same symptoms. I also made an examination of it on the same day, and found the same conditions, with but very slight variations, as in the Pomelear horse.

"With these examinations as data, we ask what is the trouble with the horses, and what name shall we give the disease? I answer, certainly not cerebro-spinal meningitis, because the cerebrum, the spinal cord nor their meninges, are at all affected. I am now speaking of the two horses I examined. But it is a fact, nevertheless, that their symptoms were the same as the other horses which have died of the disease so general in this county.

"Now, the real disease being in the stomach, and not in the brain, if we name it from this fact, we had much better give it some other name. But it is not always well to give a name to a disease from the parts affected, but rather to the cause of this disease. What, then, is the cause? To answer this, would be doing more than any one yet has done, for science has never fully demonstrated the cause of these diseases. It is evidently epidemic, and infectious, not contagious in a general acceptance of that term. It plays its most conspicuous

part on the stomach, and the seeming disease of the brain is but symptomatic. Of this I am persuaded, not only from the post-mortem evidences, but from the many symptoms wanting that are found in true cerebro-spinal meningitis.

"Then, if this be the disease, what treatment would be advisable? First, antiseptic, or antispuradic, if you please, or anything that will destroy these poisonous cryptæ, which make such sad havoc on the stomach. Now, from the fact that these cryptæ find a resting-place and thrive greatly in the acid secretions of the stomach, is not an alkali called for? And what would better fill this indication than sulphite of soda, or some of its kindred salts? It should, also, from the disordered state of the stomach, be soothing as well. For this, nothing, perhaps, is better than flaxseed tea, bran and a general liquid diet given warm. The supporting treatment could be maintained by general stimulants, which should be given as soon as the strength or nerve force begins to give way, which is very early in the disease, so that this treatment should be commenced very early in each case.

"I might here say that this treatment has been tried with success in one case. But 'one swallow does not make a summer,' I know. Yet, when a disease is so generally fatal as this is, we are glad to get any and all the information we can on the subject, even if we hope against hope.

"Yours, &c.,

"D. B. INGERSOLL, M.D."

During the entire year we have had the evidence that glanders is a disease of not very unfrequent occurrence in this State. As it never breaks out locally, and is always a disease transmitted by diseased animals, it is chiefly spread by the lower grades of professional horse traders, irregular veterinarians, who do not recognize the disease, and by Gypsies. The law of this State is now effective as to it, and we believe has done much to limit it. Our veterinarians have been watchful, and often, without any remuneration to themselves, have aided in the diagnosis of the disease and the destruction of the horses. As it is not, like pleuro-pneumonia, an imported disease, which the government is seeking or expecting wholly to eradicate from the country, the law does not provide payment for the horses, but deals with it as it does with hydrophobia or other nuisances which are to be abated without pay. Some time since action was brought in damages for \$15,000 against E. M. Hunt, the Secretary of the State Board of Health, and J. W. Hawk, a veterinarian for the Board, on account of the killing of glandered horses in the South Orange car stables near Newark. The constitutionality of the law is being con-

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tested before the courts. [NOTE.—The Supreme Court has just decided its constitutionality.]

In conclusion, as to contagious pleuro-pneumonia in the State, during the eight years that the State Board of Health has been in oversight thereof, the farmers and stockmen are to be congratulated that the disease, although frequently recurring, has never spread from the first centers of outbreak, and with the exception of Hudson county, has not become prevalent in any one locality. The expense of this care, including the payment for losses of cattle, and for veterinary inspectors, &c., has been less than \$2,000 per year. With those few exceptional cases that will always occur in enforcing such a law, there has been the most cordial understanding and co-operation between this Board and those concerned. While now the duties of the Board will be more those of correspondence, conference and of general oversight of the methods applied by the national officers, we shall hold ourselves in readiness to attend to any complaints, and to see to it that the best interests of our citizens are secured. The only advantage which will be gained by the new arrangement will be that the importation of disease into the State will be under control, as it can only be under interstate or national law. It has been the success of this oversight that the disease has been held in check, and is now practically confined to Hudson county, from which it can never be eradicated but by the active co-operation of New York. Arrangements have just been perfected for the quarantine of Hudson county, so that the disease may be driven from it.

The great additional need of the State is a law requiring the registry of all cattle, and the inspection of all dairies in cities. Until this is accomplished, cattle will be kept in ways injurious to their products and to the public health.

It seems to us that there is an imperative demand for some new legislation on the subject, but we leave this to the wisdom of our legislators, and to the decisions of the various Agricultural Boards. As to the various other diseases of animals, we shall continue to have such relation to them as the law allows. We believe that no department of our industries needs to be more guarded than that relating to the care of animals, and their protection, as far as possible, from sickness and from destructive plagues. This can only be accomplished by regarding the hygiene of animals as of great importance; by disseminating information among our farmers, and by securing the

aid of such veterinarians as have been really educated, and with this indispensable foundation have acquired skill, both in preventing and in treating diseases of animals. With the crowding of animals as well as of people into cities, animal diseases tend to increase and to spread. The best interests of agriculture and of stock-raising can only be secured by an intelligent appreciation of the necessities of all animal life, and by a proper restriction on all methods of keeping or of transportation that tends either to originate or propagate disease.

Recently the veterinarians of this State have attempted to secure a moderate law, which, while recognizing the right to practice veterinary medicine of all those already fully established, seeks to restrain others from using the signs and titles of a profession they have never studied or have never practiced by any authority. The law was opposed by some, and a majority was not secured for it. The following letter of Dr. Miller seems to us to state the merits of the case :

VETERINARY EXAMINATIONS.

“Assembly Bill No. 231 (I think is its number on the list) is a bill introduced by the ‘Veterinary Medical Association, of New Jersey,’ an association incorporated under the act of the Legislature chartering and incorporating educational, charitable and other societies—an association composed of regularly-graduated veterinary surgeons, and non-graduates as well. The latter by far outnumber the former in membership, but each of the latter, prior to admission to membership, passes a satisfactory examination before a board of five censors, the majority of which is composed of regular graduates. The candidates must present good evidence that they have been in actual continuous practice for a certain period in the locality in which they reside, and that they are of good moral character. If these questions are satisfactorily answered, and they pass the required examination, they are admitted as members; if not, they cannot obtain admission. This society has framed the above-mentioned bill, and proposes to use every honorable means to secure its passage. The bill does *not prohibit* any person *not a graduate* from practicing veterinary surgery. On the contrary, as before stated, it is introduced and urged more in the interest of non-graduates than against them. So far as regular graduates are concerned, the bill, if passed, will not benefit them one farthing financially. It will only elevate the character and standing of the veterinary science, and for this reason alone are we urging its passage.

“The bill is intended as much to benefit the general public as it is the profession, inasmuch as it will compel a registry of all graduates and non-graduates as well. It will prevent any person from assuming

the title of veterinary surgeon or doctor of veterinary surgery who is not legally entitled to said title. It will prevent every horse jockey, blacksmith, cow-leech, charlatan and quack who may get out of employment for a few days from hanging out a shingle or sign of 'Veterinary Surgeon,' and at once begin practice as skilled practitioners and medical experts, although, as at present admitted, many of them are scarcely able to read a medical book, and could not write an intelligent prescription to save their lives. Yet these men are allowed to advertise themselves as veterinarians, and the general public know not but what they are just what they claim themselves to be until after they have employed them to their own sorrow. Then the better-thinking and more sensible will truly say, 'these horse doctors are a miserable fraud.' The bill further provides that any man who has been in actual continuous practice in one locality for a period of five years may register as a practitioner of veterinary surgery and medicine, and continue to practice to his heart's content, although he may never have seen the inside of a college or university; but he must present satisfactory evidence to the County Clerk of his county as to his character and ability, from reputable citizens of his own township or city, certifying that his statements as to the above facts are true, before the County Clerk can make the registry. Therefore, if he is at all worthy or qualified to practice, there will be nothing to prevent him from doing so, so far as this bill is concerned. In reply to the statement made by 'Pro Bono' that horses and cattle are 'personal property,' and the owner has, therefore, the right to do as he pleases with them, and employ whomsoever he pleases to treat them, allow me to say that while this is true in a certain sense, it is equally untrue in another. If it were not so we would have no use for societies for the prevention of cruelty to animals, and I think almost every one will agree with me when I state that nearly one-half the so-called veterinarians in the country to-day ought to be the subjects for investigation and arrest from the agents of said societies, from their manner of administering medicines, &c. I respectfully contend that no horse or cattle-owner, because he owns his animal, has any legal or moral right to subject said animal to abuse or maltreatment simply because he can secure the services of men not qualified to treat them perhaps for less than he could the services of competent men.

"Nearly every other profession or calling in existence is protected by law from imposition and fraud. The medical fraternity have enactments that prohibit any one not a graduate from practicing. The druggist is protected by law, so likewise other professions. Why, then, should not the veterinary surgeon? Domesticated dumb animals cannot speak for themselves only through their dumb language, and tell you how much they suffer, nor can they enter protest when some fraudulent practitioner or miserable quack administers medicines (generally by force), the very nature of which increases rather than

relieves their suffering in most cases. The Veterinary Medical Association has introduced this bill to further the interest of veterinary science, and to try to secure to the citizens of this State a better class of practitioners, and not for any other purpose. If the citizens themselves, and stock-owners in particular, do not want to stand in their own light, they will assist us in trying to secure its passage. If they, on the other hand, feel that they always will wish to employ incompetent men, and be at the mercy of every quack, charlatan or imposter who chances to come along and solicit their patronage, at the expense of the sufferings and probably the lives of their animals, let them use their efforts for its defeat. The society will feel that it has done its duty in the matter, and will let the responsibility rest where it properly belongs.

“WM. B. E. MILLER.

“CAMDEN, February 15th.”

The reports of the veterinarians are herewith transmitted as a part of this report.

VETERINARY REPORT.

BY WM. B. E. MILLER, D.V.S.

In compliance with your request, I herewith transmit a report of the contagious diseases of animals that have come under my observation and inspection during the year ending December 31st, 1887.

CONTAGIOUS PLEURO-PNEUMONIA.

At the close of the year 1886, this disease was located in a few herds in the counties of Burlington, Camden, Gloucester, Hudson, Salem and Union, and all were held in strict quarantine, under the provisions of the law relating to the same. The infected animals were slaughtered whenever they were discovered, and in most instances the healthy ones were inoculated to prevent them from infection. In most cases the loss to the State from the slaughtering of cattle was comparatively slight. In one case, however, that of Stacy P. Taylor, of Burlington county, the rate of mortality was great, resulting finally in the destruction of the entire herd.

During the past summer the disease also broke out in Middlesex county, in the vicinity of New Brunswick and South River, and several herds became infected, which were slaughtered by the agents of the United States Bureau of Animal Industry, who were at that time and have since had charge of the work of the investigation and elimination of this disease. At the present time, so far as I am aware, there are no quarantined herds in either Burlington, Camden, Gloucester or Salem counties, and although there may be a few chronic recovered cases still left in some of the herds that were infected and quarantined, the southwestern section of the State is practically free from the disease.

TUBERCULOSIS.

This disease, unlike contagious pleuro-pneumonia, has largely increased, and I very much question if there is any part of the State

at this time in which cases cannot be found. I certainly think it demands the attention of your Board in some more definite manner than ever before. There should at least be something done to prevent the further spread, if not to slaughter the diseased animals.

SPLENIC FEVER, OR ANTHRAX.

Splenic fever in cattle has been quite prevalent during the past year, and I have investigated outbreaks, and made post-mortem examinations of many cases located in Atlantic, Burlington, Camden, Gloucester, Mercer, Middlesex, Monmouth, Ocean, Salem and Somerset counties, and have heard of cases that I did not see, in other counties in the State. In most instances the disease was confined to one or two herds in each locality where it appeared; in one outbreak, however, several herds located near each other suffered losses from the same cause.

ABORTION IN COWS.

I have very frequently been consulted during the last few months concerning this affection, and from what I have been informed, am convinced that it has been the cause of very serious loss to many of the farmers and dairymen in this section of the State.

One gentleman told me a few days ago that he had lost eight calves during the past month, and another stated that he had lost five during the same time, and that four of the five cows that had recently aborted, did the same thing last year. Of course I advised him to stop breeding those animals and turn them into beef as soon as possible and fill their places with others more suitable for the purposes for which he kept his cows.

SWINE PLAGUE.

Swine plague has been quite prevalent in some sections of the State, and as usual has been exceedingly fatal in most places. It seems to me, after all that has been written and published concerning this affection of swine, and from the circulars that have been from time to time sent out by your Board relating to the same, that if the farmers and swine breeders would take the advice, and exercise greater care, much of the loss resulting from the disease might be avoided, and probably in some instances the disease could be prevented.

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GLANDERS IN HORSES.

Many cases of this disease have come under my immediate inspection during the year, and in nearly every instance they were brought from other States or infected by animals that were thus brought, to which they had been exposed. Early in the beginning of the year a band of Gypsies encamped in the outskirts of Camden for several days, having come from Pennsylvania. They had with them quite a number of horses for sale or exchange, and while located as above stated, made several exchanges of their stock. Nearly all of the horses they had must have been diseased at the time, as was afterwards demonstrated. My attention having been called to the matter, I made an investigation, and was not only obliged to slaughter several of the original Gypsy stock, but others as well, which became affected through contact with and exposure to them. One case was traced to the extreme southern end of the county, and another to Burlington county, both of which had passed through the hands of the Gypsies, who, when they found their victims suffering from their carelessness or ignorance, or, perhaps, from their willful intentions, quickly pulled up their tents and left for Pennsylvania again, taking their animals that remained with them.

Isolated cases have also been found and destroyed in several other counties in this end of the State, nearly all of which, as stated above, were diseased when purchased either from droves that were brought from the West, or from the stock-yards of Philadelphia, where they had been collected from western droves.

CEREBRO-SPINAL MENINGITIS.

During the month of August, a disease made its appearance among horses in the vicinity of Port Republic and Absecon, Atlantic county, and in the course of a few hours several died and others sickened with similar symptoms, and lived but a short time; the affection in nearly every instance being fatal. On investigation, I found the disease to be identical in every case, and in less than a week it had extended over a section of country nearly twenty miles in length, and nearly ten miles in breadth, and was spreading rapidly, which it continued to do for nearly one month. Following along that section of

the State lying immediately adjacent to the coast, and the lowlands along the same, it reached into and across the entire borders of Atlantic and Burlington, and over large portions of Cape May and Ocean counties. In fact, nearly the whole of that immediate section of the State within a distance of ten miles of the coast, was visited by the disease. It was more fatal immediately along the low, marshy lands than it was a few miles back into the country districts, and when animals were infected in that immediate locality, the disease carried them off much more quickly than when they were taken further away from the vicinity of the water section. A careful study of the symptoms of the affected animals, positively similar in nearly every case, soon convinced me that the outbreak was that of epizootic cerebro-spinal meningitis.

In many cases there were no premonitory symptoms whatever. The animal would be working in harness, apparently as well as ever, when he would suddenly develop a loss of motor power, principally in the hind extremities, accompanied with nervous twitchings of the ears or jerking movement of the head, and at the same time exhibit a desire to lean against or upon any object within his reach, or upon the pole of the wagon, if in harness, and soon fall to the ground when no longer able to control his actions. About this time the eyes assume a wild, watery appearance, struggling begins and all the symptoms which betoken nervous and cerebral trouble become aggravated. Soon the control of the posterior extremities is lost entirely, muscular contractions and convulsions become well marked, and the animal dies during one of the convulsions or during the semi-conscious state following immediately thereafter.

On post-mortem examinations made on quite a number of cases, the lesions were invariably identical, the brain and spinal cord in each instance being the seat of affection. The spinal cord in the lumbar region was invariably softened in its substance and the membranes highly injected, and in one or two blood clots had formed between the membranes and the substance of the cord. The membranes of the brain also presented similar symptoms in all the cases that I saw and examined, and I am credibly informed by Dr. A. T. Sellers, a respectable graduated veterinarian, who also made a large number of post-mortem examinations in the several infected districts, that the same conditions existed in every case he saw. From personal visitations to nearly all the localities made by Dr. A. T. Sel-

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lers, who spent nearly two weeks in investigating and studying the disease, and from positive information received by letters from the postmasters and others in nearly every town in the infected district, together with information and facts obtained in person, I have positive proof that the number of animals that died of the disease in a period of about two months, was from three hundred and fifty to four hundred head. I would also mention as one of the facts connected with this outbreak, that so far as I know, or could positively ascertain, but two mules in all were of this number, although there were many of the mixed-bred animals owned in the infected district, and necessarily exposed to the same causes which produced it in the horses. During the outbreak, and often since, I have been asked the question, "What do you consider the cause?" After thorough investigation, and a careful study of the surroundings, I arrived at the following conclusions, namely: Whatever produced the disease in one animal produced it in all, and must be due to a specific poison entering into the system in sufficient quantities to thoroughly poison the system, acting principally on the nerve centers. The first animals to develop the disease and die from it were a lot of colts and young horses that were running to pasture on one of the salt marshes and the lowlands adjoining. They had been kept there during the entire season, covering a period of from three to five months prior to sickness, and had been in perfect health up to that time. It will be remembered that during this time there had been an unusual amount of rainfall, and the growth of vegetation all through this section of the country was more luxuriant than usual in consequence. Many of the farmers had mown their salt meadows, and the crop of grass, or salt hay, was, in very many instances, still upon the meadows. The heavy rains came, causing high tides and overflowing streams, which ran over the meadows, carrying the hay crop and other vegetable matter with it until it was deposited in large quantities along the shores of the streams and on the borders of the meadows. After the tides had gone down, and the overflowing streams had resumed their normal condition, this large amount of vegetable material, thoroughly water-soaked, was left beside the embankments and along the shores, in many instances animal matter, such as dead fish, &c., being mixed up with the vegetable deposit, and the whole mass left to decay and contaminate the atmosphere. The animals running to pasture were in some cases compelled to drink

water from streams along the banks of which the decaying matter lay, and through which some portion of the water at least was filtered. That the atmosphere was poisoned and the water polluted in the manner I have suggested, I have no reason to doubt, and I might add further, that there was in that immediate vicinity a perceptible smell, peculiar to decaying matter, all along the section where the disease originated, which the animals, constantly exposed to, were compelled to inhale all the time, and which, in my opinion, if it did not produce the disease in fact, was certainly an accelerating element in its development.

In support of my theory come reports from other sections of the country where the same state of affairs existed. In the State of Delaware, along the borders of the Delaware river and the streams emptying therein, there was also the same state of affairs, and the people in that locality lost a large number of animals from disease, the symptoms of which I have heard described as identical with those affecting the horses of the southwestern section of our State. Another important point, which I will refer to, is that when I advised the removal of the animals not already affected from the low, marshy lands to the country districts some miles distant, many such escaped the disease entirely, and some that were affected had it in a milder form and recovered, while those left exposed to the influences above-mentioned nearly all died. There was scarcely an exception to this rule. Again, animals that were brought from the unexposed country districts and kept a short time in the infected coast district, took the disease, and in nearly every case died, and that quite speedily. All of these evidences help to strengthen my opinion as to the local character of the outbreak and the causes for the development of the same.

There have been a few isolated cases, outside the infected district, both at the time of the outbreak and since, but as a rule the disease ran its course, and ended with the beginning of the winter season, when the weather grew colder.

With the exception of the outbreak above referred to, and a few cases of influenza such as we often have from exposure, the general health of the horses in the southwestern part of the State has been good during the year.

VETERINARY REPORT.

BY J. W. HAWK, D.V.S., NEWARK.

I submit the following report of the services rendered by me for the year 1887:

January 12th. Revisited a herd of cattle belonging to Mr. G. B. Pease, Verona, and released the herd.

February 5th. Visited a herd of cattle belonging to Mr. Job Winans, Linden, and found them affected with bronchial trouble.

March 29th. On this date, Mr. Winans called me to inspect his cattle, as one cow had died. I held a post mortem and found it to be affected with pleuro-pneumonia. His herd at this time consisted of twenty-seven cows. I also found four other cows affected. He had lost one cow a short time previous.

April 2d. Revisited Mr. Winans' herd, but found no new cases.

April 4th. I visited, in company with Dr. Rowland, the herd of cattle numbering eight cows, belonging to Thomas Carney, Jersey City Heights, and found some of the cattle affected with pleuro-pneumonia. Two cows were appraised and slaughtered.

April 9th. Revisited the herd of Thomas Carney, Jersey City Heights.

April 13th. Revisited Mr. Job Winans' herd, Linden, and quarantined it.

April 17th. I ordered slaughtered one cow belonging to John Miller, Newark; found her diseased with bronchial pneumonia.

April 24th. Revisited Mr. Job Winans' herd.

May 3d. I again visited Mr. Winans' herd and ordered one cow slaughtered which was affected.

May 10th and 17th. I made other inspections of Mr. Winans' herd.

May 21st. I visited a herd of cattle belonging to Mr. McCandless, at Elizabeth, and found some of the cattle suffering from tuberculosis.

June 29th. I visited the farm of Mr. E. Shepherd, Bound Brook ; found a cow there suffering with tuberculosis.

October 11th. Visited a herd of cattle belonging to Mr. Blanké, Linden. The herd showed symptoms of poison.

October 27th. Having received orders from the State Board of Health, Trenton, to inspect the stable in the rear of 81 Belleville avenue, Newark, for a supposed case of glanders, I did so, but could find no such case in the neighborhood.

VETERINARY REPORT.

BY WM. HERBERT LOWE, D.V.S.

PATERSON, N. J., December 31st, 1887.

Dr. Ezra M. Hunt, Secretary State Board of Health, Trenton, N. J.:

SIR—In compliance with your request for my report for the year 1887, I have the honor to submit the following:

More than three years have elapsed since I was appointed by your Board. The principal diseases that I have investigated in behalf of the State, are bovine tuberculosis, contagious pleuro-pneumonia, actinomykosis bovis, plumbism, hog cholera, rabies, glanders and equine influenza.

I am able to state that there is not a case of contagious pleuro-pneumonia in Passaic county, and very few cases in the surrounding counties of Essex, Morris and Bergen, at the present time. But New Jersey is one of the States that is so situated that she will never get the disease entirely stamped out without the assistance of the national government. Much has been accomplished, however, largely due to the indefatigable efforts of the chief executive officer of the State Board of Health, who has had oversight of the contagious diseases of animals in this State, but it will only be with the co-operation of the general government that this disease will be annihilated.

It is unfortunate that this exotic plague was named from the local manifestations of the disease. The name pleuro-pneumonia has led to misconception, in many instances, as to the true *nature* of the disease. Stockmen are apt to look upon the disease as a lung trouble, when, in reality, the lung lesions are only the local manifestations of it. The Veterinary Inspector, not infrequently, is unable to get the owner to understand that contagious pleuro-pneumonia is a general disease—a blood disease due to a specific germ or microbe not yet fully understood. Misconceptions as to the *nature* of the disease are entertained by intelligent as well as by ignorant men, simply because from

the name they think it must be a *local* disease. The uncertainty as to the length of the period of incubation is also apt to mislead many practical men. Although one attack is considered to grant immunity from another, yet stockmen should know that if the divesting membrane of the encysted mass of the lung tissue is not perfect, there is danger from such animals ever afterwards, and therefore they should be destroyed.

While pleuro-pneumonia is an insidious disease peculiar to bovines, and is the cause of immense loss of property to stockmen, yet it is never congenital or hereditary, and has never been known to have been transmitted to the human subject, as is the case with bovine tuberculosis.

Bovine tuberculosis may be found in almost every county in the State, and yet nothing, absolutely nothing, is being done to eradicate the disease which we ourselves are liable to contract. It is time to consider what legislation there has been on the subject, and what legislation there ought to be in regard to the eradication of bovine tuberculosis.

Equine glanders is another disease that is communicable to man by inoculation. It is a disease that is met with in most of our large cities, and which often calls for no little amount of skill to differentiate from allied diseases which are not communicable from horse to horse and from horse to man. It seems to me that it is a mistake to legislate in regard to any particular contagious disease, as has been the case with pleuro-pneumonia, when there are other contagious diseases that are equally as dangerous, if not in one sense in another.

I will pass over the subject of canine rabies, as I believe there is great exaggeration in the statements in regard to the disease.

In June, 1885, much anxiety existed among the people of Passaic on account of a supposed contagious disease among the cows of that city. My investigation led to the diagnosis of plumbism. For a full account of the sickness the reader is referred to my report in the transactions of the State Board of Agriculture for the year 1885.

An account of a case of bovine actinomykosis, which occurred in Morris county, will also be found in the same report. This is an infectious disease of animals and mankind, and although cases occur rarely in this country, yet some attention should be given to the subject by veterinary inspection.

Hog cholera is a disease that breaks out every year, and is the cause of much loss to farmers.

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Last fall an equine epidemic was reported from various parts of the State. It was variously diagnosed as spinal meningitis, typhoid influenza, carbo-hæminia, &c., by the different veterinarians who witnessed it. But, like everything of the kind, statements were exaggerated in regard to the outbreak. There had been a wet spell, followed by excessively hot weather, giving rise to vegetable decomposition in the lowlands. I looked upon the outbreak as due to miasmatic influences, caused by the excessive vegetable decomposition.

There are several diseases that are not classified with the contagious ones, such as epizootic, abortion and parturient apoplexy in cows, which farmers should be made acquainted with, especially as regards prevention.

VETERINARY REPORT.

BY A. S. LEATHERMAN, CLINTON, N. J.

I enclose you a short report. The year 1887 has been a busy year for vets. in Hunterdon county, N. J., although no new diseases have come to my notice. Among horses laryngitis has prevailed extensively, and in some cases where the animals were not properly clothed or blanketed, purpura hæmorrhagica would follow after the patient had nearly or entirely recovered. I have had at least five cases of that character, three of which recovered and two died. Typhoid influenza has prevailed in my neighborhood, mostly traced to shipments of western horses, and quite frequently complicated with pneumonia, or, as it might be termed, typhoid pneumonia. The new disease which caused quite a sensation in the vicinity of Newark and some parts of New York City, I find to be the old, original cerebro-spinal meningitis, successful treatment depending upon the character of disease, whether the attack is of mild character or of an explosive or rapid form. At all events I think there should be no difficulty in diagnosing the disease. Early treatment and use of swing when the cases are of mild form, helps them to recover. Pleurisy, pneumonia, quinsy sore throat, spasmodic and flatulent colic, have prevailed to some extent. There is a kind of colic among horses, especially during the winter season, among the farming districts, due perhaps in many cases to improper food. I would call it paralysis of the small intestines. Consequently, colicky pains follow at intervals. The patient may eat and soon after show signs of distress. The attack may last three or four days, but usually in forty-eight hours there should be some relief. If properly treated they usually recover, although if early treatment is neglected the attack sometimes proves fatal. I have had no cases of contagious or malignant pneumonia among herds. No Texas fever as in previous years, and only two or three cases of abortions in dairy cows. Among

sheep have had some food-rot or hoof-ail. Isolate and treat after thoroughly paring and cleansing feet. Have had no braxy, as in former years, at this period of writing. I have seen a good many cases of hog cholera in Warren county and Hunterdon county.

REPORTS
OF
County Boards of Agriculture.

ATLANTIC COUNTY.

ATLANTIC COUNTY BOARD OF AGRICULTURE.

OFFICERS FOR THE YEAR 1888.

<i>President</i>	PHILIP STEIGAUF.....	Egg Harbor City.
<i>Secretary</i>	HERMANN TRISCH.....	Egg Harbor City.
<i>Treasurer</i>	WILLIAM BEHNS.....	Egg Harbor City.
<i>Delegates</i>	{ CHARLES KRAUS, HERMANN TRISCH, }	Egg Harbor City.

BOARD OF DIRECTORS.

LOUIS YOUNG.....	Egg Harbor City.
CHARLES KRAUS	Egg Harbor City.
FRED. FIEDLER.....	Egg Harbor City.
PHILIP BERGMANN.....	Egg Harbor City.
J. J. KRAEMER	Egg Harbor City.

ANNUAL REPORT.

BY H. TRISCH.

The annual meeting of this Board was held December 3d, at Egg Harbor City.

After reading the reports returned by the few recipients of circulars who had taken sufficient interest to answer them, the members present made up the deficiency by their personal reports.

Like my predecessor, Mr. Hoffman, I must make complaint that but very few of the many to whom I sent the circulars of the State Board have returned them with answers; and I am able to tender my thanks only to Captain Charles D. Saalmann, of Mullica township; Hermann Henschel and Hermann Keyser, of Galloway township.

A majority of the Egg Harbor City Agricultural Society have joined the Atlantic County Board of Agriculture, which shows that

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the interest in the organization has increased. Our membership is now over one hundred.

As the remarks of the former Secretary, in his report of last year, in regard to general character, soil and industries of Atlantic county, still hold good, I shall not repeat them here.

Besides the annual meeting in December, we hold three regular meetings, viz., the second Friday in the months of March, June and September.

ANSWERS TO QUESTIONS CONTAINED IN CIRCULAR.

First. There are twenty persons engaged in the retail milk trade in Mullica township, fifty in Galloway township, and twenty-one in Egg Harbor City.

Second. We are satisfied with the present milk law.

Third. In Mullica township farms are rated for taxation at an average of \$20 per acre; in Galloway township, from \$15 to \$20 per acre.

Fourth. The rate of tax on real estate in Mullica township is \$2.01 per \$100; in Galloway township, \$1.62 per \$100; and in Egg Harbor City, \$1.90 per \$100.

Fifth. Five hundred dollars were raised this year in Mullica township for working the roads, \$1,200 in Galloway township, and \$800 in Egg Harbor City.

Sixth. In both townships, twenty-acre farms sell for from \$800 to \$12,000 each.

The raising of horses is rather on the decrease in the two townships, and in Egg Harbor City.

Of diseases, we had about twelve cases of cerebro-spinal meningitis, resulting fatally.

Mules are not generally used, and their number has not been increased during the year.

Cows are rather increasing in number; sheep on the decrease; swine increasing in Mullica township, and decreasing in Galloway township and Egg Harbor City.

Poultry-raising is on the increase, having doubled within a few years, but only a few farmers give particular attention to purity of breeds.

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The domestic animals are generally in good condition.

No swine have been lost by cholera.

Only two breeds of cows are raised, the Jerseys and natives.

In his remarks, Captain Saalmann, of Mullica, says: "The agricultural and horticultural prospects in our township are very good; the only drawback is that our lands are assessed too high, in comparison with those of other townships and cities, and therefore emigration will turn back from our borders."

The grape rot has made sad havoc in our vineyards during the past two years, and we only had a half crop, which was all made into wine. We have within our borders the best soil in Atlantic county, and the clover and grasses yield enormously.

The blight attacked the pear and apple trees in the southern part of the township.

The cranberry is one of the staple products of this township.

Nearly all this may be reported of Galloway township and Egg Harbor City.

The grape crop was so light that a number of growers had to buy grapes from New York and Ohio, in order to make their usual quantity of wine.

Besides the crops reported on, there is a great variety of vegetables raised by farmers in Galloway township, who have a ready and convenient market for their sale at Atlantic City.

During the past season we shipped from our two railroad stations at Egg Harbor City fifty-six thousand eight hundred and sixty-four crates of strawberries, nearly fifty thousand crates of blackberries, eleven thousand quarts of raspberries, two hundred and fifty thousand quarts of huckleberries, two thousand pounds of grapes, four hundred and sixty baskets (half bushel) of apples and pears, seventy-three thousand pounds of tomatoes, of which seventy thousand pounds were used by the Egg Harbor City Canning Factory, three hundred and fifty-three barrels of sweet potatoes, fifty-five barrels of turnips, one hundred and fifty-eight barrels of white potatoes, one hundred and forty-seven baskets of peaches, fifty barrels of green corn, and up to date nearly seven hundred barrels of cranberries.

CROP STATISTICS.

CROP.	PER CENT.	SELLING PRICE.	DATE.
Wheat.....	.95	per bu., \$0.90	July 10.
Corn.....	.75	" " .55	Sept. 1.
Rye.....	.95	" " .80	Aug. 15.
Hay.....	1.20	" ton, 18.00	Nov. 14.
Potatoes.....	1.30	" bbl., 2.25	Oct. 12.
Sweet potatoes.....	1.10	" " 2.25	Nov. 21.
Peaches.....	1.00	" basket, .65	Aug. 15.
Apples.....	.50	" bbl., 3.60	Nov. 8.
Pears.....	.38	" " 3.75	Oct. 12.
Grapes.....	.35 to .50	" lb, .03½	Oct. 4.
Blackberries.....	.70 to 1.00	" qt., .08 to .09	July, Sept.
Raspberries.....	.80 to 1.00	" " .10 to .12	June to 10.
Strawberries.....	1.00	" " .07 to .08	June, July.

The statistics of temperature, furnished by Mr. Henri Postma, Signal Service Observer of Egg Harbor City, are given below :

NEW JERSEY STATE WEATHER SERVICE.

ANNUAL METEOROLOGICAL SUMMARY OF STATION AT EGG HARBOR CITY, N. J.

SIGNED BY HENRI POSTMA, OBSERVER.

MONTHS.	TEMPERATURE.							PRECIPITATION.		
	Monthly mean.	Monthly range.	Date.	Min.	Date.	Greatest daily range.	Date.	Total amount.	Greatest daily.	Date.
1886.										
December.....	30.66	62.0	24	8.0	17	34.5	9	3.39	0.77	12
1887.										
January.....	31.28	67.3	23	3.5	4	31.0	28	2.28	0.58	29
February.....	36.86	68.7	11	10.5	14	32.1	10	4.73	1.47	26
March.....	35.19	61.1	2	8.5	5	38.9	2	3.33	1.18	26
April.....	46.52	83.5	11	24.9	6	33.4	11	3.77	1.52	18
May.....	61.73	89.5	11	40.8	15	40.7	11	1.04	0.46	8
June.....	67.46	92.3	17	44.5	13	39.6	13	5.54	2.54	23
July.....	77.29	100.2	17	61.4	15	33.3	16	4.59	2.10	24
August.....	69.66	91.0	12	46.3	27	29.4	10	2.60	0.82	23
September.....	61.37	84.6	7	36.2	26	38.0	9	5.70	2.95	12
October.....	53.01	87.0	8	23.8	13	39.4	16	3.78	2.22	21
November.....	41.41	71.0	27	18.8	30	34.0	3	2.60	1.07	1
Sums.....	612.44	958.2	170	327.2	185	423.3	138	43.35	17.68	223
Means.....	51.36	79.85	15.1	27.26	15.4	35.27	11.5	3.61	1.47	1.86

REMARKS.—First light frost, October 13th. First killing frost, October 15th.

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EGG HARBOR CITY AGRICULTURAL SOCIETY.

(Organized March 23d, 1859.)

OFFICERS FOR 1888.

<i>President</i>	CHARLES KRAUS.
<i>Vice President</i>	FRANK HARR.
<i>Secretary</i>	HERMANN TRISCH.
<i>Treasurer</i>	WILLIAM BEHNS.
<i>Librarian</i>	LOUIS YOUNG.

BOARD OF DIRECTORS.

JOHN C. BAAKE,

FRED. FIEDLER,

LOUIS KLEINOW.

At present the Society has a membership of one hundred and eighteen—twenty-nine more than last year.

The annual fair will be held at Egg Harbor City in the third or fourth week in September.

The increase in membership proves that the interest taken in the proceedings and actions of the Society has not abated.

Our regular meetings are held twice each month. Topics of general interest, in connection with agriculture and horticulture, are discussed, or some good article is read from one of our periodicals.

The Society takes three agricultural and horticultural papers, one for mechanics and machinists, and one family paper; and our library contains over one hundred interesting and valuable books.

Our annual fair was not a success, owing to the great Centennial Celebration in Philadelphia, which kept away a great many of our visitors. The weather was also very unfavorable. However, the Society netted enough to pay off \$250 of its indebtedness, and hopes to become entirely free next year. Although some crops proved to be very light, especially apples, pears and grapes, there were very fine displays of these fruits, also of vegetables and grains.

The Society is about to purchase one hundred acres of land, partly for a race course, and we hope to show more progress in the near future.

BURLINGTON COUNTY.

BURLINGTON COUNTY BOARD OF AGRICULTURE.

OFFICERS FOR THE YEAR 1888.

<i>President</i>	DAVID T. HAINES	Medford.
<i>Vice President</i>	CHARLES COLLINS.....	Fellowship.
<i>Secretary</i>	HENRY I. BUDD.....	Mount Holly.
<i>Treasurer</i>	ROBERT TAYLOR	Columbus.

BOARD OF DIRECTORS.

HENRY J. IRICK, Burlington County Agricultural Society, P. O., Vincenttown.
JOSHUA R. EVANS, Mount Laurel Farmers' Club, P. O., Masonville.
CHARLES R. VANSIVER, Coopertown Progressive Farmers' Club, P. O., Beverly.
GEORGE L. GILLINGHAM, Pomona Grange, P. O., Moorestown.
JOE BRADDOCK, Medford Grange, P. O., Medford.
JAMES LIPPINCOTT, Mount Holly Grange, P. O., Mount Holly.
HENRY TAYLOR, Columbus Grange, P. O., Columbus.
ALFRED SATTERTHWAIT, Crosswicks Grange, P. O., Crosswicks.
JOSHUA FORSYTH, Pemberton Grange, P. O., Pemberton.
URIAH BORTON, Rancocas Grange, P. O., Rancocas.
EDMUND COOK, Edgewood Grange, P. O., Burlington.
B. F. HOLLINGSHEAD, Moorestown Grange, P. O., Hartford.
THEODORE POPE, Delegate at Large, P. O., Mount Holly.

DELEGATES FOR STATE BOARD.

For two years ALFRED SATTERTHWAIT.....Crosswicks, N. J.
For one year.....JOSHUA FORSYTH.....Pemberton, N. J.

MEETINGS.

The regular meetings of the Board are held at Mount Holly, on the second Saturdays of August and December, at ten o'clock A. M.

Fifth Annual Report to the New Jersey State Board of Agriculture, January 24th, 25th and 26th, 1888.

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ANNUAL REPORT.

BY HENRY I. BUDD.

The meetings of the Board have been attended with more than usual interest. At the August meeting the subject of grappling with wild carrot and broad-leaf plantain and other weeds provoked most earnest discussion, all agreeing that unless some radical measures could be adopted for their extermination, thousands of acres of the best grass lands would be usurped. No amount of farming avails to eradicate them. Dr. Hunt gave us some very instructive lessons upon the relation of household wastes to the health of farms and communities. Dr. W. B. E. Miller enlightened us upon the diseases of animals and their extermination, all of which brought out a good deal of discussion.

The necessity of investigating the insect plagues so destructive to crops of all kinds; the encouragement of the natural enemies of these pests, in order that the pests themselves may be destroyed, also engaged the attention of this meeting.

At the December meeting the following subjects were discussed :

Why should farmers furnish milk to dealers by dry measure ?

Can we not save thousands of dollars annually by a better system of disposing of our milk ?

The unjust provisions of our present milk law and how they should be amended.

The cause and remedy for the present depression in the price of farms.

Is there any profit in raising corn and rye at 50 cents, and wheat at 80 cents per bushel ?

What should we raise to overcome the competition of western crops ?

Does the increase of wages, caused by protection, benefit farmers ?

The prices of farm products are twenty-five to fifty per cent. lower than previous to 1880; the price of factory labor is twenty-five to fifty per cent. higher than farm labor, consequently the farmers' sons and best labor are leaving the farms. What shall we do to bring them back ?

Diseases of animals and remedies, fruit and vegetable pests and best means of extermination.

These subjects called out much discussion.

Horace Lippincott read an able paper showing the progress of association and co-operation among milk producers; how at last after several failures they had succeeded in perfecting an organization by which they had been enabled to keep the price of their milk $\frac{1}{2}$ a cent per quart above the general price on the same delivery platform. The United Dairymen's Co-operative Association, organized July, 1885, is composed of a President, Vice President, Secretary and Treasurer and twelve Directors, who meet monthly and set the price of milk for the following month. We are working under a charter, and every member who sells his milk below the price set by the association is fined accordingly. If it be $\frac{1}{2}$ cent per quart his fine is for that amount for the whole time he sells, making him realize 1 cent per quart less than the association price. Since establishing our agency we have been enabled to keep the price of our ten thousand quarts daily $\frac{1}{2}$ a cent per quart above the fifty to sixty thousand quarts of others outside, whose milk was delivered on the same platform. And although the Milk Exchange has done all in its power to break us down, we are gradually increasing in numbers and strength, and have sold during the past year three million twelve thousand eight hundred and thirty-four quarts, and have collected \$114,112.01, \$8,929.54 more than the dealers paid for the same proportion of milk on the same platform.

Our association, having demonstrated to you the feasibility and profit of co-operation, why will you not organize under a protective charter, establish an agent in Camden, and thus maintain for yourselves a uniform and remunerative price the whole year round?

George Abbott, Jr., read an earnest paper upon the iniquities and injustice of the present milk law, and suggested the following amendments:

First. That skimmed-milk vessels be marked with a detachable metal tag of reasonable dimensions, and that it be lawful to sell skimmed milk as such throughout the State.

Second. That no standard of solids be used for milk, but that publication be made of the results of inspection and analysis.

Third. That milk be sampled in the presence of the owner, his employe or agent.

Fourth. That samples be sealed in three portions, and one then be

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handed to the owner of the milk, his agent or employe; one be forwarded to the State Experiment Station, to be subsequently analyzed in case of dispute, and one be retained by the Inspector.

Fifth. That in prosecutions for the adulterations of milk, the testimony of professional hired witnesses shall be excluded.

Sixth. That section 8 of said act be absolutely repealed.

The result of this discussion was the appointment of a committee, in conjunction with a like committee from Camden Board, to digest and suggest amendments that will protect alike the producers, dealers and consumers, and offer same for the consideration of the State Board of Agriculture.

The committee, after due deliberation, recommended said Board to secure during the present session of the Legislature an amendment to the present law, so it will read "knowingly or willfully offering for sale milk below the lawful standard."

David Rulon, of Crosswicks Grange, read an interesting paper upon "The Causes for the Depression in the Price of Farms."

First. The marvelous development of the Great West through land subsidies to railroads and their consequent rapid construction. They in turn had thrown open to settlement hundreds of millions of acres of virgin soil, to cultivate which they had brought like cattle from the crowded centers of the old world, at much lower freight rates, the hardy sons of toil, who, living with scarcely more than the comforts of animals, have extracted wheat, corn and other staples from these broad acres at merely nominal cost. While competing corporations, called into existence by a generous government and liberal loaning of eastern savings, have carried the same at such low rates of freight that eastern farmers are met with prices that prevent them tilling their land to a profit. The consequence is that every day the Sheriff's hammer falls with a sickening thud as their time-honored firesides are transferred to only those who are forced to take them for money loaned when the price of land was considered impregnable at double the amount it will now bring. Corporate rapacity, organized anarchy, a corrupted franchise, intemperance, disproportion between rewards of physical and professional labor, unjust rating of farms for taxation, high percentage of taxes, all tend to depress the price of farms, and should be rapidly corrected, or Jersey farmers will soon lose their goodly heritage.

Alfred Satterthwaite said farmers had plenty of money up to 1873.

Since then the reverse has been the case ; farmers have been steadily losing money, both in the workings of and the depreciation of their land.

While agriculture should be the most remunerative, it had become the most unprofitable ; causes—contraction of the currency and adverse legislation. The tariff and financial policy of the government is largely responsible. He thought farmers should be better represented in Congress.

Chas. Collins said the farmers in his section were fairly prosperous ; no depreciation in the value of land.

David T. Haines accounted for that by their living nearer Philadelphia. They found a market for their produce without the interposition of freight charges or middlemen. Farmers should combine and co-operate for better prices, the same as they do in other business, form syndicates and boards of trade and trusts ; brains should govern muscle.

W. R. Lippincott believed a revision of the tariff would give the farmer an equal chance with the manufacturer. The repeal of the duty on many articles of raw material would enable the manufacturer to command the markets of the world, and thus insure more steady running of the factories, and consequently more regular employment of the operatives. He approved of paying high wages for labor, as the workmen and families were always the most liberal buyers and best consumers of farmers' produce.

And this brings us to our comment on the reports received of the condition and progress of agriculture in the twenty-seven townships that compose our county. This report cannot be made as flattering as could be desired. There has been for several years a tendency to lower and still lower prices for the products of the farm, while the cost of producing has been gradually increasing until there is no margin of profit in those articles that have mostly engaged the attention of delvers in the soil. This tendency is having its legitimate result by creating a spirit of unrest among our farmers. Hundreds of farms are offered for sale and rent without takers, and mostly when the sales have been consummated the mortgagees were the buyers at one-half the price the farms were considered safe at before the war affected the standard of values.

Elegant farms, that were once considered cheap at from \$90 to

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\$125 per acre, sell from \$30 to \$70, while many are offered without receiving a bid.

Rents have a corresponding range of value, and tenants entering into engagements do not in the majority of cases pretend to fulfill them. People who have money will no longer invest in farms. From being the only realty, land is coming to be considered no longer such ; but those investments which formerly were not classed among the real securities are now in the shape of corporate bonds and stocks finding ready takers, until the billions of the country are principally absorbed for railroad, manufacturing and speculative purposes.

To this statement there are some exceptions. Lands near towns and cities that have present or prospective value for building lots, or where near enough for the owners to raise a variety of perishable articles and convey them fresh to fixed customers, getting full retail prices, thus saving the commissions and cost of transportation, are still commanding a good price. The reasons for these conditions are many. The higher prices of factory, mechanical and professional labor are drawing all our best, both male and female, to employments that are lighter and more remunerative, consequently the farmers, neither in doors nor out, can command the intelligent and skillful, but only those discarded by other factors, and freshly-imported foreigners, and these latter only long enough to learn the ways of their more intelligent American co-laborers.

† The education of our sons and daughters, through the colleges and common school systems, is learning them that the world yields greater rewards to tillers of the brain than delvers in the soil ; consequently they will never, unless forced by necessity, again engage in the drudgery of the farm or household.

As pertinent to the above remarks one correspondent writes: The condition of the farmers, I think, as a whole, is worse than known in the present generation and there does not seem to be any better prospect. All that a farmer has to sell brings extremely low prices and labor is very high and unsatisfactory. Take for instance at the present time a farmer with one hundred acres of land produces one hundred quarts of milk per day, which nets him \$3.50. He has his interest on his capital, risks, &c., feed, hire and his own labor, while if he hires a mechanic for a day, he has, in most cases, to pay him as much as the whole proceeds of his farm. Now, I would like to know why so much difference in the pay of the man that makes the spade

and hoe and the man that uses them, and until there is a solution of that question and more equal distribution of profit, the raising of larger crops is a secondary consideration.

Another writes: It is impossible with present prices to pay legal interest; when produce was three times the present price the rate of interest was only one per cent. higher.

The markets for the staple products of the country have been for years overcrowded on account of the immense area in this and other countries having been rapidly thrown open to cultivation, which through cheap labor in India and abundance of machinery in this, added to cheap transportation, has flooded markets with products at much lower rates than Jersey farmers are able to grow them. The truth of this last assertion has this year been strongly illustrated. Disease, drouth and insects spread over a large part of our western country, insects and excessive moisture over this, thus lessening the production of many articles that came in competition with our farmers; the result has been, where our people happened to raise a large crop of the deficient articles, the prices obtained have been largely remunerative. This pertains to cabbage, tomatoes, boiling corn and even fruits and some forms of dairy products.

Many of our farmers insist that as it is impossible to protect farmers from pauper labor, we having to sell our products in competition with the ryot labor of India, three pence per day, we should be enabled to buy what we consume at the lowest possible price of production; and this result they maintain can only be accomplished by a modification of the tariff, admitting free of duty raw material and all articles that are largely consumed but greatly enhanced by the tariff. In short, if we are forced to sell low we must buy low.

Others insist we must let the tariff alone, as any tampering with it will derange the industries of the country, throw operators out of employment and thus destroy their ability to purchase our commodities. Allow the surplus to accumulate in order that it may be distributed among the States to lighten the burden of State, county, township taxation, which bears particularly heavy upon real estate, for it cannot be hid like stocks and bonds from the Assessor's eye. Another proposition in the same line is to have the general government loan its surplus to the States at one per cent., the States to the counties at two per cent., the counties to the land at three per cent.; the result would be light taxation all around, as the difference between

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one and three per cent. would pay State and county taxes ; insure a low rate of interest for all kinds of business, for it would determine the standard for mortgage investments.

Others clamor for a lower rate of interest—the reduction of the legal rate to five per cent. or lower—while others say the farmers would be able to borrow on much more favorable terms if the collections of mortgages were made much easier. It takes too long and costs too much, often the face of small mortgages, to collect them. Money-lenders in other States avoid our State, and when they do lend ask a higher rate than at home, because of these difficulties in collection.

Much dissatisfaction is also expressed against the banks, because they will not loan to the farmers at less than the legal rate, while they negotiate city paper from four to four and one-half per cent. Their coffers overflowing with unused funds, their cashiers scour the cities for manufacturers' and merchants' paper, and often take risks when there is little of substance to back them and often lose by them more than their profits in a decade of years, while by farmers they seldom lose, and when they do, in such small sums the banks scarcely feel the loss. These points are well taken, and if banks would raise and lower their rates of discount to the farmers according to the scarcity and abundance of funds there would not be the same clamor for the reduction of the legal rate of interest.

Others say the farmers do not enjoy their former prosperity because they have fallen into extravagant habits, but if all are intent on economy the surplus would still further increase and still lower prices would be the rule.

Others write, we must raise fruits, vegetables or such perishable articles as the West and South cannot compete with. Many attempt this but quickly find that long distance is but a relative term, for steam and rapid transit have placed but a few hours between us and our distant rivals. But if all our farms were to be thus devoted, our near-by cities, and towns could not absorb the supply. Eighteen hundred and eighty-six produced unusual crops of these perishable articles ; the consequence was that thousands of baskets of fine fruits and vegetables did not pay the cost of marketing. So we can see no reliable law but scarcity to provoke paying prices, and scarcity in this broad country only comes with drought, floods, destructive insects or disease, and these factors leave the most needy unprovided for. And

now at the risk of being called a doctrinaire or crank I have presented the various discouragements and complaints, and the remedies suggested, with the hope that your honorable body will evolve some panacea for the many ills to which agriculture at present is *no doubt* subjected.

CROP REPORTS.

Corn has been a moderate crop except in localities not affected with the excessive moisture prevailing through a large part of the season. The winds have also executed much damage, at different times almost twisting the roots from the soil. The increased price it is now selling for, 60 to 70 cents per bushel, is a sure indication of a shortened yield.

Wheat.—The half crop of wheat has been mostly owing to the late seeding, the ground being so dry at sowing time, it could not be properly prepared, and where it was the seed failed to sprout for the want of moisture, which condition prevented rooting sufficiently to withstand the severe freezing of the past winter. The price shows a slight indication to advance from the seeming standard of 80 to 90 cents per bushel.

Rye.—About three-quarters of a crop; growth hindered by same cause as wheat, but being more hardy it yielded better. The straw and grain show an advancing tendency; has risen from 50 to 60 cents per bushel, straw from \$10 to \$12 per ton.

The growing winter grain, except on badly-drained land, looks well; plenty of moisture and mild weather are making it grow even at the present writing, the middle of December.

Oats grew well, but the excessive moisture and hot sun prevented them from being gathered in perfect condition; many farmers, after repeated trials, gave up the ghost and allowed them to rot on the ground, even after they were cut.

Hay.—There have been some large crops. It is not often that moisture in our section shortens a hay crop, but the excess of it on the low-lying and best grass lands reduced the yield in many cases one-third. The average about one and one-half tons per acre; price low.

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Young grass has rooted well and promises a good return for next year.

Pasturage has been abundant the whole season; no complaints except where it was overstocked.

Potatoes.—Good early; short late; quality poor; price would be very high were it not for foreign importations. The smallest yield since 1881, when prices averaged in the winter of that year, 90 cents to \$1 per bushel. Crop for the United States, 1881, one hundred and nine millions; 1886, one hundred and sixty-three millions; 1887, one hundred and thirty-four millions.

Sweet Potatoes.—A moderate yield, very variable in sections; rotted badly; price good.

Apples.—One of the poorest crops known for years. Thousands of trees entirely devoid of fruit. Where they succeeded in wrestling with the weather, insects and other enemies, they were so knotty and unpalatable as to scarcely deserve the appellation apple. To this some notable exceptions, a few large crops.

Peaches.—Half a crop; sold well; averaged about \$1 per basket, although the quality was nothing to be proud of. Large number of trees have been and are being set out.

Grapes.—Almost a failure after fruiting; too much moisture, mildew and grape rot; too many rose bugs, caterpillars and slugs.

Pears.—Bartletts a light crop, but Kieffer, Favorite, Lawrence yielded well and sold well from \$3 to \$6 per barrel.

Cherries, Strawberries, Raspberries and Blackberries about half crops, but sold well.

Melons.—A moderate crop; too much moisture.

Tomatoes yielded lightly, especially in the first part of the season. The result was big prices in the city markets, and consequent inability of canners to obtain supplies. Almost too late in the season they fruited better and thus enabled the canners to partially meet their

contracts, but the frost caught thousands of baskets that needed a few days more to perfect them.

Asparagus was a good crop, chiefly sold to canners for about 5 cents per pound, which price was very satisfactory to producers.

The *Early Pea* crop was short, only two-thirds of a crop; prices very low. Late peas yielded much better and sold for satisfactory prices.

The *Early Sugar Corn* was good, but prices low; later better; the average prices realized were satisfactory. The tendency among our farmers is to substitute boiling for field corn, as it often pays four times as well. Two hundred and fifty thousand ears have been shipped in one day from Beverly wharf and depot.

Cabbage crop generally poor, worms destroying the majority planted, yet there were in the county some exceptional yields, which brought their owners large returns.

Cucumber and *Pickle* crop very short; about one-third of a crop, caused by excess of rain.

Poultry.—A good crop, selling for better prices than last year.

Pork.—A small crop; price 6 to 7 cents per pound; disease and low prices have weaned our farmers from what was formerly one of our largest industries.

Sheep.—Farmers seem to be fattening less and less sheep and raising fewer lambs each year. Early lambs are profitable where success is obtained in getting them early, but fully one-half fail, and this year have been particularly unfortunate. On account of the excessive moisture foot-rot has prevailed and destroyed the profit of many flocks.

Cranberries.—Two-thirds of a yield, price good and advancing; business more than profitable when compared with other crops. We have numerous growers who have realized each from \$5,000 to \$12,000 from their bogs this year, and one over \$20,000.

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Milk in full quantity nearly the whole season ; market heavy part of the year, but yields the farmer more cash than any part of his animal industry.

The milk supply at the Camden railroad station has greatly increased during past five years. In 1883 the shipments amounted to about three million quarts. From November 1st, 1886, to November 1st, 1887, the average has been nearly one million quarts per month, or about twelve million quarts for the year, an increase of over two million quarts above the corresponding period of 1885 and 1886. Much of the increase is due, it is claimed, to the rigid milk laws of the State. Nearly all of this milk comes from Burlington county. From spring to fall, during six months, the price is $3\frac{1}{2}$ cents ; the remaining six months realize about 4 cents per quart. The railroad claims of this $\frac{1}{2}$ cent per quart. The most of this goes to Philadelphia dealers. Seventy single and six double teams cross the ferry each day except Sunday for these shipments.

Answers to questions tabulated by New Jersey State Board of Agriculture :

Question No. 1. Answer : There are about fifty farmers engaged in the retail milk trade in our county.

Question No. 2. Answer : Some are satisfied ; most are not satisfied with the working of the present milk law. Percentage of solids too high ; law too arbitrary, many wish it amended so as to read " knowingly or willfully adulterated."

Question No. 3. Answer : The average rates per acre of farms for taxation in the county are about \$80.

Question No. 4. Answer : The rate of tax per \$100 on real estate in the county averages about \$1.

Cinnaminson township.....	\$0.90
New Hanover township.....	.93
Medford township.....	.98
Shamong township.....	1.25
Chesterfield township.....	.85
Chester township.....	.93
Beverly township.....	1.15
Woodland township.....	1.56
Southampton township.....	.90
Lumberton township.....	.95

Northampton township.....	\$1.25
Pemberton township.....	.90
Mansfield township.....	.82
Springfield township.....	.90
Burlington township.....	1.01½
Willingboro township.....	1.01
Delran township.....	1.02
Egg Harbor township.....	1.15
Washington township.....	1.80
Eastampton township.....	.94
Westampton township.....	.89
Florence township.....	.98
Mount Laurel township.....	.95
Randolph township.....	1.50
Bass River township.....	1.34
Evesham township.....	.96
Bordentown township.....	1.65

Question No. 5. Answer: The amount raised for working the roads in each township varies from \$1,000 to \$2,000; the most of the townships appropriate \$1,200. The average for the county in the agricultural townships is about \$1,200. The pine townships appropriate and need but little.

Burlington township has covered her roads mostly with a fine compacting gravel, found in the township, the farmers carting the same free of cost alongside of their farms. Medford in 1886 adopted a system of buying Atco gravel of the Camden and Atlantic railroad at \$6.60 per car-load, delivered at Medford; each ton covers about one yard, costing about 50 cents. The farmers cart the gravel without charge; the township pays the shovelers and loaders. Before adopting this plan they spent nearly as much each year, and had only poor soil and sandy roads. Now they have over nine miles of the best of highways, costing in five years about \$8,000, at an extra cost of only \$1,400 over the previous five years' pursuing the old methods.

Question No. 6. Answer: The selling price of average farms with improvements, when not affected by prospective value for building lots, ranges all the way from \$33, \$48, \$60, \$70 to \$100.

There is little demand; many are offered without bidders. The opinion generally prevails that the farms outside of the river districts

and the nearest sections to Philadelphia would not sell for the mortgages on them, and this would be one-half what many of them have been sold for. The best, strongest-soiled and most fertile farms are selling for the least, as they are more distant from the markets, and have been devoted to corn, wheat, oats, pork and beef, all of which articles have not for years paid the cost of producing; while the vegetable and small-fruit farms on the poorer lands, which mostly lie nearest the cities and cheap water transportation, have paid better and consequently have not suffered a like depreciation in value.

Question No. 7. Is the raising of horses, cows, sheep, swine and poultry on the increase or decrease? Disease, &c.

Answer: Horses on the decrease; mules on the decrease; cows about the same; sheep decrease; swine large decrease; poultry increase.

The general condition of animals good. Many farmers lost chickens from cholera, for which there seems to be no remedy.

Two cases of hog cholera in the county, one near Mount Holly, the other near Burlington, quite fatal in both cases. No cause given; suddenly broke out in each place, and disappeared with the death of all the swine.

Grades are thought to be better suited to the general farmer or dairyman than thoroughbreds of any breed. In swine the same idea prevails. In sheep the Southdown crossed upon the ordinary drove stock is the popular idea. In poultry the Plymouth Rocks, judiciously crossed, are the favorite strain.

Leading breeds of swine are Jersey Reds, Chester Whites, Magees. Cows—Jerseys, Guernseys, Holsteins. Sheep—Southdowns. Chickens—Plymouth Rock, White Brahmas, Langshang, Common and Mixed breeds.

Taking one hundred as the standard, the yields and prices have been as follows:

CROP.	PER CENT.	SELLING PRICE.	DATE.
Wheat	65	per bushel, \$0.80	on November 10.
Corn	85	" " .50	" " "
Rye	80	" " .50	" " "
Oats	90	" " .34	" " "
Hay	80	" ton, 13.00	" " "
Potatoes (White).....	60	" barrel, 2.00	" " "
Potatoes (Sweet).....	80	" " 2.00	" " "
Peaches	50	" basket, 1.00	in season.
Apples	15	" barrel, 2.25	on November 10.
Pears	40	" " 3.00 to \$5.00	" " "
Grapes	40	" pound, .04 to .08	in season.
Blackberries.....	50	" quart, .06½	" " "
Raspberries	60	" " .08½	" " "
Strawberries.....	70	" " .09	" " "

STOCKHOLDERS' ANNUAL MEETING.

The annual meeting of the stockholders of the Burlington County Agricultural Society was held at the Court House on Saturday afternoon.

John B. Collins, Corresponding Secretary, called the meeting to order. Robert B. Engle was elected Chairman and Mr. Collins, Secretary.

The minutes of the last annual meeting were adopted as read by Mr. Collins.

Edward B. Jones, Treasurer, then read his report as follows :

The report of the Treasurer of the Burlington County Agricultural Society for the year ending January 14th, 1888 :

RECEIPTS.

Cash on hand at last report.....	\$10,225 80
Note in bank, less discount.....	4,912 50
Borrowed on notes of individuals.....	7,000 00
Sale of county bonds, with interest.....	261 45
Rents and privileges.....	4,783 82
Amusements	1,744 97
Advertisements in schedule.....	754 50
Entrance paid for horses.....	2,552 75
Lunch counter.....	646 12
Coat and package-room.....	56 45
Crossing the ring.....	199 00

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Lumber, stone, &c., sold.....	\$184 75
Admission to grand stand.....	4,546 44
Admission to grounds.....	19,810 75
Cash refunded.....	110 22
Balance due Treasurer.....	51 96

Total..... \$66,841 48

PAYMENTS.

New grand stand.....	\$26,524 21
Altering old stand into exhibition building.....	2,000 00
New platform, fences and repairs.....	841 03
Dues National Trotting Association.....	56 00
Water rent.....	45 00
State tax.....	4 00
County bonds.....	9,000 00
Note in bank.....	5,000 00
Fair supplies and expenses.....	748 72
Printing.....	1,045 84
Advertising in newspapers.....	651 17
Advertising, other than newspapers.....	604 71
Insurance.....	532 61
Postage.....	453 73
Stationery.....	59 83
Schedules.....	632 95
Hay, straw, poultry feed and fodder.....	542 76
Use of steam fire engine during fair.....	126 25
Engraving.....	130 90
Decorating buildings.....	71 00
Society guest-room.....	430 15
Public lunch counter.....	386 36
Judges.....	152 00
Police.....	485 50
Clerks.....	526 74
Turnstile men.....	202 25
Detectives.....	77 00
Attendants and guards.....	743 75
Laborers.....	179 40
Music.....	310 20
Telegraphing.....	24 00
Expressage.....	42 60
Medals and diplomas.....	71 25
Premiums.....	12,249 75
Amusements, Myrtie Peek.....	\$610
Tight-rope.....	75
Dog show.....	100
Performing horse.....	50
Water-lily exhibit.....	50
	885 00

STATE BOARD OF AGRICULTURE.

Salaries.....	\$925 00
W. L. Powell's shortage on Society sale.....	7 36
Sundries	72 40
Total	<u>\$66,841 48</u>

INDEBTEDNESS.

Notes outstanding.....	7,000 00
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(Signed) EDWARD B. JONES,
Treasurer.

Your committee, appointed to audit the Treasurer's account, hereby report that they have attended to the same. They have examined the vouchers and find them correct. There is a balance due the Treasurer at this date of \$51.96.

(Signed) JAMES W. DEACON.
 ROBT. B. ENGLE.

Secretary Collins then read the Directors' report. It is as follows:

DIRECTORS' REPORT.

To the President and Stockholders of the Burlington County Agricultural Society:

Having a balance in the treasury at your last annual meeting of about \$10,000, you then authorized your Directors to borrow \$25,000 more, and proceed with the united sum, to erect a commodious grand stand, and make such other improvements as might be necessary on the grounds of the Society. Following this direction, the result of our labors has been:

A new grand stand, costing in all its details about.....	\$26,524 21
Moving and converting the old stand into a new exhibition building.....	2,000 00
For new cases, office and repairs to exhibition building No. 1.....	300 00
For repairs and skylights in the exhibition building No. 2....	100 00
For stage platform in the ring opposite the grand stand.....	100 00
For new fence in front of the grand stand.....	<u>100 00</u>
In round numbers.....	\$29,124 21

The different items of expenses, that make up the whole cost of the grand stand, are as follows, viz.:

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Grading.....	\$285 00
Stone walls and piers, 350 perch.....	1,140 00
Lumber, 510,000 feet.....	10,211 14
Superintendent, carpenters and labor.....	5,878 86
Plumbing, water closets and ranges.....	2,042 00
Roofing and spouting.....	1,468 08
Mill work, doors, windows and mouldings.....	988 84
Hardware.....	823 90
Seating galleries and dining-rooms.....	1,300 00
Painting.....	1,245 39
Architects.....	550 00
Sundries.....	591 00
Total.....	<u>\$26,524 21</u>

Our experience with the storms has demonstrated the necessity of altering our original intentions of leaving the interior of the stand exposed to the weather, so we are now inclosing it all around, and placing a row of posts under the trusses that support the upper tier of seats, which improvements will probably cost \$1,000 more than we have already expended.

We now have one of the finest and most complete grand stands in the country ; its extreme dimensions, three hundred by sixty-four feet, and five stories high in the back, with its two seating stories, and dining-rooms under the whole, will seat six thousand, and dine at one time one thousand persons. On Thursday of fair week, ten thousand persons passed through the gates to the grand stand and quarter stretch in front.

The converting of the old stand into a two-story exhibition building, two hundred by seventy-five feet, proved to be a timely addition to our space, for it and all the others were filled to repletion. To properly display all the material that crowds our halls, demands another building equally as large as either of our present ones. Our accommodations for cattle, sheep and swine are insufficient to properly care for the increasing number of animals offered for exhibition.

Our advertising has been conducted in the usual liberal manner; at a moderately increased cost.

Our receipts from all sources, as you have learned from the Treasurer's report, were greater than heretofore, being \$35,389.77 ; last year, \$32,318.60, an increase of \$3,071.17. Our fair expenses, including premiums, were \$21,958.93, leaving a balance of \$13,430.84.

The items of increase over last year were principally from the grand stand, \$1,714.69 ; refreshment stands and privileges, \$1,800 ;

from horse entries, \$500. Our premiums amounted to \$12,249.75, an increase of \$130.25.

Our guest building supplied fifteen hundred meals at a cost of \$386.36, or about twenty-five cents apiece.

Our insurance, although expensive on account of the underwriters having fixed a rate of three per cent. for five years, is complete, amply covering all the buildings.

The railroad service was this year most perfect; the immense crowds were carried to and from the grounds without detention or accidents.

Although authorized to borrow \$25,000, and bond the property for the same, we have not found it necessary to issue bonds, but have borrowed, on notes, \$7,000 at five per cent. interest, which notes are still outstanding, being the only obligations and debts against the Society at this time.

All of which is respectfully submitted by the

BOARD OF DIRECTORS.

Joshua Forsyth moved that the report be accepted and a vote of thanks be tendered the Directors for the industrious and enterprising manner in which they had fulfilled their duties. The motion was carried.

Henry Ellis asked if a committee on legislation had not been appointed at the last meeting to see if this Society, like the State fair, could not receive an annual appropriation from the State.

Dr. Parry said a committee had been appointed, but it was unable to secure the appropriation on account of opposition from the State fair.

Col. Sloan thought co-operation with other societies in the State would insure the passage of a law granting the appropriations. He moved that the instructions given the Board of Directors at the last meeting on this subject be continued. Carried.

The old Board of Directors was then renominated and elected, as follows: Isaac Fenimore, William S. Taylor, Henry I. Budd, Benjamin F. Deacon, Joseph Wills, John B. Collins, Henry Ellis, Samuel H. Chambers, William R. Lippincott, William C. Parry, Judson C. Gaskill.

The Chairman appointed James W. Deacon, James Lippincott and Charles M. Sloan, Finance Committee, and the meeting adjourned.

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REPORT.

BY F. W. HILYARD, D.V.S.

MOUNT HOLLY, December 10th, 1887.

To the Burlington County Board of Agriculture :

GENTLEMEN—In compliance with the request of your Secretary, Henry I. Budd, I offer you a report of the condition of the health of the domestic animals of your county, as far as my practice has permitted me to become familiar with the same.

I would call your attention to the question of contagious pleuropneumonia, and, as you will no doubt remember, this question was ably discussed at your last annual meeting in this place, December 11th, 1886, by Dr. E. M. Hunt, Secretary of the State Board of Health. You will also remember that the question of inoculation as a preventive of these contagious diseases was also discussed, and that at that time quite a prejudice existed against the practice, as quite a number of cows I had inoculated were disfigured by their losing their tails from blood-poisoning, &c.

The cattle referred to as being thus disfigured were operated on prior to December 11th, but inoculations performed since that time have been attended with none of this disfigurement, and we have had no further trouble. Neither have any more deaths followed, and the herds thus operated on are looking as well as others not so treated. The owners, with one or two exceptions, would be glad to have their herds inoculated again, if their herds were exposed in like manner, and they agree with me in thinking the loss could be greatly reduced, from the experience thus gained. We all know that thousands of dollars' worth of valuable cattle have been saved in this county, by the inoculation checking the disease at once, requiring but a few weeks to get it under our entire control.

During the past summer the government has had all these herds thus inoculated inspected, and in every instance found them all right, nothing worse for the operation.

Congress last year made inoculation a thing of the past, but whether this move was a wise one yet remains to be seen.

Secondly, I would call your attention to the annual increase in the number of cases of tuberculosis among the cattle of our county.

Having slaughtered myself during the year some fifteen cases, I am also well satisfied that others have been slaughtered in a similar manner by other practitioners. This disease is not materially benefited by treatment, as death must be the result, as far as any known remedies are concerned, and the disease is now considered communicable by close contact. The milk is considered unfit for food in all stages of the disease, but particularly injurious when the udder or mammary glands are decidedly affected.

Healthy and robust adults have used it with no apparent deleterious results, but bottle-fed babes, whose entire sustenance is derived from such milk, will succumb under its poisonous influence. Cats have died as from a scourge when fed largely with it, and no animal should, therefore, be permitted to live after the disease has become positively developed.

I will next glance very briefly over the late outbreak of epizootic, cerebro-spinal meningitis, among horses of this and adjoining counties, making its appearance first along shore, but spreading inland for miles, being very fatal in most instances in the early part of the outbreak. Mules, though not so subject to its devastating influences, did contract the disease and die in a number of instances.

Opinions differ as to causes, but it is generally conceded to be of germitic origin and non-contagious. A large number were saved later on during the term of the epidemic by medicinal and preventive treatment. This disease is, of itself, nothing new, as we have occasional cases annually, but such an outbreak as this has been is, I am glad to say, very rare. The loss to this county alone, I am satisfied, will amount to one hundred and fifty head of horses and some twenty mules.

We had an outbreak of the same disease in a herd of cattle during the past summer, in this neighborhood, costing the lives of three cows in less than a week. I at once gave the herd a treatment with the best of results, no more cases appearing.

Hog cholera (pneumo-enteritis) still continues to exist to some extent, but not near so extensively as in former years, the loss being very much smaller, owners slaughtering at first appearance of the disease.

We have had more than usual of the glanders in this county during the past year, but as yet no instances have been known of the disease spreading to other stables or horses, great care having been

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observed as to isolation, and a perfect system of ventilation and disinfection has been perseveringly adopted and followed.

The cases have been of spontaneous origin, save two; one of these animals was purchased in Philadelphia, and the other case contracted the disease from the animal so purchased, as they composed one team. The owner of these cases has two more horses which have been badly exposed, with no appearance as yet of any further spread, but at this writing only two weeks have elapsed since the disposition of the last case, making the other two animals still in jeopardy.

We are now having, at the time of this report, an outbreak among horses of a type of influenza, with severe lung complication. I have in my own practice as high as four or five cases in one stable. The disease has thus far yielded readily to treatment, and I have lost but one case so far out of some fifty cases I have treated.

Parturient apoplexy (milk fever) has caused the death of some valuable cows during the year, but in my practice seventy-five per cent. have recovered, without the value of the animal being decreased.

Other diseases of a minor nature have occurred, with very small loss.

Barbed wire still continues the veterinary surgeon's friend, as a large number of accidents—some of them very bad—have occurred, costing the life of some valuable horses.

Goring by bulls (old) has been quite alarming, one man alone having had three horses killed in less than two weeks by his own bull. Too much care cannot be observed in this particular by those owning animals of this kind.

Fires have been entirely too common among farm buildings to be of an accidental character, and more decided measures should be persevered in to lead to the arrest and conviction of such offending parties.

All of which is cheerfully and respectfully submitted.

CAMDEN COUNTY.

CAMDEN COUNTY BOARD OF AGRICULTURE.

OFFICERS FOR THE YEAR 1888.

<i>President</i>	VAN BUREN GIFFIN	Kirkwood, N. J.
<i>Vice President</i>	JOEL HORNER.....	Merchantville, N. J.
<i>Secretary</i>	GEORGE T. HAINES	Haddonfield, N. J.
<i>Treasurer</i>	J. STOKES COLES.....	Haddonfield, N. J.

BOARD OF DIRECTORS.

E. BURROUGH, Merchantville, N. J.
S. L. BURROUGH, Merchantville, N. J.
AMOS E. KAIGHN, Ellisburg, N. J.
CHAS. S. ALBERTSON, Magnolia, N. J.
DANIEL W. HORNER, Merchantville, N. J.

DELEGATES TO STATE BOARD.

VAN BUREN GIFFIN	(One year).....	Kirkwood, N. J.
JOHN A. MERIDITH	(One year).....	Haddonfield, N. J.

SOCIETY AND CROP REPORT.

BY GEORGE T. HAINES.

A special meeting of the Board was held in the autumn, at which time arrangements were made for gathering statistics for the annual meeting. We also had on exhibition samples of seed wheat, potatoes, peaches, pears, &c., which called forth pertinent and timely remarks and discussions.

The annual meeting was held in the Court House, November 29th, 1887; all the townships in the county being represented except Winslow.

The following resolutions were read and adopted, and directed to be forwarded in our report to the State Board, viz.:

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1st. WHEREAS, The laws governing the sale and fixing the penalties for the adulteration of milk, as now on the statutes, do not accomplish the object desired, without unjustly discriminating against producers and dealers ; therefore,

Resolved, That we hereby call upon the forthcoming Legislature to so amend the laws governing the sale of milk, and its adulteration, that while protecting the consumers, no injustice be done to the producers and dealers.

Resolved, That we also call upon the State Board of Agriculture to exert its influence to accomplish the result as set forth by these resolutions.

2d. *Resolved*, That a committee of three be appointed by the Chair to confer with the County Board of Burlington county, with a view to secure a united course of action in regard to protecting the interests of the farmers of this section of the State from unjust discrimination in the sale of our products in the markets of Philadelphia and elsewhere.

Joel Horner, of Stockton township, read a paper on grapes, which is not here published.

I. W. Nicholson, of Delaware township, read a paper on insects. [See "Insect Defoliators," following the County Board reports—
SECRETARY.]

Chas. S. Albertson, of Gloucester township, read a paper on cereals and vegetables, an extract of which will follow the township reports. They will be printed in the annual report.

GLOUCESTER TOWNSHIP REPORTS.

Farmers, generally, are satisfied with the results of the year. With a few exceptions, it has been the best in yield and prices for at least ten years.

We still feel very much the oppression brought about by that class of middlemen who charge the consumer double the price paid the farmer, and sell out of baskets holding from a half peck to a peck less than those we deliver it in. It is not in our power to reach this class by law.

We have a little hatred to the milk law as it now stands before the farmer ; not that we do not want a good law, but that it should not

be so arbitrary as to strike so directly and so surely at the farmer, whether innocent or guilty, with no hope for redress if innocent, injuring his good name at home, and forming guilty suspicion abroad among his customers.

STOCKTON TOWNSHIP REPORTS.

It is not too much to say that within the boundaries of Stockton township, a greater variety of edible products is raised than in any other district of like size in the United States. Except that portion which is being absorbed by the numerous small towns and villages, as sites for building purposes, it presents the appearance of a vast market garden.

Possessing a great variety of soil and a population inured to excessive industry, and with large markets close at hand, it has been the aim of the trucker or farmer to "work it for all it is worth."

We have "heavy-land farms" whose yield of wheat, corn and hay will vie with any in the State. We have "sandy-land farms," land which the pioneer discarded as worthless, but now, by liberal manuring and proper cultivation, repay their occupants at the rate of \$300 per acre.

Fruit-growing is carried on extensively; one farm alone having twelve thousand pear trees coming into bearing the present year. Vine-planting is still on the increase, checked to some extent by the ravages of the rose bug, black rot, and mildew. Strawberries, though not planted so generally as a few years ago, are made specialties by those whose land is especially adapted to their growth. The blackberry, which, for many years, was one of the most paying crops, seems to have been placed of late somewhat in retirement, owing to unremunerative prices, and the failure of the Wilson's Early to stand the rigors of the winter. Some of the newer sorts appear to be quite hardy, and when early, have brought satisfactory prices. The past year seems to have been a phenomenal one for the early raspberry man; crops good, and the prices savored somewhat of the golden days of the past. The crops of apples, pears and peaches, on the whole, were light.

Of the vegetables, with a few exceptions, of course, the yield was about up to the average. One notable exception was the tomato, which fell off about fifty per cent.; of the cause of this deficiency,

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opinions differ—some attribute it to the excessive heat at the time of blossoming, others to the unfavorable conditions at the time of planting.

The raising of vegetables under glass by artificial heat is a growing industry in our township, and one worthy of more than passing notice. One firm alone use one hundred thousand square feet of glass, and have a capital of \$60,000 invested in the business, employing from seven to twenty-five hands, and consume three hundred and fifty tons of coal yearly. The expenses amount to from \$3,000 to \$5,000 per year for repairs and improvements. The yearly sales of this firm amount to about \$15,000.

We append a list of the various articles grown, together with what the firm considers a fair estimate of the value of each crop, and the amount that it is expected the present season will yield.

Lettuce	\$5,000 00
Parsley	1,350 00
Mint	500 00
Radishes.....	1,600 00
Watercress	1,200 00
Cauliflower	2,000 00
Leeks.....	50 00
Carrots.....	100 00
Okra	50 00
Peppers.....	50 00
Grapes.....	1,200 00
Peas	50 00
Beans	50 00
Mushrooms	150 00
Brussels Sprouts.....	1,200 00
Egg Plants.....	200 00
Cucumbers	150 00

This is an expensive business; to make it pay, it is not only necessary that the utmost vigilance be used in the cultivation of the products, but after growing them, that they should be advantageously sold. This feature of the trucking business, and it may be said of the farming business in general, is one to which but little attention is given.

Manufacturers and business men in the cities, already protected from foreign importations by a prohibitory tariff, still deem it of the utmost importance that they be further protected, and form "com-bines" and "trusts" to curtail the production and regulate the price.

Not so with the trucker ; he plants liberally, and sells his products when grown at market price—sometimes up, but oftener down. No “trust” dictates how much he shall plant ; no “combine” of his shows what prices he shall sell at.

Occasionally some unknown and unforeseen circumstance cuts short the crop, as was the case with the tomato the past season. While the yield was about half of the previous year, it is safe to say that the crop was quite as profitable, because there was no surplus to regulate the price.

As the surplus of grain in Liverpool regulates the price in the United States, thereby putting the American farmer in competition with the coolie and pauper labor of heathen India, so with the tomato crop, the surplus in the Philadelphia markets, when sold to the canning-houses, fixes the price of the article in the aforesaid market.

Taken altogether, the prices have, as a rule, been better this season than the previous one, and among the truckers there is more feeling of contentment than for some time heretofore. Feeling thus encouraged, I doubt not many are impatient for the coming of spring.

CROP YIELD—SUMMARY FOR THE COUNTY AS FAR AS REPORTED.

	Acres.	Yield Per Acre.
Wheat.....	1,835	19 bushels.
Rye.....	1,045	16 bushels.
Corn	2,972	48 bushels.
Hay.....	4,348	1½ tons.
Potatoes, White	800	144 bushels.
Potatoes, Sweet	300	145 bushels.
Corn, Sweet.....	100	92 baskets.
Lima Beans.....	.....	.....
Watermelons	150	.....
Citrons.....	258	328 baskets.
Cabbage	413	3,000 heads.
Tomatoes.....	895	382 baskets.
Egg Plants.....	2¾	475 baskets.
Apples .....	.....	.....
Pears.....	50	300
Grapes.....	.....	.....
Blackberries.....	.....	.....
Raspberries .....	.....	.....
Strawberries.....	50	2,273 quarts.

At a meeting of the Farmers' Association of Camden county an animated discussion took place in reference to our road laws and the

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care of our public roads, and after a general expression of opinion the following resolutions were passed :

1st. *Resolved*, That the suggestions of William M. Lanning, Esq., as embodied in his essay read before the New Jersey State Board of Agriculture at its last meeting, be approved by this meeting, and that we request the delegates to the State Board of Agriculture from this county to advocate the adoption of the same.

2d. *Resolved*, That the Farmers' Association instruct their Secretary to urge the Executive Committee of the State Board of Agriculture to set apart on their programme a special time to act upon the advisability of abolishing all the present road law and, in place thereof, have a law similar to the one suggested by Wm. M. Lanning, Esq., in his paper read before that last meeting of the State Board of Agriculture.

CEREALS AND VEGETABLES.

Selection of Seed.—On no other condition does the success of a crop more largely depend than upon the selection of seed. In this we cannot ignore the rule of the survival of the fittest. Only the most perfect types should be used for seed.

Care of Seed.—Perhaps there is no important duty more neglected by the average farmer than the care of seed. The care he gives his seed, when selected from his own products, would seem to indicate that he doubted the existence of a hereafter.

Selection and Application of Fertilizers.—In this branch of farming, science has been more applied than in any other. And there seems yet a broad field open for investigation, as there is a broad field open for imposition, and this is being worked for all it is worth. But there are some honest fertilizers, made so, not from an honest conviction of duty, but by State enactments. Although much research and diligent inquiry have been made in artificial fertilizers, yet none has been found so far-reaching and universally valuable as the accumulation from the stable and barn-yard. But as the supply of this is insufficient to meet the demands of our extensive and extending acreage under cultivation, and as the cost of application and transportation is so large, we are driven to the use of commercial fer-

tilizers. Admitting and accepting this, it remains for us to select from almost an unlimited number of brands, those most valuable and best adapted to our soil. Fertilizers are intended to supply to the soil those elements which are needed for plant-food. Plants use from ten to fourteen elements in their growth. There are but three of these that the soil and air fail to furnish in sufficient quantities. These are nitrogen, phosphoric acid and potash. A complete fertilizer, then, is one containing these. Commercial fertilizers contain some of the other elements. But if the soil needs any of these, such as lime, sul. acid, magnesia, it is much more satisfactory to buy them pure. In the application of fertilizers there are a great variety of opinions. The most liberal and, in the long run, the most successful farmers believe in broadcast application and a thorough mixture with the soil. Where immediate results are desired hill and drill application is best, though attended with some risk to the young plant.

The Growth of Plants.—Although apparently the simplest process lies shrouded in the deepest mystery, the germination of the little seed, the rapid growth of stem and the peculiar changes of color, the luxuriant foliage, the brilliant blossoms, the ripening harvest, are subjects beyond our comprehension. A closer study of this important subject would, no doubt, lead to grand practical results. If science would determine the proper conditions and supplies demanded at the various stages of growth, it would indeed do much for the agriculturist. Strange to say, the distribution of the roots of plants in the soil is a subject that has received comparatively little attention from the agriculturist. It would seem that before we can give an intelligent opinion as to the best system of cultivation, or the best methods of applying fertilizers, we should know something of the character of the roots that sustain the plant and the position they occupy in the soil. If the fibrous roots through which the plant receives its nourishment grow very near the surface, it is certain that any but the most shallow cultivation must lacerate the roots. If, on the other hand, the fibrous roots chiefly lie deeper than the ordinary plow reaches, it may be advisable in preparing the soil to plow deeper, and thus mellow and fertilize the soil at the point where the roots can be more directly benefited.

These interesting inquiries suggest themselves: How far do varying soils, seasons and climates influence the extent or position of the

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roots of plants? Does fertility or temperature have the greater influence in determining the position of roots? If the former, then fertilizing the surface tends to entice the roots upwards. If the latter, then fertilization can be of use only so far as it reaches the feeding-ground of the plant. If temperature determines the location of the roots, the same plant in different climates will demand different treatment. Perhaps heredity exerts a stronger influence than any other or all other causes. An investigation of this subject could not be without good results.

Cultivation.—The important questions in this operation are the time to commence, the time to stop, the closeness at different stages of growth, and the depth—all determined by the weather, and the crops and variety cultivated.

Harvest.—At this interesting time, the proper season, the manner of harvesting, the storing of the crop, and the disposing of it, all claim the attention of the farmer. And then the hazardous duty of investing the net proceeds.

We will speak only of corn. There are many varieties cultivated with varying success, some of which are Dent, Gourd-seed, Chester county, Eight-rowed, Flint, Eight-rowed yellow, Golden-dent, Silver-white, and many others which are hybrid varieties, as some of these are.

In selecting the seed, the finest ears with the deepest grains are selected in the fall, thoroughly dried and protected from severe freezing weather during winter, as freezing frequently kills the germ. Careful experiment by the New York Experiment Station demonstrates that the largest crops of both corn and fodder are produced by planting the tip grains, while the butt grains produce the smallest crops. We here find that the old custom of tipping our seed-corn is a mistake, and that we had better butt it. Experiment by the same authority proved that the planting of an excess of seed and thinning produced the best results.

In most soils an application of a small amount of fertilizer to the hill is beneficial, inasmuch as it stimulates the young plant to a rapid growth out of the way of cut worms and other insects; but hill fertilization cannot be depended upon for the production of a large crop.

Experiments with corn, however, have shown some curious results.

State experiments show that the application of fertilizers—even barn-yard manure—to soil in a good state of cultivation, and containing a reasonable amount of plant-food from natural sources, such as decaying sod, &c., did not pay. The value of the increase in yield did not approach the outlay for fertilizers; and even in soils that did not seem to have much plant-food, the addition of fertilizers did not increase the crop to a paying amount. This is accounted for in many ways. There seems to be a limit, even below a very large crop, to the amount of plant-food which can be used by a plant, even when no especially unfavorable conditions exist. Some of the unknown physical conditions and changes to which I have referred, no doubt exert some influence; and further, it must be remembered that corn makes its growth during a long period at that season at which the disintegration of the mineral and organic ingredients of the soil is going on, so it is not strange that a soil in hardly a fair state of fertility should be able to furnish, without aid, an average crop of corn; but the production of one crop of corn on a soil not very fertile, renders it necessary to add plant-food liberally for the succeeding crop. •

CUMBERLAND COUNTY.

CUMBERLAND COUNTY BOARD OF AGRICULTURE.

OFFICERS FOR 1888.

<i>President</i>	THOMAS E. HUNT.
<i>Secretary</i>	W. O. GARRISON.
<i>Treasurer</i>	T. F. D. BAKER.

ANNUAL REPORT.

BY W. O. GARRISON.

Another year has come and gone, and, with it, its successes and failures.

To some it has brought the full fruition of their brightest hopes; to others, the confirmation of their gloomiest fears. The life of our farmers is not all sunshine, yet even the dark clouds of disappointment are bright on the upper side.

Farming is getting to be a business, and not simply an occupation, and whenever an intelligent man conducts his farming with the same prudence, forethought and regard for details that are required in mercantile life his success is assured.

Competition is everywhere close, but that it is no closer in producing crops than in other branches of business is shown by the fact that many men who would starve in any other business manage to subsist by tilling the soil.

The average selling price of farms, as reported from various townships, is from \$60 to \$100 per acre. Some farms are selling below and others far above the amounts named.

For taxation, farms are rated at from \$60 to \$80, while the rate of tax ranges from 75 cents to \$2.50 per \$100.

The public roads of the county are kept in good repair.

Farmers and others complain of the burdens imposed by turnpike companies having the right to lay tribute on every person driving over three of the main arteries of travel in the county.

When and how can this burden be removed?

Landis township raises the largest amount for public roads, and has the best highways. The township raising the lowest amount I will not name, lest its inhabitants should be ashamed to have the name appear in print.

The dairying interest is rapidly growing and much is being done to improve the stock of cattle. Most of the largest dairymen claim larger profit from milking good grades than from pure-bred stock.

The present milk law is fairly satisfactory, though some claim that the per cent. of solids as fixed is too high.

There is much complaint of the measure demanded by the buyers of milk, the wholesale dealers buying by the gallon of two hundred and sixty-eight cubic inches and selling by the standard liquid measure of two hundred and thirty-one cubic inches.

All township reports agree that there is an increase in horses, cows and poultry, and a decrease in mules, sheep and swine.

The county, as a whole, has been remarkably free from epidemic diseases of all kinds among domestic animals, but in limited areas losses have been heavy in horses, hogs and poultry.

The wheat crop was only eighty-five per cent. of the average yield, and at the low price was not profitable.

Corn was good; yield about one hundred and twenty per cent. Price was fair, making it a profitable crop.

The acreage of oats is always small with us, and the crop was light—only seventy-five per cent.—and quality inferior.

The potato crop was one hundred and forty per cent., price and quality good.

Tomatoes did not yield as well as usual, as the early blossoms blighted, making the crop late as well as light. The price paid at the factories (\$6 per ton) is not satisfactory to the farmers, many of whom are organizing and demanding an advance of \$1 on the contract for coming crop.

The peach crop was not over twenty-five per cent. of full crop, and many farmers who were depending on their orchards for ready cash have carried empty pockets.

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So small was the crop that the Peach Exchange, organized earlier in the season, was not opened for business.

If the crop this year proves good, it is the intention to open the Exchange and sell the fruit direct from the wagon of the producer. A building has been erected near the railroad station for the business.

With the exception of strawberries, which yielded one hundred per cent., the small fruits were a partial failure, blackberries being rated at only thirty per cent., grapes at thirty-five per cent. and raspberries at seventy per cent.

The County Agricultural Society is in a healthy condition, the membership being larger than ever before. Many necessary improvements have been made and new buildings erected to meet the requirements of a modern fair.

It is an important factor in bringing about changes in cultivation, crops raised and breeds of animals kept.

Without such gatherings, few would know what is being done outside of their own immediate neighborhoods or would have an opportunity to compare, under the most favorable circumstances, the different breeds of animals, each of which is extolled as the best by its champions.

The entries in all departments were in excess of previous fairs, and the amount paid out in premiums nearly double.

A number of enterprising poultry fanciers have organized an association to promote the interests of poultry growers. Their first exhibition was held January 2d and 3d, in Bridgeton, and was in all respects a success.

The County Board has held two public meetings, which have been the means of disseminating valuable information.

The next meeting will be held in February, and will, no doubt, be attended by a large number of our most intelligent farmers.

ESSEX COUNTY.

ESSEX COUNTY BOARD OF AGRICULTURE.

OFFICERS FOR 1888.

<i>President</i>	I. S. CRANE.....	Livingston.
<i>Vice President</i>	M. H. CANFIELD.....	Caldwell.
<i>Secretary</i>	J. H. M. COOK.....	Caldwell.
<i>Treasurer</i>	AUSTIN E. HEDDEN.....	Verona.

DIRECTORS.

E. WILLIAMS,	J. H. BALDWIN,	W. W. BURNETT,
R. C. CAMPBELL,	O. E. FREEMAN.	

DELEGATES TO STATE BOARD.

AUSTIN E. HEDDEN,	WM. DIECKS, JR.
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ANNUAL REPORT.

J. H. M. COOK, SECRETARY.

Although the farmers of Essex have tilled their lands during the last season with their usual industry, and we believe with increased knowledge and discretion, yet the results have seldom been more discouraging, for in many instances our crops have been total failures.

Our County Board has maintained its usual life and activity. It numbers forty members, and they have kept a watchful eye upon the doings of our Legislature, and have not been wanting in their promptness in advising our representatives as to the direction in which they should use their influence in passing upon the various bills relating to our interests, which have been presented for consideration and action by our law-makers.

All the members of our County Board meet so frequently in their respective Granges that they seem to prefer those occasions for a practical discussion upon the ordinary farm topics; and I think these

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frequent meetings of the Granges do much to detract from the interest felt in the meetings of our County Board.

Still, though the interest in our meetings has not been what we could desire, we feel that our Board of Agriculture is exerting a power for good in our county, and through its auxiliary connection with our State Board the farmers of Essex feel that they have an influence with the "powers that be."

Our Granges are growing in numbers and influence, and they are developing as enterprising institutions for the dissemination of practical knowledge upon the leading questions of the day.

A more intelligent tilling of the soil, and a wiser employment of our leisure hours, will be the inevitable result of these discussions in our Granges.

The Essex County Fair, managed as heretofore, by a joint committee from Livingston and Caldwell Granges, was held this year in the Orange Rink, a commodious place, in a central locality.

The exhibits in every department exceeded in numbers and quality all our previous efforts. Our farmers and their wives devoted their time and exerted their ingenuity towards making a beautiful display of the products of their industry, both out and in-door work being represented. They succeeded admirably, and everything about our fair was acceptable, except the weather, which was very unfavorable. The rain fell almost without intermission during the entire week, and consequently the fair did not equal our expectations financially.

The production and sale of milk continues to be the leading industry of our county, and the number of our milkmen who retail milk directly from their own dairies is increasing every year.

The pasture growth last season was luxuriant and the supply of milk abundant, yet the prices received for the milk have been carefully maintained, a fact which we attribute to the legislation that banishes skimmed milk from the market.

Our farmers think that the sale of skimmed milk heretofore has reduced the price received for whole milk, on account of its opening the way for deceitful competition with the pure or whole milk.

Our farmers want to sell whole milk, and express a strong desire to have the present laws regulating the sale of milk continued in force. They consider them the best possible protection for the honest milkman, and they feel that a repeal of these laws will reduce the price of whole milk below the cost of production.

Mr. I. S. Crane has furnished me with some information from Livingston, in which he states that the farmers there are improving in the management of their herds, having purer air in their stables, purer water, and better feed for their stock.

Crops are poor, and the raising of horses, cows, sheep and swine is decreasing, but the raising of poultry is on the increase.

Mr. O. E. Freeman, of Orange Valley, reports the results of market-gardening in his district. He says seven hundred poles of lima beans yielded \$125 worth of beans, and three and one-half acres of sweet corn sold for \$225.

Mr. John Ball, of South Orange, reports the crops in his township nearly up to the average. Poultry-raising is on the increase, but the raising of horses, cows, sheep and swine is on the wane.

Mr. Goble, of Verona, reports that there is no marked increase in the amount of glass, and in the number of hands employed in winter gardening. The principal increase has been among commercial florists. He says the growers are abandoning the old system of hot-beds and cold frames for the green-house, and are deriving a great advantage from the change, because it gives them more complete control of the temperature, and lightens the labor. For nearly two weeks at a time this winter it would have been death to every plant in a hot-bed to have lifted the sash, even for a single minute.

The green-house is accessible in all kinds of weather, and although the first cost is considerable, it will last for ten or fifteen years, without much expense, except that of heating. The same sash that were used for hot-beds can be used for the green-house, and, when heated by the old, but by no means the poorest way (by a furnace with flues running the length of the building), we can have the finest place possible for growing flowers and vegetables, and there is no sudden rise of temperature to burn the plants off, and no shriveling of the tender leaves for want of a little fresh air at the proper time.

This winter, in addition to lettuce, beets, radishes and cucumbers, they are raising tomatoes, which, Mr. Goble says, are selling at a great advance over the southern ones, which go begging at 50 cents per quart.

Mr. Goble predicts that the hot-bed will soon be a thing of the past. He also thinks that all our growers will adopt the green-house improvement, and make money by the change.

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CROP REPORTS.

Our crops are below the average this year. Wheat and rye were badly winter-killed. Oats were unusually late, and suffered severely from wet weather, especially during harvesting time.

Potatoes were uncommonly poor; in many instances the first setting rotted entirely, and the later setting was small and irregular.

I estimate the yield of the different crops as follows:

Wheat.....	60
Rye.....	75
Oats.....	50
Corn	90
Hay	100
Potatoes.....	50
Apples.....	25
Peaches.....	100
Pears.....	70
Grapes.....	60
Blackberries.....	100
Raspberries	90
Strawberries.....	75
Melons	90

The prices for farm produce ranged about ten per cent. higher than last year.

Market-gardening, on light, sandy soil, has yielded crops above the average, and the produce has been sold to better advantage than formerly.

The failure of crops in our vicinity is very largely due to the overflow of the Passaic river, caused by the unusually heavy rains, and our farmers feel the absolute necessity of some provision being made against a repetition of this calamity. To this end they brought the subject before the people at their annual picnic, which picnic was instituted by our Grangers soon after their organization. It has now become a very popular occasion, affording the best possible opportunity for arriving at public opinion among our farmers on any measures of interest to them, and giving them an opportunity to cultivate public sentiment, either pro or con, upon any subject.

The provisions for this yearly "Feast of Tabernacles" are so diversified that every variety of taste for out-door enjoyment is sure to be gratified, and everybody goes because everybody else will be there,

and, in addition to the social enjoyment and opportunity for friendly greeting, good speakers are secured to entertain and instruct our people upon some subject of importance and universal interest.

The loss of many thousands of dollars by the high water forced the problem of drainage upon the public attention, and the time was fully occupied with the discussion of the importance and feasibility of providing an outlet for these destructive floods.

Our usual place of meeting, on the bank of the river, had to be abandoned for higher ground this year. The bank was too wet for safety.

The Passaic is a very sluggish stream, because of the dam at Little Falls. There is no proper and sufficient outlet for it at times of storm, and it must spread out over thousands of acres of beautiful meadow and pasture lands. In a heavy storm the river also frequently rises sufficiently to find its way into adjacent dwellings, filling up cellars, inundating lower floors, and obliging the inmates to move to the upper floors and there study the principles of navigation until the water subsides sufficiently to allow safe locomotion in small boats, for the purpose of reconnoitering the premises, estimating damages, &c. We heard last summer of some families in such imminent danger that their neighbors were obliged to go to their rescue.

The natural outlet of the Passaic has been rendered useless, for any immediate relief, by the unlawful addition to the dam at Little Falls. The water sinks away so slowly that the grass and vegetation decay in the hot sun, and the malarious odors, emitted from such a vast quantity of rotting vegetable matter, affect the health of the entire community very seriously, therefore our Granges deem it important to inquire into the best method of securing a speedy relief from this intolerable evil, and to this end secured the best talent in our land to discuss the question of drainage at our picnic.

Professor George H. Cook, State Geologist, was the first speaker introduced upon the platform, by the Hon. A. W. Cutler. He was heartily welcomed by the people, and all were interested in his discussion on "The Feasibility of Drainage."

Prof. Cook fixed a large colored map of the Passaic valley where all his audience could see it, and by this means the physical features of our section were plainly delineated, and the effect of removing the reef and of lowering the dam at Little Falls was shown, conclusively,

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as reclaiming thousands of acres of valuable land that are now comparatively worthless.

He pointed out, by means of his map, the locality of the different sections of meadow that are covered with water during the continuation of a freshet, viz.: "Black Brook meadows, containing 1,790 acres; Great Piece, 3,200 acres; Little Piece, 780 acres; Long meadows, 430 acres; Hatfield swamp, 1,730 acres; meadow from this swamp to Cook's bridge, 320 acres; another strip adjoining this, 560 acres; and from Columbia bridge to Chatham, more than 500 acres; Troy meadows, 2,950 acres; Bog and Vly, 1,200 acres, and also 5,000 acres called high land, which is so nearly level with the water that you can't dig more than a few feet without striking water."

Dr. Cook has surveyed all this river valley accurately, and he finds that the fall from Little Falls clear up to Chatham, a distance of twenty-three miles, is only three inches to the mile, and at Little Falls there is hardly fall enough to make the water run. The bottom of the river, eighteen miles up from Beatty's dam, is lower than the top of his dam.

Dr. Cook said he had conferred with the oldest and most experienced engineers in this and other States, and they all agree that by cutting away the reef five feet, and lowering the dam seven feet, the velocity of the water would be doubled, and all these low lands would be drained, and become valuable property, for all the accumulation of water would run off so fast that there would be little or no freshet, and the vegetation would not be seriously injured.

Dr. Cook also gave us an accurate history of the illegal erection of Beatty's dam, which is now higher than the reef itself; he said it was his opinion that "a long and unrestrained continuance of a nuisance will never legalize it;" and he also said that the cost of draining these lands would not exceed the value of the crops lost this summer, on account of these freshets.

Dr. E. M. Hunt, of the New Jersey State Board of Health, followed Dr. Cook, and spoke upon the "Necessity of Drainage," merely for sanitary reasons. The Doctor's wide reputation added weight to his remarks. He said:

"Health is the greatest of all possessions; a man sick for a week, a month, or three months, and there is a loss of \$90 or more. It is not a healthy section of country that makes your men weak and your women and children feeble. Family after family testify that for the

last forty years, as long as they remember, malaria and other diseases have been prevalent. Drain these lands, and there will be an increase in the health and an increase in the wealth of this section.

"Look at the valley of the Pequest, and see what great advantages have been derived from draining. Where, before draining, epidemics of a malarial type prevailed, now there is no more disease than on the upland. The evil influence of the malarial diseases lurking in these wet lands can be felt even as far as Morristown. It is as much to the interest of the people living in the uplands to have these lands drained as it is to those who live near the wet land, for the lives of those living in malarial districts are shortened."

Several eminent men supplemented the previous speakers in a very convincing manner, to show that we cannot afford to have these lands covered with water.

Hon. A. W. Cutler, before leaving the meeting, said: "On Tuesday of the present week I had the pleasure to be in the Pequest valley, and there saw by ocular demonstration what had been done. Six thousand acres of land that three years ago were not fit for man or beast to travel upon, worthless, entirely under water, have been drained, and now constitute the garden of Warren county. During all the last month of incessant rain those lands were free. I saw, as I passed, acres upon acres of them with corn growing on them. The land was sold for \$10 per acre three years ago. I have since seen it sold for \$25 per acre, and I have seen land, without a particle of labor being put upon it, covered with brambles, sold for \$85 per acre."

After two full hours of logical reasoning, and in the face of facts and illustrations drawn from observation and experience, we were forced to conclude that Mr. Beatty is running his mill at Little Falls at the expense of the lives and property of his fellow-citizens.

His reservoir extends for twenty-three miles, and embraces nearly thirty thousand acres of fine meadow and pasture, the greater part of which was entirely ruined by the water last summer.

GLOUCESTER COUNTY.

GLOUCESTER COUNTY BOARD OF AGRICULTURE.

OFFICERS FOR 1887.

<i>President</i>	THOMAS BORTON.....	Mullica Hill.
<i>Vice President</i>	JESSE S. BROWN.....	Mickleton.
<i>Secretary</i>	B. R. BLACK.....	Mullica Hill.
<i>Treasurer</i>	DAVID S. ADAMS.....	Mickleton.

DIRECTORS.

WM. H. BORDEN.....	Mickleton.
SAMUEL M. PARKER	Swedesboro.
JOS. J. BROWN	Mullica Hill.
JOHN GAUNT	Mullica Hill.
AMOS GARDINER.....	Mullica Hill.

DELEGATES TO STATE BOARD.

THOMAS BORTON.

B. R. BLACK.

THE COUNTY BOARD REPORT.

BY THE SECRETARY.

The Gloucester County Board of Agriculture held four meetings during the year, two at Mullica Hill, one at Swedesboro, and one at Mickleton.

The business transacted at these meetings mainly consisted of attempts to conform our organization to the new law relating to County Boards, and of discussions in regard to crops.

Numerous experiments with crops and fertilizers were made by members of our Board, but they have not been reported with sufficient accuracy to make them worthy of mention in this paper.

CONDITION AND PROSPECTS OF AGRICULTURE.

Agriculture in our county is in a more hopeful condition than at the time of our last report. Farmers who were not too much embarrassed found a balance in their favor at the close of the season's labor. Copious rains fell during the growing season, and the crops on which Gloucester county farmers mainly depended for profit, were good, and the average prices higher than in 1886.

This has encouraged us to make preparations for planting a still larger acreage and growing larger crops, and should conditions be as favorable as in 1887, the crop of 1888 will probably exceed, by a large amount, all former yields.

The growth of the towns along the line of the railroads, and of manufactories in them, is enlarging our home markets. Increased facilities for transportation, by the extension of the line of railroad from Williamstown to Mullica Hill, is encouraging farmers along the line to more extensive planting of cultivated crops.

A noteworthy feature of our farming is the large and increasing quantity of commercial fertilizer used. We have two firms in the county engaged in its manufacture. New York and Philadelphia horse manure is also freely used in addition to the home supply.

CROPS, YIELDS AND PRICES.

There has been no disease among live stock worthy of note. Very few cases of hog cholera have been reported. Roup is the most troublesome disease of all among domestic fowls, and no effectual means have been found for either prevention or cure.

Our stock of horses comes chiefly from Kentucky, Indiana, Illinois and Ohio. Very few are bred in the county, though farmers are now giving increased attention to this matter.

The supply of cattle and sheep for fattening is mainly drawn from Western New York and Pennsylvania. Less attention than formerly is paid to the fattening of stock. The number of swine fattened is not increasing. Prices for 1887 were \$1 per hundredweight higher than in 1886.

The poultry product of the county, which is always large, is still increasing. Prices have averaged higher than in 1886. Early

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broilers brought from 60 to 65 cents per pound, and farmers who were so fortunate as to have them to sell, made a good profit.

Creameries do not flourish in Gloucester county. Butter is made, almost exclusively, in the home dairy.

Owing to frequent rains pasture has been abundant, and the yield of butter large, and prices have kept well up.

The acreage sown to wheat is decreasing. The crop was poor, and can hardly be rated above seventy. The price in November was 80 and 85 cents. Fall weather was favorable for seeding, and a good stand was secured.

Corn yield one hundred per cent., and price in November 50 cents; Rye yield ninety, and price in November 55 cents. Oats but little grown, and yield one hundred, with price in November 35 and 40 cents per bushel.

Hay, when a stand was secured, made a full crop. Yield about eighty-five, and price \$10 and \$15 per ton. There is a good catch of grass from fall seeding.

White potatoes, acreage increasing yearly; early crop good; late crop very poor. The early crop is the principal one in the county. Yield eighty, and price in November \$1.75 to \$2 per barrel.

Sweet potatoes, acreage increasing; ground-rot and black-rot troublesome. The crop at digging-time did not fulfill expectations. Yield eighty-five, and price in November \$2.75 and \$3 per barrel. Returns from this crop highly satisfactory.

The interest in peach-growing is reviving, and many orchards are being planted. Crop a failure the past season. Yield twenty, and price 75 cents and \$1.50 per basket.

Apples a failure; yield twenty, and price \$1.50 per barrel.

Grape vineyards in this county are small. The rot and rose-bugs are discouraging growers. Crop a total failure in some cases. Yield twenty-five, and price from 3 to 4 cents per pound.

Small fruits averaged a yield of about seventy-five; prices a little higher than those of the preceding year.

Melons largely grown, and acreage increasing; average price fair, but low late in the season.

Tomatoes affected with rot, and late in ripening; yield seventy-five, and average price good.

Sweet corn yielded one hundred, and average price good. Badly injured by the worm, and no remedy known.

Other truck yielded fairly well, and prices were better than in 1886.

Vegetable plants are grown extensively in our county, and are distributed widely by Philadelphia seedsmen. This is a growing industry.

REAL ESTATE, TAXES, ETC.

The selling price of average farms, at voluntary sales, is \$60 to \$70 per acre, which, in most cases, is far below cost. Farms are not in demand.

Farms are rated for taxation in many cases up to their full selling value.

Tax rate per \$100 ranges from 70 to 85 cents.

There are probably not more than a dozen farmers in the county engaged in retailing milk. Fines were imposed on two of them for technical violations of the milk law.

The objection to this law, so far as reported, is, that it is capable of being, and sometimes is, enforced "for revenue only," and not simply to secure honest dealing in milk.

HUNTERDON COUNTY.

HUNTERDON COUNTY BOARD OF AGRICULTURE.

OFFICERS OF THE BOARD FOR 1888.

<i>President</i>	JOHN T. COX	Flemington.
<i>Vice President</i>	R. S. CONOVER	Locktown.
<i>Secretary</i>	E. M. HEATH	Locktown.
<i>Treasurer</i>	E. E. HOLCOMBE	Mt. Airy.

BOARD OF DIRECTORS AND SOCIETIES REPRESENTED.

JAMES LANE	Readington Grange.
JOSEPH HAGAMAN	Sergeantsville Grange
JAMES KERR	Kingwood Grange.
E. E. HOLCOMBE	Ringoes Grange.
URIAH SUTTON	Locktown Grange.
DAVID BODINE	Pomona Grange.
A. B. ALLEN	N. J. Fruit Exchange.
B. E. FINE	Hunt. Co. Agr'l Society.

DELEGATES TO STATE BOARD.

JOSEPH HAGAMAN (two years).	H. F. BODINE (one year).
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ANNUAL REPORT.

BY H. F. BODINE.

There is not as much interest taken in our County Board as I would like to see.

At our meeting at Flemington, during August, the attendance and interest were not sufficient to transact business, and yet agriculturists are constantly finding fault because their rights are being invaded and no help is given them by those in authority. They have all they can hope to have, certainly, until they learn that by co-operation they can secure their rights.

I read an article on this subject recently which so coincided with my views that I reproduce it here. It is:

"All other industries have an organization, and can accomplish what they desire. But when an organization of farmers is attempted other classes at once cry out that it is a political movement, intended to benefit some fellow who considers himself above the average farmer in intelligence, and as farmers are divided in their political views and affiliations, distrust shows itself among them, and perfect organization is prevented.

"When manufacturers organize for the purpose of raising the tariff on their wares, does any one think they are organizing a political party? Or, when railroads organize a pool, or raise the freight and passenger tariffs, are they looked upon as political schemers? If manufacturers, railroads and others can organize for the accomplishment of their purposes without being charged with political disloyalty to the parties to which the individuals belong, why should such suspicion attach to farmers under similar circumstances? There is no reason in the world for such a charge, and when it is made farmers should look out for the motive which prompts it, and it will generally be found to originate with such politicians who think that the country will go to the dogs if they are not placed in some fat office at the next election.

"The power of organization, in all enterprises of a public and private character, has been so frequently demonstrated, and the manner of effecting and maintaining organization so well understood, that individual effort, in a large way, has almost become a thing of the past, and it appears strange that the men who have suffered most for the want of organization, and who would be most benefited by it, do not see the greater necessity of further uniting for the purpose of promoting their interests and welfare. Manufacturers organize and demand of Legislatures, State and national, the enactment of laws for their protection, and it is done. Railroads combine and demand particular privileges. But the farmers, who feed and clothe the world, and pay for the privileges and protection which enrich others, have never organized for their own protection, notwithstanding they know they have the power to enforce whatever demand they make."

The season with us has not been as prosperous as some others. The yield of wheat and rye has been very small; due, in part, to the late seeding, which was caused by the extended drouth, making it difficult to prepare the ground for seeding these crops.

The oats crop promised to be as good as that of 1886, but owing to the heavy storms which set in at ripening, and which continued during the harvesting season, much of the crop was lost.

The corn crop yielded well on high ground, but in many places, on low land, the crop was greatly damaged by reason of the heavy rains during the growing season.

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Buckwheat yielded better than in the previous year ; the acreage sown was large, many peach orchards of two and three years' growth being sown, and while the crop was better than that of 1886, the price was also better, so that those sowing buckwheat did well with that crop.

Hay was much the same as that of the previous year, being quite good, and having been gathered in good condition.

Potatoes were a short crop, and are worth, at this writing, 75 cents per bushel ; they are quite scarce at these figures.

The crop of apples in many localities was very fair, while in some sections they were scarce.

Peaches, half a crop ; quality not as good as in some former years. This was no doubt due, in part, to wet weather during the ripening period ; but this has not discouraged peach-growers, for all the trees that can be procured will be set the coming spring.

The New Jersey Fruit Exchange, mentioned in my report of last year, is no longer an experiment, but an existing fact. The Exchange opened for business on the 31st day of August, and while many doubted, others were confident of its success, and with the push and vigor put forth by its managers, success came. Instead of selling our fruit in market through commission dealers, often at very unsatisfactory prices, we were gratified to see buyers on the Exchange from Boston, New Haven, Hartford, Albany, White Haven, New York, Philadelphia, Baltimore, Wyoming, Cincinnati, and other points, making the Exchange a lively place, so much so, in fact, that the people of the town in which the Exchange was located turned out in large numbers to witness what many predicted would be an institution of but a day, and prices were thus obtained in our home market that were a great deal more satisfactory than those received by parties selling on consignments.

At the opening of the Exchange, it had just enough opposition from the right direction to assure success.

I am informed by the managers that there were nearly fifty thousand baskets sold through the Exchange, and I am sorry that I cannot give you in this report the average price obtained.

Should we have a good crop of fruit the coming season, we expect even greater results.

Other localities are calling for branch Exchanges, and doubtless

they will be established before the opening of the fruit season of this year.

The estimated crop of peaches for 1888 is seven hundred and fifty thousand baskets in this county, or about one-half the crop of 1886.

The four creameries in the county are all running, and their patrons are generally satisfied with their workings.

The Grange Societies are in pretty much the same condition as at the time of my last report.

There will be efforts made to erect canning and evaporating establishments in the fruit-growing sections of the county during this year, to work off the surplus fruit that too often depresses our markets, and should the right parties take hold of the matter, they will doubtless prove beneficial not only to those investing their money in the enterprises, but to those raising fruit.

In my report to the State Board this year I had intended giving the experience and results obtained by some of our small-fruit growers, but I have had so little time since the fall work has been finished on the farm up to the time set for the completion of the county reports that I could not gather that information which would have been most valuable. If facts and figures could have been given they would have been of more interest, but reports in which the statements are approximated are not so valuable.

The thoughts I have expressed with regard to the organization of farmers are presented with the hope of encouraging organization where it is thought desirable.

There has been a great deal of real estate offered in the county at public sale during this fall, most of which brought satisfactory prices, though there was some that found no buyers.

I have been unable to secure any of the circulars sent out by the State Board during the year, and this has been a serious drawback to me in attempting to make up this report. [They were sent early to your Secretary.—F. DYE, *Sec'y.*]

Could I have had a series of questions, such as are sent to County Boards, to be circulated among correspondents for their answers, or could I have known that the State Board desired me to make a report, material could have been gathered that would have made this paper much more valuable.

MERCER COUNTY.

MERCER COUNTY BOARD OF AGRICULTURE.

OFFICERS FOR 1887.

<i>President</i>	THEO. CUBBERLEY.....	Hamilton Grange.
<i>Vice President</i>	J. M. DALRYMPLE.....	Hopewell Farmers' Club.
<i>Secretary</i>	FRANKLIN DYE.....	Lawrence Grange.
<i>Treasurer</i>	H. R. WITHINGTON.....	Titusville Farmers' Club.

BOARD OF DIRECTORS.

J. B. HORN.....	Pennington Grange.
WM. A. HOUGH	Ewing Grange.
A. L. HOLCOMBE	Hopewell Farmers' Club.
WM. B. VAN PELT.....	Mercer Grange.
DAVID MCGALLIARD.....	Hamilton Grange.
FRANKLIN DE COU.....	Hamilton Agr'l Ass'n.
JOHN F. PHILLIPS.....	Princeton Agr'l Ass'n.
THOMAS B. DE COU.....	Lawrence Grange.
WM. S. RIGGS.....	East Windsor Agr'l Ass'n.

DELEGATES TO STATE BOARD.

FRANKLIN DYE (one year).....	Trenton, N. J.
J. M. DALRYMPLE (two years).....	Hopewell, N. J.

CROP REPORT.

BY FRANKLIN DYE.

Mercer county occupies an enviable position among her sister counties, being surrounded by some of the best counties in the State—Burlington, on the south, excelling in varied agriculture, fine farms, good farmers and fat hogs. Monmouth, on the east, out of whose depths surrounding counties have been enriched, while her own coffers have been filled with inflowing cash from outgoing marl; rich and strong, with pride enough to keep her to the front. Middle-

sex, rightly named, occupying the middle position in the State, and with Monmouth and Mercer—the three “M’s”—comprising the heart of Miss New Jersey. Of these three, Mercer possesses the chief attraction, for “thither the tribes go up”—the children of “Polly-Tics.” They are a numerous company, coming from every part of the State, and are named from their ancient mother, “Polly-Ticians.” They are not all alike, for while some seek to advance their own interests merely, others are equally intent on advancing the general good.

What has this to do with agriculture? Within our limits we hold the Capitol of the State, replete with historic interest. To these halls of legislation are sent each year men who are expected to enact new and amend existing laws, in order to secure the greatest good to all the people. The farmers of Mercer county ask their brother farmers to take a direct and more abiding interest in State elections; not as partisans, but to secure the election of MEN—men to fill positions of trust; to legislate for the general good and for the advancement and favor of agriculture, the foundation of all other industries. Yes, brothers, send MEN to the Legislature. There is no lack of honest, wise, firm men, in all our counties, men who will not disgrace, but will do honor to the name, the subject and the place of legislation.

Again, Mercer county is most favorably located for market and transportation facilities. Whatever is grown in the county and is not consumed in its growing towns and cities, of which Trenton is the chief, finds quick transportation to Newark, Jersey City and New York on the north, or to Philadelphia on the south. The importance of local markets, for perishable farm produce, cannot be overestimated. Farms and market gardens so situated are worth more per acre than even richer lands more remote from market, for every cent added to the cost of transportation is so much less profit to the producer.

Reference is made to Trenton. It is a rapidly-growing city. Building has been carried on during the last few years with surprising rapidity, and the growth is substantial. The population, including its suburbs, Chambersburg and Millham, is sixty thousand. It is a manufacturing city. One cause for the growth of manufacturing in such variety, is its transportation facilities, as stated above. Another cause is that it is a healthful location. Manufacturing material is also found near the city. In Ewing township are vast ledges of

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splendid building stone, which are extensively used here and elsewhere. In Hamilton township, on land that was not considered to be of much value for farming purposes, a quality of clay has been discovered, resembling red lead, which is a perpetual source of income to its owners. This clay is used in the manufacture of pottery ware in the Trenton potteries, the first city in this line of business in the United States. Thousands of tons of sand, suited to the manufacture of brick, are annually dug in Lawrence township, and carted to the numerous brick works west of Trenton, where millions of brick are made each year. But to enumerate and describe the various manufacturing interests of Trenton would require a volume.

The increase of population, incident to and depending on manufacturing industries, is of great value to those engaged in agricultural pursuits.

EDUCATIONAL ADVANTAGES.

The facilities for acquiring an education in Mercer county are unsurpassed. In Princeton, Princeton township, are institutions of learning, both scientific and theological, known over the civilized world. In Pennington, Hopewell township, is the flourishing and popular Methodist seminary. At Hightstown, East Windsor township, is located the Peddie (Baptist) Institute, now established on a sound financial basis. At Lawrenceville, Lawrence township, a series of buildings have been erected, costing over half a million dollars, equipped with all the modern appliances for acquiring a finished education. While, in Trenton, the well-known State Normal School, with others of lesser note, carry forward this great and important work. Every township has its church or churches, in connection with its schools, and there is no lack of opportunity to become good, as well as wise.

RAILROAD FACILITIES.

Like many of our comparatively-modern improvements, their importance and value are underestimated. Without these our products would have a circumscribed market indeed, and those suffering from drought or other cause in one State might perish before help could reach them from the abundant harvests of another. The pleasure of the summer excursion and the winter tour, combined with the knowl-

edge gained by observation, would be something unknown. The flourishing seaboard towns of this State, with the immense streams of travel, and the expenditure of money incident thereto, adding to the permanent population and wealth of the State many thousands annually, would be impossible without railroads. The morning papers of our metropolitan cities, now received by the man of business before breakfast is announced, would have to be given up. The pleasures of correspondence with a far-away friend would require months, instead of a day or two, as now.

But *capital is oppressive*. Yes, when used for certain purposes. Let us remember that, while we are condemning the oppressions of capital consolidated, that it is necessary, *absolutely necessary*, to mass capital, in order to build our railroads, to construct our canals, to erect, equip and carry on our vast and increasing manufacturing enterprises. But for these vast industries, the limitations of trade would be very circumscribed, and the amount of money in circulation would be small indeed. When, to develop a nation's resources, to put in motion the wheels of industry, to encourage manufacturing, to spread the sails of commerce—thereby giving employment to the laboring classes, at a fair reward, at a safe and honest profit to the investors—capital is consolidated, it is legitimately employed, and it becomes a blessing to all. But when corporations are formed, and huge trusts are organized to monopolize trade, or to control the necessities of life, simply and only to enrich their members, thereby preventing the equal and harmonious progress of the people's industries, depriving the individual citizen of his share of trade, and, by questionable means (Proverbs, i., 11–19), reducing the selling price to the producer and increasing the purchasing price to the consumer, of every commodity they control, capital is consolidated, it becomes a curse to the people, and is to be resisted, by all lawful means, as the worst form of despotism.

In the adjustment of the difficulties that at times arise between capital, *legitimately employed*, and labor, or labor organizations, it would be well for laboring men to consider, first, what would be the daily return for a day's work if none of these industries existed, if the capital of the men with large means were used only to meet the wants or gratify the pleasures of their immediate families, regardless alike of others' needs or of the possibilities of increasing their wealth by mercantile operations? A glance at the non-manufacturing countries of

the East, with their dependent peasant masses, ought to answer this question satisfactorily. Second, if the capital, from which we seek an increase of wages, is legitimately employed; in our efforts to secure what we seek, are our methods such as to accord equal justice to all laboring men? Labor is justifiable in seeking such a reward for its expenditure—it is bone and muscle and life—as is commensurate with the profits resulting therefrom to the employer. While seeking this, it must not prohibit a brother laborer from doing the work it refuses to do, else *labor organized* becomes despotic and tyrannical towards *labor unorganized*. This latter course strikes so far and reaches and injures so many against whom labor has no controversy, as is, alas, too abundantly illustrated in the last decade, it is to be deprecated.

Arbitration, between honorable men, ought to secure a fair and satisfactory adjustment of all difficulties.

While our farming lands are fairly productive, the net results are far below what they ought to be.

At the prices at which many farms were purchased, \$125 to \$150 per acre, with the prices of farm products tending downwards since the war, and the consequent reduction in the value of land for farming purposes, the farm in numerous cases mortgaged from one-third to one-half the purchase amount, the mortgage nets more to the mortgagee than the farm does to the nominal owner, and he doing the work. There is no demand for farms, for the reason that more profitable results are realized from capital invested in other pursuits.

No country can prosper long when every other business yields a better return for time and money expended than that of the producer of the raw material.

It would be well for our political economists to inquire into the cause of this one-sided prosperity in time to avert a crash, which will surely come unless a remedy is soon applied.

Taxes are levied to meet the expenses of the government without regard to the productive value of real estate, especially of farms.

Farming lands are rated too high, and the percentage of taxation kept well up. Public improvements are projected on a scale often far more expensive than is really necessary, and much beyond the ability of many taxpayers to meet.

Our school funds are kept up and teachers' salaries paid, but the children of the poorer classes at least are not educated. Parents are

indifferent to its importance, or the earnings of the boys and girls are needed or coveted for the family support.

If we tax for education let us educate or abolish the tax.

A tariff has long been maintained to nurse manufacturing interests. Now let us impose a tariff so high on all raw material, vegetables, &c., that the farmer can produce, that there will be encouragement to, and profit in their production, thus developing to their fullest extent our country's and our people's resources.

Unless this is done the other extreme will soon be sought by tillers of the soil, and protection will be a thing of the past.

The crop returns, as far as received, indicate a yield, in general, below an average good year. Some large returns have been realized, as the township reports show, but they have been very exceptional.

Corn was injured by high winds before harvest and heavy rains at blooming-time, preventing perfect pollenization.

Potatoes were injured by rain, causing rot.

Wheat is below even its ordinary low average, fifteen bushels per acre, and the price is still below a dollar.

Oats, where not harvested early, were almost totally ruined by the rains.

Fruit has been irregular in yield. Insects injurious to fruit culture seem to be increasing.

No prevailing disease among stock.

The following is the average yield of each crop in the county, as per the township reports, 100 being the standard of a good crop:

Wheat, 80 per cent.; corn, 78 per cent.; rye, 80 per cent.; hay, 83 per cent.; potatoes, 60 per cent.; peaches, 58 per cent.; apples, 40 per cent.; pears, 55 per cent.; grapes, 40 per cent.; blackberries, raspberries and strawberries, each 80 per cent.

For taxation, farms are rated at (county average) \$73 per acre; tax rate, per \$100, 78 cents.

Amount raised for working the roads in each township (county average), \$2,100.

Few farms are changing owners.

The proceedings of the County Board are marked with the usual interest, which is always good.

The meetings are held regularly four times each year, and are well attended.

At the annual meeting, which occurs in February, the State Ex-

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periment Station was indorsed and its importance emphasized, and the members of the Board were urged to inquire into its work and to aid it in all possible ways.

The President of the Board delivered his fourth annual address at this meeting. [This address of Mr. Ege is of sufficient general interest to be reproduced here, but owing to the crowded condition of our State Board Report it is omitted.—SECRETARY.]

Mr. E. Williams, Secretary of the State Horticultural Society, also delivered an able and suggestive address on "Small Fruits for Farmers," such as might be expected from him.

The Directors made their annual report, stating :

"That Hopewell Farmers' Club is in a flourishing condition. Twelve new members added during the year. Is trying to establish a weather service station. New interest has awakened in small fruit culture. Poultry and the dairy interest are receiving more attention.

"Princeton Agricultural Association has passed its twentieth anniversary. Attendance and meetings good.

"Mercer Grange meets monthly ; attendance and interest kept up.

"Hamilton Grange is in better condition than formerly. Purchasing is done through the Grange agency.

"Pennington Grange is increasing. More attention is given to the production of milk.

"Hamilton Township Agricultural Association is flourishing—meets twice each month in winter. Numbers over one hundred members. Has purchased a good library. Dairying, small fruits and early vegetables are the leading interests.

"The Board again indorsed and urged the passage of Senate Bill 372."

At the June meeting, crop reports were made, as is the usual custom, setting forth the present condition and the prospective yield of each.

Discussion as to the most profitable use to which cows can be devoted resulted in the conclusion that, where market is near—milk ; where market is remote—butter.

Diseases among farm stock and successful remedies used were discussed. A member stated that, to prevent gapes in chickens, lice must be kept away. These enter the young chicks' throats and develop into gape worm (?). Use powdered sulphur to keep the nests of the mothers clean during setting.

Hon. James Buchanan, M.C., addressed the board on "The Farm-

ers on Legislation," setting forth more especially what has been and what is being done to favor farming interests by law-makers.

Referring to the Interstate Commercial Belt, he stated that fifty per cent. of the freights were carried at special rates. He affirmed the need of thorough organization among farmers.

The making and saving of manure was discussed. The Secretary stated that our present method of making and saving manure is, in reality, no method. We are slow to learn. He asked if we could not run all our straw through the stable, thence to the field. Do not throw the straw into the barn-yard, to lie half the year.

Mr. Hough agreed, but did not see, however, how we could house all our manure. .

Mr. Ege has extended the front of his barn so as to make the bulk of his manure under shelter.

Mr. Hendrickson would, if possible, make all under shelter.

J. B. Green—This subject opens a wide field, and an interchange of views would be beneficial. Does not believe in throwing straw into the barn-yard, but through the stable first, and thence as soon as possible to the field. He had visited a farm in Pennsylvania, where the manure was carted to the field once a week. This gentleman would prefer to have it thus applied, even in winter.

Mr. Buchanan—Will not a difference in soil make a difference in the effect of the manure?

A. D. Anderson believed the use of oil of vitrol in the preparation of fertilizers, injurious to crops.

The topic, "What discouragements do you see in the way of farmers, and how will you remove them?" led to an animated and helpful discussion.

Mr. Hough—Our children are good for nothing on the farm.

Mr. Carhart—Too much education given to children nowadays makes fools of them.

Mr. Ketchum—Do I understand that farming and education are incompatible? Cannot *our children* be educated? Is education against labor, or is it necessary to direct labor?

Mr. Carhart—Put him in the Institute and give him money and he will go to the beer saloon.

Mr. Ketchum—You will find, upon investigation, that this tendency began before the boys entered the Institute.

Mr. Carhart—The boys who are working their way through the Institute are doing well.

Mr. Ege—Is farming so attractive and profitable that our boys go into it? Mine can have their choice between farming and some other profession.

We expend too much in fertilizers and machines. Decrease your expenditures. Don't lose valuable time at the shop, the tavern, or in town, which might better be applied to sundry jobs at home.

Mr. Hough—What will our boys go at, with the same capital, that will pay any better? If they manage rightly, there will be no trouble.

The Secretary—The increase in land value realized by our fathers will not be secured by this generation. Land purchased immediately after the war by men of limited means was bought too high for farming purposes since that time. The price received for farm produce and the cost of production are too far apart. The former is too low; the latter, with the cost of our land added, is too great for farmers so situated to make any headway against farm incumbrances.

Mr. George Anderson—If our farmers consent to live as our fathers did, they will get along. The producing capacity of a dollar is more now than it was years ago.

As to education, our young men will not be called to fill responsible positions unless they are fitted for them. We do have reason to complain that the capital we invest does not pay as it should. Taxes have increased threefold in twenty years. The farmer who produces most at the least expense is most likely to succeed.

William R. Ward, Esq., addressed the Board at the fall session. He referred to the present milk law, the road law, and the pasturing system versus fences, for stock.

The topic, "Whether it is better on all soils alike to manure broadcast or in the hill only, to get the best results," being before the Board, Mr. Ward stated that he believed in enriching the soil in whole and not in part. The skimming system grew out of renting farms. The tenant would put on only what he could get off, &c.

Mr. McGalliard—On some light soils, manure would be lost before being taken up by the growing crop, if applied broadcast. Better put as much as is required by the plant in or near the hill, so as to be within easy reach of the growing crop, in hill culture.

Two cases of cattle disease were reported, whereupon the Secretary

was instructed to send notice of the fact immediately to Dr. E. M. Hunt, Secretary of the State Board of Health.

At this meeting, J. A. Hendrickson delivered a carefully-prepared paper on "Fertility in Plant Life."

"Profit in the Poultry Yard" was next discussed.

J. M. Dalrymple keeps his poultry in groups of twenty or thirty. This plan prevents disease. He uses plaster gypsum as a disinfectant, also coal ashes. Keeps house clean. Feeds warm feed in mornings—whole grains, so that the fowls must work for it. Gives clean water for drinking—fresh every day. Sets hens outside of farm buildings, in nests made of sixteen-foot boards, divided into proper sections. Plenty of ground oyster shells are as good if not better than patent "egg foods" for egg production. He thinks Plymouth Rocks the best general-purpose fowls.

Question—Are the large breeds more subject to disease?

Mr. Dalrymple—I think they are.

Isaac De Cou—For hen lice, use kerosene oil and whitewash. Have hens cleaned when taken off young chicks. I believe the Leghorn fowls less subject to disease. Leghorns, both brown and white, are out hunting food, while Plymouth Rocks and other large fowls sit around in the sun and wait to have their food brought to them, &c.

The following resolutions to the State Board were passed unanimously, viz.:

"1. *Resolved*, That the Mercer County Board of Agriculture is pleased to know that the Executive Committee of the State Board of Agriculture have established the headquarters or office of the Board at the State House, believing it to be a move that will strengthen the Board for all purposes contemplated in its organization.

"2. *Resolved*, That the Mercer County Board of Agriculture hereby requests the State Board to take such action as may be necessary, by legislation or otherwise, to enlarge the functions and status of the Board to a Department of Agriculture, with all the necessary appliances and helps this important interest demands.

"3. *Resolved*, That in order to increase its efficiency, suitable efforts be made to organize a County Board of Agriculture in every county of the State, and that the State Board issue and circulate to the County Boards, from time to time, such matters of information as may be deemed by the Executive Committee of immediate practical use to the farmers of the State."

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EWING TOWNSHIP REPORT.

While the whole course of farming in general is attended to in an ordinary way and is depended upon for support, there are certain branches that are made special, and from which greater incomes are obtained. Of these we might speak of poultry and cattle. The raising of the former is now attended to in all its varied branches. We know of four localities where chicken-houses have been recently established, accompanied with hatchers involving an outlay of thousands of dollars. The chicks reared in these establishments are usually sold in the month of February, and bring fabulous prices. Others give great attention to their poultry in winter by providing glass houses for them and warm feed, which develops their laying qualities in this month to such an extent as to make them a source of material profit, when not opposed too much by an importation from Germany and other places. The same might be said in reference to cabbage, potatoes, &c. The papers are all teeming with expressions of joy at this "Godsend," as they call it, from above. We have often wondered if a little protection to the farmer would not be of service in this case. This, however, is out of the question, for the wrong ox is being gored; but I am diverging. Chicks raised in hatchers, I am informed, are free from disease.

The out-door poultry-yards have three fatal maladies, viz., gapes, cholera and roup. There is no effectual remedy known for either of the three, and the poultry raiser finds himself deprived of his best stock year by year, by the epidemics from which no relief has yet been obtained.

In regard to cattle, you ask how many farmers are engaged in the milk trade, and we answer seventy-five per cent. of the farming community. This article alone furnishes more revenue by far to the farmers of Ewing township than any other that can be named; hence the great interest taken by its citizens in any measures adopted affecting the weal or woe of this large class of producing citizens.

It is a great mistake to suppose that when measures are enacted involving their interests they will stand by as idle spectators of the scene, without entering their protest. Invasions on their religious or legitimate rights excite alarm, and call for denunciation.

You ask us, "Are we satisfied with the workings of the present

milk law?" We answer, no. Then why? Because it brings impositions upon and works injustice to these producers and there is no redress for their grievances. Such are the opinions of those engaged in the traffic. This sentiment seems to be most unanimous, as evinced by the men of most refined intellect, as well as those whose prejudices are easily excited.

We speak, not for ourselves, because we are not interested, either directly or indirectly, but for those whom we are called upon to represent, after having made a most thorough and careful examination, that we may not make any misrepresentations in a matter of so much interest to the public.

We are satisfied that there are cows giving natural milk that will not contain twelve per cent. of solids, and yet the vender is liable to his fine of \$50 and all the disgrace attached to a miscreant selling a spurious article, while the man himself is unconscious of having committed an offense against the law. The Inspectors answer, "the law presumes he does know," and neither incompetence nor ignorance can plead an excuse for such a nefarious crime.

We shall not stop to discuss whether the standard established is too high or too low—our space will not permit that—but speak rather of its effects and injuries upon an unoffending community. Probably no man in the Commonwealth can have a higher contempt for, or view with greater disgust, one who would so degrade himself, or willfully violate the law of both God and man, as he who knowingly waters milk. The establishing of this standard, however, invites this process, for it is known that much milk contains far more than twelve per cent. of solids; then why not, like the distiller of whiskey, water down to proof, no matter what is done, if the law be answered?

But the most serious complaint entered by our milk dealers is the manner in which they are treated; they are stopped at all times and at all places. Their wagons are entered by officers of the law, their milk-cans are taken possession of, and their milk taken away for further examination or analysis without the consent of the owner. Their business is delayed and themselves injured.

Are these outrages to be continued, and none in higher authority to see that the law is civilly executed? Better by far that no law existed than that these things should be continued. In the name of humanity, we implore protection for these people who are laboring

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by night, as well as by day, to earn small profits upon which to support a family at home.

For these and other logical reasons we have entered this earnest plea for our fellow-citizens and co-laborers.

HOPEWELL TOWNSHIP REPORT.

BY J. M. DALRYMPLE.

Hopewell township comprises about thirty-seven thousand acres of land, divided up into four hundred and seventeen farms of over ten acres each, three hundred and thirty-five houses and lots, situated in villages, besides thirty-five vacant lots. The soil is varied, consisting of red shale, sandy loam, clay and mountain land.

The winter grain, throughout the township, presents as fine a top as it has for many years.

The Hopewell Farmers' Club has established a Weather Service office at Hopewell, to co-operate with the State Weather Service Station. The idea of keeping a daily record of temperature and rainfall is one which, in the course of years, must be valuable to any locality of agriculture.

The club now receives monthly the "New Jersey Weather Chronicle," and during the months of June and July, the "Weather-Crop Bulletin," from the Signal Service Office, War Department, Washington, D. C., is also sent weekly.

Hopewell Grange, with headquarters at Hopewell, and Mercer Grange, at Pennington, are both in active operation.

The peach crop was light, except in a very few cases. Giving the basket with the fruit was not satisfactory to the grower. Owing to this more peaches were shipped to Philadelphia markets than heretofore, the prices being as good as could be obtained in New York, besides the return of the basket.

The following are the shipments reported from various railroad stations in the township:

	Baskets.
Hopewell.....	21,768
Moore's.....	No report.
Pennington	3,773
Total	25,541

It is estimated that fully six to eight thousand baskets were disposed of in Trenton and smaller towns in the county, and in Bucks county, Pennsylvania.

About twenty-five farmers are engaged in the milk business, seventeen of whom are sending their milk to Philadelphia, and eight are retailing to the consumers.

J. S. Naughwright will open a creamery in Hopewell village, fully equipped for making butter and cheese. Many farmers have already signified their intention of selling their milk, believing it will be more profitable, besides relieving the women of much hard work.

The hog cholera has done much damage. It has reached over a district of country from about one and one-half miles west of Hopewell village, and about Harborton to near Lambertville. Some farmers have lost all their hogs by it. Generally, no remedy or preventive has been applied to check it, so far as I can learn.

We would make special mention of Mr. Nathaniel H. Hill's apple orchard, near Moore's Station on the Philadelphia and Reading railroad. The crop this year can be safely estimated at seven thousand bushels. This orchard contains seven hundred bearing trees. Three hundred of them were put out in 1858, and the balance in 1860. Half of them were set thirty-two feet each way; the balance thirty-two by thirty feet. Mr. Hill says if he were going to set out another orchard he would put them in forty by forty feet, and plant all red apples, as they sell better and do not show bruises, and would plant as many Nero as Smith Cider.

The orchard contains the following varieties, viz.: Three hundred Smith Cider, one hundred Baldwin, one hundred Russet, fifty Greening; the balance is of different varieties.

About half the orchard has been in sod about six years, the balance cultivated previous to this year. He thought the plowed part did the better, but this year the sod portion did the better—colored up the apples.

About five years ago the canker worm attacked the trees to such an alarming extent that he believed they would have killed his orchard had he not destroyed them by spraying the trees with London purple.

When the trees were small the manure was applied around them; after they became larger the ground was manured broadcast. Recently he has been applying fertilizers, using the best bone he can

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get and mixing it with muriate of potash as follows: Three hundred pounds of bone and two hundred pounds of potash, applying it broadcast about four hundred pounds to the acre, and harrowing it in on the portion that is plowed. It is the healthiest and best-looking apple orchard I know of. A number of large crops have been gathered heretofore.

Horses are increasing in number, but not enough raised to supply the demand. About fifteen years ago Mr. Theodore B. Jackson, of Brooklyn, N. Y., started the "Fair View Stock Farm," at Mount Rose, near Hopewell village, and offered the best blooded trotting sires to the farmers at moderate prices. The breeding from the trotting sires was not entirely satisfactory on account of not having properly-bred brood mares, but the second or third-cross colts have been sold at good paying prices, and the farmers are now improving their stock. The outlook for the future in this line is promising.

Cows have slightly increased; dairymen consider it cheaper to buy than raise them, although a great many farmers near Hopewell and Mount Rose are raising grades, and cross their native cows with the best Jersey strains, which has already improved their herds in quality and appearance.

Calves for stock are usually brought from New York State.

Sheep are generally decreasing in number, as fencing is getting too expensive, and lung worms are sometimes troublesome to the late lambs, a remedy for which is one teaspoonful of turpentine in two gills of milk, administered as a drench. Early lambs are profitable.

The best varieties of pears for market are Clapp's Favorite, Bartlett and Beurre d'Anjou, on standard; all others have serious faults.

Apples are considerably grown; early varieties paid the best. The leading varieties are: Primate, Sweet Bough, Maiden's Blush, Williams' Favorite, Hubbardston Nonesuch, Smith's Cider, York Imperial, Ben Davis and Barnesly.

The apple moth, or worm, can be destroyed by spraying the trees with a kerosene emulsion made as follows: Mix one gallon of oil with five gallons of sour milk. Churn by pumping from one vessel to another. When mixed, dilute with fifteen gallons of water. London purple or Paris green, one pound to forty gallons of water, is effective. Can add one pound of fine flour. The arsenics are dangerous to the users. After an orchard has been sprayed, stock must

be kept out until after a good rain. Be careful about using too much, or inhaling the mixture. The spray, to be effective, must be applied early, almost before the blossoms drop, and again after a heavy rain, for, say, one month.

Borers are common and easily destroyed by examining the trees and cutting out.

The green aphid fly can be killed by the oil emulsion.

Fruit-growing needs experience. Nine-tenths of the varieties grown ought to be weeded out—the best only pay.

Mr. S. B. Ketchum, Secretary of Mercer Grange, No. 64, states :

“The dairy interest is increasing ; many farmers keep double the number of cows they did a few years ago. A large number serve customers in Trenton with butter. Using the Cabinet Creameries, they secure a much better article at a better price.

“Fifteen farmers now ship milk from Pennington to Philadelphia. The price obtained is four cents per quart for six months, and three cents for four months, less one-half cent per quart freight.

“There is no complaint here concerning the present standard of milk. The lactometer test averages one hundred and ten to one hundred and fifteen degrees.”

MIDDLESEX COUNTY.

MIDDLESEX COUNTY BOARD OF AGRICULTURE.

OFFICERS FOR THE YEAR 1888.

<i>President</i>	CAPTAIN SAMUEL BLISH.....	New Brunswick.
<i>Vice President</i>	A. D. NEWELL, M.D.....	New Brunswick.
<i>Secretary</i>	J. M. WHITE.....	New Brunswick.
<i>Treasurer</i>	C. E. D. PHELPS.....	New Brunswick.

DIRECTORS.

CHARLES E. ELKINS.....	New Brunswick.
J. G. CORTELYOU	New Brunswick.
GEO. H. COOK, LL.D.....	New Brunswick.
MATTHW SUYDAM.....	New Brunswick.
E. FARMER.....	New Brunswick.
JOHN PIERSON.....	New Brunswick.

DIRECTORS IN STATE BOARD.

J. M. WHITE.....	New Brunswick.
D. C. LEWIS.....	Cranbury.

CROP REPORT.

BY J. M. WHITE.

Our County Board has held seven meetings during the past year, most of which have been attended but poorly ; and the agriculturists in our county, although somewhat improving in their vocation, do not yet seem to fully realize the benefits arising from concerted action and interchange of views among themselves.

The farmers of our county are largely engaged in trucking, and in the production of fruit and milk.

The last season, generally speaking, has been fairly prosperous, and

although some crops have been light, a better price has generally made up the deficiency.

Wheat was below an average crop, on account of injury done by the winter weather.

Corn and potatoes were injured to some extent by the prevailing wet weather, while rye was generally of good quality, with a half crop in some cases and a full crop in others.

Oats made a fairly good crop, but were greatly damaged by the continual wet weather during harvest.

Hay averaged about three-fourths of a crop, yet the price was not high.

Late cabbage, in some localities, was much injured by too much rain in July and August, causing them to scald on low ground, and resulting in a short crop. Fields which were uninjured made good crops, and were remunerative.

Peaches were about half a crop, and of ordinary quality, commanding low prices.

Apples yielded not more than one-fourth of a crop, were very inferior in quality, and sold for low prices.

Pears were abundant but of low grade, and were a drug on the market, selling for low prices.

Grapes are not extensively cultivated, not enough being produced to supply the home market. The yield equaled about a three-fourths crop, and, when of good quality, sold at fair prices.

Blackberries were a moderate crop, and sold fairly well, the average net price being about 8 cents per quart.

Raspberries were abundant, and of good quality, selling well, at an average net price of about 10 cents per quart.

Strawberries were greatly injured by drouth at time of ripening, the crop having been cut short, and the quality of the fruit also being injured. In our market these berries netted a trifle less than 10 cents per quart.

But few farmers in our county make a business of raising cattle or sheep, most of our stock, especially horses, being brought in from other States.

There are two or three fine herds of Holsteins in our county, one of which has frequently taken first premiums at our State Fair.

From Cranbury township D. C. Lewis reports as follows, in answer to questions sent out by your Executive Committee :

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Two farmers in the township are engaged in the retail milk trade and they make no complaint in regard to the workings of the present milk law.

Farms are rated at from \$30 to \$80 per acre for taxation, the rate on real estate per hundred for taxation being \$1.10.

The amount raised for working the roads is \$800.

The selling price of farms is from \$40 to \$100 per acre, according to locality and improvements.

The yield of wheat is eighty per cent., and price 86 cents per bushel.

Corn seventy-five, price 53 cents; rye one hundred; oats eighty-five; hay 80, and price \$13; white potatoes seventy-five per cent. yield, and sweet potatoes one hundred per cent.; apples twenty-five, and pears one hundred; grapes seventy-five.

Season favorable for all crops, except that it was too wet for corn and potatoes, and harvest too wet for oats.

From Piscataway township Captain Samuel Blish reports ten farmers engaged in the retail milk trade, and that all are well satisfied with the present milk law. Farms are rated at \$50 per acre for taxation, the rate per \$100 being \$1.20.

The amount raised for working roads is \$4,000.

The selling price for average farms is \$50 per acre.

No increase in the raising of horses, sheep or swine. A decrease in the raising of cows, and an increase in poultry.

Yield of wheat fifty per cent., and selling price, October 10th, 70 cents; corn ninety-five per cent., and price 56 cents; rye seventy per cent., and price 60 cents; oats sixty per cent., and price 25 cents; hay sixty-five per cent., and price \$13; white potatoes seventy per cent., and selling for \$2 per barrel; apples forty per cent., and price \$1 per barrel; pears fifty per cent. and selling for \$2.50.

We trust that farmers in the various townships will become more interested, and that in the future we may be able to give fuller and more instructive reports.

MONMOUTH COUNTY.

MONMOUTH COUNTY BOARD OF AGRICULTURE.

OFFICERS FOR THE YEAR 1888.

<i>President</i>	JOHN H. DENISE.....	Freehold.
<i>Vice President</i>	JOHN B. CONOVER.....	Freehold.
<i>Secretary</i>	D. D. DENISE.....	Freehold.

DELEGATES TO THE STATE BOARD.

WM. S. COMES.....	Freehold.
JOHN C. VAN DOREN.....	Manalapan.

DIRECTORS.

JAMES H. BAIRD.....	Marlboro.
JOHN STATESIR.....	Colt's Neck.
JOSIAH WOODWARD.....	Englishtown.
J. BERGEN THOMPSON.....	Freehold.
WILLIAM H. REED.....	Tennent.

COUNTY REPORT.

BY D. D. DENISE.

During the year the Board has held three meetings, which have been very well attended, but which have not awakened as much interest among the farmers of the county as had been hoped for.

At the November meeting of the Board the following, as a supplement to the dog law, was passed, and ordered to be presented to the State Board for their action :

"A Further Supplement to an act entitled 'An act for the preservation of sheep.'

" 1. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That every person who shall own, keep or harbor any

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dog or dog, bitch or bitches, shall have the same registered and numbered with the clerk of the township or ward in which the person harboring the same shall reside, and shall place upon the neck of each dog or bitch, so kept or harbored, a collar, having engraved thereon, upon a metal surface, the name of the owner of said dog or bitch, and the registered number thereof; and it shall be lawful for any person to kill any dog or bitch found straying off the premises of the owner of said dog or bitch, without such collar on its neck.

"2. *And be it enacted*, That it shall be the duty of the clerk of each township or ward in the state to provide a book for the purpose of registering the owner or owners applying for such registration, and giving to each person information of the registered number thereof, and for so doing he shall receive the sum of ten cents for each dog or bitch so registered, to be paid by the person applying for said registration, under a penalty of ten dollars for each and every neglect or refusal of the said clerk to so register.

"3. *And be it enacted*, That all acts and parts of acts inconsistent with the provisions of this act, be and the same are hereby repealed.

"4. *And be it enacted*, That this act shall take effect immediately."

In looking over the agricultural field for the last year, we find we have taken no backward steps, though our crops are not so satisfactory as in some former years, and the prices realized for our products are not calculated to make farmers, as a class, feel jubilant. I will venture to say there is no business pursued by man for a livelihood that requires, in order to make a success of it, more thorough study and a more scientific education than that of farming, in its various departments, and the day is certainly not far distant when our farmers will take and read the papers and periodicals pertaining to their calling, with as much interest as the professional man, merchant or manufacturer looks after his individual profession or business (I don't mean newspaper farming). By these means we are enabled to get, in a nutshell, the interchange of ideas, experiments and practical operations, which we would not get otherwise in five years or in a lifetime.

The subject of agriculture demands the attention of the deepest and most profound thinkers of our agricultural schools. It is a subject that should be more generally studied, and taught, and understood, not only by our chemists and scientific men, but by every farmer in our country. These things would greatly assist in making farming a desirable and a paying business.

The diversity of our soils affords opportunity for a diversity of cultivation; and it is with much interest and satisfaction I note the

fact that the farmers of our county are, each year, taking a deeper interest in the cultivation of fruit for use in their families, and that, as they become convinced of its usefulness and healthfulness, each year they are using more fruit. There is nothing that has a greater tendency to elevate, improve and refine the tillers of the soil, and their families, than constant association with good and choice fruits, and beautiful flowers.

I consider this a matter of great importance, and would urge that it be made a special subject for discussion at our County Board meetings.

Peaches are being more extensively cultivated than formerly, and there are some promising and profitable orchards in our county. The yield in midsummer gave promise of being a large one, but the cold, wet weather, and the lack of sufficient sunshine, caused a great deal of the fruit to rot before ripening, reducing the crop to seventy-two per cent.

David S. Wyckoff, of Freehold, reports that from an orchard of eight hundred trees, which has borne fruit for seven successive years, he this year marketed one thousand three hundred baskets, and another orchard, four years old, which yielded one thousand one hundred baskets of fruit. The average price per basket was 70 cents, net. Fertilizer used was phosphate and manure. Ground high and soil gravelly.

Our apple crop was the lightest for many years, and was very poor in quality, with the exception of a few of the earlier varieties. Winter apples matured rather early, and dropped badly, while those remaining on the trees until picking-time rotted badly, both before and after housing. The crop averaged about thirty-six per cent. Price, from \$1.50 to \$2 per barrel.

Pears yielded much below an average crop, and the quality was very inferior. The only variety that came up to its regular standard was the Kieffer, which was superior to the fruit of former years, both in quantity and quality. The average crop was forty-eight per cent., and the price varied from \$2.50 to \$5 per barrel.

Small fruits, during the past season, while not entirely satisfactory to the growers, were fairly good, the prices realized being better than in former years, especially so in the case of blackberries, which sold for good prices.

The wheat crop was below the average, caused mainly by the unfavorable weather of winter and spring.

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A few fields yielded a fair crop. J. H. Denise reports from five acres one hundred and ninety-five bushels, an average of thirty-nine bushels per acre; variety, the Dietz; long berry. D. D. Denise, from a field of eight acres, harvested three hundred and twenty-one bushels and twenty-eight pounds of wheat, an average of forty bushels and eleven pounds per acre; variety, Dietz; long berry. Treated in the early spring to one hundred and seventy-five pounds of nitrate of soda per acre. There were many fair yields, averaging from thirty to thirty-eight bushels per acre. Price, from 80 to 95 cents per bushel.

In view of the low prices ruling for wheat, and the probability that there will be no improvement in value for years, if ever, on account of foreign competition from countries where labor is abundant and cheap, this state of affairs will make it necessary for American farmers, and especially for New Jersey farmers, to cease raising wheat to any great extent. They will, from necessity, be driven to the growing of other and more profitable crops. I think far too many of our farmers are making wheat-growing and corn-growing too much of a specialty.

In the rye crop there was a good growth of straw, the heads were fairly well filled, and the crop was fully up to the average. The crop paid quite well by marketing the straw. The price was 60 cents per bushel, and straw brought from \$12 to \$14 per ton.

Oats, but few grown, and what were did poorly on account of the wet weather at harvest-time, making the crop almost worthless. Price was from 35 to 40 cents per bushel.

Corn, which was not grown so extensively as in former years, was planted in season, and in a good seed-bed, came up good and grew finely during part of the season, when a heavy wind came just about setting-time, damaging many fields considerably, shortening the crop fully twenty per cent. in some cases.

J. H. Denise reports from one field an average of eighty-seven bushels per acre. It was fertilized with ten loads of yard manure and five hundred pounds of fertilizer per acre; level cultivation. Price from 55 to 60 cents per bushel.

The hay crop was one of the smallest gathered in the county for some years, owing to the clover being badly killed by the winter, some fields being entirely killed. The average yield was sixty-eight per cent. of a full crop.

J. H. Denise reports the following from five acres of timothy: A yield of seventeen tons and one thousand five hundred pounds, or an average of three tons one thousand one hundred pounds per acre, weighed when marketed in the fall. Manured heavily preceding fall. From clover, five acres, fourteen tons five hundred pounds; average two tons one thousand seven hundred pounds per acre. Mixed heavily with alsike clover, making excellent hay.

Potatoes are a crop extensively grown in the county. They came up better in the spring than for some years past, started to grow rapidly and bid fair to be a promising crop, but the heavy rains checked the growth of the potatoes and caused a short crop. The average crop in the county, with the exception of the very late varieties, was about fifty-two per cent. of a full crop.

L. F. Conover, of Marlboro, grew on six and nine-tenths acres, seven hundred and thirty barrels, an average of one hundred and six barrels per acre, for which he realized from \$250 to \$275 per acre. The average price per barrel was \$1.50 to \$2.

The tomato crop had, at the beginning of the ripening period, the promise of being an extra large one, for the vines were large and full of fruit, but the cool, wet weather prevented them from ripening, and caused many of them to rot. At the close of the season there proved to be but half a crop.

Melons of various kinds were inferior, both in quantity and quality.

Considerable attention is paid to the raising of poultry, especially of chickens, for the markets on our seacoast.

Stock is in good condition throughout the county and there has been but little disease during the past year.

The feeding of cattle for the butcher was at one time a prominent industry, but now may be classed among those which have but little importance.

The sheep industry will also be a thing of the past, unless we can secure protection against dogs.

The increasing demand for milk, especially in the county, is leading many to direct their attention to its production, which is more profitable than feeding stock.

The subject of roads is one which interests the whole traveling public. No one loves a bad road, and every one likes a good one. The improvement to our roads has been very perceptible since the

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new road scrapers have been put into operation. But, still, they are not what the traveling public needs. The public need to understand that road-making is an art—a trade—and that road-repairing is also a trade, and therefore we must look for men who understand the business, just as much as in any other trade.

Our road districts are too small, and we have too many Roadmasters whose experience in building and repairing roads is limited. We think it would be better to have one good Roadmaster for the whole township, and one of experience; and let him begin work in the spring, as soon as practicable, and work throughout the season.

REPORT OF THE MONMOUTH COUNTY AGRICULTURAL SOCIETY.

BY CHARLES D. B. FORMAN, SECRETARY.

This year closes the thirty-fourth and last of the existence of the above Society.

The annual fair was held this year, on the 13th, 14th and 15th of September. The exhibits in some departments surpassed those of former years, and all were very good.

On account of unfavorable weather at the time of the annual fair for the last four years, the Society has been unable to pay more than its actual current expenses.

Consequently, at a recent meeting of the stockholders it was thought best that the property of the Society be sold, and that its affairs be closed up.

The grounds, buildings, &c., were accordingly advertised, and sold at public sale on December 17th, 1887, for the sum of \$6,275.

In the meantime a new organization has been effected, to supersede the old Society. The capital of the new organization is limited to \$25,000.

The certificate of incorporation has been filed, and the stock is being rapidly subscribed. It is the purpose of the stockholders of the new organization to place it on a firm financial basis, and make its exhibitions second to none in the State.

The officers of the new organization have not yet been elected, but it is safe to predict for Monmouth county a most attractive fair in the future.

MORRIS COUNTY.

MORRIS COUNTY BOARD OF AGRICULTURE.

OFFICERS OF THE BOARD FOR THE YEAR 1887.

<i>President</i>	HON. A. W. CUTLER.....	Morristown.
<i>Secretary</i>	W. F. ELY.....	Madison.
<i>Treasurer</i>	GEORGE COOK	Hanover.

BOARD OF DIRECTORS.

M. M. COOK,	GEORGE W. FELCH,	WM. JAMES,
WM. B. LINDSLEY,	JOHN MITCHELL,	OSCAR LINDSLEY.
HENRY W. YOUNG,	B. S. CONDIT,	

ANNUAL REPORT.

Our County Board has held but one meeting during the past year, and for the first time the interest was not confined to the members of the Grange alone, but we had the pleasure of seeing some of the best men in the county in attendance, some of them coming six or seven miles to hear Prof. George H. Cook, who gave an address on the necessity and advantages of our State and County Boards of Agriculture, an address so ably delivered and so impressive that many of those present joined the membership.

We trust that in the future the County Board will have more interest taken in its proceedings, and that more meetings will be held.

The farmers in the western part of the county are engaged in raising grain, principally corn and oats, and in the eastern part of the county milk is the principal interest, and low as the price of this product is, and has been for the past year, it is about all our farmers have to depend on for a living.

The year has been one that should have been a blessing to farmers, but for the low prices received for their products. Pasture has been

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unusually fine, especially during the autumn, as it held on well into the fall. Warm rains have fallen about as often as needed, having done much to effect a saving of hay for winter fodder. Hay in this section is scarce and high, owing to the loss of the crop on our low meadows, caused by the frequent freshets, and farmers will have a difficult matter to fight their way through the foddering period owing to this fact. Most of our farmers have sufficient low ground to yield them hay enough, of second quality, to feed their dry cows and young stock, but for producing milk one could get about as much from his cows from feeding this lowland crop were he to blow his cattle up with a bellows. Take away our milk market and the farmers of this section would lose money on their corn and wheat and other cereal crops at the present low prices. The majority of our milk farmers feed brewers' grains, which make more milk, some think, for the money expended than anything else known, though others argue that bran of same value fed side by side with brewers' grains would produce as much milk or more than the grains will produce. If this could be established it would be a blessing in many ways, as our milk would be much richer and better in every way for consumption. One thing seems to be a settled fact—if the milk produced from the feeding of grains is not injurious to those persons using it, the cows soon show the effect, and are soon worn out and must be sold and others purchased to take their places, in order that the milk-supply may be kept up. Some people may deny that a cow is stimulated by these grains, and that the feeding of grains does not injure the cow, but it is generally known in this section that farmers in renewing their worn-out stock do not purchase those which have been thus fed, but rather cows that come from another neighborhood, where it is known that no grains have been fed. Old farmers claim they can tell a cow that has been grain-fed any length of time, by the decayed teeth of the animal.

Another important consideration, and one which every farmer should take into account, is the increase in the quantity and value of the manure made by feeding bran and cotton-seed meal. We are told by good authorities, we lose only from ten to twenty per cent. of the strength of the feed in the animals consuming it. Cotton-seed meal has been fed by a few of our farmers for the past five or six years. Last year a car-load was sold here, and two more car-loads are

now on the way. Those who have fed it for milk and butter consider it the best feed they can buy.

Few counties in the State, besides Morris, Essex and Passaic, have suffered as portions of these counties have, lying along the banks of the Passaic river. When a farmer loses one crop, it is bad enough ; but there are many farmers so situated who, during the past summer, lost by the excessive rains every spear of hay, and every growing crop they were raising, and who had not a pound of hay, a bushel of potatoes or an ear of corn to carry their families or their stock through the winter. The Passaic river frequently rises, and as quickly falls again, or in a few day at longest ; but the past year has been one that the oldest people cannot remember to have seen its like for freshets, when lands were under water for such a length of time, and that at the time of year when all the growing crops could be destroyed.

We have thousands of acres of low meadows, some of which produce the finest meadow hay, often averaging three tons to the acre, which, when harvested at the proper time, without being flooded, is often preferred to timothy for feeding horses. This year, every acre was lost ; and when you understand that in these three counties we have some 15,000 acres affected by the water, one can readily see that the loss has been immense. There is no doubt, also, that the scum left on the grass by the subsiding water often tends to produce sickness, as this scum was so hard, when dried by the sun, that ducks and geese could walk on it without breaking it, and creating an odor that one could smell a long distance.

Meetings have been held for the purpose of taking some decided measures to have the Passaic river so drained that this cannot occur again. The Granges of Essex and Morris counties held their annual picnic on August 24th, and made the draining of the Passaic the subject for discussion. It was estimated that over 10,000 people were in attendance, though the weather was very unfavorable.

The meeting was presided over by the Hon. A. W. Cutler, and addresses were made by Prof. George H. Cook, Dr. Hunt and President Burrough, of the State Board of Agriculture, and State Master R. Coles, of the New Jersey State Grange, all whose addresses made the meeting the most interesting that was ever held among agriculturists in these counties. Prof. Cook was born within two miles of where the meeting was held, and having made the subject of the rises

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of the Passaic river one of his life studies almost, was well able to give us facts and figures that no other man could have given.

Dr. Hunt has also shown a great interest in this, and has been at a number of meetings, arguing the necessity of draining this river if for no other reason than that the health of the residents in its vicinity demands that something be done, and we hope that strong measures will be taken with the Legislature to give us relief which should have been given us years ago. If this can be done there is a great deal of land never before under cultivation that can be redeemed and cultivated and made to produce the finest crops.

REPORT FROM HANOVER TOWNSHIP.

BY M. M. COOK.

1. The large majority of farmers are engaged in the production of milk.
2. The larger majority are satisfied with the present milk laws.
4. Sixty-seven cents.
5. Twenty per cent.
6. No sales reported.

Wheat, twenty-five per cent., worth 85 cents; corn, twenty per cent., worth 54 cents; rye, forty per cent., worth 60 cents; oats, ninety per cent., worth 40 cents; hay (upland), ninety per cent., worth \$17; potatoes, seventy-five per cent, worth \$2.25; horses, decrease; mules, none; cows, increase; sheep, no change; swine, decrease; poultry, increase.

The wholesale milk business is increasing, and better care is being taken of the cows.

There has been some disease among hogs, supposed to be hog cholera, the disease in most cases proving fatal.

The Chester Whites are considered the most profitable.

Wheat and rye were light on account of the drought. In the fall of 1886 came up poor and wintered out.

Timothy hay crop was about equal to the average, but the flowed meadows were an entire failure on account of the heavy rains in summer.

There are some four thousand acres in the township.

REPORT FROM PASSAIC TOWNSHIP.

BY WM. B. LINDSLEY.

1. There are three retail dealers in milk.
2. They are satisfied with the present milk laws.
3. About \$30 an acre.
4. Eighty-one.
5. \$3,000.
6. \$60.

Wheat, forty, 83; corn, five, 55; rye, one hundred, 58; oats, twenty-five, 37½; hay, twenty, 18; peaches, one hundred, \$2.40; apples, twenty-five, \$2.50; pears, one hundred, 4 cents; grapes, twenty-five, 4 cents; blackberries, one hundred, 10 cents; raspberries, one hundred and ten, 8 cents; strawberries, one hundred and fifteen, 10 cents; horses, only a few raised; mules, none; cows, seventy-five per cent. raised; swine, fifty per cent. raised here; sheep, a small per cent. raised here; poultry, not much fine stock.

Stock is generally kept in good condition, and we seldom hear of contagious diseases.

Butter-making is followed by most of the farmers.

Jersey cattle are thought to be superior for milk and butter, and are much sought after by the wives of the farmers.

About \$3,000 are raised in the township for the repairing of the roads. This money is applied in a very unscientific manner, generally, not only in this township, but in all this section of the State, except in Chatham township, west of Newark and north of Plainfield.

The system of carting earth from the foot of the hills for the purpose of making water-breaks on the hill roads, generally made where there is plenty of earth near at hand or alongside, is an abomination, and should be abolished in this intellectual and advanced age. Much money could be used in placing our roads in proper condition, but the people must not be burdened with heavy taxation, as must needs be done to build Telford roads. But let us encourage the system of cutting away the dirt from the wheel-track to the ditches, thus furnishing sufficient material to build up the center of the roadway, causing the drainage-breaks to disappear, and giving us good roads for nine months in the year at least. Graveling should also be done, if possible, gradually, and we would soon have country roads our township might well be proud of.

SALEM COUNTY.

SALEM COUNTY BOARD OF AGRICULTURE.

OFFICERS OF THE BOARD.

<i>President</i>	JOS. W. COOPER.....	Pedricktown.
<i>Vice President</i>	RICHMAN COLES	Woodstown.
<i>Secretary</i>	H. C. PERRY.....	Alloway.
<i>Treasurer</i>	J. WALTER PANCOAST.....	Sharptown.

DIRECTORS.

JOHN W. DICKINSON.....	Woodstown.
WM. A. MILLER	Cohansey.
EMPSON ATKINSON	Woodstown.
EDWIN L. BORTON.....	Woodstown.
BENJAMIN F. STRAUGHN	Pedricktown.
M. D. DICKINSON.....	Woodstown.

DIRECTORS TO STATE BOARD.

J. WALTER PANCOAST (one year).....	Sharptown.
JOHN W. DICKINSON (two years).....	Woodstown.

SOCIETIES REPRESENTED.

West Jersey Agricultural and Horticultural Association, Salem County Pomona Grange, No. 6; Woodstown Grange, No. 9; Friesburg Grange, No. 81; Courses Landing Grange, No. 60; Pedricktown Grange, No. 46.

ANNUAL REPORT.

The Salem County Board of Agriculture has held four regular meetings during the year, all of which have been well attended and a good degree of interest manifested.

Besides discussing various questions pertaining to agriculture at our annual meeting, held on the 19th of February, John W. Dickinson, Delegate, gave an excellent report of the meeting of the State Board of Agriculture.

At the second quarterly meeting, held in Pittsgrove, April 27th, Woodnutt Pettit gave us an excellent paper on corn culture, and Allen Moore gave his method of growing white or Irish potatoes.

At the fourth quarterly meeting, held in Woodstown, October 26th, we had the pleasure of listening to Prof. George H. Cook, in the interest of the Agricultural College, Experiment Station and farmers in general. Woodnutt Pettit also gave us a valuable paper on the cultivation of hedges. We have also commenced a series of experiments in connection with the Experiment Station, in order to ascertain the relative values of phosphoric acid from South Carolina rock and from dissolved bone.

Four farmers, one in each of the following townships, Alloway, Oldmans, Pilesgrove and Pittsgrove, are experimenting with phosphoric acid on wheat this fall, under the direction of Dr. A. T. Neale, Chemist of the Station.

We also have a committee appointed to report at our next meeting on the feasibility of an annual stock sale.

The regular meetings of the Board are held quarterly, on the fourth Wednesday in January, in April, in July, and in October.

REPORT OF SALEM COUNTY POMONA GRANGE, NO. 6.

BY REEVES FLITCRAFT.

Salem County Pomona Grange, No. 6, has fifty-six members in good standing. Its meetings are held quarterly at Woodstown. They consist of discussions on farm topics, essays and such other business as is presented.

The meetings are both instructive and entertaining.

The Granges throughout the county are holding their own, purchasing articles to a large extent, such as lime, fertilizers, seeds, binding twine, &c.

Salem county is a rich agricultural district, and is adapted to the growth of fruit and vegetables, hay, grain, &c.

Dairying is carried on to quite a large extent.

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REPORT OF ALLOWAY TOWNSHIP.

BY H. C. PERRY.

There is but one farmer in this township engaged in the retail milk trade; all others are wholesale. They are not satisfied with the workings of the present milk laws. Their reason for this is that the percentage of solids as required is too high.

Farms are rated at \$60 per acre for taxation.

The rate of tax is 90 cents per \$100.

Two thousand five hundred dollars is raised for working the roads.

The selling price of average farms is about \$75 per acre.

The raising of horses, cows, sheep and poultry is on the increase.

The raising of swine is on the decrease. The cholera is very bad at this time.

Chicken cholera has not been as bad this year as in former years.

Corn, rye, hay, sweet potatoes, pears and strawberries have been about an average crop, while wheat, peaches and apples have been far below the average.

Oats and white potatoes have been above the average, whilst grapes, blackberries and raspberries have been almost an entire failure.

Prices: Wheat, 90 cents per bushel; corn, 50 cents; rye, 65 cents; oats, 35; hay, \$10; white potatoes, \$1.75 per barrel; sweet potatoes, \$2.50 per barrel; peaches, 80 cents per basket; apples, \$2 per barrel; blackberries, 10 cents per quart; raspberries, 12 cents per quart; strawberries, 6 to 10 cents per quart.

Tomatoes have been a good crop, and sold at the canning factories at \$6 per ton.

REPORT OF LOWER PENNS NECK TOWNSHIP.

BY EPHRAIM FOWLER, SALEM P. O.

There are no farmers in this township engaged in the retail milk trade; all are wholesale. They are not satisfied with the workings of the present milk law. The reason is, for common stock the per cent. of solids is too high.

Farms are rated at from \$50 to \$100 per acre for taxation.

The rate of tax per \$100 on real estate is 85 cents.

Two thousand dollars is raised for working the roads.

The average selling price of farms is \$100 per acre.

The raising of horses, cows, swine and poultry is on the increase.

Wheat, corn, oats and hay have been an average crop.

Sweet potatoes, peaches and strawberries have been below an average crop. Prices on December 1st, wheat, 90 cents; corn, 47 cents; oats, 35 cents; hay, \$10 per ton; sweet potatoes, \$2.50 per barrel. September 1st, peaches, \$1 per basket. June 12th, strawberries, 6 cents a quart. Tomatoes have been a largely increased crop over last year. Average crop eight tons per acre; price \$6 per ton. Wheat following tomatoes does not look well; cause, getting it sown late.

I think corn or potatoes should follow tomatoes. Cropped in rotation instead of wheat.

MANNINGTON TOWNSHIP.

Mr. Woodnutt Pettit reports a very light crop of all fruits. We have one canning factory put up by two farmers, who canned about fifty acres of fruit. From eight to ten tons is quite the average this year per acre; the best lands have the lightest crop. There have been about four hundred and fifty acres grown in the township this year.

There are not half the hogs in the township there were in 1884, owing to the loss sustained by farmers through the ravages of the "swine plague" or "hog cholera," so called, in previous years. It was not so malignant this year as formerly.

About fifty farmers are selling milk to dealers.

HEDGING.

AN ESSAY READ BY WOODNUTT PETTIT AT THE MEETING OF THE SALEM COUNTY BOARD OF AGRICULTURE.

"In compliance with a request from your Executive Committee that I should furnish you with an article on hedging as a farm fence, to be read at this meeting, I herewith submit the following :

"My remarks are intended to apply to the Osage, having had but little experience with anything else.

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"In preparing the site for a hedge-row, I plow the ground, throwing the furrows all one way, which will leave the ground level without backing or dead furrow, ten feet wide if there is room, though eight feet will do. If full of brier roots, poison vines and grass roots, turn it over as neatly as circumstances will admit of, then roll thoroughly with a heavy roller; then with an Acme or Disc harrow—the Acme is best—thoroughly pulverize and level the bed off. After that is done I set out by line, using a spade by shoveling down and pushing away from me to leave sufficient room to insert the plant, which should be set as deep as it stood in the nursery bed. I prefer plants home grown, one year old, and if properly set not two per cent. will die. If brought from a distance, or have been dug and buried in trenches in the nursery where grown for some time, before setting examine well to see that their vitality is not impaired by mismanagement in shipment or trenching.

"In setting out, sort so as to put plants of a uniform size together, for a large plant will crowd a smaller one nearly out of existence.

"The question may be asked, Would it not be better to thoroughly farm the hedge site, if of such a character as above described, the year previous to setting the hedge? I answer from experience emphatically, no. Put the labor for such purpose direct in the tillage of the hedge, and farm it from the time of setting till the 1st of September following just as thoroughly as you would a row of onions. At the end of the season I have a gain of one year's growth, and you will be astonished how the poison vines, briars and foul stuff have disappeared, and if the soil is fertile the hedge will make a growth from three to six feet high. Farm level and don't ridge with a plow.

"The first and second winters allow no rubbish to collect around the plants for mice to harbor in, they being very destructive to a young hedge.

"The second spring I replant where missing with large, strong, vigorous plants, because those adjacent being well rooted, would soon crowd the life out of the replant if small when set.

"The second spring cut back the previous year's growth down to about ten inches in height, after which, with a one-horse plow, about the middle of April, begin about three to four feet from the hedge and throw the furrow away from it, and continue so doing till I get plowed up close as possible to it. What little remains I hoe out by hand. Now, if there should be any poor or barren spots or hillsides

with the soil washed away, in the hedge-row, manure with fine compost manure. About ten days after, thoroughly harrow with a sharp spike harrow, then throw a light furrow direct to the hedge and continue plowing around it, if possible, till all the originally-prepared bed for setting is entirely plowed out. The balance of the season use the cultivator as long as the growth of the hedge will admit of, and the hand-hoe to exterminate all foul growth which the cultivator leaves.

“The third spring trim off the lateral branches, so as to force the growth into the upright shoots, then cultivate with a sharp horse-hoe, putting a blanket on the horse to protect him so that he will walk close to the hedge, and that will be all the cultivation with a horse the hedge will admit of for the season. Foul stuff, if any, destroy with a hoe.

“The fourth spring, or three years' growth from setting the hedge under the foregoing management, it will be of sufficient size to lay, though if left one year longer will make a much stronger barrier. The canes at three years' growth should be nearly the size of ordinary broom handles, and many plants will produce more than one cane. In laying, leave uprights about eighteen inches apart, cutting them off from two feet nine inches to three feet from the ground. From the remaining canes trim off the laterals and hack about two-thirds off at the ground with an axe and weave in through the uprights. If the hedge should be thin in places, as most of them over the country are, through bad management, then drive stakes for uprights and weave in all the plants. The advantages in laying are, it makes a strong fence in the bottom, being absolutely hog-tight and cattle and horses will have to jump to pass over, because they cannot thrust weak canes aside and push through; and again, at the hack made on the laid canes a new growth starts after it is laid, which thickens and strengthens the hedge. After the laying is done all protruding branches lop off with a pair of shears, then cultivate precisely as the second year up to the 1st of June, when cultivation has to be dispensed with thereafter.

“About the 1st of June trim with a grass hook, inclining the shape to a pyramidal form. Again trim at or about the 1st of July, also 1st of August and September, at which time it should not be more than from three to three feet six inches high, and about the same in

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width at the base, and trained to a point on top. This makes four trimmings for the year.

"The following spring, before the hedge puts out in leaf, trim off protruding shoots which put out after the last September trimming, with a pair of shears, and go through the same programme every year thereafter as laid down the preceding year. Be sure and cut back to the old wood every time, so as to keep the hedge back to not more than four feet high, without it encloses a grazing field, where, if necessary, it may be allowed to grow higher. Bear in mind the lower the hedge the easier trimmed, presenting less surface, so to make it just high enough to turn stock, is best and most economical to care for.

"The advantages of pyramidal shape are, first, a good thick hedge in the bottom, which no other shape will admit of, because the tips of the lower laterals can get the rays of the sun the same as the tops do. Second, the bottom being thoroughly shaded, no grass or foul stuff can get a foothold, and you will have a hedge—a thing of beauty and practical utility—just as long as the above directions are carried out.

"My experience in growing hedges is that the immense roots that make such serious aggression on the adjacent crops cease just as soon as the hedge is laid and kept within the bounds designated.

"I will now endeavor to give you an approximation of the relative cost of a first-class hedge fence and a good post-and-rail or worm fence, and the attending annual direct and indirect expenses thereafter, for the ensuing fifteen years, as follows:

Hedge plants cost per rod.....	\$0 10
Preparing ground and setting.....	10
Three years' cultivation, 5 cents per year.....	15
Laying	10
Incidentals which may arise.....	05
Total cost per rod when laid.....	<u>\$0 50</u>

EXPENSES PER ANNUM ON THE SAME.

Interest per rod.....	\$0 03
Yearly trimming per rod.....	07
Total cost per annum per rod.....	<u>\$0 10</u>
First cost of post-and-rail or worm fence per rod.....	<u>\$1 20</u>
Interest on original outlay.....	\$0 072
To keep in repair.....	008
Total cost per annum per rod.....	<u>\$0 080</u>

"Barbed wire fence I have not taken into consideration. It can be built much cheaper, but is so objectionable on account of liability to injure stock that many farmers will not use it under any consideration. At the end of fifteen years I see no reason why the hedge should not be as good or better than ever, but the rail fence, if not demanding a renewal, will be attended with a greatly increased expense. The advantages of a good hedge fence are, it don't blow down, can be trimmed close up to with a mowing machine, and also is pleasant for the eye to rest upon, being very ornamental.

"Disadvantages.—Some hindrance to adjacent crops; must be trimmed when needed, and admits of no putting off without creating greatly increased expense in labor. In this particular matter the Osage hedge is extremely arbitrary, so much so as to bring reproach upon itself in the opinion of the average farmer.

"All the little things I have alluded to in its propagation must in the main be attended to or else disappointment in most cases will be the result; and as a consequence I don't think it advisable to recommend any but those who will take an interest in its propagation to undertake to raise one. A good hedge, like a good chain, has no broken links."

SOMERSET COUNTY.

SOMERSET COUNTY BOARD OF AGRICULTURE.

OFFICERS FOR THE YEAR 1888.

<i>President</i>	A. A. CORTLEYOU.....	Neshanic Station.
<i>Vice President</i>	HON. CALVIN COBLE.....	Neshanic Station.
<i>Secretary</i>	WILLIAM S. POTTER.....	Somerville.
<i>Treasurer</i>	L. R. VREDENBURG.....	Somerville.
<i>General Superintendent</i>	PETER DEWITT.....	Somerville.

DIRECTORS.

JAMES P. MAJOR.....	Somerville.
HENRY S. LONG.....	Raritan.
ALBERT VOORHEES.....	Millstone.
JACOB S. HOAGLAND.....	Harlingen.
S. E. GARRETSON.....	Raritan.
JAMES CRAIG.....	Dunellen.
JOHN B. LEWIS.....	Baskingridge.
H. A. VAN DERBEEK.....	Lamington.
JOHN S. RANDOLPH.....	Bloomington.

DELEGATES TO STATE BOARD.

DAVID C. VOORHEES.....	Blawenburg.
WILLIAM S. POTTER.....	Somerville.

ANNUAL REPORT.

BY WM. S. POTTER.

There being no organization of farmers in the county, except the Somerset County Agricultural Society, this has become the County Board of Agriculture, by electing its officers and directors in accordance with the act establishing State and County Boards of Agriculture.

Our stated annual meeting is held on the third Saturday of February, at the Court House in Somerville.

We had a large attendance of farmers at our last meeting, coming to hear Professor Cook's address before the Board. He always interests the farmers, usually speaking upon the use of fertilizers and manures. After his lectures he invites the asking of questions in regard to subjects of interest to farmers.

CROP REPORT.

The leading products are hay, corn, oats, peaches, pork, poultry, beef, butter and milk, about in the order named.

Very few of our farmers are engaged in the retail milk trade; some townships report none—others from eight to ten. No complaint against the workings of the present milk law reported.

Average value of farm land for taxation from \$40 to \$50 per acre. Tax rate from 90 cents to \$1 per hundred.

Farms sell at from \$45 to \$60 per acre.

The raising of horses is on the increase, and reported quite profitable. The Norman or Clydesdale horses are getting to be quite popular. Very few mules are raised. Cows on the increase; sheep perhaps twenty-five per cent. increase, which are never raised except as lambs for market. Swine have increased perhaps ten per cent.

Poultry has increased perhaps twenty-five per cent., due chiefly to their being raised by artificial means very successfully. But little disease among poultry.

No disease prevailing among horses or cattle, except occasional cerebro-spinal meningitis reported.

According to the reports the yields of crops are as follows, one hundred per cent. being taken as the standard:

Wheat, twenty-five per cent., average price, 90 cents, December 1st; corn, ninety per cent., average price, 56 cents, December 1st; rye, seventy-five per cent., average price, 60 cents, December 1st; oats, one hundred per cent., average price, 30 cents, December 1st; much of the oat crop was caught by heavy rains at time of harvesting, and could not be gathered; hay crop, one hundred per cent., average price, \$14 per ton, December 1st; white potatoes, fifty per cent., average price, \$2 per barrel; sweet potatoes not raised; peaches, sixty per cent., average price, \$1 to \$1.50 per basket; apples, fifty per cent., \$1 per barrel; pears, ninety-five per cent., average price, \$2.50 per barrel, September 1st; grapes, thirty per cent., selling at 4 cents per pound;

SOMERSET COUNTY.

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blackberries, one hundred per cent., 8 cents per quart; raspberries, one hundred per cent., and 10 cents per quart, and strawberries, seventy-five per cent., and selling for 8 cents per quart.

REPORT OF SOMERSET COUNTY AGRICULTURAL SOCIETY.

ORGANIZED 1870.

The members and officers are the same as those of the County Board. Annual meeting and election on third Saturday in February. Annual fair held first week in October.

The last annual fair was held October 4th, 5th and 6th. We had good weather, and the fair was well attended. The exhibits in all departments were especially good.

The receipts were as follows:

Gate admissions.....	\$3,667 00	
Grand stand admissions.....	416 00	
Inside of track admissions.....	63 75	
Sale of oats.....	11 97	
Sutlers, and ground-rents.	672 55	
J. C. Shaw, rent of grounds.....	100 00	
Speed and other entries.....	1,340 50	
	<hr/>	\$6,359 27

Expenditures:

Premiums.....	\$2,934 75	
Advertising, &c.....	1,610 25	
	<hr/>	4,545 00
Receipts over expenditures.....		\$1,814 27

SUSSEX COUNTY.

SUSSEX COUNTY BOARD OF AGRICULTURE.

OFFICERS FOR 1888.

<i>President</i>	HON. THOMAS LAWRENCE.....	Hamburg.
<i>Secretary</i>	JOHN LOOMIS.....	Deckertown.
<i>Treasurer</i>	THOMAS ARMSTRONG.....	Deckertown.

DIRECTORS.

A. PEEDER.....	Andover township.
N. A. STACKHOUSE.....	Andover township.
PETER D. SMITH.....	Byram township.
L. S. MARTIN.....	Frankford township.
J. W. CRANE.....	Frankford township.
GEORGE GREEN.....	Green township.
D. WARBASSE.....	Green township.
W. HARDEN.....	Hampton township.
J. J. HIBLER.....	Hampton township.
B. K. JONES.....	Hardyston township.
W. J. KIMBLE.....	Hardyston township.
S. SLATER.....	Lafayette township.
R. SNYDER.....	Lafayette township.
D. EVERETT.....	Montague township.
G. HORNBECK.....	Montague township.
WM. RICKNEY.....	Newton township.
R. M. KEIMBLE.....	Sparta township.
G. GENDERMAN.....	Sparta township.
J. I. SMITH.....	Sandyston township.
J. LAYTON, SR.....	Sandyston township.
M. BUDD.....	Stillwater township.
W. P. COURSELL.....	Stillwater township.
WM. OWEN.....	Vernon township.
CAPT. BAILEY.....	Vernon township.
W. A. STILES.....	Wantage township.
THOMAS ARMSTRONG.....	Wantage township.
J. ROE.....	Wallpack township.
E. BELL.....	Wallpack township.

DELEGATES TO STATE BOARD.

W. A. STILES.....	Deckertown.
THOMAS ARMSTRONG.....	Deckertown.

SUSSEX COUNTY.

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ANNUAL REPORT.

BY JOHN LOOMIS, SECRETARY.

The Sussex County Board of Agriculture having been organized for so short a time, but few experiments have been tried among the members, and as the county is large, and most of our farmers are Democrats, it works slowly, though it will get there after awhile.

The crops in Sussex county during the past year, as a general thing, have been very good. Very little manufactured fertilizer is used, as experiments tried for a few years past have proven that these fertilizers are too expensive, and do not increase the crops sufficiently to warrant this additional expense.

Our farmers give their attention largely to cattle producing milk. The cattle being fed largely with grain gives additional strength and value to the manure made; consequently our ground is kept in good order for rotation of crops of various kinds, and in Sussex we can raise almost anything on our soils, if properly cared for (voters not excepted, and all kinds at that, and we do not require artificial fertilizers to do it, either).

We find that one of the best methods of fertilizing our lands is to sow clover seed, the roots of the crop thus produced having a large amount of fertilizing property, keep the soil loose, and in good condition, at the same time furnishing a large amount of the best pasturage.

Grain-raising has become such a poor business, on account of the low prices obtained, that our farmers plow as little as possible, and as long as clover and timothy will stay in, and produce a fair crop, we let the land lie, though the freezing in winter and dry weather in summer, during the past few years, have so run out the grass crops as to oblige us to plow our upland sward every six or seven years, and in some cases oftener.

While Sussex county cannot be said to be a large grain-raising district, yet there are large quantities grown, but not enough, we believe, to feed the stock raised within the county, as our farmers are heavy feeders of grain.

Previous to the beginning of the milk business in Sussex county

the cattle came out in spring very poor, but now you can find good beef cows in almost any dairy you may see.

One of the greatest mistakes our farmers make, in my judgment, is keeping too much stock, and thus being obliged to feed more than they can raise, compelling them to buy feed, thus producing a surplus of milk, and reducing the price received for this product. This places the farmer at the mercy of the middlemen, when he must accept whatever they are willing to give, as the supply governs the price.

You ask whether we are satisfied with the present milk law.

I am authorized by our organization to say that we are entirely satisfied with the law as it is, and strenuously object to having it changed.

We have in our county, in different localities, twelve creameries which receive milk, some of which is made into butter. From others cream is shipped, while others sell milk in the New York market at the season of the year when milk is scarce in the market. These depositories of milk all help to keep down the price received by the farmers.

I give you the figures showing the products sent from this county to New York during the past year: 570,000 cans of milk, of forty quarts each; 18,000 cans of cream, and 110,000 pounds of butter.

THE PEACH INTEREST.

There are in the county of Sussex about twenty-five peach orchards in bearing, and others growing. The present average is about twelve hundred baskets each, making about thirty thousand baskets, at an average price per basket, this year, of 90 cents.

Potatoes have been a light crop for this section, and not of the best quality.

Apples in some localities were a fair crop, and in others very short.

Strawberries, raspberries, cherries, &c., have produced very good returns for labor expended.

The poultry business is increasing and improving, and it is becoming to the farmer a source of considerable revenue. Large quantities of chickens are sent off in the spring and about the holidays.

No disease prevalent to any considerable extent among our horses and cattle during the past season.

Hay has been a heavy crop, but heavy rains about the time of har-

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vesting overflowed the bottom lands and spoiled hundreds of tons by washing and dirt.

Wheat has yielded about ten bushels per acre, on an average, being an uncommonly poor crop.

Rye about thirty bushels per acre, and corn averaged about eighty bushels per acre.

The average yield of wheat, corn, rye and oats was much less than the ordinary yield with us.

LOCAL FREIGHTS.

We, as well as farmers all over the State, complain of the net results of our business. Is it any wonder, when we in New Jersey pay more freight for what we send or receive than is paid in any other State in the Union, and yet have more railroads to the square mile than any other State?

Being located between and adjacent to the two largest cities in the Union, our markets should be the best in the world, yet how can we be expected to prosper when we must give one-third of our products to have them carried less than one hundred miles? Will not the State Board of Agriculture look after these outrages put upon us by the railroads, by recommending proper legislation? And, also, the high rate we are compelled to pay in taxes. We are paying about three times the amount now that we paid before the war, on the same amount of property; can any one tell us why it is? We, as farmers, are paying more than our just proportion, while our profits have steadily decreased, and our farms year by year have depreciated in value.

UNION COUNTY.

UNION COUNTY BOARD OF AGRICULTURE.

(Organized December 11th, 1868.)

OFFICERS FOR 1888.

<i>President</i>	DENNIS LONG.....	Irvington.
<i>Secretary</i>	DENNIS C. CRANE.....	Roselle.
<i>Treasurer</i>	ROBERT WOODRUFF	Westfield.
<i>Librarian</i>	DENNIS C. CRANE.....	Roselle.

DIRECTORS.

J. W. CORY.....	Westfield.
OGDEN WOODRUFF.....	Elizabeth.
WM. B. DUDLEY.....	Westfield.
D. B. WADE.....	Union.
MOSES O. WINANS.....	Elizabeth.
J. L. BENEDICT.....	Elizabeth.
JAMES W. HIGGINS.....	Elizabeth.

DELEGATES TO STATE BOARD.

DENNIS C. CRANE.....	Roselle.
NOAH W. PARCELL.....	Elizabeth.

ALTERNATES.

OGDEN WOODRUFF.....	Elizabeth.
J. L. BENEDICT.....	Elizabeth.

ANNUAL REPORT.

BY DENNIS C. CRANE.

The Union County Board of Agriculture greets brother farmers in other sections of the State, and hopes the annual meeting of the State Board of Agriculture, to be held next month, may be enjoyable, and tend to advance our common interests.

The State Board has our confidence, and we believe its work should

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be extended, and that the Legislature would be justified in making still larger appropriations for its use.

As individual farmers we feel that we have a claim upon the State for the help and protection which is accorded other occupations, and which the Board is endeavoring to give the farmers of New Jersey.

In giving, as it were, a picture of the farming interest in our county, and our experience and views, it seems to us wise, as well as right, that we present the dark side as well as the light, for then will your Board, in planning for the general welfare of us all, be enabled to do that which is for the best, and those who read the report will not be misled.

GROWTH OF POPULATION AND MATERIAL WEALTH.

There is evident improvement in all our towns and villages, and in places not too remote from railroad stations. Those who are settling among us are mostly clerks, business and professional men and their families from New York.

A great variety of taste is shown in the architecture and painting of the houses, especially those lately erected. Nicely-kept lawns, flower beds, winding walks and ornamental trees add grace and beauty to their surroundings.

The high, rolling lands along the line of the Delaware, Lackawanna and Western railroad and the villages through which it passes—Millburn, Short Hills and Summit—are enticing a well-to-do class of citizens. The more gently rolling country on both sides of the Philadelphia and Reading railroad, and the Pennsylvania railroad, with their cheap, quick and pleasant transportation to and from New York, are giving to the cities of Rahway, Elizabeth and Plainfield, and the smaller places, Westfield, Cranford, Roselle, Linden and Fanwood, a development which is very gratifying to all who are interested in the welfare of the county. To farmers who are not in debt this yearly extension and improvement gives a prospective value to their places lying just outside the town limits that excites their hope and ambition. The increasing good society, churches, schools and railroad facilities also make life to him and his family more enjoyable, and if he has crops to sell above his own needs he realizes an extra price if he sells direct to the consumer.

While we have many fine farms, owned by men of means who

keep good stock and grow good crops, and many more nice, well-kept small places in the suburbs of the villages, the farming interest has not prospered in a like manner.

BURDENS AND WASTES OF FARMERS.

While it is pleasant, and there are advantages derived from living near towns and cities, there may be disadvantages especially felt by the poor but good-hearted farmer, often proving like the last straw that breaks the camel's back. If he has run in debt for his land and has to pay interest, the extra price per acre which he paid does not make the land yield better crops than could be raised on cheaper lands of similar character further back in the country. Again, for animals raised and crops grown the extra price received does not make up the difference, and especially is the burden increased if there is unproductive land and loss of crops by drouth, rains or bad management. Interest or rent, taxes, wages and a living must be eked out just the same. The assessor's valuation is usually higher, and more taxes have to be paid, and being in the line of public improvements, he not unfrequently has to pay extra assessments. None of these things, however, help him in working his farm, or in growing larger crops and getting better prices. Another burden which the land-poor, but sensitive, intelligent farmer has to contend with, and which those living in communities entirely made up of farmers are exempt from, is the exactions of society. Associating as he and his family do in church and school and other ways with people whose incomes are larger, and who are able to keep servants and spend money more freely, the farmer finds himself almost before he suspects whither he is drifting, spending his time and money in a style of living which his income will not warrant. This society also not unfrequently demoralizes the family as farm-workers; comparing their hard work and self-denial with the apparent ease, comfort and enjoyment of their associates in town, they become disheartened, discontented and lose interest in their work, and the poor farmer is left to drag his load alone.

Possibly the old settler might say there is another burden which comes from want of contact with those of like taste and aim in life. There are not as many native-born Americans as there used to be making farming their business. Foreigners and half-hearted amateurs own

and work many places. As a rule there is little inspiration or knowledge to be obtained from associating with them, and acquaintance does not increase your confidence so that you feel like co-operating with them in enterprises.

Thus it seems that while there are advantages in living near towns and villages, it is not an unmixed blessing for old-fashioned farming. Like every other rose, it has its thorn.

Many of our farmers, and in fact farmers generally, have either too many acres, or not sufficient capital to work their places up to the point where profit commences. They not unfrequently spread themselves over too much ground, more than they can manure and care for properly, and the consequence is, as every good farmer knows, that the work is not done properly or in season, and only half a crop is harvested. It is a lesson many of us need to learn—to plow no more than our manure-pile and help will enable us to care for properly, in order that a good crop may be raised. Better that we let the land lie idle, or let it grow up in timber, or that we fence it in for pasturing stock, than that it be plowed and improperly cared for and cropped. We believe the same principle holds good with animals; better a good, able team of horses, well fed and kept, and fit for work every day, even though an extra man, requiring the payment of extra wages, has to be hired, than to keep three or four old, half-fed horses that stand idle eight months in the year, and better that we sell at some price, or any price, the scrub cows, and give extra feed to those capable of yielding a good quantity and quality of milk; or better that colts and heifers be kept, or something that is increasing in value with growth, than that we should keep stock that do not pay for feeding. Many farmers waste their labor endeavoring to grow stock or crops beyond their skill and not suitable to their farms. Many other ways of wasting substance on our farms might be enumerated, but to do so would overrun the limits of this paper.

DAIRY FARMING.

The raising of milk for consumption in the towns and villages adjacent, continues to be one of the principal paying industries of the county. Nearly half of our farmers are more or less engaged in this. Some farmers retail the milk themselves, while others sell through middlemen. The cows kept are mostly graded stock, and sell, when

brought in from the back country, at prices ranging from \$40 to \$65 a head with calves by their sides.

Some marks of Alderney, Holstein and Ayreshire blood are seen much more frequently of late, and the quality of the stock is improving.

The prices received by farmers for milk during 1887 has been $2\frac{3}{4}$ cents for six months, and $3\frac{3}{4}$ cents for the other six months.

The discrimination of the railroads in favor of farmers further back in the country, charging low freight rates, keeps the price received very near that received by the Hunterdon county farmers.

Some twenty-five cans, on an average, are left daily at the Elizabeth depot, coming from stations on the line of the Central railroad.

The average retail milkman sells from fifty to two hundred and fifty quarts of milk daily, and the price received is about double that paid the farmer. As the stock-in-trade of the average milkman is usually only a horse and wagon, and perhaps four or five milk cans, and he spends only a little over half a day in doing his work, the farmer, considering his capital invested in land, stock and cost of feeding, besides his labor and the risks run, justly concludes that he does not get his share of the profits. It looks as though farmers should co-operate, and adopt an economical system of collecting and delivering the milk under their own management, and so do away with at least one-half of the present wagons and men, and save to themselves at least 1 or 2 cents per quart.

All with whom we have conversed agree that the law requiring milk offered for sale to be pure, and to come up to a required standard, is to the interest of the farmers of Union county, as well as to the interest of consumers and the honest milkman.

There have been no diseases among our cattle, excepting on two farms, where pleuro-pneumonia broke out, and in these cases the State officials were notified, and their prompt and effective measures prevented the spread of the disease.

We have visited several breeders of thoroughbred cattle, and saw some fine animals and conveniences for keeping them that only men of ample means can afford.

Col. A. M. Martin, of Summit, has a fine herd of fancy-bred Jerseys, numbering sixty head of young and old. They are in charge of James F. Vaughan.

Among the herd are some that have a high butter record. Fill-

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pail second has made twenty-six pounds and two ounces of butter in one week. Another, Pearl of Summit, twenty-one pounds and ten ounces.

Mr. Martin's barn is large and conveniently arranged. The cow stables are well lighted, and heated with steam in very cold weather. Besides the usual place for hay, feed, &c., there is a silo, a milk-room, an ice-house, with a large refrigerator closet, &c.

A steam engine runs the machinery for cutting the hay, grinding the grain, and the centrifugal cream separator. Milk and cream are both sold in the villages of Summit and Short Hills, put up in glass bottles. The price received for the milk is 10 cents per quart.

Mr. Johnson, of Plainfield, son of John Taylor Johnson, is another keeper of high-bred, registered Alderneys. He has some eighty head, altogether. His barn, stables and silo are very large, and his buildings are substantial and contain most of the modern improvements. He sells his milk at retail in Plainfield, and gets 8 cents per quart. He grew not only a large quantity of corn for ensilage, but some lucern for feeding green during the summer, and was much pleased, both with the quantity grown on an acre and the way the cattle consumed it. It somewhat resembles excessively-large white clover.

Mr. William Lindsay, of Union township, has a fine herd of Ayrshires and Guernseys—twenty-seven head of the former and thirteen head of the latter—all registered stock. He has been very successful the past fall in winning prizes at fairs in this State, Pennsylvania, Maryland and Virginia, altogether receiving one hundred and thirty-three single premiums and twelve herd premiums. He produces the milk and sells it at retail in the Elizabeth market, receiving 6 and 7 cents per quart in summer, and 8 cents per quart in winter. He considers the Ayrshire cow the milkman's favorite, as this breed produces more milk per head than any other, in proportion to the amount of feed consumed. The milk stands carrying well, and, while it may not be so rich in butter, it has the cheese elements and those qualities which make it equal if not superior to other kinds of milk for feeding children and for family use. Breeders of thoroughbred colts prefer Ayrshire milk over all others for feeding colts. Besides these good qualities, it is the most hardy breed as well, subsisting and thriving on poorer pasture and rougher food. She is also a good breeder, seldom failing to catch with calf. The drawbacks at present are, there is no boom to make them sell for fancy prices; the teats in some of

the cows are short and small for large hands, and have not that free flow which is desirable, and possibly some of the cows are a little wild in disposition, though not much more so than the average.

The Guernsey, he thinks, is the best family and butter cow. She is larger, has a better disposition than the Alderney, and, as a rule, is a deeper milker, and the milk and butter have a higher color. The grades from a Guernsey bull are invariably good cows.

Mr. John O. Magie, of Elizabeth, is also a breeder of Ayrshires, and has about twenty head. He has been equally successful at the fairs where he has exhibited.

Mr. Chauncey B. Ripley, of Westfield, has a well-selected herd of registered Jerseys, numbering in the neighborhood of fifty head. There are probably between one and two thousand head of thoroughbred cattle, of all breeds, in the county, kept for family use and by small breeders.

FENCES.

Fences are, to a certain extent, a necessity when stock is kept, not so much (if we live in a Christian community) to fence out our neighbors' cattle as to fence in our own. Tethering is dangerous, and to depend on men or boys to watch the cattle is uncertain, and frequently proves more expensive in the end.

The farmer wants to know, at all times, where his stock is, and be able to utilize his land to the utmost, and in order to do this, he must have not only road and boundary fences, but inside fences as well. Because of their expense it is an important item in farm improvements. The old post-and-rail fence was good and free from many of the objections of its rivals, but it is fast disappearing, because of decay, because it is more costly than wire, and the Arabs find it makes good firewood.

The chief objection to the barbed wire fence is its invisibility. Animals, especially horses, are apt to run into it and injure themselves, and should they get their legs over the wire or in any way fast in it, it saws deep and dangerous wounds. Because of this risk our farmers have a strong prejudice against it. Should it be used, however, it is recommended that the land be plowed up to the fence on both sides, leaving a deep furrow two or three feet from the fence; it tends to make the animals stop and hesitate before they jump over or have anything to do with it. They also suggest a top rail, either

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an old fence rail or a two-by-four scantling, using two or three buck-thorn ribbon wires beneath the rail. It is not a perfect fence, as it is more or less dangerous; the posts rot and the wire rusts, so that it has to be replaced in ten or fifteen years, which is a heavy tax on the farmer.

A fence should be durable, one that will turn all kinds of stock without injury, not likely to get out of order and not too costly.

We sometimes wonder why it is that fruit, nut or useful timber trees are not set for posts, where permanent fences are required, the branches while young to be trained fan-shaped along wires, poles or rails. It is no more trouble to do this than to plant them in orchards. In certain places peach trees, grape vines, currant and gooseberry bushes might be set between to fill up vacant places, and thus turn the land to profit.

We remember seeing at the State Fair some years ago a bottom for a post, made of clay and burned. It was about two and a half feet long and corrugated to give it strength. Two half-inch holes penetrated the center near the top for bolts to hold the two strap-irons that fastened it to the wooden or iron posts above. Because of its durability it seemed to us a good idea, and if it can be made and sold cheaply enough we think it might be used to advantage.

ROADS AND STREETS.

The much that has been said in the past about the necessity and advantages of good roads has brought forth good fruit in our county. For several years there has been a decided advance made in the improvement of our roads. The rocky hills that skirt our northern border, and which contain unlimited quantities of trap-rock and building stone, heretofore considered of little or no value, are having their day. Five stone-crushers are kept busy making fine this unexcelled material for making good roads, and the prospect is that other crushers will find work, for the interest in the matter is growing.

Besides the general road-tax last year there was raised in the twelve townships of the county \$20,000 as a special tax, the money to be expended for crushed stone. While some of our farmers find it hard to pay the assessments, they and the property-owners in the villages willingly vote for the appropriations. The pleasure of going to and from town, winter and summer, rolling along at a good pace over a hard,

smooth, well-graded road, is a pleasure which only those who have fretted themselves and their horses in days gone by can fully appreciate. All are convinced that it is a saving to the wear and tear of horses, harness, wagons and valuable time, more than enough to compensate for the additional expense. Then, too, the land-owner realizes he can sell his property more readily and at better prices.

The increased activity in building during the last two or three years is, no doubt, largely due to our improved roads. Persons coming out from New York, and renting for a year, are induced to stay, possibly, after a year or so, buying a lot and building. For some years back there seemed to be almost as many going as coming; now we are holding more firmly those who come, especially those who keep horses. There have been, thus far, about fifty miles of roads and streets top-finished with crushed stone in different parts of the county, besides considerable private work done, and the tendency is to keep it up. The cost is heavy. The price at the crusher is from 75 cents to 85 cents a ton. Then, the carting one or two miles to the railroad, the freight, and the carting again, make it count up to \$1.50 to \$2 per ton by the time it is in place on the road. Stone is heavy, and a ton is not much in bulk. As applied on ordinary country roads a ton will reach from one to three feet, depending upon depth and width. Formerly it was thought necessary to excavate about six inches of the old roadway, and sometimes as much as one foot, and then carefully lay a bed of large stone, with smaller on top, and still a finer grade on top of this, but it is found that large stone are objectionable. After a time the frost and heavy teaming work them to the surface; the wheels wear off and the rains wash away the finer stone, leaving the larger stone exposed. This leaves a rough road to travel over. The most approved method to-day is, after the road is properly graded and rounded, to dump and spread with the shovel fine broken stone from three to six inches thick right on the surface, using no stone larger than a hen's egg for the lower layer, spreading a light covering of clay soil upon this to bind it together. After a rain, or heavy shower, to wash the soil into the crevices, another coat of finer stone, and stone dust is put on top, two to four inches thick. From eight to fifteen feet in width of the center of the road is finished in this way.

In some instances the stone are afterwards rolled with a heavy roller, but this is not generally done. The horses' feet and wagon

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wheels soon compress and make the dressing hard and smooth. Some prefer to use the fine and coarse stone mixed as it comes from the crusher, without sifting, and not use the clay soil as above suggested.

The stone is carted on a wagon body made of loose spruce or pine plank, each plank separate on bottom and sides, so that the load can be dumped without shoveling.

It seems as if there ought to be a more comprehensive system for making roads and keeping them in repair, especially our main highways connecting cities and towns. Often the townships through which these roads pass are too poor to grade or top-dress with stone, and keep them in passable condition. They are like the poor links in a chain. As the cities are largely benefited by having good roads leading to them, it would seem to us as if they should bear their share of the expense of putting them in good condition and keeping them so. It might be well to make them county roads, leaving the by-ways to be attended to by the townships through which they pass.

DIRT ROADS.

While roads where cracked stone has been used have been very much improved, our common roads are just as stony, rutty, muddy and dusty, and, sometimes in the spring, just as impassable as ever. It is possible, we claim, to have a good dirt road for nine months in the year, and passable during the remaining three months. When good they are the most pleasant of all roads to ride over, easy for the feet of horses, and free from the hard, gritty noise of stone roads. We offer a few suggestions on the subject:

First. We consider it of primary importance that the Overseers shall be competent. That they are, as a rule, incompetent, is obvious to every intelligent observer. Last year we suggested that the State Board of Agriculture adopt rules and advice for working roads, and that those aspiring to the position of Road Overseer first pass an examination, showing that they are well acquainted with the rules thus set forth.

That a competent Road Overseer should be a live man, with good common sense, plenty of practical experience in handling men and teams, acquainted with the most approved methods of doing the work, and some business ability, hardly needs to be said. The compensa-

tion should be generous enough, and the position permanent enough, to make it an object for a competent person to post himself thoroughly on the subject. Many of our farmers' sons would take to it as a duck does to water.

PRACTICAL ADVICE ON ROAD-MAKING.

All surface stones larger than a hen's egg, either in the middle of the road or on the sidewalk, we consider a detriment, and should be dug out and carried to some springy, wet place, and used to make an under-drain, in the center of the road, and running parallel with it. The drain should be two or three feet deep, and two feet wide. An earthen tile should be laid in the bottom, and the stones used for filling up to within one foot of the surface. There should be a free outlet for the water from the drain. The road-scraper or planer is a very valuable instrument, when rightly used, where the roads are not too stony. It puts the dirt where it is most needed—in the ruts, holes and depressions—and leaves it nicely leveled. A good, able team of horses, and a good scraper, will do more and better work, when the surface earth is dry and loose, than ten men with shovels.

The early spring, before the grass and weeds start, after the frost comes out, and at intervals through the spring and summer, as soon after rains as the ground becomes dry enough, and before it gets too hard, are the best times to do the most effective work.

In laying out a new road, or commencing to make good an old one, time is not lost fixing the course, the right grade, direction for the water to run, width of wagon-bed, sidewalks, &c. When once these are wisely fixed they should in after times be strictly adhered to. An ordinary country road should be wide enough to enable two carriages or wagons to roll along abreast without danger of interfering, and then a more abrupt slope to the bottom of the ditch on either side. Instead of rounding the roads on hills it is often better to cut out the ditches on either side and cart the earth to the lower ground, thus making an oval-shaped road in both places, and also improving the grade of the road.

Frequently the gravelly soil of the hills improves the road when mixed with the clayey soil of the lowlands, and vice versa.

Turnpiking, or rounding up the road, should be done before the first of August, to give the ground a chance to settle before winter sets in. It should be well done and rounded up well, say two or

three feet above the bottom of the ditches, so that it will not have to be disturbed again for years. Ruts and holes made by wagons afterwards in the course of usage, should be filled up by carting gravel or earth from some hill near by, instead of again plowing up the road proper.

Plowing can best be done in the spring, when the ground is loose and the sod and weeds are not so hard to handle. The same will apply equally to the cleaning of ditches. Care should be taken to see that the ditches have a good free outlet for the accumulating water drained from the road-bed. The sub-soil usually makes a harder and better road than the loamy top-soil, therefore it should be the aim of the Overseer to place the sub-soil on top and in the middle of the road. Turnpiking is complete only after the ground has been leveled, the stone picked up and grass seed sown on either side.

BEAUTY SHOULD NOT BE IGNORED.

A country road should not only be hard and smooth and well graded, but pleasant and attractive as well. This increases travel, and the amount of travel has much to do with regulating the value of the property adjoining. A little attention given to the course of the road often brings out pleasant views.

The sidewalks and sides of the roads should be leveled nicely, and made to grow a good grass sod, so that it can be mown easily twice during the summer. This can generally be best done by the farmer who owns the land on either side, when he resets his fences and plows his land. Then he should continue the furrows clear out to the road track, planting and cultivating through the summer and seeding down nicely in the fall. Shade trees should be set on the sidewalk three or four feet from the gutter; the holes should be generous in size—not deep—and the best and richest earth that can be found used to fill in around the roots. The limbs of the trees should be trimmed up well, not allowed to grow low.

Where brooks cross the road, if it is a living stream and the water is good, it should have an easy approach down into the water on one side of the bridge, so that horses and carriages can be driven down the slope and through the water without unpleasant sensations. Stones should be taken out, and the bottom graveled, so that the water will not become riled, or the carriage muddied. The bridge

might have climbing ivy running over its sides, and weeping willows growing along the water's edge. Where springs make it possible, water troughs should be provided at intervals along the road, so arranged that horses can be driven up and easily watered.

At cross roads large, smooth-faced stones should be lettered, directing the traveler. This and much more might be suggested. If done, these little things would make our country roads much more enjoyable to ride over, besides adding to the value of the property adjoining. Men of means and intelligence buy and make their homes where such improvements are.

Mr. Chauncey B. Ripley, of Westfield, is our champion Road Overseer. Although a man of wealth and professional cares, he accepts the care of the roads in his district, and makes them, not only hard and smooth to ride over, but gratifies good taste in ornamenting them as well.

BIRDS.

We have heretofore spoken of the disappearance from our meadows, our woodlands and door-yards, of the song birds which gave life and beauty to our homes, and also kept in subjection the insects that destroy our fruit and vegetation.

During the latter part of last summer, and the early part of the fall, there seemed to be none at all; the gun, the small boy, the cat and the sparrows have preyed upon them until it would be fitting for the county to erect a monument to their memory. As we think of their blessed influence, their usefulness and beauty, is it not enough to stir our hearts with holy wrath against their wicked enemies? What shall we do, not only to save them, but ourselves? We say—away with the gunner in our State; we have no use for him; he breaks down our fences, tramples our crops, and insults us when we remonstrate with him; we have no bears, panthers, wolves or other dangerous animals in our midst; the gunner is a relic of the backwoods, and a barbarous age. He who shoots the small game of to-day for pleasure only is deficient in laudable ambition and feeling. In some way there should be a sentiment awakened that will lead people to respect and enforce the present game laws, and possibly make them stronger.

Two years ago in our report we suggested that the State Board of Education appoint one day in the year for our public schools to ob-

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serve in the interest of useful birds. A part of the exercises of the day to consist of compositions on the different species of birds and their habits, the sin of destroying their eggs, shooting or trapping them. The State law and penalty regarding the destruction of birds should be read to the pupils by the teacher, and explained to them.

We believe, if the idea were carried out, it would tend to educate the children and their parents to love and protect the birds, instead of, as many seem to now, glory in their destruction.

ELM-TREE BEETLE AND WORM.

Another serious question, which is, are we going to lose the beautiful elm trees which for so many years have graced our road-sides, door-yards and meadows? As is generally known, within the last two or three years, a small beetle and worm eat the foliage during the summer, so that the trees look at times as if they were dead. That it weakens the vitality of the tree, and will, unless in some way checked, prove their destruction, seems almost certain. The well-known remedies have been tried, but, for the most part, they are not considered sufficient to meet the trouble. Our Experiment Station officials should give it their earnest attention.

UNION COUNTY STATISTICS.

TOWNSHIPS.	Milkmen.	Assessors' valuation of land, per acre.	Tax Rate.		Working Roads.		Price of farms, acre.
			General.	Special.	General.	Special.	
Elizabeth	20	\$200	\$1 28	\$1 32	\$20,000	.....	\$300
Linden	8	75	1 03	1 08	1,000	\$1,700	125
Union	12	75	1 28	75	1,000	2,500	100
Springfield.....	6	50	1 20	72	1,500	.....	75
Cranford	4	75	2 40	.....	800	1,500	125
Summit.....	6	100	2 50	.....	3,400	.....	150
New Providence.....	4	50	1 80	.....	500	.....	75
Westfield.....	6	50	1 70	.....	4,200	2,000	100
Fanwood.....	5	50	1 12	60	3,570	.....	100
Plainfield	15	100	1 80	.....	7,250	2,500	200
Clark	5	50	1 50	.....	500	.....	75
Rahway	10	100	2 85	.....	3,500	2,500	125

TOWNSHIPS.	Corn.		Hay.		Oats.		Potatoes.		Apples.	
	Yield, per cent.	Price.	Yield, per cent.	Price.	Yield, per cent.	Price.	Yield, per cent.	Price, per bbl.	Yield, per cent.	Price, per bbl.
Elizabeth	100	\$0 55	90	\$18 00	50	\$0 30	100	\$2 00	30	\$2 00
Linden.....	100	55	90	18 00	50	30	75	2 00	30	2 00
Union	100	55	90	18 00	50	30	100	2 00	30	2 00
Springfield.....	100	55	90	18 00	50	30	75	2 00	30	2 00
Cranford.....	100	55	90	18 00	50	30	75	2 00	30	2 00
Summit.....	100	55	90	18 00	50	30	75	2 00	30	2 00
New Providence.....	100	55	90	18 00	50	30	75	2 00	30	2 00
Westfield.....	100	55	90	18 00	50	30	75	2 00	30	2 00
Fanwood.....	100	55	90	18 00	50	30	75	2 00	30	2 00
Plainfield.....	100	55	90	18 00	50	30	90	2 00	30	2 00
Clark	100	55	90	18 00	50	30	90	2 00	30	2 00
Rahway	100	55	90	18 00	50	30	75	2 00	30	2 00

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UNION COUNTY STATISTICS—*Continued.*

TOWNSHIPS.	Peaches.		Pears.		Grapes.		Straw-berries.		Black-berries.		Rasp-berries.	
	Yield, per cent.	Price, per basket.	Yield, per cent.	Price, per bbl.	Yield, per cent.	Price, per lb.	Yield, per cent.	Price.	Yield, per cent.	Price.	Yield, per cent.	Price.
Elizabeth	100	\$0 75	85	\$2 00	50	\$0 03	65	\$0 11	90	\$0 08	75	\$0 10
Linden	100	75	85	2 00	50	03	65	11	90	08	75	10
Union	100	75	85	2 00	50	03	65	11	90	08	75	10
Springfield.....	100	75	85	2 00	50	03	65	11	90	08	75	10
Cranford	100	75	85	2 00	50	03	65	11	90	08	75	10
Summit.....	100	75	85	2 00	50	03	65	11	90	08	75	10
New Providence	100	75	85	2 00	50	03	65	11	90	08	75	10
Westfield.....	100	75	85	2 00	50	03	65	11	90	08	75	10
Fanwood	100	75	85	2 00	50	03	65	11	90	08	75	10
Plainfield	100	75	85	2 00	50	03	65	11	90	08	75	10
Clark	100	75	85	2 00	50	03	65	11	90	08	75	10
Rahway	100	75	85	2 00	50	03	65	11	90	08	75	10

TOWNSHIPS.	Number of Jerseys.	Number of Ayrshires.	Number of Holsteins.	Number of Grades.	Number of Natives.
Elizabeth	100	50	10	200	300
Linden	40	25	5	225	325
Union.....	125	75	25	400	820
Springfield.....	50	25	10	225	200
Cranford.....	25	15	5	50	90
Summit.....	125	25	5	75	100
New Providence.....	50	35	5	65	225
Westfield.....	100	25	10	150	225
Fanwood.....	125	25	5	75	175
Plainfield	75	15	5	90	175
Clark	50	20	10	80	200
Rahway	50	20	5	75	180

While but few farmers in Union county can boast of having made any advance in their pecuniary condition during the past year, they feel that they ought not to complain when they compare their condition with that of farmers in other sections of the State, or other sections of the country. The season for the most part has been good for growing crops; rains have come in good season, and no untimely frosts or troubles of much importance have visited us.

Farmers who were a little ahead of their work, under-drained their low land and manured liberally, are for the most part smiling. In July there was a rainy spell that knocked down the oats, so that only half a crop was harvested, and that saved was very much injured. Late-gathered rye was caught and somewhat damaged, and not a little hay was damaged, especially that cut late and grown on low ground. Wheat is not much of a crop with us; more rye is raised, because the market for the straw is good. Potatoes did well on the light and loamy soil of Union township, but were poor and rotted somewhat on the heavy lands in other parts of the county. Corn was very good. Pasture, fall-sown grain and timothy, turnips, garden vegetables and berries were also good. It was not the bearing year for apples, still some orchards did well. Peaches did very well; this is a growing industry with those owning hilly, stony farms in the back part of the county. The late varieties, especially, are raised. They find a ready market at good prices in the towns and villages near by.

Pears were a good crop and good varieties sold well. Cultivated raspberries and blackberries are not grown so much of late years as formerly.

There are some good-sized patches of strawberries raised for the near-by markets, but their cultivation is not on the increase. The South, with low freight rates, is a little too much of a rival.

Tomatoes are quite an important crop, grown more or less by farmers as well as gardeners, for market and for the canning factory. They rotted quite badly last summer.

There is also quite a large acreage of cabbage raised, though the cabbage worm is becoming quite a serious drawback to their profitable culture.

While there is no doubt a large number of horses in the county kept for work, and cows kept for milk, the raising of cattle, horses, sheep, swine and poultry is probably on the decrease. Several rea-

UNION COUNTY.

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sons might be given for this. The old, native-born, practical farmer, with the old system of raising a little of everything for home consumption, especially stock and grain, has given place to transient owners of the land, with little faith and practical knowledge. These farmers hiring most of their work done find the cost of raising greater than the value of the crop or animal when raised.

The fences, too, are not as good as formerly, probably for the reason given above, that there are so many changes of owners or tenants.

But very little butter is made, so there is very little buttermilk to feed to hogs.

The dogs are too numerous to keep sheep with safety, and poultry-raising, of which there seemed to be a fever two or three years ago, has fallen off. The principal cause of the declension, however, is the low price received for poultry in the market.

There are not a few grade cows raised, and we think the raising of thoroughbreds is on the increase in this county. Dry cows seem to be a drug in the market; Chicago dressed beef has killed their sale.

The cities of Elizabeth, Rahway and Plainfield should give our farmers better facilities for selling their produce. A market centrally located, near the depots, and protected from the weather, with stands, waiting-room and stables, is what is wanted. The market fee, stabling, &c., should be reasonable enough to encourage the farmer and gardener to patronize it, and the consumer and storekeeper could meet on certain days of the week and make exchanges.

As it is now, everything is carted to Newark, five, ten or fifteen miles distant, and sold to middlemen. Nearly all our own storekeepers go there for their vegetables, oftentimes bringing home the very things that were raised in their own immediate neighborhood; or if the farmer or gardener does not take his load to Newark, he must drive the length and breadth of these cities, calling at every store, and spending the best part of a day to do that which he might have done in an hour or two at a well-established market-house.

COUNTY BOARD MEETINGS.

During the past year the County Board has held nine meetings at the county Court House, for the discussion of subjects pertaining to the farm and garden.

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Last winter the meetings were quite well attended, and the discussions interesting.

Arrangements were made for holding our annual picnic in August, but circumstances prevented our holding it the day that was set, so it was decided to have social meetings during the winter at the houses of the members in different parts of the county.

Some of the questions that have received attention at our meetings have been :

Enriching poor lands.

The cultivation of the grape.

What constitutes a good farmer ?

Care of stock in winter.

Raising potatoes.

Increasing the manure-pile, and how best to apply it to crops.

Dirt roads, and how to work them.

How best to make stone roads, besides quite a number of miscellaneous questions.

We also hope to have some good meetings this winter.

WARREN COUNTY.

ANNUAL REPORT.

We are trying to organize an Agricultural Society in this county, and we shall have it in time to send a representative to the next meeting of the State Board if possible. I am quite anxious in the matter, and think the time will come when the farmers will unite both for their social and political interests. While I would not care to make it a political organization, I think it would be well to keep one eye on our public interests, as the interests of the farmer have been entirely ignored by our public officers. It never occurs to them that one-half of the population of the country is engaged in agriculture—in fact, the farmers don't know it themselves, and never will know whether they hold the balance of power until they get to organizing and meeting together, and discussing matters among themselves.

Organization is what we need, and that is why other business men are recognized. I would like to know that there was an organization in every county in every State in the United States. It is useless for me to speak of the condition of the farmer, and the depression of farm land. Every one knows the condition of these at the present time. But the question must be met, and the remedy is—

First. I think the tariff has been a great injury to the farmer; the duty on whiskey has deprived us of home consumption. I can even remember when one-half of the grain raised in Warren county went to the distilleries, and those times were the best the farmers ever had in Warren county. But then the question of temperance comes in. I don't think it would make much difference, and I would be the last man that would advocate anything that would increase intemperance. Every person that is fool enough to drink whiskey can get enough to drink now, such as it is. The principal difference would be that if whiskey was cheap it would be better, and there would be no inducement to adulterate it, and if alcohol was cheap it would again take its place in the arts, and be a very useful article.

If Congress would take the duty off of spirits, I believe grain would advance twenty per cent. inside of eight months. Also, the lawful rate of interest is too high. That has a tendency to depreciate the price of real estate.

I introduced a five per cent. bill in 1880, and it has been trying to struggle through ever since, but has been overruled by capital. The State Board last winter passed a resolution on the matter which I approved. Now I have written all you will care to read, but will give you the statistics asked for by your Secretary.

The raising of horses is on the increase; of mules none are raised; cows, sheep and swine-raising is on the decrease, and the raising of poultry is on the increase.

As to diseases, swine are afflicted with the hog cholera; I use pitch, tar and sulphur. For fowls I never found a remedy when afflicted with the cholera. I have tried several breeds of hogs and found the Chester Whites the best. Sheep and swine are the most profitable stock that I can raise. I keep one hundred ewes and twelve brood sows, raise early fowls and sell my pigs when about five months old.

Fancy fowls would be very profitable if it were not for the disease. Five hundred Leghorn hens will lay at least fifty thousand eggs in one year, which would bring \$1,000.

The various crops average about as follows, and sold on December 16th for the prices given:

Wheat, sixty per cent., worth 90 cents; corn, eighty per cent., worth 50 cents; rye, eighty per cent., worth 55 cents; oats, seventy per cent., worth 28 cents; hay, ninety per cent., worth \$15; potatoes, white, seventy-five per cent.; peaches, one hundred per cent.

But few farmers in Warren county are engaged in the milk business, and give but little thought to the milk laws.

Farm land is sold at from \$40 to \$90 per acre in Warren county.

The tax rate varies in the towns and country, and is from \$6.71 to \$8.80 per \$1,000.

The value of farm land in Warren county is fearfully depressed, and will not bring what it is assessed for by twenty per cent.

[NOTE.—The above report from Warren county comes in response to correspondence of the Executive Committee, looking to the formation of a County Board. It is hoped an organization will soon be effected.—*Sec'y.*]

ENTOMOLOGY :

COMPRISING

Cuts, and Over Two Hundred Delineations of Various Insects,

WITH

SOME GENERAL TRUTHS IN APPLIED ENTOMOLOGY.

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ENTOMOLOGY.

The following paragraphs are taken from "Riley's General Truths in Applied Entomology." They set forth briefly the importance of this whole subject, the history and progress of the science and the remedies most effectual, so far as known, with the most efficient means of application.

When remedies such as "arsenical suspension liquids," "kerosene emulsion," &c., are referred to under the descriptive cuts following this paper, the reader will find the manner of making them fully described among or following the cuts; and other remedies besides the above are also given. It is the purpose of the Executive Committee, provided their action has the approval of the Board, to continue, enlarge and perfect this work now feebly begun, confining its scope more especially to insects injurious or helpful to New Jersey farmers and fruit growers. With this end in view they recommend that specimens of (seemingly) new insects that are found to be destructive to any crop be collected, with brief notes descriptive of the pest, setting forth as far as possible the time it first appeared, its methods of propagation, plants or trees infected by it, habits of working and time of departure. Also information concerning the use of insecticides, new or old, mode of preparation (liquid or powder), and method and time of application, and the appliances for doing the work, with the results following their use.

All communications and specimens should be addressed to **GEORGE D. HULST**, Entomologist, State Experiment Station, New Brunswick, N. J.

EXTRACTS FROM "GENERAL TRUTHS IN
APPLIED ENTOMOLOGY."

BY PROF. C. V. RILEY.

Insects play a most important part in the economy of nature. The average townsman, whose knowledge of them is confined to certain lectual and household pests, can scarcely appreciate the fact or have any other feeling than repugnance and contempt for the annoying hexapods of his acquaintance. Yet, as scavengers, as pollinizers of our flowers and fruits, or as food for other animals, they not only vitally concern man, but, philo-ophically considered, are seen to be essential to his very existence.

We receive also some direct benefits from insects. They supply us with the sweetest of sweets, our very best inks and dyes, and our finest robes and tapers, to say nothing of various acids, lacs and waxes; while few who have not studied the subject have any just idea of the importance of insects and their products as articles of human diet.

But the benefits, whether direct or indirect, which man derives from insects, must always appear trifling compared to the injury they inflict on our agriculture.

In the primitive condition of the country as the white man found it, insects doubtless took their proper place in nature's economy and rarely preponderated in any direction to the injury of the wild plants scattered, for the most part, sparsely throughout their range. Harmony between organisms in the sense of the widest inter-relation and inter-dependence, had resulted in the long course of ages. But civilized man violated this primitive harmony. His agriculture, which is essentially the encouragement and cultivation in large tracts of one species of plant to the exclusion of others which he denominates weeds, gave exceptional facilities for the multiplication of such insects as naturally fed on such plants. In addition to this inevitable increase of species thus encouraged, many others have been unwittingly imported from other countries, chiefly through the instrumentality of commerce with those countries; for it is a most significant fact that the worst weeds and the worst insect pests of American agriculture are importations from Europe. Thus, in addition to the urdue in-

crease of our native species, as above noted, we have to contend with these introduced foreigners, and it is no wonder that Dr. Fitch declared America to be the land of insects, for as compared to Europe we are truly bug-ridden.

As I have stated (*Encyclopædia Americana: Agricultural Entomology*), "The losses occasioned by insects injurious to agriculture in the United States are in the aggregate enormous, and have been variously estimated at from \$300,000,000 to \$400,000,000 annually. It will never be possible to fully protect our crops from the ravages of the many species that injuriously affect them; but it is the aim of the economic entomologist to prevent as much of the loss as possible and at the very least expense. To do so effectually the chief knowledge required is of an entomological nature, *i. e.* the full life-history and habits of the different species; and this implies a great deal of close and accurate work in field and laboratory. By means of it we learn which species are beneficial and which injurious; and the ability to distinguish between friend and foe is of the first importance in coping with the latter, for it is a notorious fact that the farmer often does more harm than good by destroying the former in his blind efforts to save his crops.

A great deal has been written and published of late years on the subject of economic entomology, much of it, however, at second hand; for, unfortunately, the original workers are few. That comparatively small progress has hitherto been made, is due to this last fact, as well as to the intricacies and complex nature of the subject. The economic entomologist, to do effectual work, must possess not merely a knowledge of the particular injurious species, and its habits, with which he wishes to deal, but must study its relations to wild plants as well as to the particular cultivated crops it affects. He must also study it in its relations to other animals. Indeed, its whole environment must be considered, especially in connection with the farmer's wants, the natural checks which surround it, and the methods of culture that most affect it. The habits of birds, the nature and development of minute parasitic organisms such as fungi, the bearing of meteorology, must all be considered, and yet, with the knowledge that a study of all these bearings implies, he will frequently fail of practical results without experiment and mechanical ingenuity.

The earlier writers on Applied Entomology, as Peck, Harris, Fitch, Walsh, Le Baron, Glover, did good work in unraveling the life-mys-

teries of injurious species, and framed their advice to the cultivator from these entomographic studies. Mere study of this kind alone, however, while essential, is not often productive of those important practical results which follow when it is combined with field work and experiment by competent persons and upon scientific principles. Many of the remedies proposed and recommended in the agricultural press are either ridiculous, or else based on misleading empiricism, and economic entomology, as a science, is of comparatively recent date.

I can, in this paper, give but the briefest reference, by way of illustration, to some of the means alluded to. I have already indicated the prime importance of a knowledge of the life-history of the species to be dealt with—a knowledge that can come only by direct and careful inductive research carried on sometimes during many years; for every insect exists, in the course of its development, in four different states, three of them more or less abruptly marked by metamorphosis, and each with habit and environment peculiar to it. Thus the same species may inhabit earth, air and water at one or the other period of life, and yet be quite incapable of a change of environment at any one period. It took me five years, with a number of observers at command, to definitely settle some points in the life-history of the cotton-worm (*Aletia xyliana*, Say), and with all the resources of the French government—its liberal premium, its superior and sub-commissions appointed for the purpose and at work for the past fifteen years—there is much that is yet mooted in reference to the Grape Phylloxera. You have all heard of this insect, and perhaps a brief statement of its habits will serve to illustrate the complicated problems with which the economic entomologist often has to deal. I quote in substance from one of my reports:

“The full life-history of the species exhibits to us no less than five different kinds of eggs. 1. The regularly ovoid egg, 0.25 mm. long and half that in diameter, of the normal, agamic and apterous female, as it is found upon the roots. 2. The similar, but somewhat smaller egg of the gall-inhabiting mother. 3. The female egg from the winged mother, rather more elliptical and 0.4 mm. long when matured. 4. The male egg from same, $\frac{1}{4}$ less in length and rather stouter. 5. The impregnated egg, 0.32 mm. long, still more ellipsoidal and with peculiar sculpture and anal point. We have also the peculiar spectacle of an egg from the winged mother increasing from 0.34 mm. (its size when laid) to 0.4 mm. (its size just before hatching),

giving birth to a perfect insect 0.4 mm. long, and this, without any nourishment, laying an egg 0.32 mm. long. A being thus born, and without any food whatsoever, lays an egg very nearly as large as that from which she came.

"We have, further, the spectacle of an underground insect possessing the power of existence even when confined to its subterranean retreats. It spreads in the wingless state from vine to vine, and from vineyard to vineyard, when these are adjacent, either through passages in the ground itself, or over the surface; at the same time it is able in the winged condition to migrate to much more distant points."

The recent advance in our knowledge of the life-history and habits of species has been great, but leaves yet an immense field for future research.

Insects probably outnumber in species all other animals combined, some three hundred and fifty thousand having already been described, and fully as many more remaining yet to be characterized. The proper and conscientious characterization of a genus or species of some microscopic creature involves as much labor as that of one of the higher animals. Of the above number a goodly proportion are injurious to cultivated crops. Lintner recently records no less than one hundred and seventy-six affecting the apple.

Of insecticides any number of substances have been recommended and many of them tried, with more or less satisfaction. Of these may be mentioned lime, sulphur, soot, salt, wood-ashes, corrosive sublimate, naphtha, naphthaline, turpentine, alum, carbolic acid, phenyle, cyanide of potassium, blue vitriol, ammonia, alkalies, benzine, vinegar, sulphuric acid, quassia, vitriol (the sulphate of copper), hot water, &c. Most of these may be successfully used for specific purposes either dry, in liquid or in vapor; but the three most useful insecticides of general application in use during the early days of economic entomology in this country, and up to within a few years, were undoubtedly tobacco, white hellebore and soap. Tobacco-water and tobacco-smoke have long been employed against Aphides and other delicate insects, and are most useful. A quite recent advance in its use is by vaporizing. The vapor of nicotine is most effectual in destroying insects wherever it can be confined, as in green-houses. Thus the boiling of tobacco in such a green-house is as effectual as, and less injurious to the plants than the older methods of syringing a decoction or of fumigation by burning; while experience by Mr.

Wm. Saunders at the Department of Agriculture during the past two summers shows that the vapor gradually arising from tobacco stems strewn on the ground and regularly moistened is likewise effectual.

White hellebore, either dry or in liquid, has long been one of the most satisfactory insecticides against Tenthredinid larvæ, otherwise known as false caterpillars, of which the imported Currant-worm (*Nematus ventricosus*) is a familiar type; while soap, syringed in strong suds, will kill some soft-bodied plant-destroyers, and when used as a paint on the trunks of trees is an excellent repellant against the parents of different borers.

Transcending in importance, however, any of these older insecticides are the three now most commonly used because most satisfactory. They are: (1) arsenical compounds, (2) petroleum, and (3) pyrethrum. The first act through the stomach, and are effectual chiefly against mandibular insects; the second and third act by contact, and are, therefore, of more general application, affecting both mandibular and haustellate species.

This glance at the chief insecticides now in use may convey some idea of the recent progress in this direction, but will convey no idea of the far greater number of substances, whether drawn from the animal, vegetable or mineral kingdom, that have been experimented with and found wanting. After the discovery of a satisfactory insecticide, however, various important problems must be solved, and particularly how to apply it to greatest advantage, having safety to man and stock, harmlessness to plant, and economy, in mind. The solution of these points and others that the peculiar habits of the insect to be controlled involve, brings us to the question of mechanical contrivances and appliances; for while much ingenuity has been exhibited in devising mechanical means of directly destroying noxious insects without insecticides, it is chiefly in the proper application of these last that the greatest mechanical advances have been made, both in this country and in Europe.

Here, again, the subject is so vast that I cannot enter into details. One can form some idea of the recent activity in this direction by glancing at the figures in the first report of the United States Entomological Commission on the Rocky Mountain Locust, my bulletin on the Cotton-worm, and other official publications. Perfection here, as in other kinds of mechanical appliances that aid man's progress in art and science, is usually the slow outgrowth of tedious trials. How-



FIG. 1.—*Galeruca xanthomelæna*; a, eggs; b, larvæ; c, adult; d, eggs (enlarged); e, sculpture of eggs; f, larva (enlarged); g, larva (enlarged); h, side view of greatly enlarged segment of larva; i, dorsal view of same; j, pupa (enlarged); k, beetle (enlarged); l, portion of elytron of beetle (greatly enlarged).—(After Riley.)

ever brilliant the original theoretical conception, the practical details are almost always the result of sheer experiment and trial. Failures precede success. Yet success will usually follow in proportion as certain principles are kept in mind covering particular needs in special cases—principles deduced from entomological studies.

It will already have been gathered, from what has preceded, that the chief insecticides are applicable in liquid, and as liquids have an advantage over powders in field use, instruments for atomizing and distributing liquids constitute the most important part of insecticide machinery. The desiderata in a spray-nozzle are, ready regulation of the volume to be thrown; greatest atomizing power, with least tendency to clog; facility of cleansing or ready separation of its component parts; cheapness; simplicity, and adjustability to any angle.

(See further extracts under head of "Remedies," page 532.)

NOXIOUS INSECTS AFFECTING THE ELM.

THE ELM-LEAF BEETLE.

The Imported Elm-Leaf Beetle (*Galeruca xanthomelæna*, Schrank) is very injurious in the Northeastern and Eastern States of the Union. Its natural history is fully given in Riley's Report as U. S. Entomologist for 1883, p. 159, Plate XII., fig. 3.

REMEDIES.—Arsenical-suspension liquids used in spray, destruction of larvæ when they descend the tree to pupate, destruction of pupæ under rubbish, &c., destruction of beetles when in hibernation under rubbish, and in cracks and crevices.

(See "Preventive Remedy," p. 503; also, Trough Remedy for Canker Worm, p. 507.)

NOXIOUS INSECTS AFFECTING SHADE-TREES.

THE BAG-WORM.

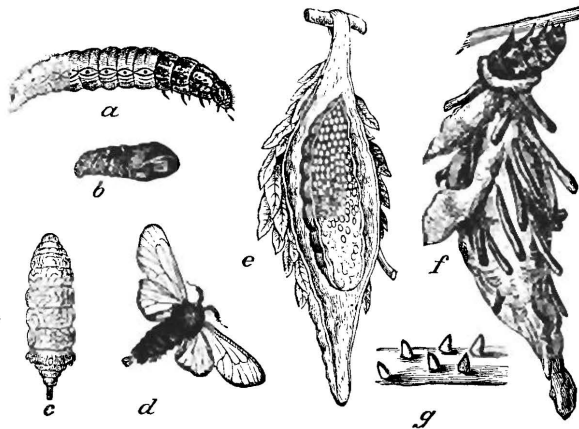


FIG. 7.—*Thyridopteryx ephemeraformis*: a, larva; b, male chrysalis; c, female moth; d, male moth; e, follicle and puparium cut open to show eggs; f, full-grown larva with bag; g, young larvæ with their conical upright coverings (all natural size) —(After Riley)

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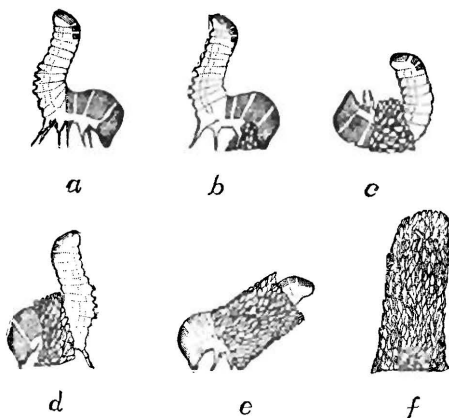


FIG. 8.—*Thyridopteryx ephemeraeformis*. How the young larva prepares its bag.—(After Hubbard.)

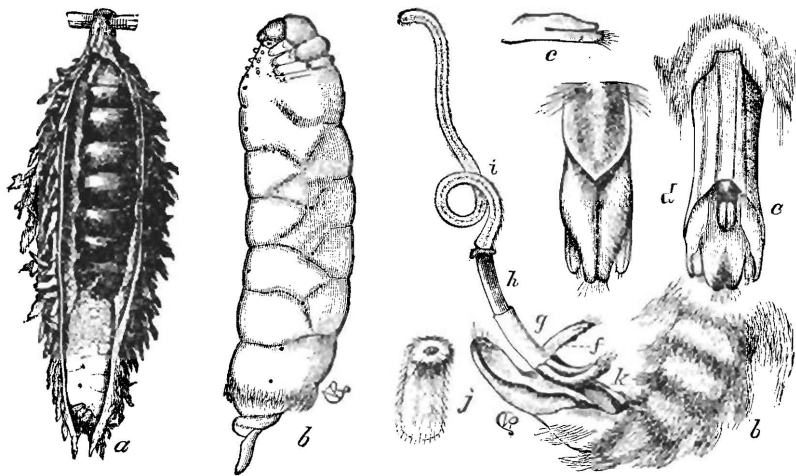


FIG. 9.—*Thyridopteryx ephemeraeformis*: a, follicle cut open to show the manner in which the female works from her puparium and reaches the end of the bag (natural size); b, female extracted from her case (enlarged).—(After Riley.)

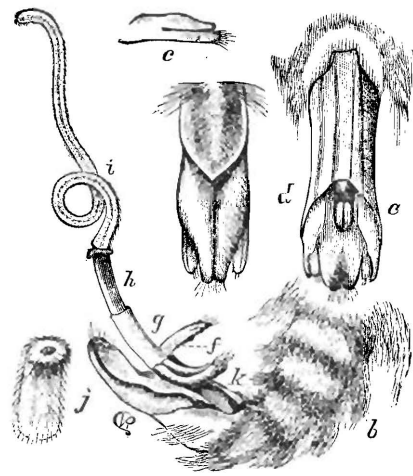


FIG. 10.—*Thyridopteryx ephemeraeformis*: b, the end of male abdomen from the side, showing genitalia extended; c, genitalia in repose ventral view; d, do, dorsal view (enlarged).—(After Riley.)

The Bag-worm (*Thyridopteryx ephemeraeformis*, Haw.) is particularly destructive to many species of shade-trees. Its natural history is fully treated in Riley's Bulletin No. 10 of the Division of Entomology, U. S. Department of Agriculture, pp. 22–28.

REMEDIES.—This species can be treated like other leaf-eating insects.

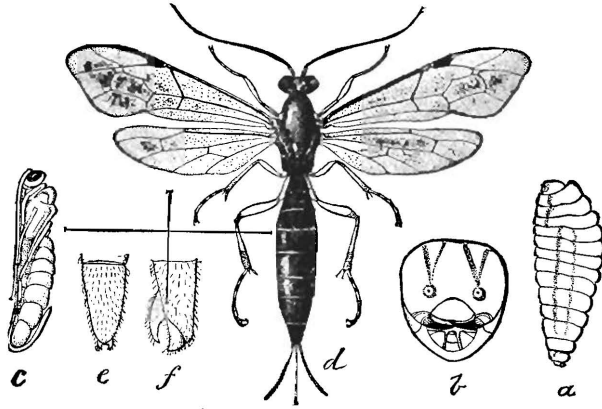


FIG. 11.—*Pimpla conquisitor*: a, larva; b, head of do., from front; c, pupa; d, adult female (hair-line indicating natural size); e, end of male abdomen, from above; f, same, from the side (all enlarged).—(After Riley.)

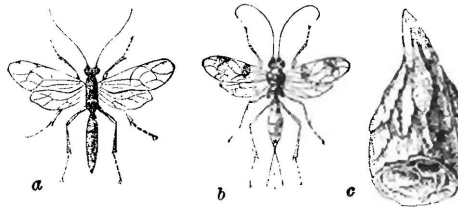


FIG. 12.—*Hemiteles thyridopterigis*: a, male; b, female; c, sack of bag-worm cut open, showing cocoons of parasite (natural size).—(After Riley.)

Pimpla conquisitor, Say, and *Hemiteles thyridopterigis*, Riley, are two of the hymenopterous parasites infesting the Bag-worm. They are described and figured in the same article. (An extract from which is here given.)

ENEMIES.—The Bag-worm is so well protected in all its stages that no insectivorous bird nor predaceous insect is known to attack it. In spite of the absence of predaceous enemies, the Bag-worm suffers from the attacks of at least six true parasites, while two others, which may be primary but are probably secondary, are reared from the bags. Three of these are Ichneumonids, viz., (1) *Pimpla conquisitor*, Say (fig. 11); (2) *Pimpla inquisitor*, Say, and (3) *Hemiteles thyridopterigis*, Riley (fig. 12). Of these, the last-named is most abundantly bred, and we have always considered it as the most important parasite of

the Bag-worm. The past season, however, we have ascertained that three species of the genus *Hemiteles*, viz., *H. utilis*, and two undescribed species, are unquestionably secondary parasites, and this renders it quite likely that *H. thyridopterigis* may also be secondary, or, in other words, a parasite of one of the true parasites of the Bag-worm. It is a question, however, which only the most careful study, with abundant material, can decide, as the law of unity of habit in the same genus finds many exceptions in insect life.

THE WHITE-MARKED TUSSOCK-MOTH.

(*Orgyia leucostigma*, Sm. & Abb.)

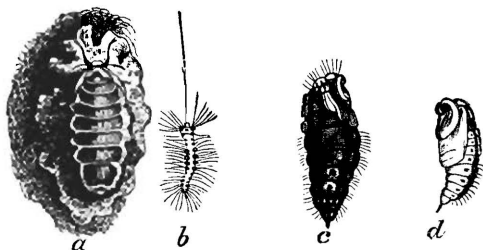


FIG. 13.—*Orgyia leucostigma*: a, female on cocoon; b, larva; c, female pupa; d, male pupa.—(After Riley.)

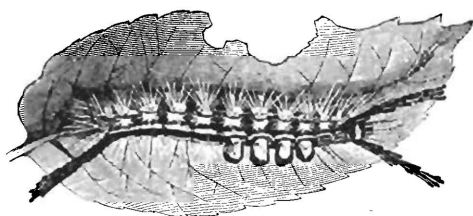


FIG. 14.—*Orgyia leucostigma*: female caterpillar.—(After Riley.)

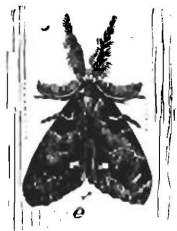


FIG. 15.—*Orgyia leucostigma*: male.—(After Riley.)

The White-marked Tussock-moth is one of the great insect pests that so frequently denude our shade-trees. Its natural history is given in Bulletin No. 10 of the Division of Entomology, by Prof. Riley (U. S. Department of Agriculture, p. 29, figs. 13, 14 and 15).

NATURAL ENEMIES AND PARASITES.—The fact that the caterpillar makes no effort to conceal itself shows that it enjoys immunity

from enemies, and notably from birds. In fact, the American yellow-billed cuckoo, the Baltimore oriole and the robin are the only birds which have been observed to feed upon the larvæ. Predaceous insects are also not particularly fond of this hairy caterpillar, the well-known Wheel Bug (*Prionidus cristatus*, see fig. 16) and a few other Soldier Bugs being the only species which occasionally suck its juices. Nocturnal birds, and especially bats, will, no doubt, devour many of the male moths flying about after dusk, but the destruction of a portion of the males has no appreciable influence on the decrease of the worms of the next generation. The egg-masses appear to be effectually protected by the froth-like covering, as neither bird nor predaceous insect has been observed to destroy them.

While the list of enemies that devour the species is thus small, that of the parasites is fortunately quite large, and it is due to their influence that the caterpillars are not permanently injurious. There are several true parasites of this insect. (Extract from [Riley's] Bulletin No. 10, "Our Shade-Trees and their Insect Defoliators.")

REMEDIES.—Spraying with arsenical-suspension liquids.

THE FOREST TENT-CATERPILLAR.

(*Clisiocampa sylvatica*, Harris.)

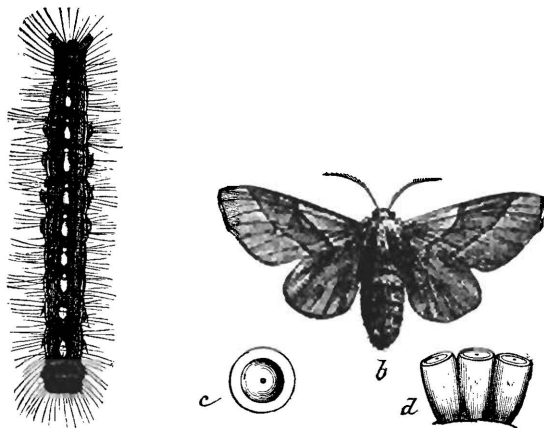


FIG. 10.—Caterpillar; b, female moth; c, d, egg of the oak tent-caterpillar.—(After Riley.)

The Forest Tent-caterpillar is not as readily observed as its relative, the Orchard Tent-caterpillar. Its nests are not such prominent fea-

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tures of neglected orchards, being of a very slight texture. The insect is quite common on apple, cherry, walnut and other trees, but is chiefly destructive to the foliage of oak. It is treated in Bulletin No. 7 of the U. S. Entomological Commission ("Insects Injurious to Forest and Shade-Trees," p. 40, fig. 10).

REMEDIES.—The tents or nests can be quite readily destroyed by cutting off and burning, or by burning with a torch on the tree. Also arsenical poisons may be used.

THE FLAT-HEADED BORER.

(*Chrysobothris femorata*, Fab.)

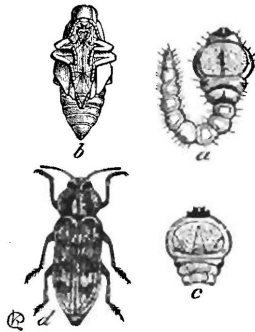


FIG. 2.—a, the apple flat-headed borer; b, pupa; c, under side of head and thoracic rings; d, beetle.—(After Riley.)

The Flat-headed Borer is one of the most injurious borers known. It injures all kinds of trees, but chiefly apple, oak, maple and linden. Young orchards very frequently succumb to the attacks of this borer. It is treated in Bulletin No. 7 of the U. S. Entomological Commission ("Insects Injurious to Forest and Shade-Trees," p. 17, fig. 2).

REMEDIES.—Cutting out where the larvæ are detected at work and washing the trunks with adhesive noxious mixtures, to prevent oviposition.

THE FALL WEB-WORM.

(*Hyphantria cunea*, Drury.)

The Fall Web-worm is one of the most injurious caterpillars, frequently defoliating the great majority of our shade-trees. It is very

fully treated in Riley's Report for 1886. (Report of the Commissioner of Agriculture for the year 1886, pp. 518-539, Plate X., fig. 1, 2 and 3.)

REMEDIES.—Spraying with arsenical-suspension liquids.

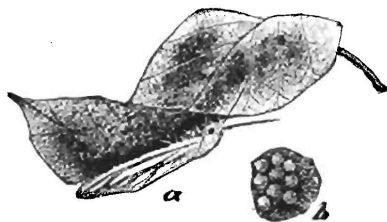


FIG. 17.—*Hyphantria cunea*: a, moth in position on leaf, laying eggs, side view: b, eggs (enlarged) —(After Riley.)

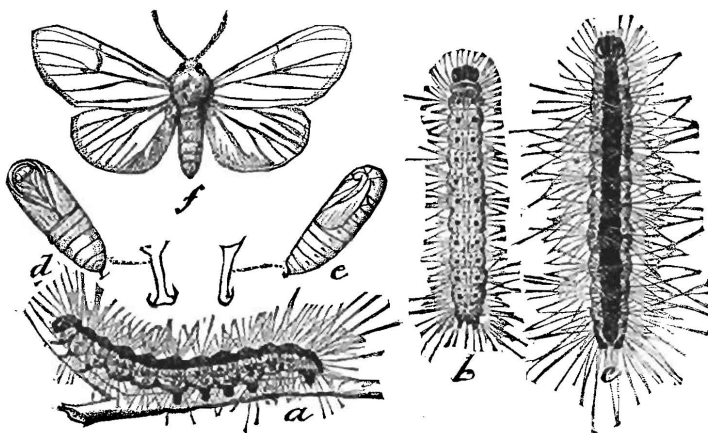


FIG. 18.—*Hyphantria cunea*: a, dark larva, seen from side; b, light larva, from above; c, dark larva, from above; d, pupa, from below; e, pupa, from side; f, moth.—(After Riley.)

Extract from above report:

"The customary method of burning the nests is by means of rags saturated with kerosene or coal-tar and fastened to the tip of a long pole. An old sponge has been substituted to advantage for the rags, but probably the best substitute for this purpose is a piece of porous brick. In a pointed communication published in the *Evening Star* of August 21st, Major Key, agent of the Humane Society, thus describes the making of a 'brick-torch.' 'Take a piece of soft brick, commonly termed salmon brick, trim it to an egg shape; then take

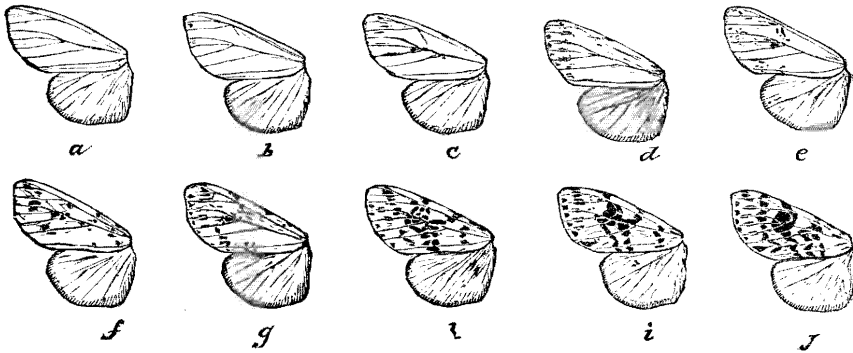


FIG. 19.—*Hyphantria cunea*: a-j, wings of a series of moths, showing the variations from the pure white form to one profusely dotted with black and brown.—(After Riley.)

two soft wires, cross them over this brick, wrapping them together around the opposite side so as to firmly secure it; now tie this end to a long stick, such as the boys get at the planing-mills, by wrapping around it; then soak the brick in coal-oil, light it with a match, and you are armed by the best and cheapest weapon known to science. Holding this brick torch under the nests of caterpillars will precipitate to the sidewalk all the worms on one or two trees at least from one soaking of the brick, and it can be repeated as often as necessary. Then use a broom to roll them under it and the work will be done, the controversy ended and the trees saved.'

"A little thorough work with a simple torch like this, *at the right time*, will in nearly every case obviate the necessity of the more expensive remedies later in the season, when the worms of the first brood have grown larger, or when the second brood has appeared."

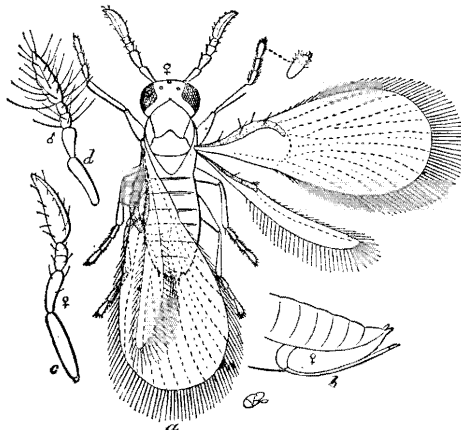


FIG. 23.—An egg-parasite: a, female; b, tip of female abdomen; c, female antenna; d, male antenna (all greatly enlarged).—(After Riley.)

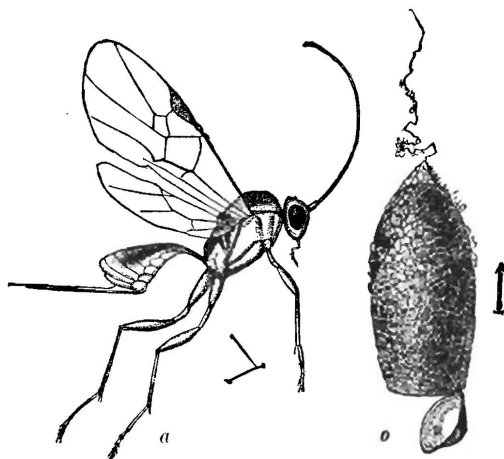


FIG. 24.—*Meteorus hyphantriae*: a, female; b, cocoon (enlarged).—(After Riley.)

Meteorus hyphantriae is one of the primary parasites of the Fall Web-worm, and is treated in the above article, p. 533, Plate X., fig. 4.

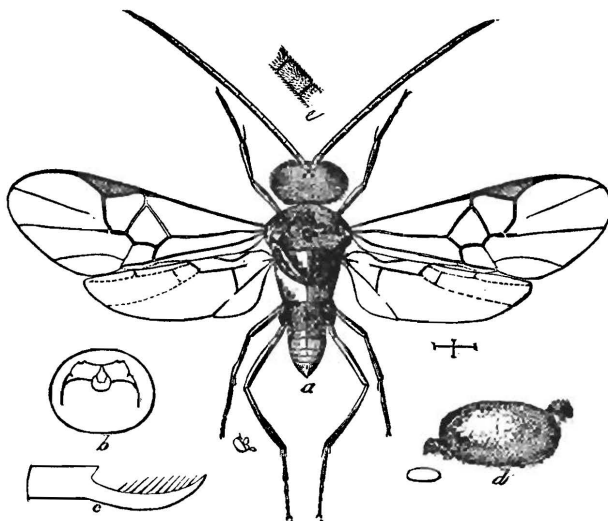


FIG. 25.—An *Apanteles*: a, female fly; b, outline of head of larva in position to show the chitinized parts of the mouth, the mandibles not visible, being withdrawn; c, one of its mandibles as seen within the head of a mounted specimen; d, cocoon; e, joint of antenna (all enlarged); natural size of a and d in hair-line.—(After Riley.)

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This egg-parasite (*Trichogramma pretiosa*, Riley) and the *Apanteles aleticæ*, Riley, both infest the Cotton-worm, but are here inserted to show the form of parasites infesting the Fall Web-worm mentioned in above article. They are described and figured on pp. 102 and 103 of "Riley's Report on the Cotton-worm" (Fourth Report of the U. S. Entomological Commission).

For the four preceding-named pests use the following

PREVENTIVE REMEDY.

It so happens, fortunately, that there is one thoroughly simple, cheap and efficacious remedy applicable to all four of these tree depredators. From the natural history facts already given, it is clear that they all begin their work very much at the same season, or as soon as the leaves are fairly developed, and arsenical mixtures properly sprayed on the trees about the middle of May, or when the eggs are being deposited and before they hatch, and repeated once or twice at intervals of a fortnight later in the season, will prove an effectual protection to trees of all kinds.

The "Cyclone" or "Eddy-chamber" nozzle is better suited for work of this kind on small trees than any yet in use. It is small, simple, cheap, will not clog, and gives an admirable spray. A combination nozzle may be made of several of these, which will be readily supported by the section rod, and will throw a more profuse spray.

The arsenical compound known as London purple is, as already shown, perhaps preferable to white arsenic or Paris green in that it is not so liable to burn the leaves, while its color enables one to readily distinguish poisoned from non-poisoned trees. Moreover it is very cheap. From one-quarter to three-quarters of a pound of this substance should be used to a barrel of water, and with this quantity of water it is best to mix three quarts of cheap or damaged flour, which will serve both to render the mixture adhesive to the leaves, and also to lessen the tendency of the poison to burn the leaves. Three-quarters of a pound to the barrel may prove too strong a mixture for delicate and susceptible young trees, and it will be best for general application to make the amount from three-eighths to one-half pound to the barrel. Paris green will require a somewhat heavier dose—say from one-half to one pound per barrel of water.

A number of other means have been tried and are more or less effectual in destroying these defoliators. Such are the application of various other insecticides, particularly an emulsion of milk and kerosene, the burning of the webs (in case of the Web-worm) by thrusting a lighted torch, made of various patterns, into the webs; but after full trial, nothing has been found more satisfactory than the arsenical mixtures here recommended. They have the advantage over all other means—that they kill directly the worms begin feeding, and at the same time have a preventive influence. Properly sprayed on the under side of the leaves so as to adhere, they are not easily washed off, and they not only kill, without injury to the tree, all the worms at the time upon such tree, but all those which may hatch upon such tree for a number of days and even weeks subsequently.

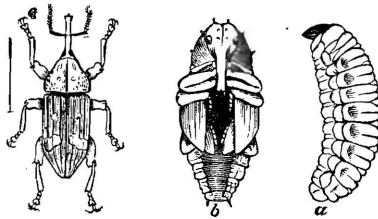
Preparation of the Poison (London purple).—A large galvanized iron funnel of thirteen quarts capacity, and having a cross-septum of fine wire gauze, such as is used for sieves, also having vertical sides, and a rim to keep it from rocking on the barrel, was used. About three quarts of cheap flour were placed in the funnel and washed through the wire gauze by water poured in. The flour, in passing through, is finely divided, and will diffuse in the water without appearing in lumps. The flour is a suitable medium to make the poison adhesive. The London purple is then placed upon the gauze and washed in by the remainder of the water until the barrel is filled. In other tests the flour was mixed dry with the poison powder, and both were afterward washed through together with good results. It is thought that by mixing in this way less flour will suffice. Three-eighths of a pound of London purple to one barrel of water may be taken as a suitable percentage. Three-eighths of an ounce may be used as an equivalent in one bucketful of water.

Effects of the Mixture.—The flour seems to keep the poison from taking effect on the leaf, preventing, to some extent, the corrosive injury which otherwise obtains when the poison is coarsely sprinkled or too strong. It also renders the poison more permanent. On the leaves, especially on the under surfaces, the London purple and flour can be seen for several weeks after it has been applied, and the insect is not only destroyed, but is prevented from re-appearing, as least for a long period. By poisoning again, a few weeks later, the insect is

deterred with greater certainty for the entire season. By being careful to administer the poison before the insect has worked, and, above all, to diffuse the spray finely but not in large drops, no harm worth mentioning will accrue to the plant from the proportion of poison recommended.

NOXIOUS INSECTS AFFECTING THE PINE.

THE WHITE PINE WEEVIL.



a, larva, from side; *b*, pupa, from beneath; beetle, from above (all enlarged) —(After Packard.)

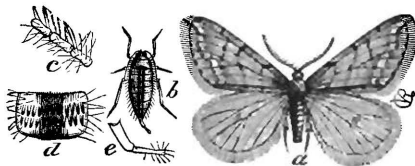
The White Pine Weevil (*Pissodes strobi*, Peck) is fully described in the report of the Entomologist for the year 1885, p. 322, Plate IX.

REMEDIES.—Usually artificial remedies are not practicable, but for young trees in a lawn the terminal shoots might be protected by repellants, as emulsions or obnoxious soap mixtures.

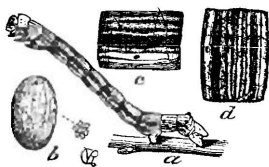
NOXIOUS INSECTS—CANKER-WORMS—AFFECTING THE APPLE AND ELM.

THE SPRING CANKER-WORM.

(*Paleacrita vernata*, Peck.)



Paleacrita vernata: *a*, male moth (natural size); *b*, female do. (natural size); *c*, joints of female antennæ (enlarged); *d*, joints of female abdomen (enlarged); *e*, ovipositor (enlarged).—(After Riley.)



Palsacrita vernata: a, full-grown larva (natural size); b, eggs (natural size and enlarged); c, side view of an enlarged segment of larva; d, dorsal view of same.—(After Riley.)



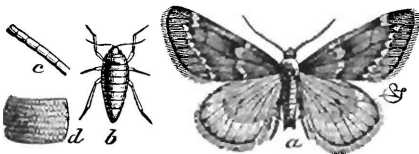
Palsacrita vernata: female pupa (enlarged).—(After Riley.)

The Spring Canker-worm does its greatest injury to the apple. The worms occur also upon the plum and elm, but occasion no serious injury. It is very fully treated by Riley in chapter VII. of the Third Report of the U. S. Entomological Commission, pp. 170 to 179, Plate III., figs. 1, 3 and 4.

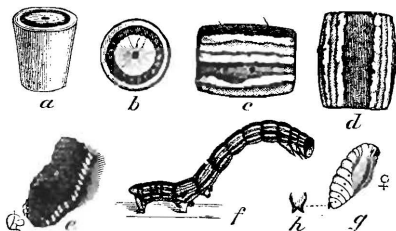
REMEDIES.—The females of both species of Canker-worms being wingless, they should be prevented from ascending the tree to deposit their eggs, but after the larvæ are at work arsenical-suspension liquids are to be recommended.

FALL CANKER-WORM.

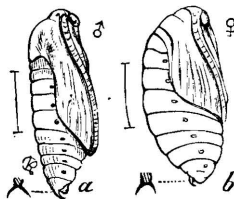
(*Anisopteryx pometaria*, Harr.)



Anisopteryx pometaria: a, male moth (natural size); b, female do.; c, joints of female antennæ (enlarged); d, joints of female abdomen (enlarged).—(After Riley.)



Anisopteryx pometaria: a, b, egg, side and top view, (enlarged); c, d, side and dorsal views of an enlarged segment of larva; e, egg mass (natural size); f, larva, (natural size); g, female pupa (natural size); h, dorsal view of anal tubercle of do. (enlarged).—(After Riley.)



Anisopteryx pometaria: a, male, pupa (enlarged); b, female do. —(After Riley.)

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The Fall Canker-worm is best known as denuding the elm, though it occurs also on the apple. It is fully treated in the above chapter VII., pp. 179 to 197, Plate III., figs. 5, 6 and 7.

NOTE.—The following remedies are from “Encyclopædia Americana: Agricultural Entomology,” by Prof. C. V. Riley.

SPRING CANKER-WORM REMEDIES.—A good remedy is found in fall ploughing, which breaks up the pupa-cell and submits the pupa to the action of the cold and wet. The most satisfactory remedy, however, consists in encircling the tree with a bandage or trough, so made as to prevent the female from climbing up to deposit her eggs. The most effective and inexpensive trough consists of a square frame of timber laid on the ground around the base of the tree, with a continuous wide groove at the top filled with petroleum. The trough has to be watched constantly, and kept clean and well filled with the oil. The space between the frame and the tree should be filled with packed ashes. (See also p. 165, Report.)

FALL CANKER-WORM REMEDY.—The troughs used for the Spring Canker-worm are equally effective here, but, as half the eggs are laid in the fall, the troughs must be kept in operation through the months from October to April.

NOXIOUS INSECTS AFFECTING THE MAPLE.

THE COTTONY MAPLE SCALE.

(*Pulvinaria innumerabilis*, Rathvon.)

The Cottony Maple Scale in some seasons occasions great damage to the Soft or Silver Maple; it is also found upon other trees, but not often to an injurious extent. It is fully treated in Riley's Report as U. S. Entomologist for 1884. (Report of the Commissioner of Agriculture for the year 1884, pp. 350–355, Plate X., figs. 2, 3 and 4.)

REMEDIES.—Scale insects of various kinds can be successfully treated with kerosene emulsion. Full directions for making are given

in Report of the Agricultural Department, 1884, p. 330, *et seq.* Strength to use must be settled by experiment on plant treated. Lye washes are also good. (See "Remedies," p. 532.)

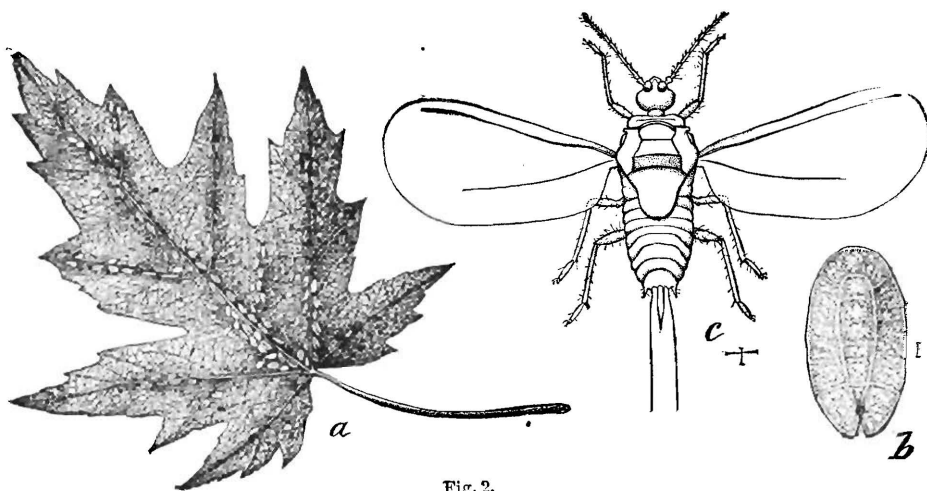
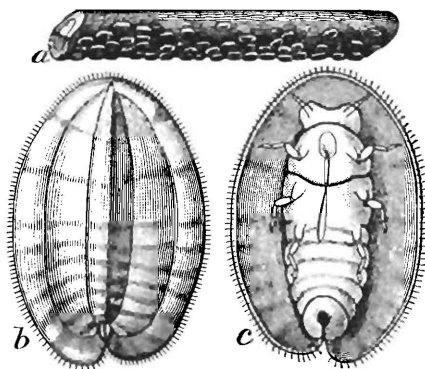


Fig. 2.

a, leaf with male scales (natural size); *b*, single male scale; *c*, male dorsal view (enlarged).—
(After Riley.)



a, female scales in fall (natural size); *b*, do., dorsal view; *c*, do., ventral view (enlarged).—
(After Forbes.)



a, b, females with egg-masses in late spring on maple leaf and stem of Maclura—(natural size).—(After Riley.)

THE SIXTEEN-LEGGED MAPLE BORER.

(*Egeria aceris*, Clemens.)

The Sixteen-legged Maple Borer usually follows the work of the flat-headed borer, burrowing under the bark ; it sometimes girdles

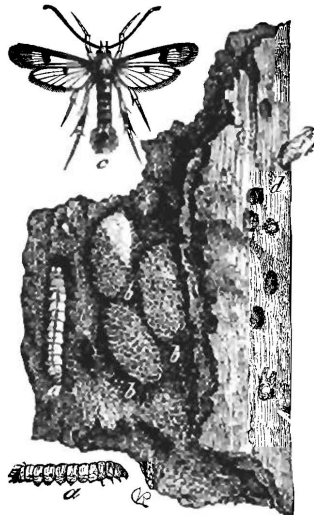


FIG. 47.—*c, Egeria aceris*; *a, caterpillar*; *b, cocoon*; *d, pupa cases*.—(After Riley.)

and kills the tree. It is treated in Bulletin No. 7 of the U. S. Entomological Commission, by Dr. Packard. ("Insects Injurious to Forest and Shade-Trees," p. 106, fig. 47.)

REMEDIES.—Lye and soap washes in proper strength will keep the bark clean and smooth, and thus tend to prevent injuries. White-wash has been recommended as a preventive.

THE GREEN-STRIPED MAPLE-WORM.

(*Anisota rubicunda*, Fabr.)

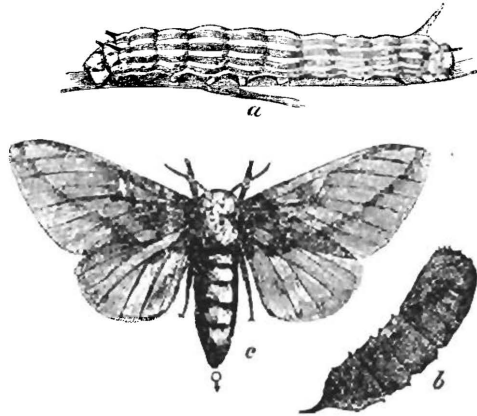


FIG. 48.—The rosy forest caterpillar; b, pupa; c, female.—(After Riley.)

The Green-striped Maple-worm is sometimes very abundant and injurious to the foliage of the Maple, chiefly of the Soft Maple. It is treated in Bulletin No. 7 of the U. S. Entomological Commission. ("Insects Injurious to Forest and Shade-Trees," p. 109, fig. 48.)

REMEDIES as for other leaf-eating insects.

NOXIOUS INSECTS AFFECTING THE GRAPE-VINE.

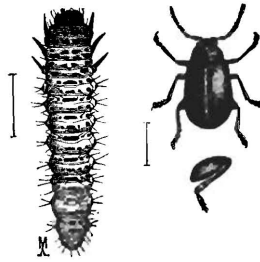
THE GRAPE-VINE FLEA-BEETLE.

(*Graptodera* [*Haltica*] *chalybea*, Illiger.)

The Grape-vine Flea-beetle is a small steel-blue jumping beetle, which in early spring eats into the bud and later gnaws holes in the leaves. The brown larvæ eat irregular holes in the leaves.



Twig of grape-vine with larvæ and adults of *Graptodera chalybea*.—(After Comstock.)



Graptodera chalybea; larva, adult, hind femur of adult.—(After Comstock.)

It is fully treated in the Report of the Entomologist. (Report of the Commissioner of Agriculture for the year 1879, p. 213, Plate III., figs. 1 and 2.)

REMEDIES.—Arsenical-suspension liquids may be safely used where fruit will not be affected. Or the beetles, soon as they make their appearance, may be jarred off and caught in some convenient receptacle and destroyed.

THE SNOWY TREE-CRICKET.

(*Aecanthus nivens*, Serville.)



FIG. 21.—Female tree-cricket (natural size).—(After Harris.)

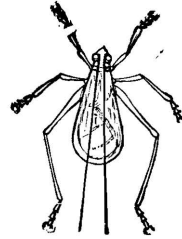


FIG. 20.—Male tree-cricket.—(After Harris.)

The Snowy Tree-Cricket is not by any means confined to the grape-vine, but does also great injury to the blackberry, raspberry, &c. The slender, pale-green cricket, with white wings and a large ovipositor, inserts her eggs in the stems of various cultivated plants.

REMEDIES.—Cut and burn affected canes, thus killing the injured parts. It is described and figured in Bulletin No. 7 of the U. S. Entomological Commission. ("Insects Injurious to Forest and Shade-Trees," p. 60, figs. 20 and 21.)

NOXIOUS INSECTS AFFECTING WHEAT.

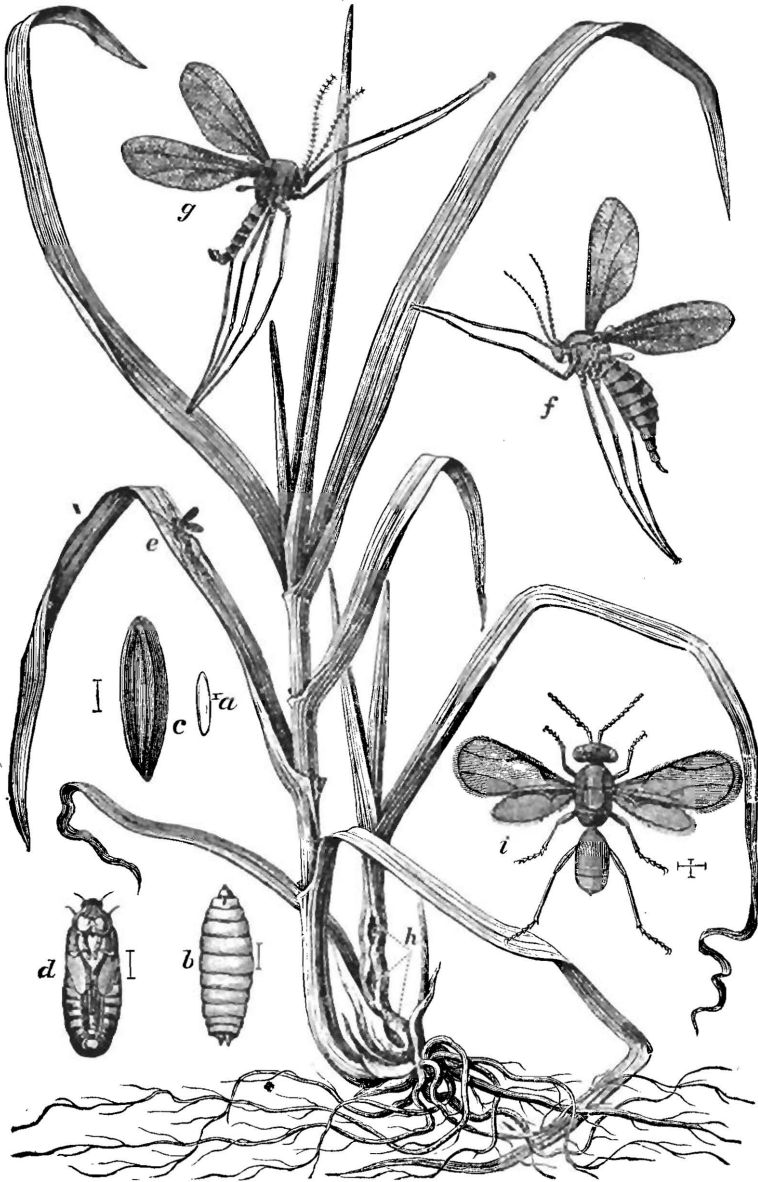
THE HESSIAN FLY.

(*Cecidomyia destructor*, Say.)

The natural history of this noxious insect is given in the Third Report of the U. S. Entomological Commission, 1880–1882, pp. 198–248, Plates IV. and V.

REMEDIES.—Undoubtedly burning the stubble is one of the best remedies, also sowing early strips and then plowing under after the fly has settled in it.

(For description of a new fly affecting wheat, see p. 164, Report.)



A healthy stalk of wheat on the left, the one on the right dwarfed and the lower leaves beginning to wither and turn yellow; the stem swollen at three places, near the ground, where the flaxseeds (*h*) are situated, between the stem and sheathing base of the leaf.

a, egg of the Hessian fly (greatly enlarged, as are all the figures except *e* and *h*); *b*, the larva (enlarged), the line by the side, in this and other figures, showing the natural length; *c*, the flaxseed, puparium or pupa case; *d*, the pupa or chrysalis; *e*, the Hessian fly (natural size) laying its eggs in the creases of the leaf; *f*, female Hessian fly (much enlarged); *g*, male Hessian fly (much enlarged); *h*, flaxseed between the leaves and stalk; *i*, chalcid or ichneumon parasite of the Hessian fly, male (enlarged).

Fig. *b*, drawn by Mr. Riley; *d* and *f*, by Mr. Burgess; *a*, *g* and *c*, *i*, by the author. Copied on wood by L. Trouvelot.

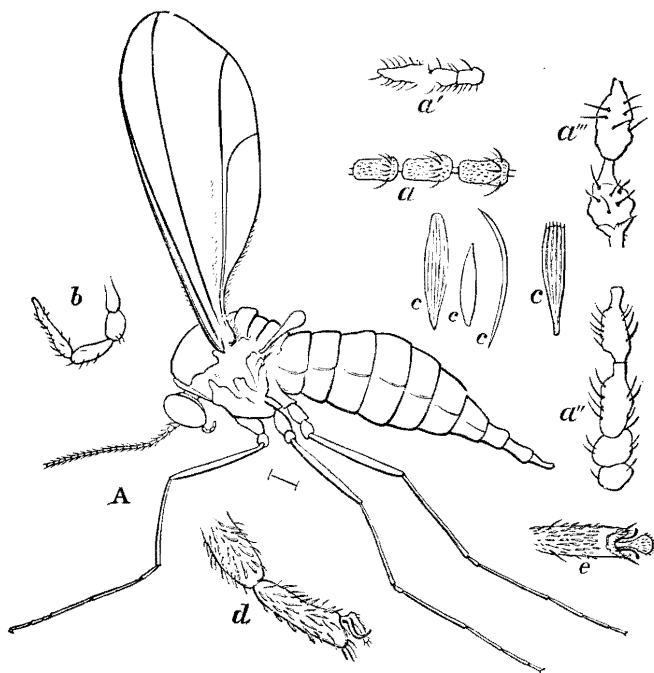


FIG. A.—Side view of the female Hessian fly (greatly enlarged); *a*, three joints taken from the middle of the antennæ of the female; *a'*, the three terminal female antennal joints; *a''*, the four basal, and *a'''*, the two terminal male antennal joints; *b*, a maxillary palpus; *c*, scales from the body and wings; *d*, *e*, side and vertical view of the last joint of the foot, showing the claws, and food-pad or pulvillus between them, and the scales on the joint. Drawn by Mr. E. Burgess.

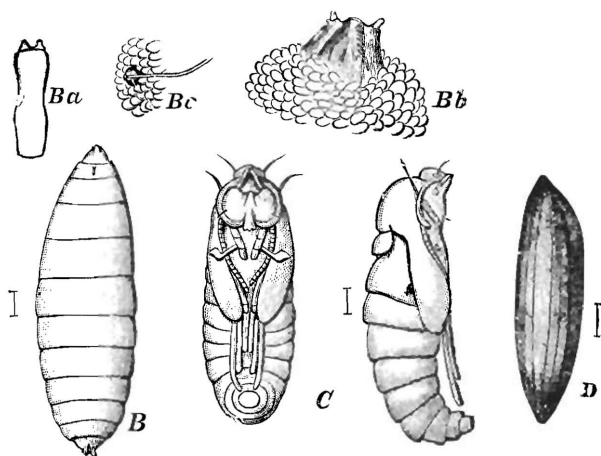


FIG. B.—Larva (magnified), with the breast-bone in the second next ring to the head; *Ba*, the breast-bone (highly magnified); *Bb*, head, from beneath (enlarged); *Bc*, larval spiracle and its tubercle and trachea leading from the spiracle. *B*, drawn by Mr. Riley; *Ba*, *Bb*, *Bc*, by Mr. Burgess.

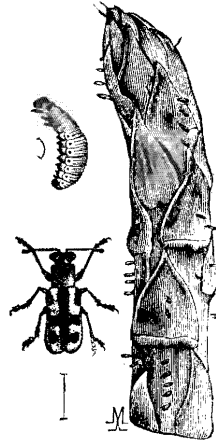
FIG. C.—Side and front view of the pupa or chrysalis. Drawn by Burgess. The abdomen of the side view of pupa is rather long, as the insect, when drawn, was just emerging from the semi-pupa stage, which it assumed December 1st.

FIG. D.—The flaxseed, puparium or pupa case. The line by the side of the complete figures denotes the natural length of the insect.

NOXIOUS INSECTS AFFECTING THE ASPARAGUS.

THE ASPARAGUS BEETLE.

(*Crioceris asparagi*, Linn.)



Crioceris asparagi: eggs, larva, adult.—(After Comstock.)

The Asparagus Beetle is an imported insect doing great damage in limited regions of the Eastern States. It is fully treated in Comstock's Report as U. S. Entomologist. (Report of the Commissioner of Agriculture for the year 1879, p. 216, Plate III., fig. 4.)

REMEDIES.—Dry slaked lime dusted on the larvæ is considered the most effective.

Another remedy.—Cut out and burn infested stalks.

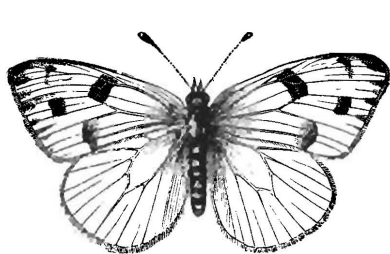
NOXIOUS INSECTS AFFECTING THE CABBAGE.

CABBAGE-WORMS.

The Southern Cabbage Butterfly (*Pieris protodice*, Boisd.) is the native species of cabbage butterflies, which was quite abundant in the more southern regions of the Atlantic States before the advent of the

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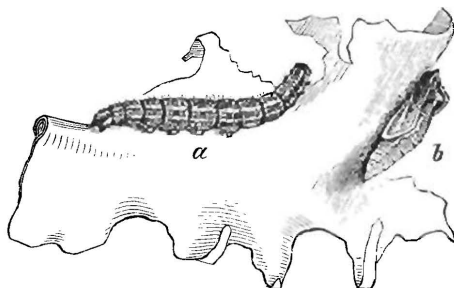
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Pieris protodice, male.—(After Riley.)



Pieris protodice, female.—(After Riley.)

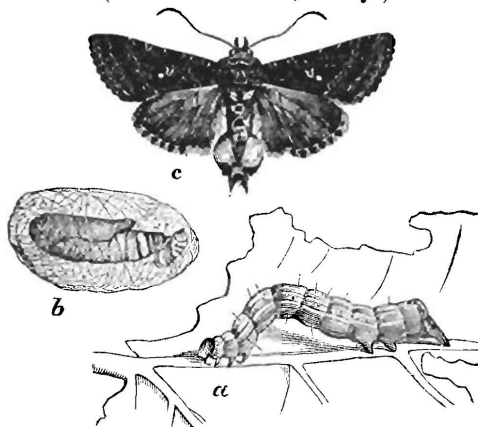


Pieris protodice: a, larva; b, pupa.—(After Riley.)

imported species (*Pieris rapæ*, Schrank). Its natural history is fully given in Riley's Report as U. S. Entomologist, for the year 1883, p. 114, Plate X., figs. 2, 3 and 4.

THE CABBAGE PLUSIA.

(*Plusia brassicæ*, Riley.)

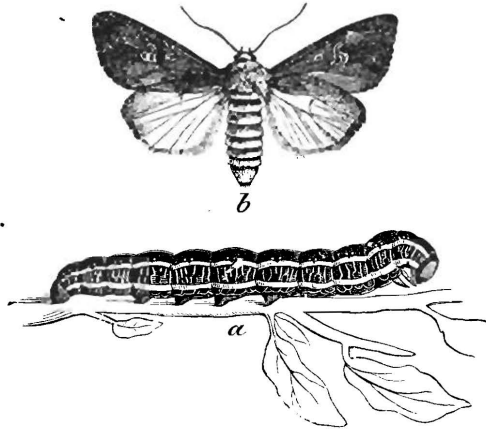


Plusia brassicæ: a, larva; b, pupa; c, moth.—(After Riley.)

The Cabbage Plusia is treated in the same report, p. 119, Plate XI., fig. 2.

THE ZEBRA CABBAGE-WORM.

(*Ceramica picta*, Harris.)

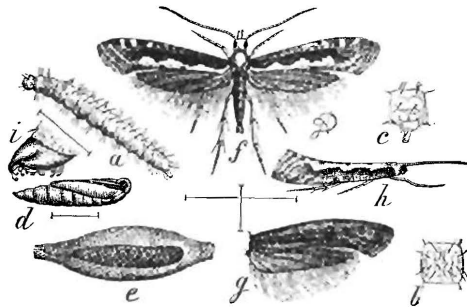


Ceramica picta: a, larva; b, moth.—(After Riley.)

The Zebra Cabbage-worm is also very injurious. Its natural history is given in the same report, p. 125, Plate XII., fig. 2.

THE CABBAGE PLUTELLA.

(*Plutella cruciferarum*, Zell.)



Plutella cruciferarum: a, larva (enlarged); b, dorsum of a single joint (greatly enlarged); c, side view of same; d, pupa (enlarged); e, cocoon (enlarged); f, moth (enlarged); g, wings of dark variety (enlarged); h, moth at rest (enlarged); i, cremaster of pupa (greatly enlarged).—(After Riley.)

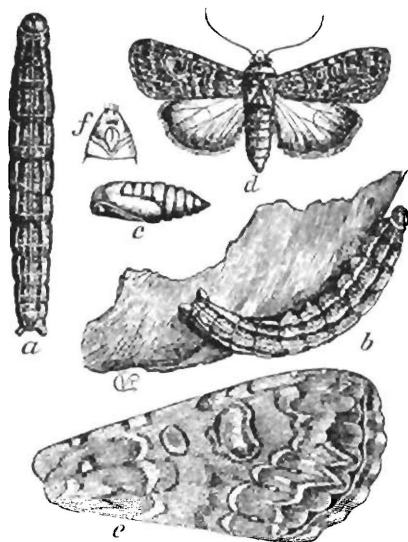
The Cabbage Plutella is a very injurious insect, much smaller than those given above. Its natural history is given in the same report, p. 129, Plate XI., fig. 5.

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THE CABBAGE MAMESTRA.

(*Mamestra chenopodii*, Albin.)



Mamestra chenopodii: a, b, larva; c, pupa; d, moth; e, wing of same (enlarged); f, anal segment of pupa.—(After Riley.)

The Cabbage Mamestra is common both in Europe and in North America. Its natural history is given in the same report, p. 123, Plate XII., fig 1.

THE CABBAGE PIONEA.

(*Pionea* [*Orobena*] *rimosalis*, Guenei.)

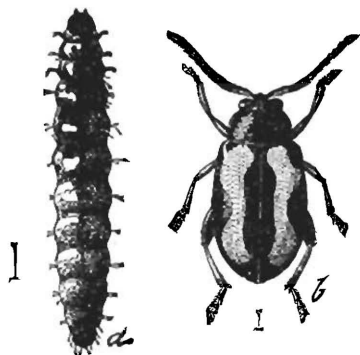


Pionea rimosalis: a, larva; b, pupa; c, moth; d, segment of larva (enlarged).—(After Riley.)

The Cabbage Pionea is a smaller moth, belonging to the family of *Pyralidæ*. It is also very injurious to the cabbage plant. Its natural history was given in the same report, page 126, Plate XI., fig. 4.

THE WAVY-STRIPED FLEA-BEETLE.

(*Phyllotreta vittata*, Fabr.)



Phyllotreta vittata: a, larva; b, adult (both greatly enlarged).—(After Riley.)

The Wavy-striped Flea-beetle is another very injurious cabbage insect. Its natural history is given in the Report of the Entomologist for the year 1884, p. 301, Plate III., fig. 6.

REMEDIES.—The naked larvæ of the several moths and butterflies are very safely treated with pyrethrum. This is a most satisfactory remedy, but should not be made so dilute as usually recommended. Good powder may be diluted four to six times.

Insects affecting the roots are safely treated with kerosene emulsion diluted about ten times. [See Formulas, p. 532.]

NOXIOUS INSECTS AFFECTING THE STRAWBERRY.

THE STRAWBERRY WEEVIL.

(*Anthonomus musculus*, Say.)

The Strawberry Weevil has of late years occasioned great loss to the strawberry crop by injuring and killing the blossoms of this plant. It is fully treated in Riley's Report as U. S. Entomologist. (Report of the Commissioner of Agriculture for the year 1885, p. 276, Plate VII., figs. 6 and 7.)

[For a new (?) insect affecting the leaves of the plant, see page 168 of Report.]



Anthonomus musculus: spray of strawberry showing beetles at work (natural size).—(After Riley.)



Anthonomus musculus: adult (enlarged).—(After Riley.)

REMEDIES.—It is well-nigh impossible, from our present knowledge of the life-history of the species, to suggest a satisfactory remedy. While the beetles are at work on the blossoms they might be successfully treated with kerosene emulsion, but this would need to be done over and over again, as they do not all appear at the same time, but come forth on successive days.

NOXIOUS INSECTS AFFECTING GRASS.

THE ARMY-WORM.

(*Leucania unipuncta*, Harr.)

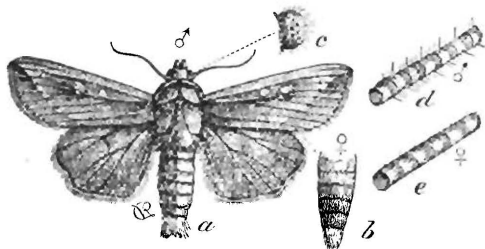
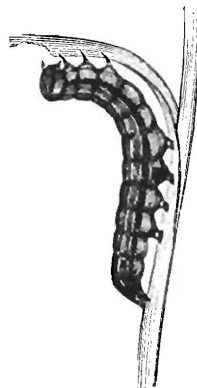
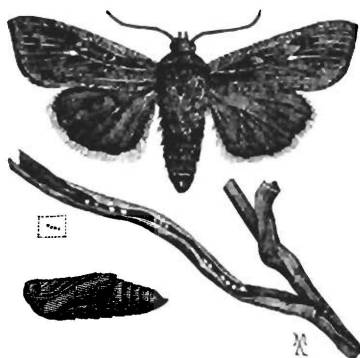


FIG. 1.—*Leucania unipuncta*: *a*, male moth; *b*, abdomen of female (natural size); *c*, eye; *d*, antennal joints of male; *e*, do. of female (enlarged).—(After Riley.)



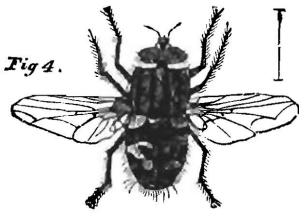
Leucania unipuncta: larva (natural size).—(After Riley.)



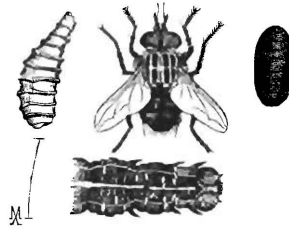
Leucania unipuncta: eggs, pupa and adult.—(After Comstock.)

Its natural history is given in the Third Report of the U. S. Entomological Commission, 1883, pp. 89-156, Plate I., figs. 1 and 5.

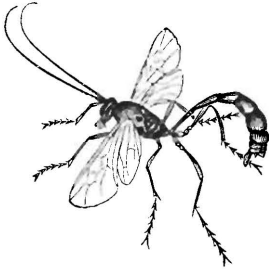
This insect is found in all parts of the world, but only in North America is it known as particularly destructive. It has been constantly studied by entomologists for nearly thirty years past, yet only in the last few years have certain important points been ascertained which complete our knowledge of its life-history. In the Northern States there are usually three generations in the course of a year; in the Southern States four or five, and, in all probability, occasionally six. The injurious brood is usually the second of the season. The insect hibernates both in the moth or imago and in the larva state, while in mild winters at the South (even as far north as Maryland) a succession of generations is kept up through the winter. The eggs are preferably laid in rows of from ten to fifty in a folded grass-blade or in the sheath of a stalk of stubble, in localities where the growth is rank and coarse, as in the vicinity of fodder-stacks; and the moths have even been found to oviposit in old corn-stalks under the dry leaf-sheath. The eggs are always concealed, no matter what their locality. The larvæ live normally as cut-worms, feeding at night and remaining concealed during the day and only when occurring in enormous numbers do they take on the habit of marching from field to field in search of food, which habit has suggested their popular name. The duration of the larva state is from two to four weeks, or much longer in the winter months, and the pupa is formed beneath the surface of the ground. The pupa state lasts from two to three weeks.



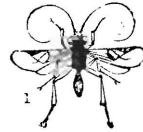
Exorista leucanix (somewhat enlarged).—
(After Walsh)



Nemoreia leucanix: larva, puparium and
adult; also forepart of an army-worm, showing
placing of parasitic eggs.—(After Com-
stock.)



Ophion purgatus (natural size).—(After Riley.)



Apanteles congregatus (greatly en-
larged).—(After Walsh.)

Ordinarily the food of the Army-worm consists of the grains and grasses, but when marching and pressed by hunger it will devour clover and many garden vegetables.

All attempts to explain the influence of the weather upon the periodical appearance of the Army-worm have resulted in the simple conclusion that following a year of extreme dryness we may more certainly expect the worms than after a year of average rainfall.

About a dozen true parasites of the Army-worm have been recorded, and its natural enemies among the predaceous beetles and insectivorous birds are very numerous.

REMEDIES.—Annual burning of fields, straw-piles, weeds and other rubbish as late as possible in the spring will do more than anything else toward preventing the disastrous appearance of the worms. When they have appeared in force they can be prevented from passing from one field to another by judicious ditching. The side of the ditch towards the field to be protected should be dug under, and about every three or four rods a deep hole should be dug, in which

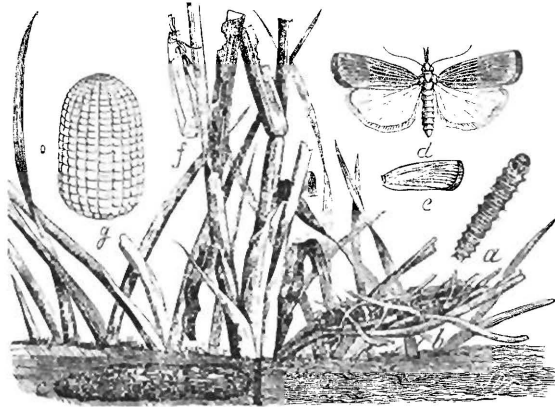
the worms will collect, so that they may be killed by covering them with earth and pressing it down. The use of the ditches may be further supplemented by dusting the grass upon the further side for a strip a few feet wide with Paris green or London purple mixed with flour or plaster. As a substitute for ditching, where fence-lumber can be easily obtained, a line of it may be set up on edge and the top smeared with kerosene or coal-tar, preferably the latter. (Extract from "Agricultural Entomology," Riley.)

Exorista leucaniæ, *Ophion purgatus*, *Apanteles congregatus*, Say, are parasites mentioned and described in the same report.

(See, also, article in the Report of the Entomologist for the year 1879, p. 187, Plate I., figs. 1 and 2.)

THE VAGABOND CRAMBUS.

(*Crambus vulgivagellus*, Clem.)



Crambus vulgivagellus: a, larva; b, web of same; c, cocoon; d, moth, dark specimen; e, wing of light specimen; f, moth at rest (natural size); g, egg (enlarged, natural size shown at side).—(After Riley.)

The Vagabond Crambus is sometimes very injurious to meadows. Its natural history is given in the Report of the Entomologist for the years 1881–1882, p. 179, Plate X., fig. 2.

REMEDIES.—Burning over infested meadows late in fall.

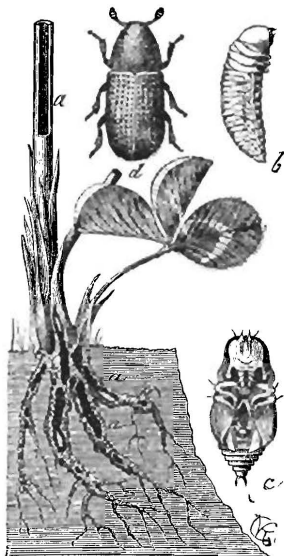
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NOXIOUS INSECTS AFFECTING THE CLOVER.

THE CLOVER-ROOT BORER.

(*Hylesinus trifolii*, Müller.)



Hylesinus trifolii: a, a, a, burrows made by the insect; b, larva, lateral view; c, pupa, ventral view; d, beetle, dorsal view; b, c, d, enlarged.—(After Riley.)

The Clover-root Borer feeds in the roots of clover. Its natural history is given in Riley's Report as U. S. Entomologist for the year 1878, p. 248, Plate V., fig. 2.

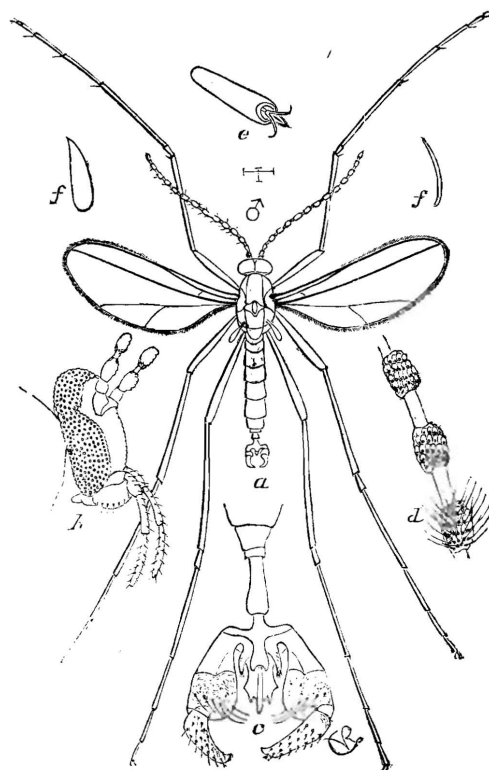
REMEDIES—Plow under affected field. Rotation of crops.

THE CLOVER-SEED MIDGE.

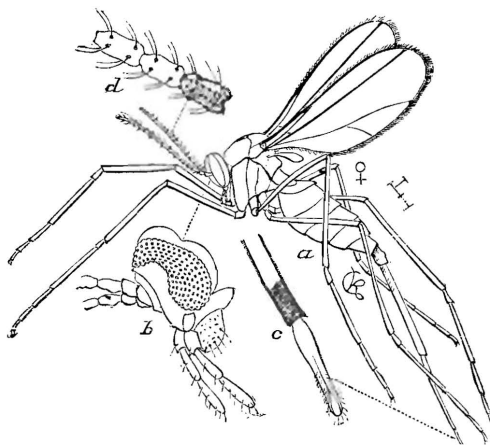
(*Cecidomyia leguminicola*, Lintner.)

The Clover-seed Midge is treated in the same report for 1878, p. 250, Plate V., figs. 1, 2 and 3.

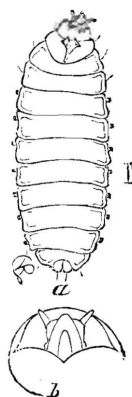
REMEDIES.—Cut the crop while larvæ are yet in seed capsule. Abandon seed crop for one year.



Cecidomyia leguminicola: a, enlarged dorsal view of male with scales denuded; b, head; c, genitalia; d, antennal joints, more highly magnified to show structure; e, tarsal claw; f, f', forms of scales.—(After Riley.)



Cecidomyia leguminicola: a, enlarged side view of female with scales denuded, to show more clearly the structure; b, head, more highly magnified to show structure of the eye, palpi and basal joints of antennae; c, tip of ovipositor, highly magnified and showing at end of penultimate joint the manner in which it is clothed with minute hair; d, highly magnified antennal joints, their minute, hairy clothing shown on the lower one.—(After Riley.)



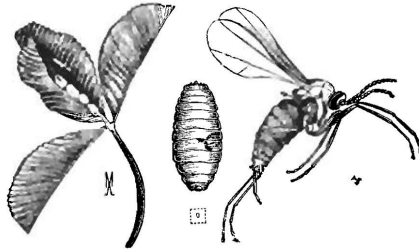
Cecidomyia leguminicola: a, larva (enlarged), ventral view; b, head retracted and more highly magnified.—(After Riley.)

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THE CLOVER-LEAF MIDGE.

(*Cecidomyia trifolii*, Löw.)



Cecidomyia trifolii: larva, cocoons and adult.—(After Comstock.)

The Clover-leaf Midge infests the leaves of the white clover. Its natural history is given in the Report of the Entomologist for the year 1879, p. 197, Plate I., fig 5.

PREDACEOUS INSECT ENEMIES.

The caterpillars of this moth have quite a number of external enemies, which slay large numbers of them. The well-known Rear-horse (*Mantis Carolina*, see fig. 20) seems to be very fond of the caterpillars. The so-called Wheel Bug (*Prionidus cristatus*, see fig. 16) has proved to be one of our best friends in reducing the numbers of the caterpillars. This insect was formerly by no means very common in cities, but of late years it has greatly increased in numbers, and is now a well-known feature in all our public parks and such streets as possess shade-trees. Outside of the city it is rarely met with; nor does it extend much farther north than Washington. It is, like the Mantis, in all its stages a voracious feeder upon insects, slaying alike beneficial and noxious ones. The bright red larvæ and pupæ, also carnivorous, are seen in numbers during the summer; they usually remain together until hunger forces them to scatter. They assist each other in killing larger game, and are to this extent social. The Wheel Bug could be observed almost anywhere last summer, usually motionless, stationed upon the trunk of trees, waiting for the approach of an insect. If one comes near, it quite leisurely inserts its very poisonous beak, and sucks the life-blood of its victim. When this becomes

empty it is hoisted up in the air, as if to facilitate the flow of blood, until eventually it is thrown away as a mere shriveled skin. The appetite of the Wheel Bug is remarkable, whenever chances offer to appease it to the fullest extent. Frequently, however, times go hard with it, and, notwithstanding it is very loth to change a position once taken, it is sometimes forced to seek better hunting-grounds, and takes to its wings. The Wheel Bug has been observed to remain for days in the same ill-chosen position, for instance, upon the walls of a building, waiting patiently for something to turn up. It is slow in all its motions, but withal very observant of everything occurring in its neighborhood, proving without doubt great acuteness of senses. It does not seem to possess any enemies itself, and a glance at its armor will indicate the reason for this unusual exemption.* During warm weather this bug possesses a good deal of very searching curiosity, and a thrust with its beak, filled with poison, is very painful indeed. Boys call it the Blood-sucker, a misnomer, since it does not suck human blood. The eggs are laid during the autumn in various places, but chiefly upon smooth surfaces of the bark of tree-trunks, and frequently in such a position as to be somewhat protected against rain by a projecting branch. The female bug always selects places the color of which is like that of the eggs, so they are not easy to see, notwithstanding their large size.

Euschistus servus, Say, is another hemipterous insect that preys upon the caterpillar of *H. cunea*, and in a similar manner to the Wheel Bug. It is a much smaller, but also a very useful insect.

Podisus spinosus, Dall (fig. 21), in all its stages, was quite numerous during the caterpillar plague. Its brightly-colored larvæ and pupæ (fig. 22) were usually found in small numbers together; but as they grew older they became more solitary in their habits. All stages of this insect frequent the trunk and branches of trees and are here actively engaged in feeding upon various insects. As soon as one of the more mature larvæ or a pupa has impaled its prey, the smaller ones crowd about to obtain their share. But the lucky captor is by no means willing to divide with the others, and he will frequently project his beak forward, thus elevating the caterpillar into the

* The eggs of the Wheel Bug are pierced, however, by a little egg-parasite—*Eupelmus reduvii*, Howard.

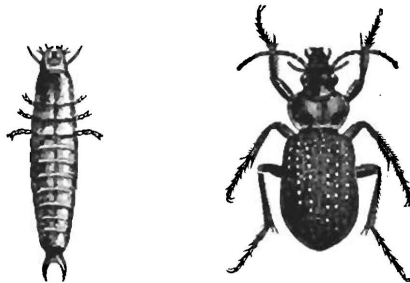
air away from the others. The habit of carrying their food in such a difficult position has perhaps been acquired simply to prevent others from sharing it. A wonderful strength is necessary to perform such a feat, since the caterpillar is sometimes many times as heavy as the bug itself. The greediness of this bug was well illustrated in the following observations: A pupa of *P. spinosus* had impaled a caterpillar, and was actively engaged in sucking it dry; meanwhile a Wheel Bug utilized a favorable opportunity and impaled the pupa, without forcing the same to let go the caterpillar. The elasticity of the beak (fig. 21 *a*) of these bugs must be very great; they can bend it in any direction, and yet keep it in sucking operation. The poison contained in the beak must act very rapidly, since caterpillars impaled by it squirm but for a very short time, and then become quiet. (Extract from Bulletin No. 10 [Riley's], "Our Shade-Trees and their Insect Defoliators," pp 44, 45.)

PREDACEOUS INSECTS.

DO NOT DESTROY THESE.

THE FIERY GROUND-BEETLE.

(*Calosoma calidum*, Fabr.)



Calosoma calidum: a, larva; b, beetle (natural size).—(After Riley.)

The Fiery Ground-beetle, a member of the order of Coleoptera, or Beetles, is very beneficial, eating all kinds of larvæ. It is mentioned as feeding upon the Canker-worms (Third Report U. S. Entomological Commission, p. 177, and on p. 185 as destroying large numbers of the Army-worm).

THE WHEEL BUG.

(*Prionidus cristatus*, L.)

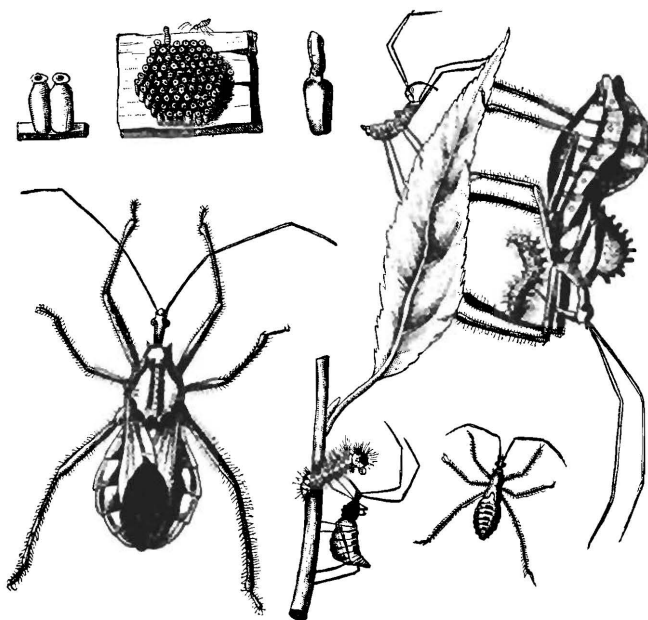


FIG. 16.—*Prionidus cristatus*: eggs, larvæ and full-grown specimens.—(After Glover.)

The Wheel Bug is a member of the order Hemiptera, or Half-winged Bugs. It is a very useful bug, sucking out the juice of many of our most injurious insects. It is figured on p. 32, fig. 16, of Bulletin No. 10 of the U. S. Department of Agriculture; also Report for 1875, p. 128.

(*Podisus spinosus*, Dall.)

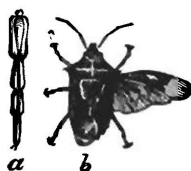


FIG. 21.—*Podisus spinosus*: a, enlarged beak; b, bug, with right wings expanded.—(After Riley.)

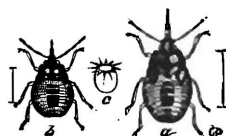


FIG. 22.—*Podisus spinosus*: a, pupa; b, larva; c, egg.—(After Riley.)

Podisus spinosus is a member of the Heteroptera, or Half-winged Bugs, and is one of the important predaceous insects of this country. It preys upon many noxious insects. In Bulletin No. 10 of the U. S. Department of Agriculture ("Our Shade-Trees and their Insect Defoliators"), its history is given (p. 45, figs. 21 and 22); also on p. 97 of the Fourth Report of the U. S. Entomological Commission.

THE CAROLINA MANTIS, OR REAR-HORSE.

(*Mantis Carolina*, L.)

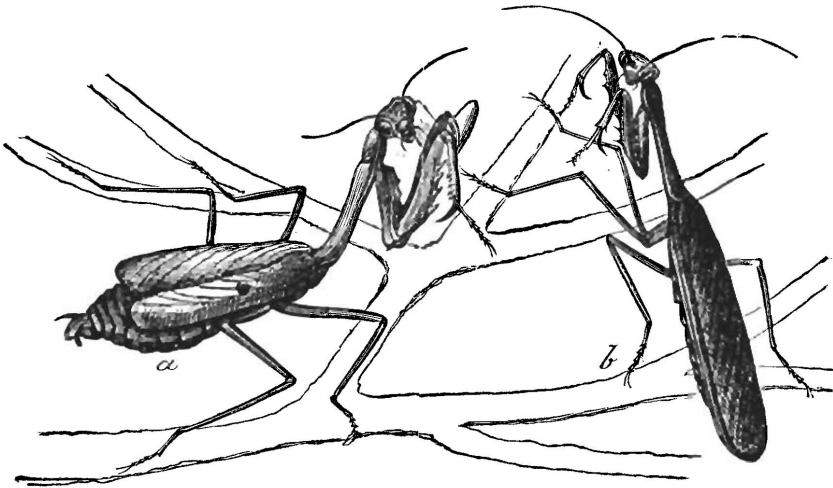


FIG. 20.—*Mantis Carolina*: a, female; b, male.—(After Riley.)

The Carolina Mantis, or Rear-horse, is a member of the order of Orthoptera, or Straight-winged Insects. It is a very rapacious insect, and consequently a very beneficial one. It is mentioned in Fourth Report U. S. Entomological Commission (p. 99, fig. 25) as destroying the Cotton-worm, and in Bulletin No. 10 of the U. S. Department of Agriculture ("Our Shade-Trees and their Insect Defoliators") as preying upon the Fall Web-worm (p. 44, fig. 20).

REMEDIES.

1. ARSENICAL COMPOUNDS.

Paris green and London purple may be used in suspension in water in the proportion of from one-half pound to one pound of the powder to forty gallons of water. When mixed with flour or other diluent, the proportion should be one part of the poison to twenty-five or more of the diluent. The liquid should be kept constantly stirred. (From "Agricultural Entomology," Riley.)

2. KEROSENE EMULSIONS.

Kerosene, two gallons; common soap, one-half pound; water, one gallon. Heat the mixture of soap and water, and add it boiling hot to the kerosene. Churn the mixture by means of a force-pump and spray-nozzle for five or ten minutes.

Rule to Know When Perfect.—The emulsion, if perfect, forms a cream, which thickens on cooling, and adheres without oiliness to the surface of glass. Dilute with cold water before using, to the extent which experience will indicate is best.

KEROSENE WITH SOAP AND MILK.

Of the various substances used in attempts to emulsify and mix kerosene with water, none are more satisfactory than soap and milk, both being everywhere accessible and cheap. Milk was first suggested in 1880, by Dr. W. S. Barnard, while carrying on experiments against the cotton-worm, and subsequent experiment, especially by Mr. H. G. Hubbard, has given the simplest and most satisfactory methods of making the emulsion quickly and permanently. An emulsion resembling butter can be produced in a few minutes by churning with a force-pump two parts of kerosene and one part of sour milk in a pail. The liquids should be at about blood heat. This emulsion may be diluted with twelve or more parts of water to one part of emulsion, thoroughly mixed, and may be applied with the force-pump, a spray-nozzle, or with a strong garden syringe. The strength of the dilution must vary according to the nature of

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the insect to be dealt with, as well as to the nature of the plant ; but finely sprayed in twelve parts of the water to one of the emulsion it will kill most insects without injury to the plant. (From "General Truths in Applied Entomology," Riley.)

It cannot be too strongly impressed upon all who use kerosene as an insecticide, that it can be considered a safe remedy only when properly emulsified. This is obtained only upon violent agitation. It is formed, not gradually, but suddenly ; in short, "it comes" like butter. See rule above.

3. PYRETHRUM.

Pyrethrum can be applied, (1) as dry powder ; (2) as a fume ; (3) as an alcoholic extract, diluted ; (4) by simply stirring the powder in water ; (5) as a tea or decoction. As a powder, it may be mixed with from ten to twenty times its bulk of wood-ashes or flour, but before use should remain for twenty-four hours with the diluent in an air-tight vessel. ("Agricultural Entomology," Riley.)

Pyrethrum cinerariæfolium is sold under the name of "Buhach." The insecticide property dwells in a volatile oil. It acts only by contact, and its action on many larvæ is marvelous, the smallest quantity in time paralyzing and ultimately killing. Its influence in the open air is evanescent, in which respect it is far inferior to the arsenical products ; but being perfectly harmless to plants it can frequently be used on vegetables where the more poisonous substances would be dangerous. The wonderful influence of this powder on insects has led to the belief that it might prove useful as a disinfectant against fevers and various contagious diseases by destroying the microzoa and other micro-organisms, or germs which are believed to produce such diseases. It should be tried for that purpose.

4. REMEDIES AGAINST ROOT-FEEDING INSECTS.

Of all insecticides to be used against root-feeding or hypogean insects, naphthaline, sulpho-carbonate of potassium and bisulphide of carbon are the chief. Dr. Ernst Fischer, in a recent work, has shown that naphthaline in crystal may be satisfactorily used under ground, destroying by slow evaporation. But bisulphide of carbon still holds the first place in France against *Phylloxera vastatrix*. It is conveyed beneath the ground at the rate of one-half to one kilogram per vine

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by special augers, or by more complicated machinery, drawn by horses. It is believed that petroleum emulsions will supersede it as an underground insecticide, and prove to be the best, cheapness, safety and efficiency considered. (From "General Truths in Applied Entomology," Riley.)

PREVENTIVES OF GRAPE DISEASES.

The recipes prescribed by the United States Department of Agriculture for the treatment of mildew and black-rot of the grape, are here republished. They are as follows:

NO. 1. EAU CELESTE, OR BLUE-WATER.

One pound sulphate of copper.
One and a half pints of liquid ammonia.
Twenty-two gallons of water.

NO. 2. EAU CELESTE.

One pound sulphate of copper.
One pound carbonate of soda.
One and a half pints of ammonia.
Twenty-two gallons of water.

Dissolve the sulphate of copper in one gallon of boiling water. In another vessel dissolve the carbonate of soda, then pour the two solutions together, and when all chemical reaction ceases add the ammonia.

Dilute the mixture to twenty-two gallons when required for use.

NO. 3. BORDEAUX MIXTURE.

Sulphate of copper, six pounds.
Fresh lime, four pounds.
Water, twenty-two gallons.

Slake and dissolve the lime in two or three gallons hot water, and strain it, making milk of lime. Dissolve the copper sulphate in three gallons hot water, mix the two solutions and add water to make twenty-two gallons. The mixture should be well stirred before applying as a spray to the foliage and fruit.

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In preparation of formula No. 1, Eau Celeste, the copper sulphate should be dissolved in a gallon of hot water, then pour in the ammonia a little at a time, until all the copper is precipitated; the liquid is then turbid, and of a clear blue color. Add several gallons water and let stand an hour or two to settle. Then pour off the clear liquid, which contains sulphate of ammonia, the compound which causes burning of the leaves. Then pour upon the precipitate left in the vessel enough liquid ammonia to dissolve it, say one pint of ammonia; the result is a clear blue liquid. Dilute this with water to make twenty-two gallons.

The Department of Agriculture directed a trial of these various formulas to be made, in order to determine which is preferable. Reports from all the experiment stations in the United States, of the experience of 1887, indicate that the Bordeaux mixture is most effective in preventing or curing grape mildew and anthraenose. Reports from France are favorable to Eau Celeste, formula No. 1.

The formulas are slightly modified from those used last year, to obviate the chance of injury to the young and tender foliage of the vine.

As regards the efficacy of these preparations in prevention of leaf mildew, experience proves them all to afford complete protection. Concerning the black-rot the testimony conflicts. The weight of evidence, however, especially from France, is that if employed early in the season it is protective against black-rot.

EXTRACTS FROM A PAPER READ BEFORE THE
CAMDEN COUNTY BOARD OF AGRICULTURE.

BY ISAAC W. NICHOLSON.

The importance to the agriculturist of a more extended knowledge of entomology is but imperfectly appreciated. It is important to be able to distinguish which are our friends and helpers and which are our foes, and make their habits somewhat familiar, thereby acquiring the power to move successfully and prevent their encroachments in the destruction of the various crops that are liable to their attacks.

In a short article of this kind it will be impossible to more than merely outline the number which are a serious drawback to our efforts in agriculture, or the friends which are enemies to them.

Quite recently a worm has made its appearance in the wheat crop. [See page 164, Report.]

The past summer a fly of the Stromox family was also noticed. [See page 163, Report.] It is entirely unknown at the U. S. Entomological Department at Washington. It is believed to be an imported species.

The May bug is a beetle which requires three years to attain a perfect development, during this time feeding upon the roots of plants. Whilst in the larva it is sought by many birds and chickens, and pigs, moles and some other animals have a tendency to keep them in check.

The beautiful metallic lustre of the June bug is but a slight recompense for the ravages committed by it during its three years of underground life, when it attacks the strawberry plants as a small white grub, cutting off the roots and entirely blasting the hopes of the grower, after the plant has successfully withstood transplanting. Lawns suffer very severely from their attacks; sometimes the grass is so completely shorn from the roots by them that it can be rolled up like a flower. When such cases occur, the moles will make roads in nearly every part of the affected spots and frequently get the blame for the damage, when they are acting a friendly part and are preventing their further development, thereby preventing an increase.

The wire-worm, which is so destructive to the young corn when it is in the larva state, is of the Clater family, or snapping beetle; its

enemies are the crow, blackbirds, robins, &c., and the larvæ of the lady bird, of which there are eight different species. They are very homely, but quick and persistent in their attacks, seizing their prey by the thorax, and not relinquishing their hold until they have completed their repast. They attack all kinds of grubs, and at maturity destroy the ova of many kinds of insects, not the least of which is the potato bug and aphids, or lice which are upon fruit trees, plants, rose bushes and melon vines.

The tomato worm belongs to the Sphinx family, and when matured is a night-flying moth. When one is found with little white cocoons upon it, which might be mistaken for eggs, be careful not to destroy it, as it has upon it that which will not only destroy it, but the little trachina flies which emerge from those cocoons will pay their respects to other worms and deposit eggs, the larvæ from which will feed upon the juices of the worm, thus destroying it.

How many prized hedges of evergreens and trees have been despoiled or killed by the attacks of the basket-worm, which is often unseen until its work of destruction has been accomplished. It takes the persistency of the fly catcher or wheel bug to prevent their devastating our roadsides of the beautiful cedars, or the lawns of their effectiveness.

The ovum of the wheel bug is found upon the under side of limbs of trees in a cluster of about twenty glued together in a pentagon-shaped mass. The larvæ, when young, look like small red spiders, are very voracious, and will attack caterpillars, flies, &c. The developed bug can readily be mistaken for a squash bug, but upon examination of the shoulders there is a semicircle with teeth upon it; hence the name wheel bug. It is also one of the greatest insect enemies of the fall web-worm, which defoliated many trees during the present season. [See "Predaceous Insects," page 529.]

Eozochistus servus is another insect that preys upon the caterpillars similar to the wheel bug. *Podisus spinosus* is also quite common during a caterpillar plague; in all stages of this insect it is found feeding upon insects.

But few birds are known to feed upon them. The black-billed cuckoo and the common screech owl are known to be attracted to it.

The cabbage-worm, though of quite recent introduction, is known by its formidable increase. It is one of the greatest obstacles to the successful raising of the crop, and as is the case with all importations

of such plagues, there seems to be no parasitical enemy to it. Within a few years, under the auspices of the Agricultural Department, at Washington, there have been two importations of a parasite from England, one of which appears to have been successful.

The larvæ of the hand-maid moth, which are seen in large clusters on apples and many oak and walnut trees, after completely destroying all the tender part of the leaves, fall upon the ground to undergo the transformation period. They are attacked by a fly a little larger than the common house fly, which, despite the wiggling of the worm, deposits its eggs in segments of the worm's body, when the larvæ of the fly feed upon the juices of the worm, completely destroying and keeping it in check, so for some years they are found only in limited numbers.

An insect with the color and marking of the hornet, but much larger, known as the burrow wasp, is very active and swift on the wing, capturing the cicada (harvest fly), taking it to its cells under ground, storing it with other insects and their larvæ for the nourishment of its own larvæ.

The greater benefactor in keeping insects in check is undoubtedly the fungus which attacks their bodies, generally their abdomens and under their wings. It is of a reddish color, and frequently can be seen with the naked eye on the common house fly, and upon the larvæ of some of the larger insects, such as the true locust, crickets, and different species of caterpillars.

It is very doubtful economy, in order to protect some crop from the insectivorous birds, to wantonly slay them, for who has not watched the incessant labor required of a pair of robins or blackbirds to keep a supply of grubs or beetles in the open mouths of their young? So with all the native birds; through heat and rain they are incessant workers, and with a little care their damage to crops is not the one-hundredth part of what their benefit is by their continual exertions to feed their young and gratify their own appetites. Even the quail is but a sort of the granivorous, substituting the ants, beetles and grubs much the greater part of the time.

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