

STATE OF NEW JERSEY.

Thirty-Second Annual Report

OF THE

State Board of Agriculture

1904

Printed by Order of the Legislature.

NEW JERSEY STATE LIBRARY

TRENTON, N. J.
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1905

To the Hon. Franklin Murphy, Governor of New Jersey:

SIR—In accordance with the act creating the State Board of Agriculture, adopted April 22d, 1884, and with the provisions of the law approved June 15th, 1895, I have the honor to present the report of said Board for the year 1904.

FRANKLIN DYE,

Secretary.

Dated Trenton, November 4th, 1904.

State Board of Agriculture.

OFFICERS AND EXECUTIVE COMMITTEE FOR 1905.

PRESIDENT.

E. B. VOORHEES, New Brunswick.

VICE-PRESIDENT.

JOHN T. COX, Readington.

TREASURER.

WALTER HERITAGE, Swedesboro.

SECRETARY.

FRANKLIN DYE, Trenton.

H. V. M. DENNIS, Freehold.

GEORGE E. DE CAMP, Roseland.

JOHN M. LIPPINCOTT, Moorestown.

STATE CHEMIST.

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

STATE ENTOMOLOGIST.

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

MISS JESSIE V. RUE, STENOGRAPHER OF THE BOARD.

BOARD OF DIRECTORS.

New Jersey State Board of Agriculture.

1905.

Term of office, one year, dating from January 1st, 1905, to December 31st, 1905, for all except County Board Directors.

CLASS A.

EMMOR ROBERTS, Geological Survey.
E. T. GILL, Board of Visitors, Agricultural College.
GEO. E. DECAMP, Director of Experiment Station.
EDWARD B. VOORHEES, Professor of Agriculture.

CLASS B.

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

CLASS C.

ELIAS S. BLACK, }
ALBERT REPP, } State Horticultural Society.
S. THORNTON HOLLINGSHEAD, .. Burlington County Pomona Grange.
E. L. BOLLS, Cumberland County Pomona Grange.
ELMER CLEMENT, Gloucester County Pomona Grange.
WILLIAM Y. HOLT, Hunterdon County Pomona Grange.
CHARLES E. RUE, Mercer County Pomona Grange.
HAMLIN WOOLMAN, Salem County Pomona Grange.
F. S. ADDIS, Warren County Pomona Grange.
A. J. RIDER, }
JOSEPH EVANS, } American Cranberry Growers' Association.

BOARD OF DIRECTORS.

BOARD OF DIRECTORS.

NAME.	ADDRESS.	TERM.	COUNTY.
JOS. BUTTERHOF,	Egg Harbor City,	2 years,	Atlantic.
L. H. PARKHURST,	Hammonton,	1 year,	"
MALCOM H. ANGELL,	Etna,	2 years,	Bergen.
SAM'L R. DEMAREST, JR.,	Hackensack,	1 year,	"
SAM'L L. FORT,	Wrightstown,	2 years,	Burlington.
ISRAEL KIRBY,	Columbus,	1 year,	"
CHARLES BARTON,	Marlton,	2 years,	Camden.
C. C. STEVENSON,	Blackwood,	1 year,	"
RALPH SCHELLENGER,	Green Creek,	2 years,	Cape May.
JOSEPH W. PINCUS,	Woodbine,	1 year,	"
W. S. BONHAM,	Shiloh,	2 years,	Cumberland.
JOHN T. WHITAKER,	Fairton,	1 year,	"
M. W. DeCAMP, .....	.....	2 years,	Essex.
AUGUST W. FUND,	Chatham,	1 year,	"
ALEXANDER P. OWEN,	Mickleton,	2 years,	Gloucester.
JOHN TONKIN,	Glassboro,	1 year,	"
E. M. HEATH,	Locktown,	2 years,	Hunterdon.
JAMES LANE,	Readington,	1 year,	"
J. M. DALRYMPLE,	Hopewell,	2 years,	Mercer.
THEODORE CUBBERLY,	Hamilton Square,	1 year,	"
R. F. P. VONMINDEN,	New Market,	2 years,	Middlesex.
B. DEWITT GILES,	New Market,	1 year,	"
DANIEL JONES,	Freehold,	2 years,	Monmouth.
D. D. DENISE,	Freehold,	1 year,	"
W. B. LINDSLEY,	New Vernon,	2 years,	Morris.
S. E. YOUNG,	Florham Park,	1 year,	"
CHAS. R. GRAHAM,	Red Valley,	2 years,	Ocean.
C. MILTON RORER,	Cassville,	1 year,	"
M. D. DICKINSON,	Woodstown,	2 years,	Salem.
GEORGE H. KIRBY,	Woodstown,	1 year,	"
JOHN GROENDIKE, .....	.....	2 years,	Somerset.
GEO. P. McDANOLDS,	Branchville,	2 years,	Sussex.
THEODORE M. ROE,	Branchville,	1 year,	"
F. E. WOODRUFF,	Cranford,	2 years,	Union.
JAMES L. HEADLEY,	Union,	1 year,	"
JAMES I. COOK,	Mt. Hermon,	2 years,	Warren.
N. WARNE,	Broadway,	1 year,	"

OTHER ASSOCIATIONS.

BERTRAND GULICK,	} Princeton Agricultural Association.
WILLIAM S. SCHENCK, ..	
EZRA E. DARNELL,	Mt. Laurel Farmers' Club.
DR. GEO. W. POPE,	} Veterinary Association of New Jersey.
DR. G. F. HARKER,	

REPORT OF COMMITTEE ON CREDENTIALS. 9

MR. PRESIDENT—Your Committee on Credentials beg leave to report that all the organizations comprising the delegates of this Board represented, excepting Centre District Pomona Grange.

Respectfully submitted,

M. D. DICKINSON,
SAM'L R. DEMAREST, JR.,
JOSEPH B. WARD,

Committee.

THE THIRTY-SECOND ANNUAL MEETING

OF THE

NEW JERSEY STATE BOARD OF AGRICULTURE

HELD AT

Trenton, N. J., January 11, 12 and 13,

1905.

REPORT OF PROCEEDINGS.

STATE BOARD OF AGRICULTURE.

Thirty=Second Annual Meeting.

FIRST DAY—MORNING SESSION.

WEDNESDAY, January 11th, 1905.

The Thirty-second Annual Meeting of the State Board of Agriculture was called to order by the President, Dr. E. B. Voorhees, at 10:30 A.M.

Prayer was offered by the Rev. James B. Kennedy, of Trenton.

The roll of delegates was called, showing a very full attendance.

On motion, the following program was adopted as the order of business, subject to any changes that may be necessary:

ORDER OF BUSINESS.

WEDNESDAY.

10:30 A. M.—12:30 P. M.

Prayer.

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

Presenting Order of Business.

Minutes of Last Meeting.

Announcing of Committees appointed.

On Credentials.

On Resolutions.

On Treasurer's Accounts and any other Committees.

11:30 A. M.

Reading of the Executive Committee's Report.

Report of State Grange.

GEORGE W. F. GAUNT, W. M.

Report of Treasurer, WALTER HERITAGE.

Report of Secretary of State Board.

Introduction of Other Business.

STATE BOARD OF AGRICULTURE.

Second Session.

2:00—5:00 P. M.

Report of Committee on Credentials.

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

Committee will report when ready.

2:30 P. M.

Annual Address of PRESIDENT DR. EDWARD B. VOORHEES.

3:30 P. M.

"Mushroom Production." Illustrated with diagrams.

By CAPT. CHARLES McILVAINE, Cambridge, Md. Formerly of New Jersey.

Third Session.

7:15 P. M.

"Some Poultry Problems by Lime Light."

By PROF. JAMES E. RICE, Cornell University, New York.

8:30 P. M.

"Insects and Horticulture: Southern and Other Experiences."

By DR. JOHN B. SMITH, State Entomologist.

Note—Both the above lectures will be freely illustrated with stereopticon.

THURSDAY.

Fourth Session.

9:30 A. M.—12:30 P. M.

Prayer.

Unfinished and New Business.

10:30 A. M.

"Market Gardening in the South Atlantic States and Its Lesson to Northern Gardeners."

By PROF. W. F. MASSEY, Horticulturist North Carolina College of Agriculture, Raleigh, N. C.

11:30 A. M.

"Some Diseases of Fruit Trees and Truck Crops."

By PROF. M. B. WAITE, Pathologist, Bureau of Plant Industry, U. S. Dept. of Agriculture, Washington, D. C.

Fifth Session.

2:00—5:00 P. M.

Report of Commission on Tuberculosis in Animals.

2:30 P. M.

"Modern Dairy Feeds and the Feeding Stuffs Law."

By DR. EDWARD B. VOORHEES.

To be followed by discussion on economical milk production—home-grown protein feeds, &c.

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4:00 P. M.

"The Production and Handling of Milk."

Richly illustrated with stereopticon slides.

By PROF. R. A. PEARSON, Department of Dairy Industry, Cornell University, Ithaca, New York.

Sixth Session.

8:00 P. M. Sharp.

Work of the Biological Survey in Its Relations to Agriculture.

By DR. C. HART MERRIAM, CHIEF.

Note—This lecture is provided through the courtesy of the United States Department of Agriculture; it will be delivered in the Auditorium of the State Normal School, and will be richly illustrated with stereopticon views.

FRIDAY.

Seventh Session.

9:30 A. M.—12:30 P. M.

Prayer.

Unfinished Business.

10:00 A. M.

Report of State Entomologist, DR. JOHN B. SMITH.

Discussion on—

(a) Some Reasons for the Federation of the Agricultural Organizations of New Jersey.

Opened by DR. VOORHEES.

(b) Parcel Post—Should It Be Introduced into the United States—Advantages Possible.

Opened by H. W. COLLINGWOOD, ESQ.

(c) Marketing Farm Produce—What Can Be Done to Improve This Part of Our Business.

Opened by THEODORE CUBBERLY, Hamilton Square.

(d) The Game Laws of New Jersey—Shall We Demand Their Amendment in the Interest of Farmers?

Speaker to be announced.

12:00 M.

Closing the Business of the Board.

The minutes of the last meeting were adopted as printed, and the reading dispensed with.

The President then announced the following committees:

Credentials—M. D. Dickenson, Samuel R. Demorest, Jr., and Joseph B. Ward.

Resolutions—A. J. Rider, George E. DeCamp and S. B. Ketcham.

Officers' Reports—John M. Dalrymple, John Tonkins and Theodore M. Roe.

Treasurer's Accounts—H. V. M. Dennis and John M. Lippincott.

On Visiting Delegates and Speakers—John T. Cox and George W. F. Gaunt.

The report of the Executive Committee was then presented and read by the Secretary, as follows:

Report of Executive Committee for 1904.

Soon after the last annual meeting of this Board on January 25th, the Executive Committee held its first meeting for the year. The members were all present. The object of the meeting was to take action looking to the furtherance of such legislation, at the then present session, as would inure to the benefit and not the injury of the farmers. To better accomplish this a committee consisting of Hon. D. D. Denise, Dr. Jos. B. Ward and Walter Heritage was appointed.

The Executive Committee were informed at this meeting that a number of persons interested in the production of sweet potatoes were anxious to have the information contained in the material collected by the Secretary on this subject, prior to the beginning of their work the coming spring. It was, therefore, resolved to publish the same immediately as a special bulletin, and the Secretary was authorized to secure the approval of the State Printing Board, and to prepare, print and distribute the same.

Owing to the absence of the President in Europe, the committee did not meet again until August 9th. At this meeting the members were all present. Mr. Heritage reported for the Committee on Legislation one or two meetings held, but so far as legislation in the interest of farmers in particular was concerned the committee had not been able to accomplish anything.

A notice of the next meeting of the American Association of Farmers' Institute Workers, of which this Board is a member, to be held in St. Louis, on October 18th, 19th, 20th, asking for suggestions of topics, speakers and delegates was received and read. The committee, on motion, appointed the Secretary a committee of one to attend said meeting.

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The Secretary, at this meeting, requested action concerning the Farmers' Institutes to be held the coming fall and winter in this State; whereupon it was decided to hold as many Institutes as the funds at our disposal would allow. Then, on motion, the entire matter of the Farmers' Institutes—number to be held, places, time, speakers, subjects and the conducting of the Institutes—was referred to the Secretary with power.

The dates, January 11th, 12th and 13th, 1905, were chosen for the Thirty-second (this) Annual Meeting of this Board, and a committee consisting of the President and Secretary was appointed to secure speakers, arrange program, etc.

The usual annual appropriation to the State Horticultural Society and to the several County Boards, based on the reports received from them, was also made at this meeting. On motion of Mr. Rogers, the President appointed a committee of the Executive Committee to attend the St. Louis Exposition in the interest of agriculture.

On October 28th another full meeting of the committee was held. The Secretary reported attendance at the Institute Workers' Convention, and that he had, by request, presented a paper on "New Problems and Methods in Institute Work in the East;" that the attendance was large, almost every State and territory in the United States and the Provinces of Canada being represented, as was also the United States Department of Agriculture. The interest in this method of disseminating agricultural knowledge was very marked, showing, by the reports made, it is growing in popularity and usefulness.

Secretary reported progress made in securing speakers and outlined the general line of discussion for the Annual Meeting, which was approved.

As October 31st marks the close of the fiscal year of the State, the finances of the Board were considered and bills due, covering our balance, were prepared and presented to the Comptroller, as also the accounts of the State Entomologist.

The work of the State Entomologist, his assistants and their compensation for the ensuing year was then considered. The salary of the State Entomologist was fixed at twenty-five dollars per month for the fiscal year beginning November 1st, 1904.

Edgar L. Dickerson was re-appointed assistant to the State Entomologist for the fiscal year beginning November 1st, 1904, at a monthly salary of eighty-three dollars and thirty-three cents.

The State Entomologist was authorized to expend twenty-five dollars per month for clerical assistance beginning November 1st, 1904, and until otherwise ordered.

For special inspection work the Entomologist was also authorized to employ Mr. H. H. Brehme for the months of November and December, 1904, at a sum not to exceed sixty-five dollars per month and expenses.

The last meeting of the committee for the year was held January 10th, 1905, when the reports were considered and the work of the year reviewed, the order of business for this meeting adopted and the several committees appointed.

The Secretary at this meeting reported as to the Farmers' Institutes held during November and December, 1904. With but three or four exceptions, the attendance was much larger than in any previous year; it began with the first session and continued to the close of the Institute. The interest in the questions presented showed that the Farmers' Institute is becoming recognized as an important and valuable factor in the matter of agricultural education. More Institutes are being asked for.

The committee are pleased to know that substantial progress is being made in this work, and they feel that the time has come when an increased appropriation for this work may be reasonably requested from our Legislature.

A Committee of Appeal, under the law of the State Entomologist, was appointed, consisting of Messrs. William H. Reid, Monmouth county; Charles Collins, Burlington county, and Cyrus B. Crane, Essex county.

The order of business presented for this meeting has been made up by our special committee with due regard to the idea of advancing in the various lines of our work, and, while it is not possible to cover all the broad fields at one annual meeting, we earnestly hope the subjects presented, with the addresses and discussions thereon, may be found helpful.

On motion the report was received and referred to the Committee on Officers' Reports.

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The report of the State Grange was then read by George W. F. Guant the Worthy Master, which see.

The report was received and ordered printed in the Annual Report.

Mr. Walter Heritage, treasurer, then submitted the following report:

REPORT OF WALTER HERITAGE, TREASURER, FOR THE FISCAL YEAR ENDING
OCTOBER 31ST, 1904.

Dr.

Total amount received from Comptroller during the year, \$3,966 00

Cr.

1904.

January 15. By Delegates' expenses to Annual Meeting, ..	\$431 2c	
Speakers and expenses,	527 11	
Executive Committee and Speakers' bill at Trenton House,	61 00	
Stenographer at Annual Meeting,	104 30	
Janitor and lantern service,	35 00	
Appropriations to County Boards of Agri- culture,	342 50	
Appropriation to State Horticultural So- ciety,	300 00	
Expenses taking dairy census,	10 00	
Investigating sweet potato industry,	68 00	
Express company's bills,	182 71	
Packing Annual Reports,	10 00	
Executive Committee's expenses,	322 98	
Expenses of Farmers' Institutes,	1,571 20	
		————— \$3,966 00

On motion the report was referred to the Auditing Committee.

President Voorhees—We will now hear the report of the Secretary.

Secretary Dye then read his report, which was received and discussed without being referred to the Committee on Officers' Reports.

(See report and discussion following.)

At the close of the discussion of the Secretary's report, Board took recess until 2 p. m.

AFTERNOON SESSION.

The President—The first business in order is the report of the Committee on Credentials. The Secretary will call the roll again for absentees.

The Secretary then called the roll and found but few delegates absent.

A committee consisting of one member from each county duly represented was then named to nominate officers for the ensuing year, the members present from each county naming their member of this committee.

The Secretary called the roll of counties and the following were nominated:

- Atlantic county—L. H. Parkhurst.
- Bergen county—Malcolm H. Angel.
- Burlington county—Charles Collins.
- Camden county—C. C. Stevenson.
- Cape May county—J. H. Pincus.
- Cumberland county—W. S. Bonham.
- Essex county—George E. De Camp.
- Gloucester county—Alexander P. Owen.
- Hunterdon county—Edward M. Heath.
- Mercer county—Josiah T. Allinson.
- Middlesex county—R. F. P. Von Minden.
- Monmouth county—D. D. Denise.
- Morris county—S. E. Young.
- Ocean county—C. R. Graham.
- Salem county—George H. Kirby.
- Somerset county—No nomination.
- Sussex county—Theodore M. Roe.
- Union county—James L. Headley.
- Warren county—James I. Cook.

Vice-President Cox then assumed the chair and Dr. Edward B. Voorhees delivered his annual address, which see.

On motion the address was accepted with thanks and referred to the Committee on Officers' Reports.

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Moved by Mr. Collins that the address of the President be printed at once for immediate circulation previous to the issue of the annual report. Carried.

Vice-President Cox—Are there any matters contained in this address which any of the members of the Board feel like discussing now?

Mr. Ford—I recollect one suggestion which I think deserves the attention of this meeting, and that is the removal of the tariff duties on wheat. We are interested in that as producers. I think it is a matter that should be taken up, and we ought to show our interest in it, so that our representatives in Congress will not favor the removal of the duty.

Mr. Denise—I am opposed to bringing up this tariff question before this Board. We differ politically, and it is right we should, but I don't think it is right to discuss that matter here. I am a tariff man, but I don't think it should be brought up here.

Mr. Ford—We would agree upon that entirely, but it seems to be a timely question.

Mr. Rider—I think it ought to be discussed and I think it can be discussed without going into politics.

Mr. E. Black—I am just like Brother Denise. I don't want that question of tariff brought up in this meeting. You know what the people voted last fall.

The President—I believe that if the farmers could pass a resolution endorsing the principle that whole grain shall not be exported, when it is possible to manufacture it here, it would be a good thing. This is a great drain on our soils and we receive no return when it is shipped out of the country. Also the principle which is involved in the matter of the cheap land in the Canadian country and the raising of wheat and then shipping it over here. It seems to me that does have a direct bearing upon people in the building up of their own farms. If they fail they can skip to the other side and get land for practically nothing and raise grain and ship it here and get as much as they did here. That is going to work an injury. It is all right to endorse that principle; it does not affect the tariff question primarily. It affects a principle, and undoubtedly a good one, that we should begin at home and take care of our own, and we have got a

pretty big job to take care of the land that we have and see that it is built up rather than run down. Those are the two lines on which I think we might well express ourselves, and it is not a question of one man's politics or another man's politics, which has no business here.

Mr. Ford—I don't think it is worth while to be afraid of such questions, just because they have tariff in them. Let us leave off that other name and take the remarks our President has made and stand behind that. I think this question is of vast importance to us.

Vice-President Cox—If there is no further discussion on this question upon which the President has addressed us, and the supplemental remarks made by him, we will go to the next order of business, which is mushroom production. This is a question in which many of our people are very much interested. It will be treated by Captain Charles McIlvaine, now of Cambridge, Maryland, but formerly of New Jersey. I am glad to present the Captain to his New Jersey constituency again.

Captain McIlvaine then read his paper on the subject named, which was received and ordered to be printed in the Annual Report. (See address.)

Mr. Rider—I desire to submit a resolution:

Resolved, That the Legislature be requested to amend the corporation law of 1896 so as to grant to corporations for agricultural purposes within the State the same exemption from annual State tax on capital of one-tenth of one per cent. as is now granted to manufacturing and mining corporations.

On motion referred to the Committee on Resolutions.

Mr. Denise—There don't seem to be anything more on the programme this afternoon, and as it is too early to adjourn I would ask the President to tell us a little of what he saw of farm life when he was abroad.

The Vice-President—We will be pleased to hear from Dr. Voorhees concerning his European trip.

Dr. Voorhees—Not expecting to be called upon to give an account of my trip abroad, I am not prepared to give a definite or logical statement of my impressions. I made a rather hurried visit to England, Scotland, Ireland, Belgium, France and

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Italy, and was especially impressed with the agricultural conditions as they exist upon the continent. Intensity of practice was apparent on all sides, not only in reference to the matter of production, but also in reference to the utilization of every inch of available land. This intensive culture is probably due to several causes, and primarily the necessity of obtaining as large crops as possible, in order to support the large population. The intensity of culture was not only evident from the large yields, but by the absence of foreign growths. They not only raise large crops, but they consist entirely of the plants that they are intending to grow—there are no weeds to interfere with the growth of the crops. Every bit of the culture was just as good as it could be. This may have been due in large part to the fact that labor is abundant and cheap, yet complaints were made that labor was not as abundant or as efficient as formerly. The labor question is agitating those countries quite as much as here.

Another matter which was strikingly impressive was the small plots of the different crops under cultivation. Wheat, rye, oats and potatoes were largely grown, but upon individual areas so small as to appear insignificant to persons accustomed to seeing great fields of these crops from 10 to 40 or 50 acres. This fact was not so true of Northern Germany, where the areas devoted to the different crops are very much larger, ranging from 10 to 100 acres; yet the intensity of the culture was quite as great. The finest oats, wheat and potatoes I have ever seen growing anywhere were growing on fields of not less than 50 acres in area.

Another very pleasing feature of continental farming is the relatively large area devoted to the growth of alfalfa. On nearly every farm, whether it was small or large, this crop was growing, and it is regarded there, as here, as one of the most valuable crops.

As was quite natural, I made it a point to visit a few of the leading experiment stations, and found that as here they are supported by government appropriations, and fees for the analyses of fertilizers, feeds, etc., that while the income to the individual stations is not so large, as a rule, as in this country, their number is legion as compared with the number in this country.

Furthermore, the lines of investigation are more scientific in many instances than our own. In Germany, particularly, the spirit of investigation is very well developed. The system adopted there is, however, different from our own, in which the individual worker in the different departments receives recognition for his work. There the station is known by the name of the man who is at the head of it, and the individual workers and assistants do not receive the same recognition as here. I found, also, that while the experiment stations were doing a large amount of work, they were not doing as much work per person as is accomplished in this country. Their methods are not as modern as those adopted in this country. For example, in the chemical laboratories they are still using methods which were discontinued in this country years ago as being slow and cumbersome, and methods devised which are quite as accurate, but which permit of a much larger amount of work being done in a given time.

Another point in which the experiment stations there differ from our own is the method of publishing the results. There, the results of the various experiments are largely distributed by means of articles prepared by the director for the various agricultural papers. Occasionally these results are published in pamphlet form and sold at so much a copy. Thus the individual farmer does not come in as close relationship with the experiment station as in this country, and on this account I believe that our experiment stations are helping more directly the work of the farm. In one or two stations which I visited they have adopted what they are very proud to call "American methods." I think that the work of the experiment station in this country, which is growing more scientific from year to year, is on the whole more serviceable to the whole people than is the work of the experiment stations on the continent.

In England I was somewhat disappointed in the character of the farming, particularly near the large cities. I found that they were raising sheep, horses and cattle within a few miles of London. It occurred to me that in the vicinity of a city so large as London the farmers would do better to cultivate those crops needed for immediate consumption, rather than to engage

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in the raising of live stock, and upon inquiry I learned that the reason was largely due to the fact that the railroads did not encourage the shipping of products in small quantities and for short hauls, and hence the eggs, butter, vegetables, etc., were obtained largely from Sweden, Belgium, Holland and France. The people of London are not fed to any great extent by the farmers of England, and it is one of the reasons why farming in that country is in so low a state.

I was also impressed with the differences existing between farming in Belgium, for example, and that in England. While in a sense it was intensive, there was a very much larger proportion of weeds. The farming was not clean; fields of oats, barley and pastures were yellow with charlock and buttercups.

The farming I saw in Scotland was much superior to that which I saw in England—large areas of wheat, rye and potatoes were especially good. In Ireland I was impressed with the fact that too large an area was devoted to pastures and meadows. While the country is beautiful, you cannot escape the conviction that farming it is not profitable.

Another matter which is of interest to us here is the thorough organization of the farmers, particularly upon the continent, and the efforts that are being made to educate and direct individual farmers in the matter of general practice. I found in Belgium, for example, an organization of farmers which numbered over 38,000, which through its officers directed the purchase of all of the supplies in the way of seeds, fertilizers, tools, implements, as well as the purchase and sale of the products grown; besides the organization provided instruction in rather a unique way. Not only were the schools and colleges well provided, but meetings were held similar to our institutes, and in addition traveling instructors went from farm to farm pointing out the characteristics of soil, the crops best adapted for it, and which could be most profitably grown. A suggestion for the development of our institutes in this country, though I do not think that the specific kind of work done there would be applicable here, where our farmers are of a very different class, generally intelligent and capable of applying suggestions contained in printed bulletins. The farmers on the continent, particularly, are of a

lower grade of intelligence, and are apparently incapable of a high intellectual development, thus the directions have to be more specific and explicit.

I returned to this country more than ever convinced that there is no country from the agricultural standpoint, or from any other standpoint for that matter, that in any way compares in opportunity with our own.

EVENING SESSION.

The meeting was called to order at 7:15 P.M. by the President, and Professor James E. Rice, Cornell University, New York, was introduced and delivered an address on "Some Poultry Problems by Lime Light." (See address.)

Professor John B. Smith, State Entomologist, also delivered an address on "Insects and Horticulture; Southern and Other Experiences," of which the following is a synopsis:

Dr. Smith—During the summer of 1904, a visit was made to Georgia, primarily to determine what, if any, advantage had resulted in that State from the introduction of the Asiatic lady-bird as an enemy to the San José scale.

Incidentally, the scale condition in the peach orchards was investigated and information was obtained as to the methods by which the Georgia growers kept that insect in check.

Through the courtesy of Mr. Wilmon Newell, State Entomologist of Georgia, it was possible to cover the territory very thoroughly, and the general results of the trip formed the basis of the lecture. The report of the work done appears in detail in the Annual Report of the Experiment Station for 1904. Briefly summarized it was found that while the lady-birds had increased and had even become very abundant in 1903, yet, for some reason, they died off almost completely during the winter of 1903-1904, and in mid-summer of 1904 very few specimens could be found. At some of the points where they were most abundant in 1903 none at all were seen. Several colonies were collected, however, at the different points visited and sent into New Jersey, where they were placed on a fruit farm near New

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Brunswick, under such circumstances as to give them every advantage if they can find life possible in our climate.

In Georgia, the lime, salt and sulphur wash forms the chief reliance of the peach growers, and some of the Georgia methods of preparing the wash and applying it were illustrated by the slides. Some of the establishments for preparing the wash and some of the spraying outfits in New Jersey were also illustrated, and a brief record was given of some of the experiments made during the summer of 1904, and the outfit which was used for the purposes of these experiments was shown. (See discussion, minutes of Thursday morning.)

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

SECOND DAY—MORNING SESSION.

THURSDAY, January 12th, 1905.

The session was called to order by the President at 9:30 a. m., and was opened with prayer by the Rev. Dr. Walter A. Brooks, of Trenton.

UNFINISHED AND NEW BUSINESS.

Mr. Dennis presented the following report:

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

H. V. M. DENNIS,
JOHN M. LIPPINCOTT,
H. F. BODINE,
Committee.

Moved that the report be accepted and made part of the record. Carried.

The Committee on Credentials reported progress.

The President—The regular paper for this morning does not come until 10:30, and we have nearly three-quarters of an hour for discussion of other business. The Secretary suggests that

perhaps some of the members would like to ask Professor Smith questions on the lecture last night. If there are any such questions they can be asked now. I may also say that if there are any resolutions to be offered, they ought to be in the hands of the committee this morning, in order that they may have full opportunity to consider them and present their reports to-morrow.

Mr. Allinson—I want to ask Professor Smith if he ever tried this lime, sulphur and salt without boiling.

Professor Smith—Yes. I have used the material and have tried to prepare it in almost every way that has been suggested. I have also seen the material used by others in orchards during the past year. You can under favorable circumstances mix lime and sulphur so as to form a good combination; but it is harder work to do that than to boil the mixture. In the first place, to make that combination you have got to have twice as much lime as you need to combine it with sulphur. Half the lime is simply whitewash. It forms no sort of combination and has no value as an insecticide. It is a positive disadvantage, because it makes your wash thicker. It is the lime in combination with the sulphur that makes the insecticide. In the whitewash you have something that will scale off gradually. Furthermore, to obtain the combination you must use hot water. You must also have lime that will slack perfectly and thoroughly in order to get the combination, and about nine out of every ten who make the combination get an imperfect one that does practically no work and gives only bad results.

There are a number of people who have experimented in combining the lime and sulphur without boiling, by means of caustic potash, or caustic soda, and in Georgia they have adopted this method: They make the sulphur into a paste with just enough water to do it, and then add the caustic soda slowly and dissolve the sulphur with it. When you get it dissolved you have a mixture of the sulphur and soda, and then you can use that, with a little water added, to slack your lime and get a combination. Mr. Newell, Georgia, claims to have gotten very good results in that way. You are making a chemical combination, and the easiest way, after all, and the most certain, from the practical standpoint, is to combine it by means of fire.

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Dr. Phillips—Can that preparation be made in an ordinary large boiler, heating the mixture in that?

Professor Smith—Yes, a good many who made it have used just that sort of an outfit.

Dr. Phillips—After you have combined the lime and sulphur, how long will it keep?

Professor Smith—Only for a short time. The tendency of the lime is to settle at once, and just as soon as the lime has settled and has begun to cake, your mixture is no good; you can't use it again.

Mr. Allinson—What kind of an apparatus would you suggest for spraying thoroughly?

Professor Smith—That opens up the whole question again, and is one that most of the farmers solve in their own way. There is only one thing really necessary—that is a pump that will give you a sufficient amount of pressure behind the nozzle to make a fine spray. You want a nozzle that will make a fine spray, and then you want power enough behind that to force the mixture through to make just as fine a spray as that nozzle is capable of making. In all cases you only want to spray—you don't want to drench—and almost anything that will give you the necessary pressure will answer the purpose. If you ask me which I consider the best machine on the market at the present time, I say the Niagara. That gives a uniform good pressure continuously.

Mr. Roberts—In the neighborhood of Moorestown they have been using lime, salt and sulphur quite extensively. A great many people have used it, and used it pretty faithfully. They have tried to do their best. I think in the majority of cases results have been unsatisfactory. Whoever does it must do it with a great deal of care, having preparations made very near right. It is a slow, tedious job, it don't work very well, and when it is done the results are often quite disappointing. I don't condemn it. I have seen where it has done excellent work, but I have seen it also where it has not done any good.

Professor Smith—The results during the last winter were very irregular. While the work on the peach and plum trees has been quite satisfactory, so much so that I would not recommend

anything else, the results on the apple and pear trees have been quite different and not at all satisfactory. I don't like to say anything against the wash, because, after all, at the present time it is the best that we have for the purpose. But I think Mr. Roberts' warning comes in appropriately. The work has got to be done right and carefully, and then you stand a chance of getting the best possible results that the wash can offer you. I think I indicated last night that I still have hopes of making petroleum oils do the work. If we can get them into such shape that they can be used without any difficulty in preparation or application, and so that they won't hurt the trees, it would be a great thing.

Mr. Black—When we use the oil we must be just as careful. The scale won't die because you put oil on the trees. He won't get scared to death. If you put lime, sulphur and salt on the devil you will kill him. I want to ask a question about that gas sprayer. As my gas is expanding from the time I begin, will I get the same force all the time until the last of the gas is gone?

Professor Smith—Yes. The gas in its expansion acts uniformly. That is, it expands so long as there is any gas in the tank, and you get the same pressure clear through. The machine really works very satisfactorily. I have seen the sprayer used in the hands of others than the man who sells them, and I believe it is the most practical thing at the present time.

Mr. Butterhoff—That lime, sulphur and salt mixture was quite favorable with me, but it had just as good results on apple trees as on peach trees, and I think the success of it was in the material. I bought the best flowers of sulphur that I could get, and I think the trouble that most people have is in buying adulterated sulphur. The only trouble I had was in applying it. It was pretty hard on the hands. If Professor Smith can give us some advice as to controlling this dripping that comes down the pipe and keep it away from the hands, I would like to know it.

Professor Smith—There is no question about that; a good deal of adulterated sulphur has been used. Perhaps it is not fair to call it adulterated sulphur. It is not really adulterated in the true sense, but it is not pure sulphur. In the effort to get

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it cheap they don't get the flowers of sulphur which the formula calls for. In the first place the attempt was made to use the pure ground sulphur. If that is ground very fine, it is just as good as the flowers, although it is a little harder to combine with the lime. But they went further and ground up the raw material. Now, that had the impurities that were connected with the raw sulphur, before it was purified, and the result was they had a considerable admixture of other stuff that was not sulphur at all, and the heaviest part of the material was ordinary land plaster.

Mr. Borton—In regard to keeping your hands clear, I think if you will coat your face and hands with vaseline there will be no trouble.

The Secretary—In all probability we will wish to discuss the addresses that are to follow. They were put a little later on the program, as sometimes we have resolutions to discuss and new business to consider. There seems to be no such pressure now, and I would suggest and move that we now take up the regular order so as to give time for discussion. Carried.

The President—I have great pleasure in introducing to you Professor W. F. Massey, Horticulturist, North Carolina College of Agriculture. He will speak on the subject of "Market Gardening in the South Atlantic States, and Its Lesson to Northern Gardeners."

(See address and discussion following.)

Mr. Parkhurst—Your Committee on Nominations would respectfully submit the following report:

For President—Dr. E. B. Voorhees, of New Brunswick.

For Vice-President—John T. Cox, of Readington.

The office of Secretary is not vacant.

For Treasurer—Walter Heritage, of Swedesboro.

Members of the Executive Committee—John M. Lippinocott, of Moorestown; H. V. M. Dennis, of Freehold, and George E. De Camp, of Roseland.

Moved by Mr. Denise that the report of the Nominating Committee be received and adopted. The motion being seconded was put by the Secretary and was unanimously adopted.

Secretary Dye—Let me introduce to you the President, Dr. E. B. Voorhees. (Applause.)

The President—Heretofore it has been the custom when the officers have been elected to begin with the speeches of the members of the Executive Committee, and I would first call upon the newly elected member, Mr. De Camp.

Mr. De Camp—Mr. President: I think you are out of order. I would say in regard to my election here that it is a big surprise to me, and I at first refused to allow my name to be used. After hearing the reasons why they want a man from Northern New Jersey I told them they might do as they saw fit. I have attended the meetings here for a good many years. I always consider it my duty to come to the meetings of the Horticultural and Agricultural Societies. The work in our section is not strictly agricultural, but we have the votes there to pass laws, and I want to say that the members from Essex county have always been in touch with the State Board of Agriculture, the 10 or 11 votes have always been with you whenever you wanted them. I understand there is to be an effort made to try to establish a short course in agriculture at the New Brunswick College, if you can get the appropriation this winter. It would be very desirable, and I will do the very best I can for this in North Jersey.

The President—I would like to call on Mr. Dennis, of Freehold.

Mr. Dennis—All that I can say is that I am very grateful for this renewed expression of confidence.

The President then called upon Mr. Walter Heritage, Treasurer.

Mr. Heritage—Mr. President and Members of the State Board: It is not worth while for me to attempt to make any speech, but I assure you that I thank you for the renewed confidence that you have placed in me in re-electing me to this most responsible position as Treasurer of the State Board of Agriculture, and I assure you that I will keep my accounts in such condition that they may be open for your examination at any time.

Mr. Lippincott was then called upon.

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Mr. Lippincott—Mr. President and Gentlemen of the State Board: I wish to thank you for the confidence you have placed in me in returning me to this office. My desire shall ever be to use my best endeavor with the officers of the Board in promoting the best interest of the farmers of our State in every possible way.

Mr. Cox was then called upon.

Mr. Cox—I feel that it is my duty to express my gratitude to the members of the Board for this distinction, and while this is a position that perhaps carries with it considerable responsibility, yet following after the footsteps of our honored President, the labors of this office are very light, easy and pleasant. I want to assure you again that I appreciate this mark of confidence. I shall endeavor to do my duty as I have done in the past.

Calls were then made for a speech from the President.

The President—As I have expressed myself very frequently before the Board, there is no one honor that I regard more highly than to be elected the President of the Farmers' Board of this State. Formerly I had some ambition to be a scientific man. I can't say that those ambitions have been entirely eliminated from my thoughts. Nevertheless as I grow older and as I come more in direct contact with the people that are doing the work in the world, it seems to me that the closer we get to the people, those of us who are studying possibly the greater problems connected with our agricultural pursuits, the closer we get to those who have to put those problems and principles in practice, the better are we enabled to do the work which may be regarded in some wise as a higher line of work. And for that reason I believe that the work that I have had to do in connection with the presidency of this Board has been of more direct service to me as a scientific man, and therefore of more service to the people whom I represent, than if I had not such support and such encouragement as comes from the hearty cooperation and helpfulness of the farmers of this Board and of the State. I therefore thank you for the honor which you have conferred upon me, and I assure you it is my earnest purpose, my first purpose, to do the work which is for the uplifting of the farmer, both in his scientific work and in his work upon the

farm, so that we may attain to that position which we as farmers ought to take in this world, where there is so much to do.

I assure you, therefore, that I appreciate it not only, but that I shall work as I have worked, and as I hope to work, for you as earnestly as I know how. Thanking you for your courtesies at all times in the past, and for your kindness, I assure you I shall do my duty as I shall see it. (Applause.)

The President—Next order on the program is an address on "Some Diseases of Fruit Trees and Truck Crops," by Professor M. B. Waite, United States Department of Agriculture. I take great pleasure in introducing Mr. Waite. This subject is one of great importance to our people.

Professor Waite then delivered his address, which see.

The President—The next order of business is the report of the Commission on Tuberculosis in Animals, which will be read by Secretary Dye.

The report being read was, on motion, accepted as read and ordered incorporated in the minutes of the annual meeting.

Dr. Edward B. Voorhees then delivered an address on "Modern Dairy Feeds and the Feeding Stuffs Law." (See address.)

Secretary Dye—This subject, which has been presented so ably by our State Chemist, is now open for discussion. I have no doubt you have some questions to ask, and now is the time to do it.

ALFALFA DISCUSSION.

A Delegate—I would like to ask if the inoculated alfalfa can be procured at the Experiment Station?

Dr. Voorhees—Yes and no. We have sent out some soil from our alfalfa plot, but there are 34,000 farms in the State. We have got about 7 acres in alfalfa, and we will do it so long as we have any inoculated land to spare.

A Delegate—Do I understand the best way to inoculate for alfalfa is to get the soil or to get the culture from the government?

The President—I think it is very much more desirable to get the soil from a field where the germ already exists. I think it is much safer.

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A Delegate—What is the quantity and how is it distributed?

The President—We don't know exactly at the present time just how much is needed of well inoculated soil to inoculate the uninoculated soil. We have sent out various quantities, ranging from a bushel to a half barrel, and we have found that even as low as a half bushel distributed on the ground has succeeded in inoculating a new strip. A half bushel is better than nothing, and a barrel is better than a half bushel.

Mr. Evans—How long does it take for a man to produce his own bacteria?

Dr. Voorhees—Not very long, and I believe a farmer who has got a piece of land that has been well manured, there is not much difficulty about having it thereon. We have never inoculated the soil at the college farm and yet the first crop that we grew was very abundantly supplied with the nodules, and I think this whole question of the bacteria in our soil depends very largely upon the question of the proper medium and development of the substance. As soon as we get a soil that is deficient in organic matter, then we get a soil that is difficult to inoculate. But a soil that is in good condition to grow other crops is in mighty good condition to grow bacteria. That has been demonstrated again and again, so I feel that farms where soils have been well manured and are naturally good, the necessity of inoculation is relatively very much less than in the case of those that have been fertilized practically altogether by commercial fertilizer and stimulating matter which has caused a too rapid removal of the organic matter of the soil. I think that is probably the key note of the whole matter.

Mr. Charles Black—Mr. Nelson, of Allentown, after a long experiment with alfalfa production, considered the condition of the soil and the proper time of sowing more important than inoculation. I have never talked with him about it, but a gentleman who is fully acquainted with it, informed me about it yesterday, and he said that he considered it a very important matter to have plenty of lime in the soil.

Dr. Voorhees—That is very important.

Mr. Black—And to sow the seeds between the first of July and the first of August, and he didn't think if the conditions were

favorable that inoculation was of any importance whatever. I never tried to grow alfalfa but once, and that was several years ago, but if I wanted to sow alfalfa I would think it was more important to get conditions right than I would to be bothering my time over this inoculation. It is giving the seed men and imposters a chance to impose on the farmer. And now they advertise these little nodules that you can carry in your vest pocket at \$2 a package.

A Delegate—Then it is possible to raise it without inoculation?

Dr. Voorhees—Yes, and that point made by Mr. Black is a very good one, indeed. Yet we have seeded alfalfa at the college farm for months, beginning with April and going to November, and we have succeeded in getting good alfalfa in any month that we have seeded it, but I believe that late summer seeding is likely to be, in our climate, quite as successful, if not more so, than the earlier seeding that was formerly recommended, although our best success was from seeding in the latter part of April.

Mr. Charles Black—Another important matter, he said, was to get plenty of seed. Some seed 10 pounds, but he recommended 30.

Dr. Voorhees—We recommend 35.

Mr. C. H. Cook—"Hoard's Dairyman" does not recommend the clipping of weeds frequently, as is recommended here in the east, because it interferes with the growth of the alfalfa. What is your experience about that?

Dr. Voorhees—In spring seeding I think it is very necessary to keep the weeds down. We do that, but we have got the weeds. Why? Because the weeds are occupying all the space to the detriment of the alfalfa. If you allow them to grow six or eight inches you have no more alfalfa. We don't cut them to destroy the alfalfa, but in order that the food that the alfalfa ought to have shall not be gobbled up by those vandals.

Mr. Cook—To what extent does the clipping interfere with the tap roots going down?

Dr. Voorhees—I don't think that the clipping that is necessary in order to reduce weeds will reduce the depth to which the

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alfalfa will go. These weeds do not start at first, and the alfalfa occupies the entire ground, and the roots, as I have found by my own observation, are from 12 to 14 inches long inside of a month after seeding in the late summer.

Mr. Cook—What time do you recommend seeding?

Dr. Voorhees—We recommend the latter part of July or during the first part of August. I don't like to seed later than the middle of August. This year it was necessary because of the heavy rains we had about the time we were ready to seed. I much prefer to seed some time about the first of August.

Mr. Lewis—About five years ago we took a corner plot to experiment with, and we mowed it three times each year for three years in succession. We had less material on the surface the second year. The third year we mowed it and the spots had disappeared. Then I took an acre that produced 75 bushels of corn without any manure, but I put about 50 bushels of stone lime to this acre. I treated it with chemical fertilizer, phosphates and potash. I sowed it the first of May. It took nicely and grew for a while and weeds took possession of the ground. We clipped those off six or eight inches high whenever we thought it necessary, three or four times during the season. Every time we saw less alfalfa, and in the spring, which was last spring, we found there was not enough left to warrant keeping it over. So I plowed it and sowed it down in oats. As soon as the oats were taken off, I plowed it and let it lay until the tenth of August, when we sowed alfalfa. Professor Voorhees sent me a barrel of inoculated soil; I want to tell you about that.

This acre is wider at one end than at the other, and the men who broad-casted this soil skipped a piece about half the length, running out from nothing to eight feet. That eight-foot end had no alfalfa, while the rest stood a foot high when the frost struck it last fall.

Dr. Voorhees—There is evidence of inoculation upon soil that has not been heavily manured.

Mr. Lewis—We dug to find the nodules upon the roots on the corner plot, but did not find one, because the professor suggested that we might find sufficient there to inoculate this

acre, but there were none. There were no nodules on the roots of this alfalfa the first year. But now when we dig in it, after it was inoculated, we find it abounded in nodules. So I feel where a man fails the first time without inoculation, after he has inoculated his soil, and has done it properly, he will get the nodules.

A Delegate—Will you tell us about pasturing alfalfa?

Dr. Voorhees—We have never pastured at the College Farm, but it is now pastured successfully in the Western States. I think it would hardly do to pasture it here; at least it would not do as well as to pasture there, because we have so many weeds, and immediately a cow puts her foot on the crown of the clover plant, and kills it, immediately the weeds come up. I know, at least by reports, of farms in the State where alfalfa is successfully grown and where it is pastured. There is a farm near New Brunswick where the alfalfa was seeded with the wheat, about the fourth of August. Nine quarts of alfalfa were seeded with the wheat. The field was heavily manured and then seeded down. Instead of using timothy and clover, they used a little timothy, and nine quarts of alfalfa, and it was a good catch, and that man cuts two or three times and pastures the rest of the time. I was there last fall when the cattle were pasturing up to their eyes in alfalfa without apparently injuring the plant. But it was not as thick as we would like to have it. I offer that as a suggestion, as the cheapest way to see whether alfalfa will take on the ground without the inoculation. If you lose your alfalfa you have got your wheat. That is a very good way of seeing whether it will live.

Mr. Evans—Will it live through cold weather?

Professor Voorhees—Yes; and last year he cut his wheat, and along in August he cut over two tons of alfalfa hay to the acre, and then he pastured until winter with one cow to the acre. This year he cut twice, over three tons of hay to the acre, and then pastured two months. That is an evidence of using it in general farming. He didn't inoculate. It was naturally good, light soil. He manured heavily and fertilized well. He has got a good stand of alfalfa yet. But he seeded this alfalfa with some timothy, and this timothy is occupying

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the ground to too great an extent to make it possible for that to last a long time. Alfalfa ought to last in our State from nine to ten years. It is doubtful whether it will pay him to keep that so long as that.

Mr. Roberts—What is the relative value of good, well-cured alfalfa hay, compared with a ton of good alsike clover?

Dr. Voorhees—Very little difference in composition, but the alfalfa is a little richer in protein.

Mr. Massey—Have you tried the method of inoculating soil for alfalfa by sowing a previous crop of burr clover?

Dr. Voorhees—No, we don't have burr clover here.

Mr. Massey—We have in North Carolina, and that previous crop of burr clover will inoculate the soil.

Dr. Voorhees—The sweet white clover bacteria is the same, and will inoculate the alfalfa. It may be that alfalfa which grows without inoculation may have been inoculated by this plant which you name. I do know that we have a natural leguminous plant in South Jersey which carries the same result to cow peas, so that we don't have to inoculate the cow peas.

Mr. Massey—The mellilotus clover will inoculate, but I don't think our cow pea bacteria would affect it.

Mr. Schenck—Mr. Lewis used nothing but fertilizer on his soil, that is the reason he required inoculation. If he had some organic matter in the soil, I don't think he would have found so much trouble about inoculation.

The President—That may be; I haven't any doubt, however, that there are a great many soils that are well manured that haven't got the bacteria.

Mr. Lewis—In reply to that gentleman, I would say that this piece of ground was manured heavily before it was sown the first time, but I treated it chemically after that, all it wanted, I know that.

A Delegate—I am trying to get information to grow alfalfa. A year ago last April I seeded ten acres with macoroni wheat, I seeded it with 28 pounds of alfalfa; that came up very nicely; but last spring there was no alfalfa, although it came up and had the second or third leaf on.

Dr. Voorhees—I advise you to inoculate your soil.

Mr. Evans—How do you account for this gentleman's failure after he had one year's successful growth, cutting three tons during one season, and then finally playing out?

Dr. Voorhees—He didn't have the characteristic bacteria there.

Mr. Evans—How is it that it will grow without bacteria?

Dr. Voorhees—It will grow without bacteria; that is not an essential of its growth. We can make it grow under many conditions.

Mr. Evans—A soil that will grow a good crop of red clover, would you not suppose that would grow a crop of alfalfa?

Dr. Voorhees—It does not follow, because the characteristic bacteria of the red clover is not the same as the alfalfa. Mr. Lipman is here. I would like him to make some remarks concerning this matter. Mr. Lipman is studying the bacteria question practically all the time. He is the soil bacteriologist of the Experiment Station.

Mr. Lipman—In connection with the amount of organic matter in the soil we find in counting the bacteria in the soil—we can count them, we can find how many are present in a given quantity. We find as the amount of moisture in the soil is reduced, the number of bacteria diminishes very rapidly, and that is a very important point, not only on the survival of the bacteria in the soil, but upon the success of inoculation. If you inoculate your soil through seed or by the addition of old alfalfa soil and if your field is dry, there is not enough moisture there for the bacteria to multiply; the dryness may be sufficient to destroy that. That is one point. Therefore the value of manure in this connection is very great, because it helps to increase the amount of moisture. There is no other constituent of the soil that will hold the moisture so well and in as great a quantity as organic matter.

That is the reason why soils that are poor in organic matter are not likely to enable the alfalfa to develop properly, or any leguminous crop.

Another point, in connection with the survival of the alfalfa plant after it germinates. Suppose you seed your soil to alfalfa; assuming there are no bacteria present in that soil that would produce tubercles on it, the alfalfa will grow like any other plant

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will grow, without producing tubercles, and may mature a crop, provided there is nitrogen in the soil. It is under exactly the same condition as any other leguminous crops, only we know from experiments that alfalfa which does not carry tubercles has not the resisting power that plants which do carry tubercles possess. That is the reason why frequently the alfalfa dies out. It hasn't the power of resistance in a struggle for existence. They usually are crowded out by other plants, non-leguminous plants, or leguminous plants which can adapt themselves to the soil condition.

A Delegate—I want to ask if one inoculation will answer for all time, or do we have to inoculate every year.

Mr. Lipman—It is not necessary, because the bacteria once established in the soil remain there for a long time, even though the conditions are not favorable. The bacteria in the soil may become weakened by unfavorable conditions. That is the reason why old alfalfa soil gives better results than the pure culture which we produce in the laboratory.

ENSILAGE DISCUSSION.

Dr. Voorhees—Last fall we received numerous letters asking whether it was safe to cut corn which had been frosted, and put it in silo. Here is a sample, shown by Mr. Bullock, that was frosted several times. The Secretary has a letter on the subject from Mr. Detrich, of Pennsylvania, which he will read.

HARVEST HOME FARM,

GLEN LOCH, CHESTER CO., Pa., Jan. 9, 1905.

E. J. Kirk, Gen. Agt., Harder Mfg. Co.:

MY DEAR SIR—To-day I have sent you a milk bottle of ensilage taken from the middle of the silo, *i. e.*, half way between top and bottom of the silo. The ensilage is a sample of corn that had nine frosts, the first and second frost eighteenth and nineteenth of September, and the rest at intervals until it was siloed about the middle of October.

This is not the first time I siloed frosted corn. Two things I insisted upon was, first, not to put the corn in the silo while the frost was in it; second, to cut it very fine so to distribute the moisture of the stock well through the cut mass. Every observing person, at all familiar with frosted corn, knows that the stalk won't dry, neither will the ear when frosted, practically the leaf dries and breaks up and has the least feeding value of the plant. The

cattle eat my present ensilage very well and the milk pail testifies as to the quality.

My observation is, on frosted corn for silo, quality not injured, but quantity diminished.

With best wishes to the Harder Manufacturing Company,

Truly,

J. D. DETRICH.

The President—That is a very interesting matter, and one which we all like to have information on, and if any one would like to see this I will pass it around. There is another bit of silage here which has a bearing upon the suggestion made in the paper to-day. I said that the farmers could avoid the high-price foods by growing more of their own products, and particularly the alfalfa, the cow pea and so on. Mr. Gillingham has a specimen of silage, being a mixture of the cow peas and corn. I will ask him to state what it is. I don't believe that Mr. Gillingham favors mixing the entire ration in that way.

Mr. Gillingham—The idea occurred to me after hearing our President talk of raising our own protein. We planted the southern cow pea with the corn. When we cut it each hill of corn had a pea vine running up it. In addition we had two and a half acres of cow peas sown separately. We had three or four teams running and put that ensilage in, sometimes one load of corn and then a load of cow peas. Sometimes it would be three loads of corn to one load of pea vine and again one load of corn to one load of pea vine. And when we were done we had two acres of pea vines used up and enough corn with the pea vines to fill the silo. That gave us a very good mixture of cow peas and corn. If the corn had been ripe it would have husked probably between 60 and 75 bushels per acre. We cut it, using the blower that blew the material up the pipe 30 feet high into the silo, and there is scarcely a piece of corn cob that has a grain of corn on it. Every bit of that was threshed off in the blower as it went up into the silo, distributing the corn all through, so that it could hardly be seen, and the heat of the silo cooked the corn.

I am trying to show you how near we could come to feeding our cows on our own farms, on our own products. I am therefore trying a ten-day experiment, feeding my cows this protein

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ensilage. Probably it is not long enough. I believe we have protein right there, raised on my own farm, and I believe that if we had alfalfa hay, with this ensilage it would not be necessary for us to buy one pound of any feed that we could not raise on our farm. The ensilage is costing me about seven and one-half cents per hundred pounds, counting our farm worth \$100 per acre, and our teams \$3.00 per day. We feed three cents' worth of that, which would be about thirty-nine pounds, call it forty pounds to avoid fractions. With this three cents' worth, we feed six pounds of corn and cob meal and two pounds of linseed meal in all. That costs us ten and one-half cents per day. We fed that until the first day of January. We then discarded cob meal and fed four pounds of Buffalo gluten and kept on with the three cents' worth of ensilage, and the cows did just as well, but no better, on the Buffalo feed, and that costs exactly eleven cents. We commenced yesterday to feed our cows three pounds of the cob meal and two pounds of the Buffalo feed, and kept on with the linseed meal, and by ten days more, or the twentieth of this month, we will be able to tell you how that goes. We are after not only quantity but better feed. We don't sell milk, but take the butter-fat out and feed the milk to the hogs. Our cows during the first period did as well, if not a little better, on the corn and cob meal and linseed meal than they did on the Buffalo feed. I claim that if we had alfalfa hay instead of our corn fodder and other hay that we were feeding our cows, we would have been able to do just as good if not better, without bringing anything on the farm that we did not raise on it, and that is what we are after. That is what we want, if we can do it, and I believe we can. I can give our experience with alfalfa. We had the same experience as Mr. Lewis did in regard to getting inoculated soil. The year before I tried this I could not find any nodules on the roots. I got some inoculated soil from the Professor and sowed it on the fifteenth day of August, and on October first those roots of the alfalfa were full of nodules, showing bacteria there, and I hope to have success with it. If we can have as much success with our alfalfa as we did with our cow peas, I believe we will have

solved the problem that we don't need to buy our protein, as we can raise it on the farm.

The President—Those are very valuable suggestions of Mr. Gillingham, although there is one danger that I want to warn the Board against, and that is, as we increase in the number of acres of alfalfa and those other crops that yield so well, after a while we won't have land enough to keep the cows on.

A Delegate—How did you find the peas would keep in the silo. I tried that several years ago, and they didn't keep well in my silo.

Mr. Gillingham—This sample I have here is a good illustration of the quality of the ensilage. It has been here since Tuesday morning, it has been exposed to the air. This is the best ensilage I ever had in my silo. We have had a silo for about eight years, and our cattle would always leave a little ensilage, but this year, although we feed them forty pounds per day, they leave practically none. And this mixed silage keeps well.

Dr. Voorhees—We have put our cow peas in alone and they kept all right.

Mr. Gillingham—It has a much darker color than that which Mr. Detrich sent.

A Delegate—It was 15 years ago, and it spoiled on me, and I stopped using it.

Secretary Dye—One question, Mr. Gillingham. How many grains of corn do you put in a hill?

Mr. Gillingham—We mix one quart of Southern beans with three quarts of corn and put them in the hopper together. The corn is nearly three times the size of the beans. Sometimes we drop two beans and sometimes two grains of corn. After they grow large enough they begin to run up the hills of corn. It makes a perfect mat. We were compelled to have a man cut some of it by hand. He cut the stalk and threw it out and left the bean on the ground. But you want to cut it with the corn binder; that will bind them up together and put it right in the trough of the machine. If you get the bundles small enough, it is all right.

A Delegate—I want to ask Mr. Gillingham about changing the character of his milk by his feed; did you get more butter-fat?

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Mr. Gillingham—I think we got a little more butter-fat from the cob meal than from the Buffalo gluten, a very little. If we were to feed the cob meal and the cake meal with the ensilage all winter, what effect that would have on the cows I am unable to state; you feed a cow so that she commences to lay on fat, she does it at the expense of the milk yield.

The President—We will now listen to Professor R. A. Pearson on the production and handling of milk. (See address.)

At the conclusion of Prof. Pearson's address the Board took recess to 8 o'clock.

EVENING SESSION.

The evening session of the Board was held in the auditorium of the State Normal School. In addition to the members of the Board, there were in attendance a large number of the teachers and scholars of the schools.

Dr. James M. Green, principal of the schools, welcomed the Board in a few remarks, and then President Voorhees introduced Dr. C. Hart Merriam, chief of the United States Biological Survey, who lectured on "The Work of the Biological Survey in its Relation to Agriculture." The lecture was given through the courtesy of the United States Department of Agriculture.

He first explained the work of the survey by outlining its three departments of endeavor. These were studies of the geographic distribution of plants and animals, the economic relation of birds and animals with their food habits, and the preservation of game that is beneficial to farmers, with the prevention of the introduction of foreign animals and insects that would be inimical to farmers.

Dr. Merriam claimed that some of the game birds are the farmers' best friends, and the quail notably so. Hawks, owls, skunks and weasels, he said, were not pests, as 90 to 98 per cent. of their food consists of insects and mammals that are enemies to the farmer.

The lecturer gave a description of the six distinctive life belts in North America. As these were described views were thrown on the screen depicting the typical vegetable and animal life in each zone. Dr. Merriam gave much information in regard to each belt, and showed how the study of them is of benefit to the farmers of the country.

He explained that certain diseases, particularly those of cattle, insect pests and other plagues can always be depended upon to confine themselves to their distinctive life belts, and because of the fact the national department can send out warnings, and the farmers can prepare to fight the pests. In this way the agriculturists are saved thousands of dollars every year.

At the conclusion of Dr. Merriam's address the Board adjourned to 9:30 A. M. Friday, 13th.

THIRD DAY.

FRIDAY, January 13th, 1905.

The session was called to order by the President at 9:30 A. M.

Mr. Dalrymple then read the report of the Committee on Officers Reports:

The Committee on Officers' Reports submit the following:

The report of our Secretary has been already discussed by the Board.

The President's address, we endorse as a whole and suggest that we should all familiarize ourselves with the different subjects contained therein. Let us all endeavor to make our power felt for the interests we represent in all suitable ways. We also endorse the resolution to have the address published immediately.

On the Executive Committee's report would say that, after carefully examining it, we believe the committee have labored zealously to aid the agriculturists of this State and the best interests of this Board. And in consideration of this fact, your committee recommend that the Legislative Committee prepare a bill and present it to the Legislature and procure its passage, if possible, asking for an increased appropriation for Farmers' Institute work.

The interest shown by the increased attendance at these meetings, and also the increased number of Institute meetings being asked for in localities where they have not been held, show that the present appropriation is inadequate. We believe the desired legislation to be for the best interests of agriculture in New Jersey.

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In relation to the tramp question, your committee would recommend that the boards of chosen freeholders of the different counties be requested to strictly enforce the law in reference to the tramp nuisance.

All of which is respectfully submitted.

J. M. DALRYMPLE,
THEO. M. ROE,
JOHN TONKIN,
Committee.

The report was accepted, to be incorporated in the minutes.

The State Entomologist, Dr. John B. Smith, then read his annual report, which was accepted, to be incorporated in the annual report. (See report.)

Mr. Denise—Your committee appointed to wait upon the Governor and the Governor-elect would report that we have been unable to see the Governor. We saw the Governor-elect, and he regrets very much that his time is so occupied that he would be unable to be present with us, but he extended to us his good wishes, and I believe, Mr. President, that our incoming Governor is a man who, I think, will do whatever he possibly can to assist us as agriculturists.

Mr. Collins—I heartily concur in what Mr. Denise has said, and we excused the Governor from attendance with the understanding that he would come with us in the future.

The report was received and the committee discharged.

The President—We will pass to the regular order of business, and listen to Mr. Collingwood on the subject of parcel post.

Mr. Collingwood then delivered an address on "Parcel Post—Advantages Possible." (See address.)

The President—You have heard this very interesting and instructive argument in favor of the parcel post. The question is now before you for discussion.

Mr. Darnell—I was interested in free rural delivery in our neighborhood; and made one or two trips to Washington in that interest. In starting the rural delivery, which now has proved a great success, and a very extensive good to farmers, it would appear that we are running the government in debt. But the government is willing to do those things if we ask for them. Not only write letters, but go and see the members. I am sure that this parcel post is a good thing. If we will only ask for it and press our demands we will succeed, but not without.

Mr. Fort—I will suggest that the Committee on Resolutions draw up a resolution asking our Senators and Congressmen to support that measure. We can, as a body, ask that of them.

Mr. De Camp—I think it would be well to make a start in this matter. If we don't ask for it, we will never get it.

Moved, by Mr. Evans, that the Committee on Resolutions draw up a resolution asking for this parcel post. Motion seconded and carried.

The President—We will now hear from Mr. Fort on some phases of the milk question.

Mr. Fort—Gentlemen, I have attended your meetings for several years, and have been very much interested. This is the first meeting I have attended as a representative sent by the county of Burlington. I have heard about phosphates, nitrogen and potash, but I haven't heard anybody suggest anything by which we could get a higher price for our milk, and that we are all interested in.

I shipped my first quart of milk April 11th, 1895, and from that time on to the first of April, 1901, the price of milk averaged three and three-quarter cents per quart.

In the month of February, 1899, they wanted to pay three cents for milk, and, after paying the price of feed, there was but little profit. About that time I saw a little innocent advertisement in one of our papers, calling the farmers together to meet in Camden and organize a protective association. I attended, and I think about ten men came there. We adjourned to meet again in about two weeks, and probably there were fifteen at that meeting. Charles S. Atkinson came over from New Hope, Pennsylvania, and we organized what was called the Milk Shippers' Union, and started in business. The Pennsylvania people took hold of it all along the road, and I must say that my own county, which took such active part in the old milk association, laid back and sulked. They didn't come up.

Nevertheless, we went on and formulated a system and the business was left in the hands of an executive committee of nine, three from the State of New Jersey and six from Pennsylvania. We met the fourth Wednesday of every month, at 140 North Fifteenth street, Philadelphia. We found the greatest difficulty in

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getting the milk dealers in Philadelphia to recognize us as an organization. But we planned and talked and reasoned with these people until they met us in a conference. We told them the importance of two organizations working together that way and not fighting and going into cut-throat schemes—that we should work together; that their interests were our interests and ours theirs.

They were then selling milk at six cents a quart for six months and eight cents for six months; and finally we came together, in August, and united, and the first day of September they started the wholesale price of milk at four cents per quart, and the dealers and the Milk Exchange agreed to take all the surplus that was offered on the Camden platform. That was where the trouble came, on account of the milk that was shipped to the seaboard in the summer coming back and seeking a place. It made a glut.

The last day of August our President, Mr. Atkinson, and myself met there, and the old association was going to offer their milk at three and one-half cents; we demanded four cents. About the first of September farmers would come up, place their milk and charge us two prices. Instead of having an agent on the platform we were there, and I left my home and stayed there two weeks, and I soon had places for 10,000 quarts of milk per day. I bought every quart of milk that was offered on the Camden platform on the first of September, 1901, at four cents. It was sold for a dollar a can. They laughed and made all kinds of fun of me, but I was backed by the milk dealers in Philadelphia, and in less than a week milk went to four cents per quart wholesale. From that time until now, over three years, milk has averaged four cents per quart, making an increase of three-quarters of a cent per quart on milk.

This last year the highest receipts went in the Camden depot, at one time pretty near 108,000 quarts per day during June, and the lowest about 68,000 quarts in December, making an average of 75,000 per day, and at three cents per quart, advance on 75,000 quarts per day three-quarters of a cent a day shows the price that the farmers have received, making \$360,000 a year; that the farmers have received in advance of what they would

have received had we not had our organization in wood working shape.

That is what a little organization does, and it only costs the farmer \$1.00 a year to belong to it. That is all he pays, and there are many people that have never paid that that don't take any interest in it. To produce the milk that was shipped into Philadelphia and Camden and those suburbs it takes about 60,000 cows, about 325,000 quarts per day. There is an invested capital of \$24,000,000. It takes 3,000 farms at 20 cows to the farm to make 60,000 cows, and a farm that will produce a hundred quarts of good milk 365 days in the year, a well managed farm, is worth about \$8,000. Multiply \$8,000 by 3,000 makes \$24,000,000 invested capital, and where is there any industry that has got \$24,000,000 invested but what sends its committee down to Washington to lobby and secure legislation. The farmers don't ask anything. They would get what they wanted if they came out and demanded it. Every cow that produced milk which was shipped to Philadelphia from Pennsylvania and Eastern New Jersey is paid for on the first of September, at a cost of \$54.75, in the increased price. That is what our little organization has brought the farmer, and no man can dispute it. Organization is a great thing if we could get the farmers together. I don't see why we can't. It is the many that make a thing go.

I have prepared a little paper to read you, what effect the sale of oleo has on the dairy interests of the country. They talk of repealing or amending the bill. The sales of oleomargarine have diminished below the sales of the last year. They were allowed to sell it as a colored article in imitation of butter, and the sales have been about 71,000,000 pounds less. I will tell you what 71,000,000 pounds represent to the farmers of the country.

The number of pounds of oleo sold this last year is reported to be 71,000,000 pounds less than was sold the year before the passage of the Grout bill. Each pound of colored oleo sold displaced one pound of butter.

Allowing 150 pounds to the cow would require 473,333 cows to make butter enough to equal 71,000,000 pounds of oleo.

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Allowing 20 cows to the farm, gives 23,666 farms of 125 acres each laid waste. A total of 2,958,250 acres.

Allowing five quarts of milk per cow per day, equals 863,832,725 quarts of milk in one year, at three cents per quart, \$25,914,981 as the value of milk in one year. I am told that in the little State of New Jersey, our little garden State, the sales were over 6,000,000 pounds. I am going to give you the credit of keeping better cows in the State of New Jersey than they do in the United States. We will go up to the 200 average, and divide 6,000,000 by the 200-pound average makes 30,000 cows gone out of business. Allowing 20 cows to the farm, makes 1,500 farms that have been abandoned and gone out of the butter and milk business.

One hundred and twenty-five acres to the farm makes 187,500 acres laid waste in the State of New Jersey that the oleo men have knocked out of business, and taking 30,000 cows, at five quarts of milk per day, 73,000,000 quarts of milk in one year.

Now, taking the 73,000,000 quarts of milk at three cents per quart makes \$1,593,000 that New Jersey loses by the oleo in one year.

It seems like a small thing, this oleomargarine, but it is a great thing.

In Pennsylvania the loss by oleo is as follows:

Reported oleo sold in Pennsylvania the year preceding the passage of the Grout bill is 26,000,000 pounds.

This 26,000,000 pounds of oleo represents 173,000 cows displaced.

Five quarts per day from 173,000 cows, 365 days, will make 488,725,000 quarts of milk.

The 488,725,000 quarts of milk at three cents a quart equals \$14,661,750 loss in one year.

Twenty cows per farm, there being 173,000 cows, would mean 8,650 farms.

Allowing 125 acres to each farm, 8,675 farms, gives 1,089,250 acres laid waste, and yet our Congressmen go to Washington and fight and vote to spend the public money to irrigate lands, and they are going to let the oleo trust lay waste 2,900,000 acres of dairy land, the best land we have, in this country.

I hope before this meeting adjourns you will pass a resolution asking our Congressmen to vote to protect the Grout bill. (Applause.)

The President—Is there any discussion of the paper by Mr. Fort or any resolution to be offered?

A Delegate—I think the gentleman said something about standing on the platform at Camden and paying four cents and selling for four cents.

Mr. Fort—The dealers in Philadelphia authorized me to pay four cents. The milk was placed and turned over at four cents. I only acted as agent for the milk dealers and I made every quart that was offered bring four cents. I had been assured that there was not 5,000 quarts of surplus milk in all the receiving stations of Philadelphia and Camden, all included. So I canvassed the Camden platform, and I found Jews and others trying to cut prices. They handle 3,700 quarts, and that gang of men had been setting the price of milk for years.

A Delegate—I am glad to hear about this effective organization. I had something to do with the old milk association before this was started; although I am out of business now, I am glad to see that this has come and that it is so effective.

Mr. Gillingham—I think this Board ought to go on record as against this oleomargarine business, and I move that the Resolution Committee draw a resolution regarding it.

Motion amended that Mr. Gillingham prepare the resolution as suggested by him. Carried.

Mr. Denise—I want to make a suggestion. I see the farmers seem to be very much interested, and I am willing to do what I can to assist my fellow-farmer. We have been requested to write to all our members of Congress, but gentlemen, let me suggest a better way. If you people want to accomplish anything, you want to appoint a committee of two and send them to Washington. I think that is the only way to reach this subject. The Secretary and myself have gone to Washington repeatedly in the interest of this Board, and we generally got about what we asked for.

I move that the President and Secretary of this Board be a committee to represent the farmers of New Jersey at Washing-

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ton, and also appear before the committee that has charge of the Parcel Post question and the Grout bill—one committee to attend to all the cases. The motion, being seconded, was put and carried unanimously.

Mr. Charles E. Rue, representing Pomona Grange of Mercer county, offered the following resolution :

Resolved, That this State Board of Agriculture, in convention assembled, endorse the sentiment contained in the recent message of Governor Murphy relating to the regulation of automobiles; further,

Resolved, That we request our Legislature to so amend the present automobile law that no automobile be licensed if it be geared to run at a higher rate than twenty miles per hour. Also, that every automobile owner pay a license of five dollars per year, the money so collected to be devoted to the improvement of roads. All this agreeable to the recommendation of the Governor.

I move that the resolution be taken up at once.

Mr. Rider—The Committee on Resolutions have held what they supposed to be their final session, and we did not feel justified in taking up the resolution just read without giving it more time and attention. In connection with that resolution I should say, after consultation last evening with an automobilist of a great deal of experience, that such a law would drive the automobiles off the road. That would be the practical effect of reducing the speed as required by the Governor's message. There is not an automobile that could be changed to conform to this law without expending half the cost of the machine.

Secretary Dye—I move that this resolution be referred to the Legislative Committee, when appointed, through the Executive Committee.

Mr. Butterhoff—I suggest that the authorities should get more power to restrict this nuisance. I live right on the county road leading to Atlantic City, and we see a speed sometimes from sixty to seventy-five miles per hour, and the users of these roads—farmers, &c.—are getting powerless to keep their right of way, and the authorities are powerless to stop the automobilists under the present law. The marshal told me time and again—"There is the Governor himself; there is the Mayor of Camden, and there are others that come there and speed their machines," and

he said: "What shall I do? I can't go against the high officials when they do this." He is powerless, and so are the other marshals. When he telephones to Atlantic City he can't get the number, they pass so quick—when he telephones to hold them they have gone out by some other road.

Mr. Rider—Would not our way; there they draw a chain across the road, and if that don't stop them they fire some shot into the wheel.

The President—The motion is that this matter of the resolution regarding automobiles be referred to the Legislative Committee, through the Executive Committee, in order that the matter may be considered by the Board through its representatives. Carried.

Mr. Gillingham—I have drawn up this resolution, as requested:

WHEREAS, The New Jersey State Board of Agriculture, now in session, views with alarm the attempt to repeal the Grout Bill at the present session of Congress; therefore,

Resolved, That this Board urge our Senators and members of Congress to do all in their power to prevent the repeal or modification of said bill.

Adopted.

Mr. Rider—Your Committee on Resolutions would respectfully report this resolution, suggesting an amendment to the Corporation Act of 1896, that the same privilege be granted to companies for agriculture purposes that is now granted to mining and manufacturing companies, in regard to exemption from the State tax. The resolution is as follows:

Resolved, That the Legislature be requested to amend the Corporation Law of 1896 so as to grant to corporations for agricultural pursuits within the State the same exemption from annual State tax on capital of one-tenth of one per cent., as now granted to manufacturing and mining corporations.

The resolution was adopted.

Mr. Rider—The committee also reports the following resolution:

Your Committee on Resolutions recommend that the State Board of Agriculture heartily endorse the plans of the State Geologist, recommending the

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ownership by the State of unproductive forest lands, and the use of preventive measures against their devastation by forest fires.

This is a report from the committee, and I move its adoption.

Secretary Dye—I second that and heartily endorse it, and I know in that matter the Governor-elect is in full accord. Perhaps something will be done which we have wanted done in years past. Resolution was adopted.

Mr. Rider—In response to the instructions of this Board, your Committee on Resolutions presents the following. They had placed before them a memorial to Congress, which reads as follows:

To the Honorable Senate and House of Representatives of the Congress of the United States of America:

GENTLEMEN—We, the undersigned, citizens and voters of the United States of America, do hereby pray you to enact House Resolution 7874, or a similar bill, into law before the close of the ensuing session of Congress. Such a law providing for the consolidation of third and fourth class mail matter, with an extension of our present merchandise weight limit to eleven pounds, with rates five cents on a pound parcel, twenty-five cents on an eleven-pound parcel, would be a great boon to the business, social, agricultural and labor interests of the country. The fact that American express companies and railroads handle a large part of the merchandise, magazines and newspapers of American publishers at less than one cent a pound, would seem to be proof positive that this proposed service can be made to more than pay the cost of the service rendered.

Your committee added this resolution:

Resolved, That the State Board of Agriculture, in annual session assembled, unanimously endorse the above memorial to Congress, and request the President and Secretary, on behalf of said Board, to forward the same to our Senators and Representatives in Congress.

On motion, the resolution was adopted.

Mr. Rider—There are no other resolutions.

FARMERS' ORGANIZATIONS.

On motion, the President was requested to address the Board on the matter of "Farmers' Organizations."

President Voorhees—This question of the federation of agricultural organizations is right in line with the suggestion and the work that has been carried out in many of the States, and in this State also, for making the farmers as a body more effective.

56. STATE BOARD OF AGRICULTURE.

We all recognize the importance of organization. We recognize that a body of farmers is a great deal more effective in securing legislation than a single farmer, and we should recognize that a federation or organization of the various bodies into one would be still more effective.

In the past few years there has been a movement in this direction in several States. Notably in New York State, in Pennsylvania, and in one or two of the Western States; that is, each organization in the State has named representatives, and those representatives constitute what is known as a federation. By that means all of the organizations act as a unit, so that if any matter comes up in the State Legislature, that affects either the matter of automobiles, for example, or the parcel post, or the matter of an appropriation for the State Board of Agriculture, or for the Experiment Station, or for the College, all of those matters are referred to the representatives of all the organizations, the power being placed in this federation.

So it makes the farmers of the different bodies more effectual in securing those things which the farmer has desired specifically. I don't need to argue this matter at all before this Board. You all understand the matter of organization, and you all understand the effectiveness of a large mass of people in securing that which you go after.

We have had such experiences in our own State, and you find it true in Washington when you go there for legislation. The first question that will be asked you is, what do you represent, just as was pointed out by Mr. Darnell. The question was asked, what do you want, and who wants it. Now then, if you can show that in any one State what they want, what is wanted by a mighty people, as represented by the federation, then you are apt to secure a great deal more attention and recognition than you would receive if you represented a single body, for example.

Now, what is proposed to-day is to bring this matter before this Board, and possibly, if it is deemed desirable, to inaugurate a movement whereby the various organizations of this State may become a federation. That is, the State Board shall have one or two representatives, the State Grange shall have one or

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two, the State Cranberry Association one or two, the State Agricultural College or the Board of Visitors, as representing agriculture, shall have one or two; the Horticultural Society, and, in fact, all the organizations that are now existing in the State shall have representatives which shall together constitute this federation, and the federation then take such measures as shall be deemed best for the promotion of those interests which all of the farmers desire to have accomplished.

I think that there is hardly any necessity for making any further remarks upon this line. You see the object and purpose of this work. It is simply to promote the effectiveness of the organizations that we at present have. It brings us together, and by the action of the representative of each we will be able to secure that which we could not secure as a single organization, even though we are their representatives, and of considerable size. I think the Secretary perhaps has some suggestion in reference to the appointment of a committee, or getting in contact with the various organizations, so that we may have a meeting and organize. I may say that at the last meeting of the Association of the Agricultural Colleges and Experiment Stations, which is a representative body of the institutions in which all farmers are interested, that the matter was taken up there and very favorably received, and a committee was appointed from that organization to get into communication with the various organizations in the different States, and to encourage work of that sort, as properly belonging to that association, and to do the work that they were doing, because it was really in the line of education. That is, anything that has the effect of promoting the interest of the farmers is educational in its character. So that organization took favorable action, and I think we can accomplish a great deal more by a federation of our interest than by each working singly. We must remember that our interests are common; that we have principles that are essential, whatever our line of business, and that we can agree upon those essentials.

Mr. Butterhoff—I move that the Chairman appoint a committee of two or three to work in harmony with the committee already named by the college and get in touch with the other associations.

The President—I will ask Mr. Dye to say a word or two on this subject.

Secretary Dye—I have not matured anything on this question of the possible advantage that might accrue from such an organization. I heard a story, when I was a boy, of a person walking along a road that skirted a woods, and he heard someone in the woods calling out, "Now altogether heo, heo, altogether heo." The traveler said "There must be some men at work in there; I will step in and see." He went in and saw a man all alone, trying to roll a log, and before he lifted he would say, "Altogether heo." The stranger said: "What are you hollering about?" Said the man: "Somehow I seem to work better when I try to realize that someone is with me, although I am alone."

It is so in this matter. Alone we will not accomplish much, and I hope if an organization is effected it will live long and accomplish a great deal for the betterment of the agricultural interests of New Jersey.

A Delegate—I will amend the motion of the gentleman that this matter be referred to the Executive Committee with power to confer with the other organizations to form this federation.

Mr. Butterhoff accepted the amendment and the motion as amended was adopted.

The President—The next topic is marketing farm produce. What can be done to improve this part of our business? This was to be opened by Mr. Theodore Cubberley, of Hamilton Square. He does not seem to be here. Are there any other gentlemen who have anything to say on this subject? It is a very important matter.

Secretary Dye—Brother Roberts suggested yesterday that if there was any place where the farmer falls down, it is in the marketing of his produce. We give great care to what we purchase and to the preparation of the ground; then we plant and cultivate and harvest the crop. After that, usually, we begin to look around for some place to sell the crop. It seems to me we had better look for that first and grow and cultivate with reference to the market we have selected.

Mr. A. P. Owens—The marketing of farm produce ought to interest all of us. I am a little more interested in trucking

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than I am in milk and grain farming, but I would start out this way: First, get the goods, then find the market. After you have found the market, get the package—you must have the package. I use the standard package of the market in which the goods are sold. If we do not have that package, no matter how well graded or nicely packed, the produce is sold at a discount.

Next, you probably have tried the individual effort of shipping to a commission house. I always find it unsatisfactory. I have tried that. I find that I was getting for produce that was nicely packed the same price that some of the other fellows did who were packing everything in regardless of the state of ripeness, size and all that. And I took pains to find another house that would sell goods on their merits. I found that good packages and good produce would attract the same buyer time and again. A satisfied buyer means better price and therefore more profit. The commission men will tell you, "We are wholesaling, no retail business is done by our house." Where you are met that way I think the right thing to do with him is to drop him. Also, I find the use of our rural mails, which is a good thing, and the parcel post will be a better thing, a help to us in marketing our small products. I would like to see the day when that is in operation.

Another thing, our local exchanges and unions have been the means of getting better results from railroads, from transportation companies, steamboats and express companies, and also better service from the commission men or dealers. They are not all commission men. As I understand, at the last meeting of the commission men a statement was made that only 15 per cent. of the business done there was commission business. The local exchanges or unions are much better if you can sell. Say we have a local exchange or something of that at Mullica Hill, or Swedesboro. The produce is sold to the dealers that come there on spot cash. That is a good plan that has been a great help to us. I formerly sent produce to Philadelphia and sold it myself, which we are not all in a position to do, and I am not at the present time. I find this selling direct saves that commission and saves that cartage and saves the time,

which is something. I would advocate marketing through the local exchange and by the package post, keeping posted by the rural telephone and mail and getting your answers in dollars and cents.

Mr. Denise—This question of marketing agricultural produce is one of the most knotty questions that we have. It only needs one thing to make it very much better than it is, and that is organization. You cannot do anything in regard to marketing the products of the farm unless you can organize the farmers and get them together. I have been at this thing a long time and I have not accomplished anything yet for the simple reason that we cannot hold the farmers together. That seems to be the difficulty. They will stand up here and find fault and growl, and the very minute you get them where you want them they will fly. We had a case not long ago. Potatoes were down to a dollar a barrel. I went among the farmers and said: "Stop this, or they will be down to 90c." They stopped, but the next day they all sold again, and they went down to 80c., and they sold more and more. The trouble lies entirely with the farmer and nobody else. (Applause.)

Mr. Hulsart—As far as Mr. Denise is concerned his products are mostly not of a perishable nature. I am with the gentleman who spoke first. Mine are practically all perishable, and they must be gathered in and got on the market promptly, and what few words I may say are from that standpoint. If prices fall it does not matter; we have got to market the goods and be content with what prices we get, and we are compelled to use the commission man. He appears to be a necessary evil at the present time. Whether by organization we might get something better I am unable to say; I hope something can be done along that line, if organization were perfect and strong enough.

I know a little about the commission business, or how it is run from the farmer's standpoint in New York City and vicinity. I spend much time there, and I will illustrate the point by stating what occurred in Washington market one morning a few years ago. We shipped to two different markets—the Wallabout and also the Washington market, in New York. When I visited New York they found a little fault because they were not receiving

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more produce. I said: "Gentlemen, give better returns and you will get larger receipts." "You mean to tell me," said the commission men, "that we are not holding our own with the people across the river?" I said: "No, you are not." He said: "Is it the case all the week, or only Saturday mornings, when you happen to be around at market hour?" I told him I thought it was more or less all the week, but more pronounced on Saturday mornings. I said to him: "My friend, it is equally pronounced when I am on the New York side as when I am in Wallabout." But it was the case, and I have found, and a great many have found, that when we are on hand from 2 o'clock A. M., or half-past 2, until market hours are over, that the shippers who are there during that time generally receive a little better prices than the fellows who stay home. The thought has occurred to to some of us whether it would not be a good idea for us to club together, eighteen or twenty in number, put our stuff up nearly right and send one of that number to the market every morning and let him stay there until market was over, and then come home and bring the conditions of the market and the prices with him, and see if that would not do some good. I don't know whether it would, but it is being discussed at the present time.

Another thing that is laid to the farmer—and the farmer's shoulders are rather broad, and we can carry a pretty good load—it was mentioned yesterday about packing, the farmer is blamed for a good deal of that. Oftentimes you can dump a barrel of potatoes, and when you get to the middle they are not the same as on top. You can find the same in a crate of tomatoes. But it is not always the farmer that does it. I have been right in New York at this wholesale stand when a head was taken out of a barrel of apples and the contents dumped out, and in the middle was half a bushel or more of culls. That commission house bought the apples on the tree and picked them themselves, and that is done for them. I went on a man's farm where they were picking Keifer pears only a year ago, and I was astonished to see the stuff they put in the middle, and when they got on the market the farmer got the blame. I have a neighbor who sold an apple crop, and after he sold it he regretted that he did it. When those fellows came to pick, it was said: "They won't make

more than 25 barrels; the rest will be culls." But they didn't make more than four barrels of culls; the rest were prime. There are several things that might benefit the marketing, and one is that we, in our section, have no place to market at the present time, except New York and Wallabout.

The President—I think the suggestions are very good. Are there any others?

Mr. Butterhoff—In the case of fruits that are shipped on commission, much of the blame is to be laid to the farmer. In my case I always try to make the bottom layer look just as nice as the top, and I found it paid.

The President—How about the middle?

Mr. Butterhoff—And the middle also. The buyer may not look at the bottom at first, but he will get there eventually. If your stuff is not all right you will hear from your commission man and you will feel it in your returns. I find I always command two or three cents more than the top price of the market, and I attribute it to the packing. I had poor pears, just the same as the other farmers, but it was the packing that did it, simply by not putting the poor pears with the primes, but putting them separate and letting your commission man know that this is number one and that is not, and I guess you will get along pretty well.

In reference to the staple produce that we can hold, the farmer is to blame, because he markets it haphazard and he just simply dumps it on the market. If he can hold it back a while he will do better. I see they are doing it in the West, and that is the cause of our present high wheat price. The crop was not so very short as to warrant this high price, but they are holding it back and sending it to the market as the market wants it and no more.

Mr. Hulsart—We farmers find that it does not always pay to put up an honest package, and I think a good many here will bear me out. We will say that there are a half dozen farmers within a radius of a mile, all acquainted with one another; three of them will put up fine goods and three of them will put them up promiscuously. They are all shipped to the same commission man. Will that commission man give the first three men a

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much better price than he will the others, when he is trying to do business? The returns come in almost the same. Let me give you an example. A few years ago I had a good run of peppers and they were shipped to be sold, and they were the best, as they admitted. I said, "Why don't you give me larger returns?" He said, "The amount you are shipping is so small in comparison with the bulk amount that we receive that we have to make them sell the inferior."

The only produce that I ever grew that would return me more than my neighbors were getting was melons, and it was the flavor of the melon that sold it. The man that has not got melons that people will eat, that tickle the palate, can't sell them. Take the tomato, largest grown on every farm in my vicinity. They are sent to one house and practically bring the same price. One year my stock was poor, and they attempted to talk to me along that line, that the stock was not as good. I said, a year ago you made my good stock sell other people's poor stock; now do the same thing for me.

The Secretary—If Mr. Hulsart will have his half dozen or more farmers so organized that they must put up their produce according to a uniform standard, adopted as one of their inflexible rules—somewhat as the California fruit is packed—I believe he will find it will pay. The brand of such an association of producers would soon become known and appreciated.

Mr. Roberts—I can't agree with my friend Hulsart that there are times when it don't pay a farmer to put up his stock well. I am getting to be an old man, and I have been at this business all my life, more or less, and I do believe that it will pay any farmer, if he has much stuff to sell, to put it up straight every time and all the time. And I do believe that it will pay him to so distinguish his packages that anybody can tell it as far as they can see it. It is all nonsense to say that he don't get any more than a man that puts up his stuff in a slipshod way.

Mr. Hulsart—If it is sold for more, who gets the difference?

Mr. Roberts—If he is dealing with decent people, he gets it: if he is not, he had better change.

Mr. Denise—While my friend from Monmouth says that he agreed with me before, I must disagree with him this time. I don't think he expressed his own feeling when he said that he didn't believe that it paid to put up your stuff honestly, because he is not that kind of a man. I believe it pays to be honest, and I believe it pays to stamp your full name and post-office address on your goods, and let people know where it comes from. Don't be ashamed of it. I very seldom ship a barrel of produce that I don't put my name and address on, and whenever I am ashamed of it I keep it at home.

Mr. E. S. Black—Take Mr. Hale's peaches as an illustration of that—you see the package, you see all.

Mr. Roberts—I never felt more complimented than when going through the market one day a good piece from home, and I saw a lot of baskets. I recognized them at once—they were from our own home farm. I stopped and looked them over. A gentleman came out and said: "Can I sell you some apples?" "No, I don't want any. I was only looking at them, and I think I have seen that mark before." "Well," he said, "it is considered a good brand of apples." I felt complimented.

Mr. Owens—In regard to packing produce so that it will bring more money. Many of these same commission men that we have been sending to and getting that average price from are roasting us because we do not pack our produce better. Who of you ever dealt with a commission man who gave you a practical illustration of the manner in which he wanted it packed, that you could follow? I have been shipping produce and selling mine for several years, and in just 17 years I have had one man tell me what he wanted and how to do it so that I could follow his direction, and he paid me more money, and that was an asparagus package.

The President—Our next topic is concerned with the game laws. In view of the fact that no one has been appointed to lead the discussion, we will omit that, unless someone is prepared to discuss it.

Mr. Roberts—I don't feel that I am fit to speak on that matter, but I feel deeply on it. The whole subject of the game law seems to me to be an anomaly. When our fathers bought the

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land here a hundred years ago, it used to run this way: "They granted all the lands, with the hereditaments, rights, immunities, ways, waters, water courses, hunting, fishing, fowling, and all privileges and appurtenances thereunto belonging, or in any wise appertaining, unto so and so, his heirs and assigns forever, to the proper use and behoof of the said so and so, his heirs and assigns." That is what I claim we ought to have to-day. He ought to claim that all the rights, and immunities, and privileges of those lands belong to the holders that pay taxes for them. That is my idea of what ought to be. I think the time has come when we ought to take a radical view of this matter; in other words, take the bull by the horns. I would be willing to go so far as to advocate the repeal of all game laws that are enacted for the benefit of what we call the sporting interest, with the protection of all game, animals and fowl, not for the production or perpetuation of any species, or for the benefit of the community, but for the benefit of the sportsmen. I don't believe that is the right principle to go on at all. They pay no taxes as sportsmen, and most of them pay no taxes at all, but they are an intolerable nuisance in the community. Two or three years ago, probably, a most outrageous law, according to my judgment, was enacted by the Legislature. I think it was introduced by a member from my own district. I think he did it honestly, but injudiciously. He introduced a bill, and it was passed, requiring every citizen of another State, coming into New Jersey gunning, to pay a license fee of \$10. I don't know who gets the money; I haven't looked into it. That man who buys that license imagines he has the right to come over here and do about as he pleases. They come over, hordes of them, and they are bound to get the worth of their money in some way, if they can. They come mostly for a good time, and they generally come pretty well loaded up in their pockets, and are in reality in most cases a kind of walking speak-easy. They are a reckless, abusive kind of people; they regard nothing; they imagine they have a right, as they paid \$10 for it. I think that is a most injudicious law; it gives a very wrong impression. I have known these people who trespass on your properties and abuse your agents, and if you expostulate with them, they actually threaten to shoot

you. They are outrageous. I think the time has come when we should assert the privileges that were given to our fathers with the property, with all the rights, immunities, etc., belonging to the people that hold it and pay the taxes, and not to a body of men that pay no taxes and have no responsibility.

Mr. E. S. Black—I have heard Mr. Roberts speak on this question before, and I believe he is right, and it is the only right principle to work on. The law might as well say that I must preserve my strawberries and apples for some loafer out of town to eat them, as to say I must preserve my rabbits and birds for him to come there and shoot the birds and rabbits and to destroy my property besides. He does not pay any taxes. We bought that land and pay taxes on it, and we send a lot of members to the Legislature to make laws for the loafers to come and ruin our property. That property belongs to us, and the right of ownership should give us the right to order any man off or to arrest him, and do away with a lot of game wardens that the State is paying a big lot of money to, and let us be our own game wardens. We own the property.

Mr. Roberts—I would like to see the game laws that are enacted for the benefit of the sporting interests utterly eliminated from our statute book.

Mr. Butterhoff—In the southern section of our State we have plenty of waste land, and when we put up posters they are generally pretty well obeyed. Nevertheless we do think that the gunning law should be changed in the interest of the farmer. The farmer ought to have the right to kill a rabbit, or any other game, in season or out of season, when he sees that game is doing damage to him. In our County Board we had some discussion on this question, and I and my fellow delegate were instructed to use all effort here at this State Board of Agriculture meeting to have this game law made right. We thought that the quail and the grouse and similar birds should be protected. They are the farmers' best friends. The rabbit is not, and we ought to have the right to get him any time we want to.

Mr. Evans—These young fellows that come from college, and our poor people that are around, want to gun somewhere, and they will do it. I think if that license were to be paid to the farmer,

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and let the farmer have some law governing him and his rights and privileges on his own land, it would be better. He should have that remuneration and it should not go to some game association.

Mr. Roberts—I don't believe the doctrine that the young fellow is going to gun is a good one at all. I don't believe that it is the right thing to turn anybody out loose on our property, and say the State has given them the right, by paying \$10 for it. They tell us we must put up notices all around our property. I never did that the first 60 years of my life. I welcomed everybody that behaved themselves. I don't want them any more. I get 50 to 100 notices every year now and have them posted up. I find that our foremen are very anxious that I should have these notices, because it is a great relief to them. I put them up and sign them with my own name. I feel more deeply in this matter as I grow older, and I have had good cause. I have had my own people threatened with being shot by these outlaws.

Mr. A. S. Applegate—I only want to say a word on this question. I think the matter is entirely within our own hands. We can stand upon our rights if we choose to exercise them. The great opposition is to the Legislature forbidding the farmer to protect his crops from birds or game or anything of that sort. Our remedy is given to us, or prohibited rather from being taken from us, by the sixteenth article of our constitution, which says: "Private property shall not be taken for public use without just compensation."

The court of last resort of this State has passed upon that so plainly that no one need make a mistake. In a very common case argued before the Court of Errors the Court says:

"An act of the Legislature cannot confer upon individuals or private corporations, acting primarily for their own profit, although for public benefit as well, any right to deprive persons of the ordinary enjoyment of their property, except upon condition that just compensation be first made to the owner. This principle rests upon the express terms of the constitution. In declaring that private property shall not be taken without compensation, that instrument secures to the owners not

only the possession of the property, but also those rights which render possession valuable. Whether you flood a farmer's fields so that they cannot be cultivated, or pollute the bleacher's stream so that his fabrics are stained, or fill one's dwelling with smells and noise so that it cannot be occupied with comfort, you equally take away the owner's property. In neither instance has the owner any less of material things than he had before, but in each case the utility of his property has been impaired by a direct invasion of the bounds of his private dominion. This is the taking of his property in a constitutional sense. Of course mere statutory authority will not avail for such an interference with private property. This doctrine has been frequently enforced in our courts. In *Trenton Water Power Co. vs. Raff*, 7 Vr. 335, Mr. Justice Depue said: "The destruction of private property, either total or partial, or the diminution of its value by an act of the government directly, and not merely incidentally affecting it, which deprives the owner of the ordinary use of it, is taking within a meaning of the constitutional provision. * * * The injuries to which immunity from responsibility attaches are such only as arise incidentally from acts done under a valid act of the Legislature, in execution of a public trust for the public benefit, by persons acting with due skill and caution within the scope of their authority. If the injury be direct, or the work be done for the benefit of an individual or corporation, with private capital and for private emolument, the principle which absolves the parties from liability to action at the suit of persons injured does not apply, even though the public be incidentally benefited by the improvement."

"They must be classed, rather, among those limitations which the social state imposes upon the enjoyment of private property for the common good. But if in any case these annoyances become so great as to destroy or substantially impair the legitimate use of private property, the person injured becomes entitled to redress. Even the common good must then yield to private right, unless compensation be made."

Now ask anybody to say, in view of that authority and decision of this great court of last resort, from which there is no appeal in this State, how it is that any Legislature has a right to say "we will turn loose any sort of beast or bird of any kind—

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which we say we control and own—as the property of the State,” and say to the farmers: “It does not make any difference how much is destroyed by them, you must submit to it. We say that they are for the common good and to the common welfare, and we chose they shall feed upon you.” No; the Court says if you desire to feed the wards of the State of any kind upon a man’s property you must pay him for doing it. You cannot do it any more than you can send your militia and say it is elegant to have a magnificent regiment of militia to parade for the benefit of the government, and, of course, they must have something to eat, and if you go over into the farmer’s field and eat up his crops, why it is all right. They cannot do that, and it seems to me, if properly approached, the people of this State will be just as fair in consideration of that matter of the game laws as they were in the matter of pleura pneumonia. Why, that is for the protection of the cattle of this State. So the people say, Go right in and kill a man’s cow. And do they pay him nothing? Not at all; they award him some compensation. If it were insisted that dogs may go loose is it intended that our sheep shall be destroyed without compensation? No; the State provides for compensation.

There are the principles, and any man can apply them for himself. I say that law is utterly worthless and it cannot be enforced.

Mr. Darnell—The law is in the law-book, and these depredations are committed by a poor class of people. If you go before the grand jury and ask for an indictment there are many men that would excuse a poor man and say, as to the farmer: “Oh, well, he can afford to lose it.”

Mr. Evans—Before we adjourn, I move a vote of thanks to our officers and the Executive Committee for their faithful service during the past year, and for this pleasant and instructive meeting. The motion, being seconded, was put and unanimously carried.

A motion to adjourn then prevailed, and the President declared the thirty-second annual meeting of the Board adjourned *sine die*.

FRANKLIN DYE,

Secretary.

Annual Address of President.

DR. EDWARD B. VOORHEES.

Another year has passed, and with it has come such returns to the farmer as conditions of the season, of the farm, and of the farmer have made possible, and such progress as success or failure may permit.

If material success has resulted in making the individual farmer careless in respect to his methods, and in his relation to the various interests of his community, then progress has been retarded rather than encouraged. On the other hand, if material failure has not depressed, but rather infused courage into the individual and caused him to be more helpful to himself and to others, then true progress has been made.

To your President, too, has come the privilege and honor of presenting his annual address, and it has seemed to me that this year I could do no better than to direct your attention to some of the larger problems of American agriculture as they appear to me, and to indicate their bearing upon the progress and development of farming in our own State.

It is customary, more in farming, I think, than in any other line of business, for each man to consider primarily his own peculiar interests. That is, to consider them without thinking much of their relations to others, though not in a selfish spirit, but rather because of his conceptions of the conditions peculiar to the business. In one sense, too, this is fortunate, because when one's interest is concentrated, the tendency is toward a better development than it is when divided. This development of the individual and his interests, however, is in direct contrast to the tendency of the present day for organization—that is, for the concentration of capital in large corporations or trusts,

and of individuals in various labor organizations or unions, the object in each case the conservation of the interests of each. The actual force exercised must in any case, however, be the aggregate of all of the individuals, and when each individual has a special interest in a particular farm, for example, rather than a general interest in a number of farms, the chances are that the aggregate result will be greater than if the interest is divided. While every farmer is interested primarily in his own farm, he must remember that his farm and method of farming must bear a certain relation to all other farms in the State, and that the farming of the different States must bear a certain and important relation not only to the farming of the entire nation, but to the prosperity and happiness of its people. For it is to the farmer more than to any other producer that the welfare of the individual, as well as the welfare of the whole people depends. What affects the farmer, directly or indirectly affects everyone, the butcher, the baker, the candlestick maker, not only, but the minister, the doctor, the grocer, the tailor, the miller and the miner. His individual prosperity or failure affects all forms of business life and all pursuits. Whether the crops of the country are large or small is of immediate interest to transportation companies—railroads, steamship lines, trolleys and all methods of carriage and communication between States and nations. These conditions affect all manufacturing corporations, mills for the manufacture of flour, feed, cotton, wool, leather, oil, iron, steel and all builders and all those who work with iron, wood and stone. In fact, there is no line of industry that is exempt from the influence upon it of the prosperity or success of the farmer. Therefore, with all this resting upon him, the farmer has a large responsibility, and it is not only important that he should make every effort for his own sake, but for the sake of his community, of his State and of his nation, and of all nations that are dependent in one way or another upon his nation. We will, therefore, look for a moment at the origin of this little farm, and its treatment, and the relation it sustains in these respects to the bigger farm, the State, or the still larger farm, the country at large.

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It is recognized in these days of the universal spread of education that all true progress is based upon knowledge, and that development is a result of thought and investigation. Take, for example, the marvelous development that has been made the past few years in the matter of applying electricity to the arts and industries of life. This potent fluid, electricity, has undoubtedly existed for countless centuries, and yet it remained unimportant as an applied force until by virtue of an investigation as to its nature, and of the principles involved in its control and direction, that great progress was made in its application to the uses of mankind. The same may be said of the principles that are involved in the growing of plants, the everyday companions of the farmer. Real progress in the matter of farming was not apparent until the investigations of the geologist, the chemist, the botanist, the biologist, and the physicist had established a reasonable basis upon which to build a theory that would account for the various phenomena involved in plant growth. The natural forces of sun, air, water and temperature, and the principles upon which the science of geology, of chemistry, of botany, of biology, and of physics are based, are all concerned in the proper development of the farm and the true progress of the farmer, and have existed since the beginning of time. Because these are facts the methods of farming in vogue from the earliest times to the present and the methods of to-day have exerted and still exert an influence upon the development, progress and happiness of all the people upon all the earth. It is not likely that Moses when he was tending the flocks of his father-in-law in Midian gave a thought to the preparation of rations for his sheep, or to the effect of too close pasturing upon the future fertility of the soil; or that the Prodigal Son gave as much thought to the feeding of the swine under his charge in the wilderness as seems to be necessary to give in these days, for there was land enough and to spare in those pastoral times. Yet the same laws that are active now were in force then, and the results of the farm methods in those early days and in all intervening times affect the conditions at the present day.

Having directed your line of thought toward the common interests of all in specific lines of farm practice, and to our dependence upon the direction of the natural forces, let us, for a few minutes, consider this little farm of ours somewhat in the abstract and its relation to the larger farm, and see whether we can deduce concrete examples of proper methods that will help us in the solution of our own problems.

Since the solid portion of the earth first appeared certain forces, seen and unseen, known and unknown, have been constantly at work changing the character of its surface. These forces have wrought by day and by night, in summer and in winter, in sunshine and storm, but always and incessantly, and, as a result of their action, there appeared upon the hard and rocky surface, first, the humble lichen, then the more haughty gorse or furze, which, in their way, became forces, too, and assisted these mighty unseen workers until, in their task of world-building, the former rocky surface of the earth, whether the mountain or valley, whether the prairie or desert of to-day, became covered with the various forms of vegetable life, each drawing its sustenance from the mineral and organic matters, more or less broken down or decomposed, that we now call soil. This soil, which we now work and which, if left to nature again would not produce crops that the farmer regards as largely useful, with the possible exception of timber, yet a more detailed study of the action of these natural forces when not directed will, I think, give us some clue as to their value when controlled and directed by human intelligence, wherever there is the purpose to derive from such soil sustenance for man and beast.

The tendency of our cultivated fields, if left to nature's way, would be to cover them with growths of various sorts, and gradually there would be accumulated substances that would provide more favorable conditions for the growth and development of cultivated plants. That is, the continuous occupation of the soil by growing plants would, in the first place, hold the particles of soil together and prevent their movement by mechanical means, and in the second place, the growth of the plants themselves would cause a breaking up of hard and insoluble substances of that soil, making them available to plants, and the organic mat-

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ter accumulated and mixed with the mineral substance would make the soils more absorptive and would prevent the rapid washing away of the soluble constituents. Besides, because of its greater absorptive power, floods, drouths and consequent barrenness and sterility would be largely prevented.

Or, in other words, nature teaches us that if we are to conserve and improve the fertility of our soils, we must keep them occupied, thus holding them together and preventing the losses that are liable to occur through the far-reaching removal of their constituents by man's suppression of the natural growths. Nature's way results, not only in the conservation of soil, in the retention of that which is liable to be lost, but in the improvement of its character, both physical and chemical. Nature is constructive, not destructive; her tendency is constantly towards accumulation. The magnificent forests, which formerly occupied large areas of our country, and which still exist in a limited way; the broad prairies, stored with the residues representing the continuous growths of centuries, give abundant evidence of this constructive characteristic, and this wealth of forest and these store-houses of fertility, due to the beneficent provision of nature for man's use.

Let us see for a moment how man has used them. From the beginning of recorded history there has been a tendency, not merely to rob the soil of its inherent virtues, but to prevent nature, largely, at least, from contributing to its upbuilding. Many of those countries which, in the world's earlier history, were rich in fertility, and, in the words of the prophet, "flowed with milk and honey," are now barren wastes and deserts, and for no other reason than the lack of observation and the direction of the laws which are involved in the economical production of crops with the accompanying maintenance of fertility. In Roman times soil areas had been reduced to such a stage of exhaustion as to cause great anxiety on the part of the emperors, and in the first and second centuries of the Christian era efforts were made to protect the soils from exhaustion and to increase the fertility by drainage, irrigation, rotation of crops and other means. In more recent times the German States, because of the exhaustion of their soils, particularly in the North, were facing the serious

problem of food shortage, and were fortunately saved from starvation by the discovery, by Baron von Liebig, of the underlying principles involved in the growing of plants and in the improvement of soils. While certain of the German soils were naturally poor, there is no doubt but that the wasteful methods of treatment and the ravages of the nomadic hordes which overran the country in the Middle Ages were responsible for their further impoverishment. It is not necessary for us, however, to turn to ancient times for examples of farm methods which result in the rapid depletion of the soil's fertility and the loss of natural wealth. In all sections of our own country we note evidences of poor management in the treatment of our soils and management which unfortunately has been encouraged, and is even now encouraged, by a too generous and improvident government in opening new territory, which, in part, relieves the farmer of the moral responsibility.

However, while nature's way is in some particulars quite the opposite of that which the farmer must follow in order that he may obtain value from his soil, a great difficulty has been encountered in the failure to recognize until quite recently that nature's ways may continue and at the same time not interfere, but rather help the farmer in his work. Nature has been antagonized, because the principles underlying the production of crops and the conservation of the food in his soil have not been understood, and thus the history of farming in this country, as in all countries, is one of wastefulness in the utilization of natural resources. As already pointed out, nature added to the soil an abundance of vegetable matter, which in its partial decay contributes not only to the absorptive, water and food-holding capacity of the soil, but also to the building up of the crop. As the farmer began his work of soil cultivation, he created a tendency towards the reverse order of things, favoring not a legitimate use of the organic matter in the soil, but its burning up, as it were, and in consequence fertility was reduced and the yields became poorer.

Because of the abundance of land, the practice prevailed not of conservation and improvement by directing nature's laws, but of taking up more land, or of clearing it of timber, in order that

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more produce might be grown. The timber was not utilized as it might have been, since the primary purpose was to obtain the land upon which it grew. This system, which the individual farmer followed, which was practiced by farmers in the aggregate, has resulted in the destruction of our forests, in the diminution of the water-holding capacity of our soils, and in the loss of a very large portion of the fertility contained in them. It has not been proven that our destruction of forests, or the wasteful management of our lands has resulted in materially changing the climate of our country, but certainly the changed conditions of soil, in so far as they concern its water-holding capacity, are such as to considerably modify the effect of our spring and winter rains. The floods, which have recently been so devastating in their character in many parts of our country, and the periodical drouths so destructive in their nature, are due in great measure at least to the removal of our forests and to the depletion of the organic matter in our soils, with the consequent rapid running away of the water, rather than its absorption and conservation and its gradual movement toward the sea. This destructive system of farming is not confined to any special district, though it is especially noticeable in those sections of our country where single crops are the farm's main source of income, as, for example, cotton and tobacco, in the south, corn in the middle west, and wheat in the northwest. These systems of farming are very wasteful of soil fertility, because they do not provide for the building up of the soil, either in the organic matter or in its physical character. Even the ranges of the far Western States have been injured by destructive methods. The grasses have been destroyed, the water-holding capacity of the mountain sides decreased, and the available water for the irrigation of the drier plains below materially diminished. All of these methods, which have lessened the productivity of many of our soils, show but one side of the losses that are actually occurring; the side which perhaps is the least important, though it cannot be separated from the other, for the two combined must constitute what we understand by natural fertility. In other words, it has been shown that the final measure of fertility of a soil is its content of nitrogen, phosphoric acid and potash, the elements contained in

comparatively small amounts in soils and removed by crops in relatively large amounts. That is, we may have a soil quite perfect in its physical character that would hold water and give it up gradually to the plant, that would hold warmth and in other ways be perfectly capable of contributing to the growth of the plant, and yet be incapable of supporting plant life, if deprived of the constituent elements, nitrogen, phosphoric acid and potash, while in the presence of these, other things being equal, the growth of crops would be in proportion to their amounts that might be made available from year to year.

It is a fact, and facts are stubborn things and cannot be gainsaid, that the capital stock of any country, and, therefore, its present and prospective wealth, lies in its natural resources. In an agricultural country these resources are in its soil, and since the value of the soil, or its sustained power to produce crops is measured by the content of nitrogen, phosphoric acid and potash, together with the conditions which make them available to plants, it follows that this capital stock of fertility in our soils, these national resources are reduced in proportion as these elements are permanently removed from them. These, I repeat, are facts now clearly recognized, and it is upon them that the fertilizer industry in this and other countries is based, an industry which, though in a sense only in its infancy, has already reached magnificent proportions and will continue to grow in keeping with the needs for artificial plant-food. Any system of farming must, however, result in a removal from the soil of the elements of fertility, yet there is a system which, if carried out, would result in a minimum, rather than a maximum removal of those from the soil, and this system, which provides for the maintenance of the physical and chemical character of soils in other respects, may be regarded as constructive. I guarantee that there is not a farmer within the hearing of my voice but can point out numerous examples of what may be termed "constructive" and "destructive," or good and poor farming in these respects. On the one hand we have the man who, under normal conditions, always gets good crops, whose fertile fields are always occupied, whose cattle are sleek and fat, and whose home is a center of happiness, culture and content; while in the other we have the man whose crops, while not

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always poor, are never good, whose fields, only partially occupied by plants, are furrowed and gullied by the winter and summer rains, whose lean cattle are lowing for food, and whose home is poorly provided for and is the center of worry and discontent. The same natural forces are potent for good in each case; in the first they are directed and help to build up the farm, while in the other they are antagonized or neglected and help to destroy. Unfortunately, the constructive or "building-up" system has not as yet been very widely adopted, though in this country we have the best examples of it in our Eastern States, and relatively in no greater degree than in our own State. It must be understood, however, that the constructive system does not contemplate that farmers shall not sell their grain and hay and others crops, but rather that they shall so utilize those crops as to remove from the farm only the minimum quantities contained in our finished products, or what may be termed manufactured products. It cannot be said that the farmer of the northwest, who grows wheat and sells wheat, cannot be a constructive farmer, but it can be said that he is not, under his present system of practice, for he not merely sells the constituents that are absorbed by the plant and carried away from the soil in his wheat, but by his method of practice he causes to be removed from his soil by misdirected natural agencies a larger proportion of nitrogen than is removed in his crop, and thus diminishes unduly not only the important element nitrogen, but also the soil's water-holding power through the rapid destruction of organic matter or humus-forming materials.

Let us look for a moment and see what this removal of fertility, when applied to the principal field crops of our farms for one year, really means. There was produced in this country in 1903, in round numbers,

63,000,000 tons of corn.
 61,000,000 tons of hay.
 19,000,000 tons of wheat.
 11,500,000 tons of oats.
 822,000 tons of rye.
 *800,000 tons of cottonseed meal.
 764,000 tons of flaxseed.
 356,000 tons of buckwheat.
 329,500 tons of barley.

* Estimated

Each ton of these various crops removed more or less of the fertility constituents, nitrogen, phosphoric acid and potash, ranging from 140, 55 and 40 pounds per ton, respectively, for cottonseed meal, to 30, 10 and four pounds per ton, respectively, for buckwheat. Without going into further detail, it is sufficient to say that in the 2,000,000,000 bushels or over of corn there was contained :

Nitrogen,	equivalent to 6,000,000 tons of nitrate of soda.
Phosphoric acid,	equivalent to 2,738,000 tons of acid phosphate.
Potash,	equivalent to 452,000 tons of muriate of potash.

In the 61,000,000 tons of hay there was contained :

Nitrogen,	equivalent to 3,955,000 tons of nitrate of soda.
Phosphoric acid,	equivalent to 1,752,000 tons of acid phosphate.
Potash,	equivalent to 1,471,000 tons of muriate of potash.

and in the other crops, so large an amount of the constituents as to make the total removed from the soil in these crops in a single year equivalent to the

Nitrogen	contained in 14,186,000 tons of nitrate of soda.
Phosphoric acid	contained in 6,902,000 tons of acid phosphate.
Potash	contained in 2,260,000 tons of muriate of potash.

It will be observed that in this calculation, with the exception of hay, the constituents removed represent only those in the grain or seed; those contained in the straw and stalks are assumed to remain on the farm, and further that the crops of tobacco, sugarcane, sugar beets, potatoes, pastures, and all fruits and vegetables are not included. These figures are stupendous; their true significance can hardly be comprehended even by those who do appreciate and can foresee and safely predict the ultimate result of this annual and continuous removal of plant-food under present methods of practice. Some idea of the importance of these figures may, however, be obtained when we place alongside of them in similar manner the amounts of constituents that are returned to the soil in the form of commercial fertilizers. In 1899, according to the United States census, the farmers of the country paid \$54,780,000 for about 2,700,000 tons of commercial fertilizers. Assuming an average composition of :

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Nitrogen,	2 per cent.
Phosphoric acid,	8 per cent.
Potash,	4 per cent.

There was contained in these fertilizers nitrogen equivalent to that contained in 353,500 tons of nitrate of soda, phosphoric acid equivalent to that contained in 1,380,000 tons of acid phosphate, and potash equivalent to that contained in 216,000 tons of muriate of potash. Hence the total amount of constituents supplied by the fertilizers returned is equivalent to but 2 per cent. of nitrogen, 20 per cent. of phosphoric acid and less than 10 per cent. of the potash removed in the crops mentioned. It is shown by the census figures that 70 per cent. of the fertilizer was used in the Atlantic Coast States and one-half of the remainder in Ohio, Indiana, Alabama and Louisiana. That is, the largest proportion of these fertilizing materials was used in those States not largely engaged in raising the grains mentioned in the list, and it is more than probable that not a very large portion of it was used for the growing of those crops, with the exception of cotton, but rather for market-garden crops, fruits, potatoes, etc., that do not appear in the list of crops mentioned as carrying away these enormous quantities of plant-food. The large States of the central and northwest thus became the great exporters of these constituents. The farmers in those sections realize that they have by their practice ravished their soils, and that present systems must be improved if the production of paying crops is to continue. Great numbers (estimated at nearly 100,000 in the past year), rather than improve their practice, have sold their farms, and gone into Canada to rape the virgin lands of that great country, whose government is giving free farms to all comers, despite the results of our experience, under the mistaken notion that it is benefiting humanity thereby. The lower production of wheat on our farms, owing to improvident methods and to limited areas, and the increase in product in Canada, owing to virgin lands and unlimited areas, are also giving rise to another question of national importance. The manufacturers of flour, owing to the short wheat crop of the past year, want the Canadian wheat for milling, and, without looking into the future, they are doing and will do all in their power to cause a removal of the present

tariff of 25 cents per bushel, which, if accomplished, will reduce the price of our product by that amount, and will affect every grower of wheat in the country, and tend to discourage, rather than to encourage, constructive farming. With an average yield in the last decade of but 13.4 bushels of wheat per acre, it has been possible to export during that period in grain and flour an equivalent to nearly 200,000,000 bushels annually. A low crop of one year should not warrant any change in the trade conditions now existing between these great wheat raising countries, which would discourage attempts to increase our area and to secure larger yields per acre. One argument used by the millers is that, in case the Canadian wheat can be secured and manufactured here, the farmers would have the benefit of the refuse or mill feeds.

In my judgment, in view of the probability of further exports of this cereal, it would be a much better policy to advocate more strongly the removal of the discrimination now made on the part of transportation companies in favor of the shipment of whole grain. Statistics show that in 1900, 102,000,000 bushels of wheat and about 18,000,000 barrels of flour were exported, or relatively more wheat than its equivalent in flour, and, furthermore, that the price received for a barrel of flour and its equivalent in wheat, were practically the same. In the manufacture of a barrel of flour there are left approximately 100 pounds of bran and middlings; or, in other words, one-third of the weight of the original wheat is retained by the manufacturers in this country as a feed, provided the crop is exported as flour rather than wheat. Therefore, in the shipping of 100,000,000 bushels of wheat, or 3,000,000 tons, there is contained an equivalent of nearly 1,000,000 tons of valuable mill feed. Since the foreign purchaser pays the same price for the barrel of flour as he does for the equivalent whole wheat, nothing is received for the refuse feed, which is nevertheless worth here in the East \$20,000,000.

In addition to this the foreign purchaser obtains in those 3,000,000 tons of whole wheat the following amounts of essential fertility constituents, namely:

Nitrogen,	26,700 tons.
Phosphoric acid,	23,900 tons.
Potash,	16,100 tons.

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which he would not obtain were he to receive the equivalent of the wheat in flour. Consequently, this matter touches our present and prospective agricultural wealth, since these constituents, which are given away, are the measure of the productivity of our soils. The facts are, as already pointed out, that in certain of the States in this country millions of dollars' worth of these constituents are annually purchased in the form of commercial fertilizers to replace the soil fertility that was sold in the wheat and in other crops.

This, however, is a digression from the main point; these data in reference to the annual removal of plant constituents are not used to show that farming in our country, on the whole, is absolutely wasteful. That is not the point that I am attempting to make, though they do show that a very much larger proportion of the constituents than should be are in a sense destroyed. The calculations are made and tabulated mainly to impress upon our eastern farmers the very great advantages which they possess over their western neighbors, in that they have an understanding of the application of the principles which are involved in constructive farming, and also the advantages which they possess because of their locality in raising those kinds of crops which in their growth are rather constructive than destructive in their relations to soil fertility.

I doubt very much whether many farmers ask themselves the question, as they should, What are we farming for? and then seek the proper answer to it and follow its suggestions. A quite natural answer is, we are farming for a living, or for the money that is in it, or perhaps to contribute our share to the public good, but is it not a fact that in the broad sense, the object of farming is to get something to feed somebody? And is it not another obvious fact, other things being equal, that the producer who lives nearest to the consumer of perishable products is the one that has a great advantage, particularly if he understands those principles underlying his practice, which we have been trying to make clear? The farmer of the northwest does not depend directly upon the eater in a sense, because his product is not for direct consumption, but must depend rather upon a large number of persons before the actual eater obtains his pro-

duct. Yet, because the farmer in the East does not realize as he should the value of his location, or because he has not made serious attempts to remove the obstacles that are in the way, there are farmers further away who are coming in to assist him to supply his own markets.

As an illustration of the first point, let us look at our location in reference to the eaters. The State of New Jersey has within its limits, or on its borders, a total of nearly 6,000,000 persons in cities and towns of over 25,000 inhabitants. The farmers in the most remote districts of the State are within 50 miles of some one or other of these large cities. In addition to this, there are 800,000 persons in villages, towns and on farms, or a total of about 7,000,000 people within this limit. So far as I have been able to discover there is in no other State or country so large an aggregation of people located in cities within such a small radius. This fact, together with the further fact that in these large cities and towns are the homes of the wealthiest people in the world, who are anxious to obtain the very best of everything for their tables, and are willing to pay high prices for them. They are not satisfied with cold storage poultry, preserved eggs, process butter, embalmed milk, or inferior vegetables; they want these products fresh from the farm, with their sweetness and purity unimpaired, and uncontaminated with germs of decay. What does this mean to the farmers of New Jersey in the matter of the supply of these perishable feeds? It means in the first place, that if one-half pint of milk is consumed daily by each person in these cities the total required would be 1,500,000 quarts, or at six quarts per day per cow, an amount that would be produced by 250,000 cows. If only one pound of butter were consumed daily by every ten persons in these cities and towns, 600,000 pounds per day would be required to meet the demand, or the product of 600,000 cows, if the cows produced one pound per day. If 100 persons consumed only a quart of cream per day, it would require 60,000 quarts of cream daily, or the product of 60,000 cows; or, in other words, to supply the minimum amount of dairy products alone for these cities and towns a total of 910,000 dairy cows would be required, or five times as many as are now owned in the State.

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Take another line. If two persons consumed one egg per day there would be required daily 3,000,000 or 250,000 dozens, to supply this demand, which, at the average rate of production, would require about 10,000,000 hens. If five persons consumed one fowl daily it would require 1,200,000 fowls to meet this daily demand, or the product of at least 10,000,000 more hens, if we allow a 50 per cent. hatch and a 25 per cent. loss in raising, or a total of 20,000,000 hens. There are now in this State, according to census returns, about 200,000 fowls. In addition to these products, we have the demand of 6,000,000 persons daily for apples, pears, peaches, plums, berries, asparagus, celery, tomatoes, sweet corn and other garden truck, and flowers and greenhouse products, all of which, when of good quality, bring their best return in nearby markets, and the production of which would require many acres and the attention of many thousands of persons.

The farmers of New Jersey, therefore, have a market at their hands for those perishable products which command, if of high quality, high prices, and whose growth does not cause a large waste or removal of the fertility elements from the farms; besides, an increasing production of these would not, in a measure, interfere with the growth of those crops which are now generally grown on the extensive plan, and are not, therefore, highly profitable. It will be said at once, however, that it is not possible for New Jersey and other nearby farmers to meet these demands for milk and butter and cream, and eggs and chickens, and fruits and vegetables, first, because the area is too small, and second, because these can be raised and sent in from other places at a lower cost than can be made profitable here. Granting this for the sake of argument, we still find that if we assume that only 10 per cent. of these persons so located were supplied with an extra quality of milk, cream, butter, poultry, eggs, etc., it would require more than two-thirds of the cows that we have on hand to supply them. It would require 2,000,000 hens to supply 10 per cent. with fresh eggs and extra fine chickens, or ten times the total number now on our farms.

Let us, however, look at the question of limited area. Farmers in this State have been urged to intensify their practice and thus

make a unit of land mean more than it does at the present time, and while they have made progress in this direction, the products per unit of area are still relatively small as compared with those countries which have, by virtue of necessity, been obliged to intensify their practice. Take, for example, Belgium, which may be fairly well compared with New Jersey on the basis of area, though the natural conditions of soil are, in many respects, inferior to New Jersey, much of it requiring expensive drainage systems, besides large sections of the cultivated areas are quite as poor and sandy as those uncultivated in New Jersey. Belgium has an area of 10,000 square miles and New Jersey has about 8,000 square miles. The products of the two will show the intensity of the practice in Belgium and the extensiveness of the practice in New Jersey. The area and average yield of the various crops :

	Belgium.		New Jersey.	
	Yield per acre.		Yield per acre.	
	Area.	Bu.	Area.	Bu.
Wheat,	450,000	34	113,000	16
Rye,	658,000	34	68,000	16
Oats,	621,000	74	63,781	25
Potatoes,	461,000	233	57,000	90

In addition to these general crops, Belgium produces annually 2,000,000 tons of raw sugar from sugar beets, grown on about 119,000 acres. Furthermore, 75,000 acres are devoted to the growing of flax, 30,000 acres to chickory, 100,000 acres to fodder beets, 100,000 acres to vegetable gardening and a proportionately large area, over 2,500,000 acres, to clovers, meadows and orchards. The growing of stock is also an important industry, particularly of horses, cattle and swine. The census for 1902 shows:

646,556 head of cattle, as against 261,000 in New Jersey.
 246,881 head of horses, as against 95,000 in New Jersey.
 1,136,786 head of swine, as against 154,000 in New Jersey.

Hence, the productive capacity of the soils of Belgium is, for standard crops, from two to three times as great as that of New Jersey, while the areas devoted to special market garden crops

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and fruits greatly exceed our own, and the live stock kept is even greater in proportion, showing that it is possible, by careful systems of practice, to increase also the number of live stock.

Second, as to the argument that the products may be more cheaply produced in remote districts. It is a fact that such products as milk, butter, eggs, poultry, vegetables and various fruits are produced and sent into our city markets from great distances, and these, rather than our own, fix the prices at a point lower than it is profitable for us to grow them. It is stated, for example, that one poultry firm in Iowa is sending into the Eastern markets a carload of chickens per day; that creameries in Kansas, Illinois, Wisconsin and other Western States are sending many carloads of butter daily into the markets of the East. That thousands of cans of milk are shipped daily into the markets of New York and Philadelphia from points hundreds of miles beyond the confines of the State. Is this possible because of cheaper lands, lower taxes and more abundant farm labor and better farming in these far-off States? It was my privilege the past summer to get direct information as to these points in the State of Iowa, and to obtain similar data in regard to other States from reliable sources. In reference to the price of land, I found that prices per acre ranged from \$50 to \$150 per acre; in exceptional cases \$200 per acre was paid, or on the average for good land about \$100 per acre; that the taxes were not materially less on the average than obtain in farming districts in the East, and that labor was quite as expensive and as difficult to secure as here. The improvements on these farms are in no sense equal to those in our own State, nor are the average yields of grain greatly superior, except for oats. In our State there are certain communities where land is quite as high or higher even than in the States of the West, but on the whole they are very much lower, \$50 per acre or less; that in point of improvements are superior to those selling for \$100 in those States, and which by judicious management and use of fertilizers and manures would equal them in productive capacity, while the prices received here for hay and cereal grains are from 15 to 50 per cent. greater. Surely the cost of fertilizer that must be used to secure equal yields would not counterbalance the cost of the

larger capital required to obtain the same net results, if grain alone were raised and sold, while the cost of the conversion of these crops into meat, milk, butter, eggs, pork and poultry would be relatively no greater in New Jersey than in other States. The cause lies deeper, and in my judgment one of the chief obstacles which prevents the New Jersey farmer from taking the full advantage of his markets is that of easy and cheap transportation of his high-quality, perishable products. The farmer, or the community of farmers in New Jersey too distant from the market for carting, who cannot ship a carload of produce, must have recourse to express or slow freights, which either makes the carriage charges practically prohibitive or brings the products into the market in a bad condition, thus reducing the net returns to a point lower than that received by farmers at greater distances. Carriage charges for small quantities and for short hauls are practically prohibitive, which is entirely wrong, as it works injury to both the producer and consumer, and, therefore, to the State as a whole. The farmer should be furnished with the opportunity to market his produce quickly and cheaply, and thus to take full advantage of his location. Think what it would mean to the State and its people in the increased values of property if this were made possible, if every acre of cultivated land in New Jersey were worth \$200 per acre instead of \$50, and that this is possible is abundantly evident from the conditions that now exist in certain favored localities. The State now makes splendid appropriations for stone roads, which have enhanced the value of farm lands contiguous to the large cities, where it is possible to directly dispose of his high-class products. Would it be beyond the powers of the State to at least encourage the building of trolley systems for the carrying of freight from the more remote districts? This, it seems to me, must be one of the factors in the solution of present difficulties, thus making it possible for the farmer to cater to the demand of this populous section for fresh eggs, for sweet milk, plump chickens and perfect fruit and vegetables, and at prices that will encourage him to adopt the constructive and more profitable and intensive system in his practice.

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In the next place, and finally, I believe that, as intimated in the beginning, the individual farmer must recognize that he is but an atom of an enormous aggregate mass, and that the atom is only forceful as it becomes an integral part of such mass. The atom of water on the mountain top, for example, is insignificant in itself, but as a part of a roaring, raging river, rushing down the mountain side, it becomes a mighty force for good or evil, according as it is directed; so the farmer, in order to accomplish much for himself and his community and his calling, must become a part of a great body, which, having interest in common, which, united and agreeing on essentials, can, by working together, accomplish all that which is so important, so desirable, and so necessary for the right upbuilding of the individual, the State and the Nation.

We have abundant evidence in this and other States of the great social, educational and business advantages derived from farmers' organizations, even when these bodies represent only a small proportion of the farmers in the different States and in the different counties of this State. Is there any good reason, outside of the farmers themselves, why these organizations should not include, if not all, at least a majority of the farmers? Surely they have a common interest and a common aim.

Let us, as farmers of New Jersey, be not discouraged, but encouraged, because of our opportunities for progress, to unite as one coherent body in an effort to overcome the obstacles that stand in our way, and which by united effort can be removed. Let us agree on essentials, and by organization win our cause, not only because of the material benefit to us, but because it is right, and because the interest of the farmer is the interest of humanity.

Annual Report of the Secretary.

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Annual Report of the Secretary.

It is a satisfaction to report that the year 1904 gave the farmers of New Jersey a better reward for their work than did 1903, by over \$9,000,000. The work of the farmer may be as well done in a profitless year as when results are more favorable. But adverse conditions of nature, over which he has but little control, are sometimes so widespread and injurious as to rob him of his just reward, as was the case in 1903. In all probability no more money and labor were expended to secure the results obtained in 1904 than were expended in the previous year, and this makes the better reward all the more encouraging.

The several divisions of State work committed to the Board have been faithfully carried out in each case, according to the provisions of the law.

The lecture work is carried on both at the Annual Meeting and in the Farmers' Institute. The demand for these is increasing from year to year, as their value as means of disseminating scientific and practical agricultural information becomes known.

Thirty meetings were held in 19 counties during the past year.

It was my privilege, by appointment of the Executive Committee, to attend the Ninth Annual Meeting of the American Association of Farmers' Institute Workers, held in St. Louis October 18th, 19th and 20th, 1904. Having attended a number of the earlier meetings of this body, I could but mark the greatly increasing attendance and interest at the later ones.

Delegates came from most of our States, from the United States Department of Agriculture and from the Canadian Provinces, and each one seemed to realize the important place the farmers' institute occupies as a help in agricultural education. The best teachings of the institute can be utilized by the farmers immediately in practice.

Deputy Minister of Agriculture C. C. James, of Toronto, Canada, stated at the above meeting that: "In the past seven years the output of Ontario farms in the three products—beef, bacon and cheese—had increased from \$31,000,000 to \$65,500,00; the development of Ontario agriculture was largely due to the education of our farmers through Farmers' Institutes; that it was the first organization through which we got a grip of the farming community; that its progress had been sure and steady; that the methods adopted in Farmers' Institute work had proven so successful that we had utilized them along other lines; special organizations had grown out of the work of the Farmers' Institutes, and that, on the whole, we had found the Farmers' Institute work the main cause of building up our Agricultural College and of putting fresh life into all our other lines of organization and work."

We may not be able to state so positively the actual increase in money value that accrues to our farmers from this work in the States, but all agree, who have kept in touch with this movement, it has been beneficial in every particular.

ENTOMOLOGY.

The invasion of our State in recent years by the innumerable insect pests has become a serious menace to our large and widely celebrated fruit industry. Hopes that were entertained that natural enemies, parasites, might be introduced that would accomplish their destruction have not been realized as yet.

Meanwhile the only thing that can be done to hold them in check is to use the poisonous solutions recommended by science and experience. Where this has been scientifically and continuously done fair returns have been realized.

The law creating the office of State Entomologist, with power to inspect nurseries and orchards, was not enacted any too soon, and the appropriation of \$3,000 for this work will be returned to the State many times over if it can be made the means of preserving our fruit industry.

The State Entomologist, Prof John B. Smith, makes the following statement of this work for the past year:

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“During the fall of 1903 and early spring of 1904 upward of 90 nurseries were examined and 86 certificates were issued. Some of these certificates were unconditional, many were limited to specific kinds of stock, and others were issued to dealers who obtained their stock from satisfactory sources. Certificates were refused in those cases where the nurserymen failed to comply with the spirit of the law and where the stock could not be made safe by ordinary methods. Some nurseries were inspected several times before a certificate was finally given.

“During September and October, 1904, upward of 65 nurseries were examined and 60 certificates of all kinds were issued, requiring the constant field work of two and sometimes three men for most of the time mentioned. The effect of the work of the office appears in an almost universal bettering of nursery conditions, and in cleaner, more healthy stock.

“During the winter of 1903-4 upward of 200 orchards were inspected, mostly by Mr. H. H. Brehme, who was employed as a special assistant for that purpose, and a large number of orchardists were given personal directions as to the best methods of treating their trees. Quite a number of complaints were received during the year and all were promptly investigated. When they were found well based the parties at fault were notified and in every case an amicable conclusion was reached.

“The office has secured the confidence of nurserymen and horticulturists and demands upon it are increasing continually.” (See Report of State Entomologist in this volume, and Report of Executive Committee of this Board as to his assistants.)

THE FEEDING-STUFFS LAW.

In his efforts to fulfill the requirements of this law, which was enacted March 15th, 1900, Dr. E. B. Voorhees, State Chemist, who is charged with the inspections and analyses of the different feeds placed upon the market, writes respecting his work for the past year as follows:

“In the inspection of feeding stuffs required by Chapter 29, Laws of New Jersey for 1900, there was taken 570 samples last

year, of which 375 required guarantee, 138 did not require guarantee, and 57 were stock or poultry condimental foods. Of these 456 were selected for analysis. In many cases the samples requiring guarantees were not accompanied by them, due, in many cases, not to the manufacturers but to the carelessness of the dealers in not furnishing the guarantee, which is probably encouraged in many cases by the consumers' failure to demand it.

"The samples represented 150 different brands, of which six were devoid of all information as to their composition. This is but 4 per cent. of the total number, whereas last year there was 12 per cent.; in 1902, 13 per cent., and in 1901, 32 per cent., which shows a constantly increasing compliance with the law on the part of the manufacturers. In fact, the manufacturers, as a rule, have shown great interest in the work, and have done all in their power to assist in complying with the law and in encouraging a complete inspection.

"The gluten feeds and hominy meals are of a poorer average quality than heretofore, probably due to the fact of the poor quality of the corn crop of 1903, as the effect is also shown in certain of the prepared feeds, of which corn is the chief component. This fact does not excuse the manufacturer from attaching correct guarantees. Accurate chemical analyses, rather than an assumed average composition of whole grains, should be the basis of affixing guarantees, though the manufacturers themselves suffer an injustice by affixing guarantees unwarranted by the composition of the feeds.

"Adulteration was observed this year in a very few cases, and it was difficult to determine whether these were due to carelessness or intention, though, owing to the very small proportion of foreign substance found in certain of the feeds and to the fact that the foreign substances found in a number of cases were quite as expensive and quite as useful as the product in which they were found, it is believed that in these cases the adulterations were due to imperfect or careless methods of preparation and handling. In many oat feeds very large proportions of hulls were found, though these excessive amounts of hulls cannot be considered an adulteration.

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“On the whole the results of the work are eminently satisfactory, showing that consumers can, as a rule, depend upon the character and quality of the feeds now offered in the State, though they should use intelligence in the selection, owing to the very large number of different products now offered, varying widely in both their composition and usefulness.” (See paper, “Modern Dairy Feeds and the Feeding-Stuffs Law,” in this volume.)

DIRECTORS' REPLIES TO QUESTIONS.

On August 1st, 1904, a letter and blank was sent to the directors of the State Board, with the request that the answers be returned by September 10th.

The blank referred to, besides calling for statistics of crop yields, contained six questions, relating chiefly to the condition of prosperity of the farming interests throughout the State.

All the questions were answered briefly and with more or less definiteness by each correspondent. It is not considered essential to this report to print their replies in full. I have made a short comment on them, which will indicate the trend of opinion expressed in them.

Question I. State causes that have injured any crop.

The replies to this question call attention to adverse local weather conditions. These occur annually and are beyond the control of man. It is for the farmer, however, to consider whether he may not, by certain methods of manuring and of cultivation, overcome some of the possible injurious effects of extremely wet or extremely dry weather.

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

The answers to this question are governed largely by the kind of crops grown in each locality and the weather conditions affecting them. In no case were the individual replies intended, we believe, to convey the impression that the conditions of one neighborhood prevailed the State over. The statistical and other information from the entire State will reveal the general condi-

tion. It is safe to say here that, for general farming, the year 1904 has been better than 1903. And it is perhaps equally true that for the growers of small fruits and some market garden and truck farmers, this year was not so profitable as last. A majority of the replies indicate the year has been a fairly prosperous one.

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

Average farmers, in agricultural intelligence and practice, are doing well, and an average of the per cent. of profit made by these would give a general average of some profit, even though it may be that for the year, in some localities, nothing has been made above living expenses, as Gloucester and Union state, yet that is better than going backwards.

In this connection the answer of Morris applies—"It costs more for some to live than others." Numerous cases exist in all professions where one man has failed another succeeds. The question is largely one of intelligent management and self-denial, and these are requisites to success in any calling. Most of the replies state a profit has been made, running from three per cent. to twenty-five per cent.

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

The replies to this question emphasize the wide-spread deficiency of efficient farm laborers; the injuries resulting from insect pests and plant diseases; high taxes; Western and Southern competition, and the fact that farmers' sons are leaving the farm; false impressions as to the business of farming; failure to understand and apply the requirements of the situation.

It would seem that some agency might be organized whereby a fair proportion, at least, of the great stream of immigration could be directed to our farms. Many of these men have some knowledge of the various branches of farming, and, if a responsible agency could meet them on arrival here, or, preferable, select and engage them by small colonies on the other side, then they would emigrate with the knowledge that they were going to a certain locality and work.

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The satisfaction that such an arrangement would give all concerned might lead to an increase of permanent farm help throughout our State and relieve the cities of a super-abundant population. It is a question whether this would not in the end give a better, safer and more permanent help supply than will the negro floaters of the South, who make a summer tour of our State, some of whom, as revealed by the experience of the past year, are too base to be introduced into rural homes. Economic conditions may bring about a change in this respect, but to wait for relief from that source is but protracting the existing distress.

The prevailing plague of insects injurious to farm crops means united and persistent warfare on the part of our farmers and fruit growers. Their very rapid increase is, no doubt, largely due to the fact that so many of those who own fruit trees have failed to take any action for the destruction of these pests.

The work will be tedious and exacting, even though all cooperate, and very much more so if plague spots are left here and there the State over—a standing menace to the producers who are earnestly working for their extermination. Thirteen secretaries of County Boards of Agriculture report spraying is on the increase. This is an encouraging statement.

The tax question is as old as government the world over, and it would seem that the taxpayer, in this country at least, should have some influence, beyond his vote for the candidate of his choice, in determining the tax budget from year to year. If he does not, who is to blame?

For the farmers relief from most of the causes of distress named must come from the farmers themselves; the other fellow has troubles of his own. But the tax question is of general interest and should command general co-operation.

Question V. What remedy do you suggest?

Some of the replies to this question are: Laws giving the farmers the right to protect themselves against the depredations of rabbits, birds and the like found destroying their crops. Run the farm on business principles. Admit Chinese laborers, as they seem to be quiet, industrious people. Produce a good article. Organization. Good roads, trolleys and telephones the State over, and work to make social life in the country worth more.

A partial remedy for the farmers' sons leaving the farm for some other business is suggested in such answers as: Train the daughters to become farmers' wives. Interest the boys in agriculture. Provide plenty of agricultural literature. Make farm life more desirable and the farm-home more pleasant, etc.

These suggestions are good. But may we not take another step in advance and thereby introduce a change that will revolutionize our entire agricultural system in the upward direction? I refer to a thorough agricultural education, or, if that is not possible, a short course at the State Agricultural College.

The popular, progressive, paying agriculture of the future will be conducted on a much higher plane of intelligence than now prevails. Where it is even approximately so conducted now, a majority of the answers say it pays.

It is stated there are about five thousand students attending the agricultural colleges of the United States at the present time. The number of such students will rapidly increase, as year after year these graduates engage in the business of agriculture. Their farms will become centers of influence to those around them. Their crops and stock will be examined, their methods studied; and because of their success—a success which comes of scientific knowledge and practice—other farmers will equip their sons and daughters with an education along similar lines.

Law makers, students of political economy, officers and teachers in schools and colleges, as well as farmers, should become thoroughly convinced that such education pays the State. For agriculture, broadly speaking, is the only occupation that produces. In other callings men handle, make over, transport and live from this. When agriculture is low in any country, that country is low in general progress, unless, forsooth, it subsists upon the agricultural products of some other country.

The business of the world is becoming specialized, special training is becoming essential to engage in any of its many branches. And special training is now generally acknowledged to be necessary if anyone would succeed in agriculture.

With the agricultural colleges and experiment stations the farmers' institute is closely associated as a means of disseminating agricultural intelligence.

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STATISTICAL REPORT.

Based on Report of Directors and County Secretaries and from Other Sources.

The condition of prosperity or productiveness of the farms of the State cannot be determined by a few cases. The State is larger than a county; a county larger than a single farm.

The entire field of production, the range of crops, conditions and yields must all be considered. Many may fail in a given occupation and yet the business, as a whole, be a paying one. It is so with farming. In common with others, this is a business venture. Success in it depends upon business ability, capital, persevering industry and self-denial.

Notwithstanding some sections have been visited by adverse crop conditions and some crops have brought low, even non-paying prices, yet the season has been, generally speaking, a fairly prosperous one.

The following table of crop yields and values shows an encouraging increase over the returns of 1903. The crops of corn, wheat, rye, oats, buckwheat, hay and potatoes being in excess of last year to the amount of over \$9,000,000.

TABLE I.

Crop.	Acres.	Yield.	Production.	Price.	Total Farm Value.
Corn,	274,999	40	10,999,960	\$0.57	\$6,269,977
Wheat,	104,673	14	1,465,422	1.08	1,582,555
Rye,	69,967	17	1,189,439	.72	856,396
Oats,	63,143	36	2,273,148	.40	909,259
Buckwheat,	13,005	17	221,085	.65	143,705
Hay,	424,568	1.35	573,166	15.50	8,884,079
White Potatoes,	62,876	120	7,545,120	.64	4,828,876
Sweet Potatoes,	20,588	120	2,470,560	.66	1,608,569

TABLE II.

Clover and Grass Seed,	\$2,795
Miscellaneous Vegetables,	4,000,000
Dry Beans and Peas,	6,754
Onions,	105,327
Small Fruits,	1,406,049

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Grapes and their product,	\$81,758
Orchard Fruits, with Cider, Vinegar, etc.,	1,594,981
Flowers and Plants,	1,953,290
Seeds,	43,191
Nursery products,	339,926
Nuts,	20,660
Forest products,	469,005
Poultry and Eggs,	2,204,120
Wool,	31,266
Milk, 77,714,055 gallons, at 3½ cents per quart,	10,879,967

* TABLE III.

<i>Crop.</i>	<i>Acres.</i>	<i>Yield.</i>	<i>Production.</i>	<i>Price.</i>	<i>Total Farm Value.</i>
Corn,	274,999	38 bu.	10,449,962	\$0.58	\$6,060,978
Wheat,	104,673	13.3	1,392,151	1.10	1,531,366
Rye,	69,967	17.5	1,224,422	.70	857,095
Oats,	63,143	32.5	2,052,148	.40	820,859
Buckwheat,	13,005	20.8	270,504	.66	178,533
Hay,	424,568	1.39 tn.	590,150	14.67	8,657,500
White Potatoes,	62,876	115 bu.	7,230,740	.61	4,410,751

* TABLE IV.

	<i>Number.</i>	<i>Farm Price.</i>	<i>Value.</i>
Horses,	95,230	\$99.28	\$9,454,882
Mules,	5,024	98.21	493,413
Milch Cows,	179,241	39.04	6,997,569
Other Cattle,	82,661	20.33	1,668,489
Sheep,	44,685	4.08	182,439
Swine,	154,069	11.35	1,748,683

The total receipts from the crops named in Tables I and II is \$48,222,505. This makes the proportionate earnings for each of the 34,650 farms in the State for 1904—less the interest on the census farm value of \$5,638 at 5 per cent.—\$1,080.94, which is \$253.76 per farm better than last year.

Crop yields and values as given in Table III and the number and value of farm animals as given in Table IV are taken from the Year Book of the United States Department of Agriculture for January, 1904, by permission. It is published in this connection for reference.

* From the Year Book of the United States Department of Agriculture for January, 1904.

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The price of milk is based on the reports of thirteen county secretaries, which gives an average wholesale price of 3.5 cents per quart and an average retail price of 7 cents.

The number of dairy animals has not, it is thought, increased to any great extent since last year.

Corn of 1903 being so generally injured as to be almost valueless for fodder and the lateness of spring pasture virtually prohibited any additions to our dairy herds in the forepart of the season of 1904, as the books of the Tuberculosis Commission show; that being so, the total quantity of our milk yield is listed as it was last year. The price, however, is higher, but the cost of production is higher also, owing to advance in price of feeding stuffs; so that the producer will not reap much, if any, greater profit from the business that he did in 1903.

In the foregoing calculations no estimate is given of the value of animals, such as swine, veal calves, lambs and beef sold on the hoof or slaughtered; but it is no small sum.

CRANBERRIES.

The cranberry crop has become an important one among our agricultural productions. Persevering, enterprising men have given it a commercial value that did not exist in its wild state, in earlier times. Few persons who eat cranberries know where or how they grow, the methods now followed in their production, or the numerous enemies to success which must be overcome.

Furthermore, consumers sometimes complain of advance in price of certain products without knowing the cause. While prices of food products are too often advanced by shrewd speculators for their own profit, it sometimes happens that the usual yield is reduced by causes beyond the control of the grower. Such is the case with the cranberry yield of the past season.

Prof. A. J. Rider, secretary of the American Cranberry Growers' Association, states that, "Owing to cool weather, the late setting of berries in New Jersey did not mature, and from this cause crops are almost invariably falling short of estimates. The crop was about half gathered all around when killing frosts

occurred—September 15th in Wisconsin, September 22d and 23d in New England and New Jersey.

“It is estimated that in the East and New Jersey it took about 50 per cent of the ungathered crop.

“This will reduce the estimates about as follows: New England to about 75 per cent. of last year; New Jersey to about 42 per cent. of last year; Wisconsin to 40 per cent. of last year, or an aggregate reduction from last year’s crop of about 60 per cent.”

Under date of February 7th, 1905, he says: “The New Jersey crop of 1904 will be about 250,000 bushels.”

His estimate of the New Jersey and Long Island crop of 1903 (Long Island being districted with New Jersey) was 475,000 bushels, a difference against 1904 of 225,000 bushels.

Dr. Prior, according to Webster, says the cranberry was so named from its fruit being ripe in the spring when the *cranes* return, hence the name. It is interesting to recall the estimate of this and other fruits by some of the earlier settlers in Burlington county. Mahlon Stacy, writing home to his friends in England, 26th of 4th month, 1680, says:

“I have seen orchards laden with fruit to admiration, their very limbs torn to pieces with the weight, and most delicious to the taste and lovely to behold. I have seen an apple tree from a pippin kernel yield a barrel of curious cyder, and peaches in such plenty that people took their carts in peach gathering. I could not but smile at the conceit of it. They are a very delicate fruit and hang almost like our onions that are tied on ropes. I have seen and known this summer 40 bushels of wheat from one bushel sown, and many more such instances I could bring.

“We have from the time called May until Michaelmas great store of very good wild fruits, as strawberries, cranberries and hurtleberries. The cranberries much like cherries for color and bigness, which may be kept until fruit comes in again. An excellent sauce is made of them for venison, turkeys and other great fowl, and they are better to make tarts than either gooseberries or cherries. We have them brot to our houses by the Indians in great plenty.”

It seems a little singular that Prof. Rider should, at this late

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day, find it necessary to publish recipes for preparing cranberries for the table.

CANNING INDUSTRY.

The quantity of tomatoes canned in New Jersey during the year 1904, as reported by the United States Crop Reporter for December, is 815,823 cases of two dozen tins each. This is exceeded by but two States—Maryland and Indiana.

SYNDICATE OR CO-OPERATIVE FARMING.

In view of the very low price of improved farms in parts of New Jersey, and especially in some of the northern counties, and the limited supply of help for individual farmers, I believe a splendid opportunity is here afforded for farming on a large scale.

Several hundred acres in one block—possibly thousands—could be purchased and put under one central management. A general superintendent, well up in practical agriculture, and a scientific director who could attend to the more intricate questions of soil requirements, plant food necessary, dairy and other stock feeds, poultry needs, spraying mixtures, etc. The machinery outfit for such an acreage would be less in proportion than is now required for the many subdivisions. Much more of the work could be done by machinery and on a larger scale than is now the case.

Help could be employed in gangs under a sub-boss and they would work on the land with such an arrangement, whereas as individuals, working alone on a one-man farm, they will not. Furthermore, the prices of the staple crops are such that a surer and much better profit would be possible from such an investment than is at all probable, or even possible, from many of the corporate concerns that have been exploited in recent years, in which men have invested.

Additional reasons for my faith in such an enterprise are:

The land has always been considered a safe, if not even the

safest investment. Franklin said: "Land is the source of all wealth."

The prices of staple crops have not varied greatly for years and the tendency is upwards.

Population, and, hence, demand will increase.

New Jersey is in the lap of the great markets.

The land in the section referred to is naturally strong and will repay improvements put upon it.

Scientific management would economize expenditures.

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

A permanent market would be built up and maintained.

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

Cold storage could be provided for all fruit products.

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

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

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

Incidentally such a plantation would become an object lesson.

There is a bright future ahead for progressive farmers. Even now some of our professional men are purchasing country estates, beautifying them, improving the soil, and in many instances revealing capabilities of production not considered possible by the old-time farmer. Agriculture cannot remain stationary. There are too many bright minds studying every phase of it. And, in my judgment, some of the farmers' sons of to-day are making

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the mistake of their lives in leaving the old farm. The words of Washington are as true to-day as when uttered by him: "Agriculture is the most noble, the most healthful and the most useful calling of man."

An editorial in the November, 1904, *World's Work* speaks of the decline in English agriculture and the consequent physical decline of the people, due chiefly to overcrowding in cities, with the necessary results of a lack of air and of light, and, most of all, the improper care of children, bad ventilation, caused partly by a lack of proper food, etc. The drink habit receives its share of the blame, and also the use of tobacco by children.

One of the writer's conclusions from the long discussion of this subject in England is: "That the decline of English agriculture is a capital misfortune, far too small is the proportion of the people who get their living directly from the ground." And he is of the opinion that "the ever increasing attractiveness of the country is an influence that will save the American population from anything like general physical decline for indefinite centuries to come."

"If a man had to say what great influence in the world is to-day the most hopeful for the future of the human race, he might not go amiss if he said that it is the change which has taken place from ignorant culture of the earth to the scientific, healthful and profitable methods that we are at last adopting."

The above shows the trend of thought of many leading minds who are studying sociological problems to-day.

And they are looking countryward and to the farm. Strange that so many farmers' sons and daughters are looking in other directions for a business and home. Surely they have not considered the favorable side of farming in New Jersey.

We are in the lap of the great markets, in the center of a vast consuming population, which is increasing every day. On the north is New York City, with a population of 3,437,200; on the west Philadelphia, with 1,293,697. Between those two points within the State are Jersey City, with 200,000; Newark, 246,000; Elizabeth, 52,200; Plainfield, 20,000; Perth Amboy, 17,700; Rahway, 8,000; New Brunswick, 20,000; Trenton, 75,000; Burlington, 11,000; Camden, 76,000. Here is a total population of

consumers aggregating the vast number of 5,620,287. In addition to these are other cities and large towns throughout the State and the permanent and transient population along our sea coast. With these millions of people in touch of our farms, people who must be fed three times each day, if farming will not pay in New Jersey, where in the wide world will it pay?

If it does not pay in any case, the fault is not with the business, but with the management.

THE LABOR QUESTION.

The tendency of wages for farm laborers is higher. Sixteen secretaries of County Boards report a wage per month, with board, which averages \$18; and for those who board themselves, \$28 per month.

In a previous paragraph reference was made to the necessity of making some arrangement whereby reliable help might be secured for farm work. It has been suggested that there are, in our large cities, men and perhaps women, too, at all times of the year who would be glad to avail themselves of an opportunity to work in the country, did they but know to whom and where to apply.

Possibly our organizations, such as the Grange and County Boards, could secure the co-operation of Salvation Army officers, or other such who have to do with providing for the needy, and through them secure transient and permanent help. This would be doing good to both parties.

Another source of available help, though somewhat limited, is the Baron DeHirsch Agricultural and Industrial School, Woodbine, N. J. A recent circular of the School entitled "Farm Help" says: "The School graduates every year scores of intelligent, well-prepared young men, who are fully equipped to apply their theoretical and practical knowledge to the cultivation of the soil and to any other branch of farming. Agriculture, fruit growing, market gardening, landscaping, dairying, butter making, poultry and apiary are taught in this school by the most competent, up-to-date instructors.

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“The young men are getting a thorough training in the theories of farming in the school-room, and a practical knowledge on the fields and various other departments conducted on modern plans. The school does not spare money and efforts to prepare the young man for his vocation and to offer to his employers the services of a well-developed muscle and a thoroughly cultivated mind.

“It is our desire to place the graduates with progressive farmers in different localities, thereby furthering the practical knowledge they have acquired in the school. We have numerous testimonials from employers who are highly gratified with the work of our graduates.”

TRAMPS.

The army of worthless tramps that throng our highways during the summer season, spying out our homes for the purpose of theft and other crime, while nominally looking for work, should be banished and broken up. They are a constant menace to the safety and peace of the inmates of rural homes. These, with the chicken and fruit thieves, should be punished with severe penalties.

With farmers' organizations more numerous and comprising all the farmers of a given community, organized for mutual protection and help, with the rural telephone in every home, it might be possible to pick up such reprobates and bring them to quick punishment.

Referring to the terrible experience of the Biddle family last summer, the Philadelphia *Ledger* of that time said, under the caption, “The Unprotected Country”:

“The atrocious assault on Mrs. Biddle, near Burlington, N. J., by negroes, will heighten for a time the fear which is ever present to the farmers of that State and Pennsylvania. Scarcely a day passes but an outrage, a robbery, some act of open, bold villainy takes place in the country; which the perpetrators would not think of committing if they did not know that their victims are unprotected.

“It is a barbarous condition and it is growing worse all the time. The population is growing denser, the police of the great

cities have adopted the policy of compelling the criminal and the vicious to move on and the country is the sufferer. The migration of negroes from the South is growing greater year by year; they are largely the worthless, the ignorant, the criminal negroes, who have been chased, at the point of the gun-barrel, from Southern communities. These are the prowlers who infest our cities and the country-side and bring terror with their presence.

“What is to be done about it? The problem of a rural constabulary has been debated for many years. The boroughs and the counties shrink from the expense; the State hangs back, nothing is done, and in a civilized, enlightened community we have prowlers and desperadoes and men worse than wild beasts going at will, doing as they please, committing unspeakable crimes and causing constant terror to the lonely farmhouse, where the women do not know from one day to another how long they will be safe.

“It is an intolerable condition and it is a reproach to us that we permit the condition to last. It is a reproach to the farming communities that, finding adequate protection lacking, they supinely dwell week after week and year after year in the midst of alarms and do not themselves clear away the tramps, strange beggars and wandering criminal negroes from their neighborhoods and let the world know plainly that a tramp is not permitted to loiter about the country districts.

“If the farmers know their rights and dared to maintain them properly not a villianous-looking tramp, or strange negro, could go into a farming district and remain in the neighborhood without effective action on the part of the farmers themselves. They should keep the tramps under scrutiny; let them know that they are followed and watched; let them know most decisively that their presence in the country is not wanted, and compel them to go without parley or delay. Self-preservation is one of the first laws, and the farmers, lacking the official and legal protection, should combine in every county and in every school district to protect themselves.

“Farmers have their grange societies, they take concerted action in many ways, but they seem to be paralyzed when it comes to protecting themselves and their homes. A little energy and

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decisiveness would rid any county or district of tramps and wandering criminals in a surprisingly short time. Once let it be known that the farmers of Delaware county, or Chester, or Montgomery county will not permit strangers to loiter about their farms and in a very short time the country would be cleared and would stay cleared of them. We have interpreted freedom to mean utter recklessness and a permission to a large and growing class of dangerous criminals to rove at will and to place myriads of innocent and unprotected people at their mercy."

The farmers of New Jersey should take early and decided action on this question.

The President—You have heard the very interesting and suggestive paper of the Secretary, and it seems to me that opportunity should be given for discussion of the suggestions made. In connection with the suggestion made in reference to the labor question, and the importation of laborers in bodies, I would say that during the past season I was in Italy, and went purposely to a gentleman there who is in charge of a federation and talked with him upon this matter. He said that it was quite possible for us to enter into some arrangement whereby excellent workers might be obtained for country districts. In that section of Italy the kind of farming is not very different from that which we have here in New Jersey, although there are a number of crops grown there which we do not grow. As a rule the laborers are intelligent, industrious and peaceful; that is, they are not of the passionate and ugly kind that infest our cities. My purpose was to see whether it was practicable to make such arrangement. I have not yet brought the matter officially before this Board, but it might be proper for us to take it up more, and perhaps have the Board direct the Executive Committee to enter into communication with these parties, and see whether the matter might not be made profitable and helpful to the farmers of the State. Although it is not clear enough yet to enable us to determine whether it would be beneficial or not.

Mr. Rider—Would we not be up against the law concerning contract labor?

The President—That could be arranged. They are coming anyway, and my thought is only that they would be corraled so that they will come to the farm. That is, if people in that country knew there was a demand for such laborers here they would be directed in such a way that they would go to the farm. There can be no contract made to interfere with the law.

Mr. Rider—I would say that they are coming all the time, and a class of Italians are coming who are used to farming and finding their way to the farming country. I travel almost every day on the Central railroad, and there is not a day passes when there is not from three to 10 or 15 Italians coming, and they stop along by Hammonton. As they find out that some are doing well, others come. I had about 10 in my employ last year, and each one of those had some relative, and they want to speak for their cousins and brothers that want to come next year. I think that will settle itself.

Mr. Roberts—Do any of those know how to drive a horse?

Mr. Rider—No, and they don't know how to chop wood.

The President—What is your opinion about that class of help? Do they work well?

Mr. Rider—An Italian won't do as good work as a native, nor as much. But most of them are willing workers, and they eventually learn to do the work. They are good faithful workers, as a rule. I have been very much pleased with the class I had this last season. They have been very willing and worked very hard, especially if someone was watching.

Mr. Dye—I think the fact that the Italians are coming down Mr. Rider's way is owing to the other fact that they have been going there for years; they have found a home and they bring others there. In some other parts of the State it is not so.

Mr. Rider—As to this suggestion of the Secretary and the President, it strikes me favorably, that is a different class of Italians from the class we are getting in the country and in the city. I have had a padrone from the city at my place. We were employing from 100 to 200 people during the harvest season, and we have always had Italians from the country district up to last year. I changed my padrone last year and he insisted in having people from the city. He said people from the city

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and country quarrel, and he didn't want any from the country brought there. He brought down city people, and we had more quarreling than we had in 10 years. I made up my mind to go back to the country and get the country people. The Italians in the country mingle more with the American population. In the city they are herded together and don't get Americanized. In the country they mingle with the Americans, and they get to be more respectable, more honest and more industrious, and I think they are much better than the city class.

Mr. Evans—I would like to ask the President if he took notice that agricultural work in Italy was nearly all done by women?

The President—Not altogether. Where I visited there was a large proportion of men in the field, women also, but this gentleman informed me that the laborers in this district were really more intelligent and industrious and were not liable to start up so much trouble as those from the cities, who immigrate to the cities here. That occurred to me to be a good point, if we could get them from those districts. It is very congested there and they want an opportunity to get away. Any other remarks on this subject?

Mr. Roberts—I want to go back to the Secretary's address and refer to another thing. He spoke of the possibility or probability of a community of farmers, the farmers forming a close business connection. They put one or three or five or ten thousand acres into one corporation, one community, with one or two men closely connected with the business staying at home and attending to it, and one or two selling. That is very practicable, according to my judgment. I think business can be conducted that way and our products disposed of, which, after all, is the biggest part of the business, and the people can be managed to better advantage. That which he has outlined is possible, and I think we will have to come to something of that character, just as sure as night follows day.

Mr. Rider—That reminds me of a fact that exists and will perhaps be a proper subject of resolution. Our corporation laws of the State of New Jersey will not permit a farmer to organize on the same basis and the same advantage that it will a banking concern or an insurance company or any manufacturing corpora-

tion. They are exempted, while anything in the line of an agricultural company has to pay one-tenth of one per cent. every year. It would be proper to have a resolution on that matter and ask that it be changed by the Legislature. I think farmers should be permitted to capitalize on as good terms as others.

The President—There is no reason why they should not, if not on better terms. I think that matter was referred to last year.

Secretary Dye—I believe that anything that stands in the way of or retards real honest progress we have the power to sweep away if we will only combine to do it. The farmers have never stood up solidly for their rights in many ways. We can do it, and I hope that our discussion to-morrow on agricultural federation will point the way to accomplish some things in the future which now we are unable to do. I thank Brother Roberts for speaking so favorably of this suggestion. You all know who have purchased fruit put up by the California Fruit Growers' Association how attractive it looks. They require the fruit to be graded according to a standard, and to be up to a certain grade, and when it comes to the market it attracts the attention of the buyer; whereas much of our fruit that is put up, while it is put up honestly, is put up in ignorance of market demands, and has not the same chance. It is put up in driblets, and for such shipments freight rates are higher. We find the railroads encourage men to establish creameries at certain stations, because large quantities are gathered at one place. The railroad officials spoke of that very thing at Woodbine last year. I am quite sure the time will come when, if we don't form a syndicate, we will work together to properly market our stuff. We will unite for that purpose, and for the further purpose of getting scientific men to help us, taking in a county or a township, examining our land, giving us information, and so bringing the work up to a higher grade of productiveness, profit and respectability. I think that is what we want to reach. Much of our land does not produce sufficient crops, our dairy animals produce too little for profit; we do not understand it, and consequently we get small profits from the farm.

Mr. E. S. Black—I want to ask a question: If this matter could be carried on, whether it will not destroy the individuality

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that now exists among the farmers; whether, if you get large farms of 1,000 or 5,000 acres, with a scientific man to direct, what is to become of all these farmers who have now their small homesteads that go to make up the greatest country on the face of the earth? I would like to have good farm help, but I would not like to have a scientist come down and tell me everything that I should do, because once in awhile he would have to come down to find out how I do things, so that he could carry on his scientific work. I believe in the small farm and the small farmer, with our Experimental Station to advise him.

Mr. Roberts—That remark of Mr. Black's reminds me of a story told me by a worthy old gentleman many years ago, at the time the railroads were first introduced. When the Camden and Amboy Railroad was first located they had no idea of coming by Trenton; they ran their original route starting from near Camden, not very far north of Mount Holly, so as to avoid the streams, and went right through the central part of the State. Some farmers in the upper part of Burlington county were opposed to the railroad and they fought it earnestly, and their opposition caused the men who were building it to change the location, and they came by Trenton, up the river, and bridged all those streams. It cost more, but they built it that way. One of those gentlemen was asked afterwards why he had opposed that road so strongly. He answered: "What in the world would we do with our oats?" He had always been supplying oats to the stage lines and fought it for that reason. So this gentleman's objections reminded me very much of that old farmer's remark at that day.

Secretary Dye—I want to say, in reply to Mr. Black, I agree with him on that point of having many homes, but here is the condition that confronts us: The counties I refer to are selling their farms, or almost giving them away, and I suggest that here is an opportunity for one or two or a half a dozen men to try this experiment. I don't expect New Jersey will ever be gobbled up by capitalists, and I should be sorry to see it, but I should like to see an experiment of that kind; it would be a great adjunct to our Experiment Station.

Mr. Pincus—Mr. Dye mentioned the fact that the railroad company is interested in developing the farms. Last year I had a correspondence with the superintendent of the West Jersey Railroad Company, and he brought down two or three gentlemen to attend the Institute at Woodbine, and he said he was willing to do everything he could to develop agriculture. The only thing he wanted was sufficient stuff to be grown to enable him to run an extra train. I haven't been able to interest people in Cape May county sufficiently in that matter yet, but I see that they are running a special freight train that connects at Philadelphia with a special train that takes strawberries and oysters, and other perishable products of the land and sea, to the markets in the West, so as not to get it into the markets of Philadelphia, which are usually glutted and overcrowded. I think by receiving more stuff in certain localities, at central points, the railroads would co-operate with the farmers. I had correspondence with one of those gentlemen, in which he urged the County Board and the Grange to take up this matter, and then the railroads would do their part.

Mr. Denise—This farming on a large scale by a syndicate will do first rate in the Western States, where the agricultural population is not very large, but here our agricultural industry is very much diversified, and we have markets right here for everything we grow; in the West they haven't. I would like to see a combination whereby we could sell our goods in larger quantities, but, Mr. President, that is one of the things we have failed to accomplish yet in our work. We can't seem to get the farmers together. They will talk, but the very minute you say to them, "Gentlemen, we must have a little money to carry on this business; we cannot run it without," they quit. Their theory don't go down as far as the pocketbook. That is one of the great difficulties in farming. We once thought we had a combination at Freehold fixed together so that we could succeed very nicely—had lots of farmers agreed to stand by the arrangement, but the very minute we asked for money they were done. They were afraid we would make something out of it.

The President—I would like to ask Mr. Denise whether he has not got in his neighborhood practically what the Secretary sug-

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gested, namely, a canning factory at Freehold. Is not that on the same line, controlling a large area of land, so that it really means farming on a large scale, and don't the farmers that rent their farms to that man receive more interest on their investment than the average farmer of the State?

Mr. Denise—Some of them think that way and some do not. It depends a great deal upon whether a man is a first-class, up-to-date farmer. If he is, perhaps he could make a little more by farming it himself. But generally the rent they receive for the land is fully as much as the farmers, taking them as a class, would make out of the land.

The President—The principle is pretty near the same. The farmers don't organize, but there is a central party virtually buying the use of the land, something like 1,200 acres.

Mr. Denise—Yes, 2,500.

The President—That is along the same line, 2,500 acres of land is rented by one individual for the purpose of raising crops for his canning house, and the rent that he pays for the land is certainly much higher than the average net income from the average good farm of the State. As I understand it, he pays \$10 per acre for good land and takes care of it, and that is the interest on about \$200 per acre, and that is the principle. It is the principle, rather than the specific method.

Mr. Phillips—We have an illustration in Fairfield, where a company is carrying on a dairy, and a number of farms were put under one management. I think they have about 800 acres; the dairy business is carried on there, and I understand they are making a great success of it.

Mr. J. T. Allinson—Mr. Brakely, at Bordentown, carries on a farming business on the same principle. He has about 1,500 acres in peas, and I understand it is very successfully carried on.

Mr. Dennis—That is a little different; that is, where a man raises it and brings it himself to his factory. In our community, if we should combine and take a couple of thousand acres to raise potatoes to manufacture starch, that would be something on that line. But if we were going to raise potatoes and market them as potatoes, that is on the line of the suggestion of the Secretary.

Mr. E. S. Black—This illustration of pea farming near Free-

hold is not on the same line with Mr. Dye. If I rent my farm to grow peas on, I still maintain my own home, and the Secretary, if I didn't misunderstand him, in his report strongly urges us to educate the young men for farmers and keep them home on the farm. How can this be done with thousand-acre farms?

Mr. Roberts—As I understand it, it isn't intended to advocate anything of that character. Every man should have his home, just the same as he does now. It is only the community of interest, the community of labor, the community of marketing. That, after all, that selling is the great thing. Now here we get a great glut of produce and we dump it in the market, and the commission man declares he don't know what to do with it, and he must almost give it away. That is what I call a poor way of doing business. I believe we could do better in the disposition of our produce than a great many of us have been doing, and I think that with more system and forethought and active management we could bring that thing about and still every man keep his land and his home.

Mr. Rider—I want to say for the information of Mr. Black that all the good young men on the farm would be interested in such a scheme and would be needed for superintendents and to direct the work under skillful management. So that there would be greater demand for first-class young men on the farm than now.

Prof. Voorhees—This is a business proposition purely that Mr. Dye suggests, and, as I said, the principle in that and the one at Freehold is the same.

Mushroom Production.

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Mushroom Production.

BY CHARLES MCILVAINE, CAMBRIDGE, MD.

Mr. President: Your Secretary has invited me to come to Trenton to deliver an address upon the production of mushrooms. He wrote me that he had many queries from persons in the State in relation to it. So I will confine myself—while I am very much interested in the productions of toadstools and in segregating the edible from the non-edible—I shall confine myself to the production exclusively.



THE fungoid growth known as mushroom has long been luscious to the palates of men. The Cæsars ate of it at their feasts. To this day it is unrivaled upon our tables. For many centuries it has been the choice morsel of the rich and the brave—of the rich because of its flavor and price; of the brave because they were not afraid to select and eat it from among its fellow-toadstools, some of which were known to be poisonous.

Mushroom is the name given to one species of fungi. All other species of the visible kinds are commonly known as toadstools. The cry is almost universal: "A mushroom is edible; but a toadstool is poisonous." This is misleading. A mushroom is a toadstool; mushroom and toadstool are alike, fungi. It is true that in a few genera of fungi there are poisonous species. There is not one poisonous species in the genera to which the common mushroom belongs.

The *Agaricus campester*—the common mushroom—is, with its fellow varieties, a wild species. From it the cultivated mushroom is descended. It is common in most of the temperate regions of our globe. Our pasture fields, our meadows, roadsides and lanes, produce two crops of it annually. The lesser one in

the spring, the greater one in the autumn. Here be it noted that the habit of the campester is changing, and that rapidly, within the last ten years. When I was a boy I do not remember having seen upon the old home farm a single mushroom growing in the spring. The fall crop was plentiful. Now the spring crop in some localities almost equals the autumnal. The habits of many other species of fungoid growth are changing.

The common mushroom is produced from a web-like vine called mycelium. When compacted manure is lifted from your barnyards or manure heaps you have noticed a white, cobwebby substance spread over the layers. This is the mycelium or vine from which a species of fungus will grow. The mycelium of the mushroom permeates the soil of our pastures, our artificial mushroom beds, and at the proper time produces a fruit—the mushroom. For the mushroom is a fruit. Our post-office department long ago classed it as a fruit, and to this day charges one cent an ounce postage upon it, while vines, cuttings, scions are transported by it at the rate of one cent for two ounces.

Mushroom mycelium continues to live year after year in or about the place of its production, unless broken up by cultivation of the ground or other causes.

The first sign of fruiting upon it is in the gathering of a group of cells into a nodule. Under the influence of heat and moisture cell growth progresses rapidly, until at the surface of the ground a squatty, bulblike growth is found which is entirely covered by a continuous skin. This is the so-called button mushroom. It may remain in this condition for several days, in fact, until there is a rain or heavy dew. Growth is then continued. The fruit pushes through the surface, the cap begins to expand, the skin or veil ruptures, the stem elongates, the cap spreads and often within six hours a fully grown mushroom is produced.

Before the cap begins to expand it is connected with the stem by a second veil or membrane. This membrane covers the gills, which are under the cap, and which produce the spores or seeds from which new mycelium grows. It protects the young, tender gills from the attacks of insects. As the cap expands this veil tears. A part falls about the stem as a ring, a part adheres

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to the edges of the cap. It is extremely delicate and shortly disappears entirely.

On the sides of the gills the seeds are borne. These are exceedingly minute, the largest being about the one two-thousandth of an inch. Yet each contains within itself the germ and surroundings which enables it to produce after its kind. These spores are only visible under a microscope of high power. They are readily seen in body, after placing a fully expanded cap, gills down, on a sheet of white paper, and covering the cap with a tumbler. The spores will be deposited upon the paper in such quantities that a perfect print of the gills shedding them is made.

In the very earliest stage of the gills' growth, when they are enclosed within the two membranes, the seeds are white. They almost immediately change to pinkish, then darker, darker, until they are a dark purplish-brown or black. It is the ripening spores that give the color to the gills. Please remember that the spores of the mushroom are dark.

By the wind, by horses and cattle eating them after they are deposited by the wind upon dew-laden herbage, they are disseminated. By another interesting method they are planted. The tumble-bug or rather tumble-beetle—the sacred scarab of the Egyptians—makes up a ball from fresh horse or cow droppings and within it deposits an egg. The male and female beetles (this is the only known instance in insect life where the male insect assists the female in the care of progeny) roll their ball to a distance and there deposit it in a hole dug by them. The rolling covers the ball with a hard casing of earth, which prevents it from falling to pieces and preserves the moisture within. The substance of the ball is the provided food for the larvæ when hatched from the egg. It is more—it is exactly the substance which the seed of the mushroom, contained in the droppings, requires for its germination and the support of the young mycelium. Being planted by the beetle, this mycelium is in position to extend itself into a genial soil. Thus our pastures, meadows and roadsides are planted with mushroom seeds, which produce mycelium or what is called, commercially, "spawn." This meadow planting or that which is produced from the seed is known as virgin spawn, in contradis-

tion to that which is produced by running an old mycelium through properly constituted substances.

Until recent years it was contended by most naturalists that it was necessary for the seed of the mushroom to pass through the system of the pasturing animals before germination. This is conclusively proven to be erroneous.

Seeds taken from ripe specimens of the mushroom are directly used to produce virgin spawn.

So much for the wild mushroom.

The demand for mushrooms so far exceeded the product of the fields that it became profitable to cultivate them. This cultivation of mushrooms became an important industry in France and England, and has grown to good proportions in other countries, notably in America. Yet we are but upon the threshold of what we can and will do in increasing the supply of this healthy and delicious fruit.

Several French and English growers of mushrooms wrote books which purported to tell how to grow them, but it remained for Mr. William Falconer, an Americanized Englishman, I believe—a good man, anyhow—to supply America intelligently with information which, if observed, would lead to success. To him much honor is due for the encouragement he has given the industry. The United States Government, through its Department of Agriculture, has published a valuable bulletin—Farmers' Bulletin No. 204—which can be had for the asking and which all who are interested should get. Write to the Hon. Secretary of Agriculture, Washington, D. C., requesting a copy of it.

Notwithstanding the excellence and plainness of these instructions, quite as many crops of expectations and disappointments will be raised as there will be of mushrooms. Experience is necessary for uniform success.

There are excellent reasons why mushroom culture shall succeed in the United States. The energy and perseverance of our agriculturists will accomplish what they undertake. The agriculturist of 50 years ago have advanced from rule-of-thumb men to be the best of practical scientists. The Department of Agriculture, the Experiment Stations all over the land, the Agricultural Colleges, the Agricultural Societies, such as this of

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New Jersey, the influence of our public schools and public press in advancing education have placed farming upon the very pinnacle of industries.

Science, attention, care, intelligence are required in the raising of mushrooms. They are no haphazard growth. The fake concerns advertising spawn and market will have many victims. The mushroom industry will be controlled only by those who grow or buy the best spawn, and who determinedly study the necessities for success.

The first necessity is a space wherein the heat, moisture, ventilation, can be controlled. This may be in a greenhouse, room, cellar, cave or abandoned mine. It should be scrupulously clean, whitewashed, or better still, periodically sprayed with Bordeaux mixture.

A temperature of from 50 to 63 degrees F. should be carefully preserved and all sudden changes avoided, 55 to 58 being the best. Cold retards mushroom growth; too much heat stimulates the growth to its injury. When coal is used to produce artificial heat, the escape of gas from it is injurious. Summer growing of mushrooms is rarely successful. Excessive heat and the ravages of maggots injure the crop.

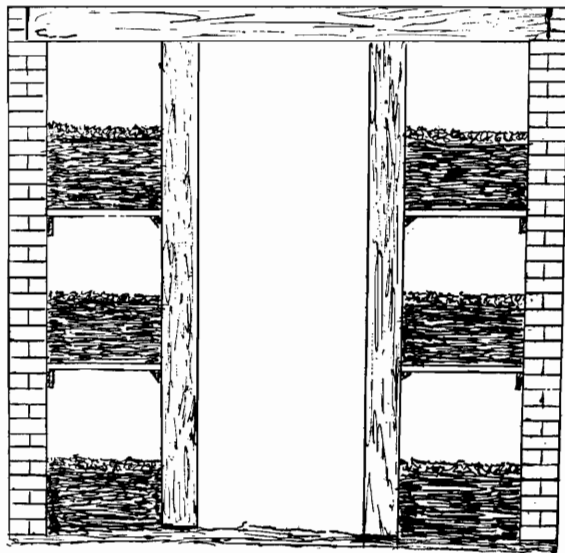
Proper moisture is a necessity, but it should be limited and within the control of ventilation. The evaporation from the beds should be gradual.

Next in importance is the preparation of the manure for the beds. Select or keep stable manure, which has not been exposed to the weather. That from well tramped sheds is best. It should be fresh. Coarse stuff should be shaken from it, but not the straw, unless there appears to be an impoverishing excess. The manure should be placed in a mass about three feet deep and well compacted. If it is not already well moistened, it should be made so by watering. Moist does not mean drenched. If the manure is too dry, or left too long without being thoroughly forked over, it will "fire-fang"—a condition every farmer knows and which is the result of overheating during decomposition.

Heat will be evolved by fermentation in the manure. In from four to six days the pile must be thoroughly forked over and again compacted. In from seven to ten days afterward, fork

over, moisten, if the manure is lacking in it, and repack. Two or three weeks afterward the temperature due to fermentation will begin to fall.

It cannot be said that it is then ready to put in beds for spawning. Now is the critical time. If the manure is too dry, it should be slowly and carefully moistened; if it is too moist, it should be aired. Squeezing a handful of it should never cause drip. The manure should creak in the hand. This creaking is easily felt and is a certain sign that, so far as moisture is concerned, the manure is in a proper condition. The composition of the manure



Bath Beds against cellar walls.

materially affects the length of time required for its fermentation and its producing qualities. This is fully set forth in Farmers' Bulletin No. 204. Time will not allow full treatment of the subject here.

Two forms of beds are commonly made; one flat, of any desired width and from eight to ten inches deep. I think there is extra safety and economy in the ten-inch bed. Flat beds may be made directly upon the floor. Where space has to be economized boxed shelves may be placed one above the other, in tiers,

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and beds made within them. From bottom to bottom they should be three feet apart. As the framework has to sustain considerable weight, it should be strong and well braced and white-washed before each filling. Another form is in that of a ridge—two feet wide at the base and about twenty inches high. These ridges are made in couples, with a narrow walk between the next couple. For several reasons the flat bed is preferable, though the ridge bed is used almost exclusively in France.

While the manure is being placed in the beds it should be moderately firmed, and when the bed is completed it should be of uniform thickness. A thermometer should be sunk in the manure. The temperature will rise rapidly, perhaps, to over 90 degrees. In from six to ten days it should gradually fall to 70 degrees or 75 degrees. Spawning should never begin until the temperature begins to fall and until after it is below 80 degrees.

Mushroom spawn, in brick shape, is that principally used in America. These bricks are separated into pieces about two inches square. A sharp hatchet or cleaver struck on the back is best to cut them with. The pieces are inserted in the bed, so that their upper surfaces are about two inches below the surface of the manure, and from ten to twelve inches apart. The bed is again compressed and leveled over.

In about two weeks the pieces of spawn should have revived and extended the mycelium within them through the mass of the bed. This is called "running." An examination of the bed will show whether or not there is a proper growth. The mycelium is easily visible, and the delicious odor of it cannot be mistaken.

Previously-prepared loam—not clay or sand—should be ready for covering the bed. Pebbles, sod, lumps should be removed and the loam have been well worked over. One or one and a half inches of it, barely moist, should be spread over the bed and leveled. Watering is usually necessary. Should the bed appear to be too dry it should be carefully and moderately sprinkled once or twice a week. Too much water will destroy the young mycelium. At no time should the beds be drenched. After a gathering of mushrooms always sprinkle the bed, as the disturbed loam will require it. Mr. Falconer recommends the use of strong manure water. To obtain full and intelligent instructions upon

all points in mushroom-raising, I advise the purchase of Mr. Falconer's book. I think the cost is about \$1.

The mushroom begins to appear in from six to ten weeks after planting of the spawn, depending very much upon the temperature of the place in which they are grown. Eight weeks is the average. The bearing life of a bed is from five weeks to five months. One-half pound of mushrooms to a square foot is the minimum paying yield, and two pounds is about the maximum. A good bed should average from a pound to a pound and a half to the square foot.

Each day after the mushrooms appear the beds should be picked over. All specimens upon which the veil under the gills is beginning to rupture should be twisted, not cut or pulled, from the bed. These are in their best marketable condition. All fully spread mushrooms should be removed. These latter do not command the best price. To me they, being fully ripened and at their highest flavor, are the best. But growers well know that the consumers who think they know all about the best of things, often know precious little about it, and that tastes vary in different localities. For instance, Baltimore pays the highest price for green-topped asparagus. New York will not have it green. It prefers the white. The policy of the grower is to suit all tastes.

After gathering, the mushrooms are sorted, the stems cut off, any dirt removed with a soft brush. They are then nicely packed in different sized baskets and sent to market. Prices vary from 30 to 80 cents a pound. The demand is always good and fair prices can be confidently expected.

Old beds cannot be again used for mushrooms, but the manure is in excellent condition for other purposes. Often when old beds are thrown out and protected they continue to produce good fruit for home consumption. No doubt experiments will reveal a method of rejuvenating old beds. Much negative information has been obtained already. The discovery will probably be made by elimination. The knowledge of what we do not know about mushroom raising is enormous and constantly increasing. After a while we will be left with what we do know, and will improve upon that.

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The selection of mushroom spawn is a subject of great importance. Bar unknown dealers in it and all advertisers of miraculous products. Great advances have been made in the production of American spawn. I am such a thorough American that I doubt not the very best spawn will be made in America. We are not satisfied with anything but the best, and we are not satisfied to ask any other people to make it for us. The beginner and the experienced grower will find it to his advantage to buy spawn from reliable and well known seedsmen. The cost of the best spawn is trifling when compared to the labor put upon the beds. A crop of disappointments is expensive.

To the beginner I say, go slow. Go on. Go through experience to success. Learn from failures. Profit by the teachings of success.

The importance of mushrooms commercially is partially shown by the quantity passed through the Central Market of Paris, alone, in 1901. There were 4,840 tons. Of these 3,040 were for canning. The statistics show an increase over the marketing of 1898 of 6,000,000 pounds, or 3,000 tons.

There is no necessity for our importing canned mushrooms. We must produce them for ourselves.

The segregation of the edible fungi from the poisonous and inedible has been my special work for 25 years. I have tested over 1,200 species and eaten meals of over 800. Detailed descriptions of these fungi and the results of my investigations are given in my book, "1,000 American Fungi." I mention this to show the food importance of the wild species of fungi, which are abundant everywhere, and which well repay knowing. Some of these species I think superior to the mushroom in delicacy and flavor. I do not think that any of them can be cultivated as rivals of the mushroom, but many of them can be transplanted to favoring spots on your farms and made to produce for your tables and for the market during the seasons in which mushrooms cannot be successfully grown.

Few know the superiority of the common puff balls, and the little conical-capped, black-gilled species which grow in clusters about your barns, lawns, posts.

The popularity of the wild mushroom would be much greater if it were not for the fear of the many in gathering it. They fear, and properly, the poisonous toadstool. I cannot spend a few moments more profitably to you than in telling how you can easily and confidently avoid the deadly species.

I have impressed upon you that the spores of the common mushroom are dark. The gills under the cap vary from pink to almost black. There is not a single toadstool with black gills that is poisonous. Again, the common mushroom always grows in the open. I have never seen it in the woods. In any event, it should be noted as a positive rule: Never eat a fungus found in the woods, believing that it is a mushroom.

The deadly toadstools belong to one genus—the *Amanita*. They all have white spores, consequently their gills are never brown, purplish or black. They have a ring about the stem, and grow from a socket. When in the button shape they closely resemble the mushroom. The *Amanatae* never grow in the open field. They are distinctly wood species. Remember these distinctions and you are free from danger.

In food value, the mushroom does not rank as high as was supposed, but all edible fungi are wonderful assimilators of other foods. The most delicate stomach will retain and digest them.

Within the limit of the cautions I have given you, there is a large and profitable field in growing mushrooms for canning and market. The experiments now in progress under the control of the United States Agricultural Department will, no doubt, simplify and improve present methods, and place success within the reach of all who intelligently observe the directions given.

I have now told you all that I can about growing mushrooms. I have given you what I believe to be the secret of preparing the manure. If the manure is too wet the young mycelium will rot and you will have no product from it. If it is too dry the mushrooms will in all probability be small, your crop will be very much delayed, and you will not have such a crop as you will have if the bed is in proper condition.

Again let me caution you. I have had many letters from all over the land, from persons who had saved some money, some

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from ladies, and they thought of going into mushroom raising and wanted to know if I thought it would pay. I have unhesitatingly written them that it will pay, but it will not pay them to put their all into it. Make a bed, a small bed, try it, make your notes of what you have done, what your success is, profit by that experience and then go on. You will have many failures, but after you have learned you will have no trouble in making mushroom raising a profitable industry. There is no reason why New Jersey, with her facilities, nearness to market, should not lead in the mushroom industry in this country. In Maryland, and especially the eastern shore, they haven't begun to raise mushrooms, so that New Jersey has an opportunity to get ahead of them very nicely. (Applause.)

A Member—Do I understand the Captain to say that no poisonous species grow in the open?

Captain McIlvane—No; I said there were no deadly poisonous species that grew in the open. There is a marked difference between the fungi which disagrees with the digestive organs of some persons and the deadly poisonous species which will disagree with all sorts of digestive systems.

Secretary Dye—Mr. Sterling has been referred to; he is a Trentonian; perhaps he has a word to say on this line.

Mr. E. B. Sterling—Mr. President and gentlemen, this is entirely unexpected to be called upon this afternoon to make an address before this Board of Agriculture on the subject of toadstools, after my preceptor in that line has given such an able talk. Some years ago, in 1897, I read an article in the *Philadelphia Press*, by Captain Charles McIlvane, upon the subject of "Fungoid Growth." At that time I only knew one variety of toad-stool. That was the ordinary mushroom (*Agaricus campester*). I made up my mind to get better acquainted, at least, so I would be able to discriminate between the poisonous and the edible. Many walks through the woods in the neighborhood of Cadwalader Park led me to think that there was a good deal of fungoid growth in that locality that was edible, and that it was not known to the majority of mushroom-gatherers that such food was edible. I placed myself in correspondence with

the Captain, and he gave me a very nice reply. He said what I have never forgotten, that he might be of great service to me, but I could not be to him; the simple reason was that he knew them all. I thought he did at that time. He knew about 600. Later on he got to know about 800, and still later on about 1,000. He found out that there were being more discovered, and he was proving the edibility of many of them on the suspected list. I believe Captain Charles McIlvane has done more in this country to prove the edibility of the American fungoid growth than anybody else, and I am one of his disciples. In this neighborhood alone I believe I have reported upwards of 700 varieties of fungoid growth. Of that lot, in the deadly growth, belonging to the Amanita family, out of the family of twenty-eight members I have found twenty-three, ten of which are deadly and will always remain deadly. Several of that family are edible, but that is the one family alone, that you learn of, that is deadly that you can discriminate from very nicely. Outside of that family most everything in this locality is good to eat.

In the woods alone, while the ordinary field mushroom this last year has been exceptionally scarce, and for three years preceding it, I have gone in the coldest day in winter, with the thermometer ten to fifteen degrees above zero, and come back with a basketful of the *Hypholoma perplexum*. I have gathered them by the pound. I have eaten, and my family have eaten them, and enjoyed them, and I have given hundreds of them to my friends, and nobody ever spoke any way but favorably of them.

In the neighborhood of a three-mile limit from the City Hall I have counted in some summers thousands and thousands of edible toadstools that have simply been going to waste. In 1898 and 1900 there was fungoid growth up in the neighborhood of Cadwalader Park, in the fields, that the ordinary mushroom gatherer would simply think were poisonous. There were hundreds at that time of the ordinary puff balls (*Calvatia cyathiformis*) being found, and they were being kicked by the toe and stamped upon by the heel. I tried in that season, 1900, to get a number of my friends to eat them; some did not, while many did so. You could not get the mushroom gatherers to eat them. They thought they were poisonous. In October, 1900, there was

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quite a fungoid growth that appeared in the pasture fields on the Atterbury farm, near the woods. I had been tramping over there, perhaps, three years without seeing a single specimen of the variety found. At that time I counted and gathered 250 specimens one afternoon of what we call the "Lepiota naucinoides." It is an American variety of an English specimen, and they are most delicious eating. They remain in a white condition for about two days before they change into a pink condition, and that is the reason why the ordinary mushroom gatherer failed to notice that they were edible. They thought because they didn't change dark right away they were not fit to eat. It was a feast for me. The variety disappeared the next year and I haven't seen them since. That is one of the strange things in the fungoid growth; they will come and they will go.

Two years ago I spent some time in Colorado, and I made up my mind to investigate the fungi of that State. I did so. I went out one day on the prairie, without thinking of finding a toadstool out there, and I met a man with a knife. He went around digging up the earth. I said: "What are you doing?" He replied: "I am hunting for mushrooms." "Out here?" I said. He said "Yes." It opened my mind. We have them above the ground here, out there they have them below the ground, and I have found them with stems six inches long. The deeper down they are the better the stem, the more juicy, because of more moisture. There are plenty of mushrooms, however, that grow above the ground in Colorado and some just at the surface.

In my investigation of the fungoid growth in Colorado I gathered hundreds and hundreds of specimens of puff balls. There they have the small puff balls, with and without stems. I found a number that had never been recorded. I sent to Mr. C. G. Lloyd, of the city of Cincinnati, Ohio, and to Professor Charles H. Peck, of Albany, New York, State Botanist, hundreds of specimens in all conditions of growth, from the immature specimen to the advanced one, and I demonstrated by my own eating of the various varieties of those little things called *Catastomas*, *Tylostomas*, *Calvatias*, *Mycenastrums*, and others, yet nothing of a poisonous nature in toadstools was found by me in that State. I brought hundreds of specimens home with me that are now at my home.

I have been trying this last year by distributing spores around my lawn and other localities to see if I could get them to grow. If any of you gentlemen would like to experiment with them on mushroom beds I would be very glad to give you some of those puff balls and toadstools from Colorado and let you try to grow them.

It has been great pleasure to me to know Captain McIlvane, who has certainly been a friend to me. When I began I sent hundreds of specimens to him. I would send them to him fresh by express. The great difficulty in that is the vermin get in and they go to ruin before they can be identified. That is why it is difficult to identify them at a distance. I have had no one here to confer with in this city, hence a great many varieties have been lost. Professor Peck has also identified hundreds of my specimens and given me the honor of discovering several new varieties—some 22 in all. My home is on Edgewood avenue, near the park, and at any time if I can be of any service to you gentlemen, it will be a pleasure to identify any that you may raise. I have myself eaten over 300 varieties of toadstools, and I am not afraid to try anything that Captain McIlvane has in his book as edible.

Mr. Roberts—When you find a mushroom and have doubt about it, how do you test that as to whether or not it is poisonous?

Mr. Sterling—I endeavor to get as many specimens as possible from the young growth to the old growth. I cut off the cap of an expanded specimen and lay it on a piece of paper. If I could get the spores of that mushroom I could tell you what family it belonged to, the white, the brown or black, and in that way we trace the genera of each family. The families are divided up into white, pink, brown, purple and black spores, that is five distinct varieties. You take the ordinary mushroom, cut the stem off, lay the cap, gills down, on a piece of white paper, where there is no draught, and in about half an hour or an hour you get the perfect form of the toadstool and the exact color of the spores, and can tell to which family it belongs.

Captain McIlvane has issued a series of charts from which you can tell exactly to what family they belong. Growing

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around the roots of your trees or stumps there are hundreds of specimens. I get my best eating varieties from decayed stumps and trees in the woods. The oyster mushroom (*Pleurotus ostreatus*) the Hypholomas, beefsteak or liver fungus (*Fistulina hepatica*) and a dozen other varieties, mostly all gathered in the woods. I am not afraid of anything poisonous outside of the Amanitas. There is a most elegant big fellow that grows around the roots of trees known as the *Clitocybe illudens*. It is a very showy variety, bright orange. The Captain can eat it, but I can't. It would make me very sick at the stomach about five hours after eating, but a little dose of whiskey and sweet oil would pass it off all right.

Secretary Dye—Is demand for toadstools and mushrooms increasing?

Captain McIlvane—It is, very marked and very rapid. In greater proportion in America than it is in France, and I showed you the increase in three years in France. It has become now one of the industries of the country. It would not pay any farmer to raise them on a small scale except for himself or to start, and then to raise them on a large scale. He should not try to raise them on a large scale until he has raised them on a small scale. You can raise 45 pounds and sell them at any time, and you can sell as many as 100,000 pounds if you raise them. To make a profit you want a large yield, and your expenses are reduced in proportion. There is one great advantage, and that is the manure is as good after it is used, and really better than it was before. It is rotted. There is a very small amount of nitrogen taken from it, and I have found where I have used it on subsequent crops that I had equally good results from manure which I had used in a mushroom bed.

Mr. Angel—I am very fond of mushrooms, but last fall I didn't find one, and I would like to know how to make use of a bed growing in my front yard, both for the larger ones and also the puff balls. The puff balls grew to enormous size in my yard, some to 2½ inches in diameter and quite prolific. I would like to use them if they can be used.

Captain McIlvane—Every puff ball which you find is edible, provided it is white inside. Every puff ball is white inside when

it is young. As soon as the spores begin to ripen it changes to yellow, and as soon as that change begins the puff ball becomes bitter. It is not poisonous then or at any time, but it is only edible when it is white inside and fresh.

Now, in relation to your puff balls, I have seen them in England weighing 40 pounds. They have been grown in Spain weighing 90 pounds. I have seen hundreds in West Virginia weighing 15 to 20 pounds. I have found them in Maryland four or five pounds in weight. You have them around here weighing a pound and a half or two pounds, probably the largest you find. When you find them, just break them open, and if they are white, take them home, stew them a little while in milk, season them with butter, pepper and salt and you never had a more delicious dish—sweetbreads are not in it—calves brains are the next thing to it. You can fry them just as you would potatoes or egg plant.

Now, while I am talking—when I get started I can't stop—I want to tell you something about puff balls. They grow in great quantities all over the land. If you ever noticed how a cow or a lot of steers, when you turn them into a meadow, as soon as they get in and there are puff balls there, they will knock every one of them over, and then they will eat of them as they please. The reason is this: If you cut off the top of a puff ball, or break it, the spores will not ripen and they will always remain sweet. In England that is taken advantage of, and when one of those 40-pound fellows grows up, they slice off a mess and keep on slicing off until it is used up. Now the cow knows as much as an Englishman. (Applause).

This little fellow that you are talking about that grows in your lawn, there are several specimens of that; they all have black gills and dissolve into ink as they ripen. You can write with it. They still use it as a commercial product in England to make black ink, made from the juice of the fungi. There are many kinds of black gill species, which grow about your lawns and around in your dump piles, or where ashes have been deposited. You will find the ground thrown up and you will find the top of the mushroom in compact clusters. They are simply delicious. This little black fellow that grows around your pasture and

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lawns and barnyards you can cut and eat it at any time, if you wash them well. I will tell you something about washing them: Let them drain a little while, and there will be enough water contained in the gills to cook them with. Let them simmer five or ten minutes and put butter and pepper and salt on them and you have a feast fit for the gods—I think the gods had entirely too good eating, for they were a most disreputable set anyhow. At any rate, you will get a good feast.

It is culinary heresy to peel a mushroom. Nearly all books say to peel them. It is simply heresy. The skin of the mushroom is one of the most delicious parts of it—decidedly the most delicious part of it. It contains a large percentage of the flavor. Whenever you are collecting mushrooms or toadstools, never turn the gills up; always keep them down. If you turn the gills up and deposit them in a basket with the gills up, the sand and dirt will get in those gills and you can't get it out. But by keeping the gills down you keep the sand out from your dish. Then throw your mushrooms into a big dishpan of water and run your finger up and the sand will come out and drop into the bottom of the pan, and if you run them through two or three waters all the dirt will come out, and you will have a clean lot of mushrooms. Then let them drain awhile, and then cook them as you please. There is only one way you can spoil them, and that is by skinning them.

Mr. Roberts—There is one time-honored mushroom that I have looked at for many years. We have one single specimen. Every Autumn it comes up on the place of a friend of mine near a big white oak tree. It looks like the top of a bushel basket. There is only one specimen, but it is a monstrous big white fellow. Ought he to eat it or let it rot?

Mr. McIlvane—You will have to tell me more about it.

Mr. Darnell—That mushroom grows under a wide-spreading white oak tree. It is probably eight or ten feet from the butt where it comes up and it stands there about two or three weeks, and I have seen the stem get from one inch all the way up to ten inches high. The top is dark brown, and the stem, I think, is white; it apparently comes up in a night, and is probably one to three pounds in weight.

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Captain McIlvane—Is the top fuzzy?

Mr. Darnell—No; when it gets pretty large it cracks open.

Captain McIlvane—It has gills under it?

Mr. Darnell—I think it has.

Captain McIlvane—You can eat it without fear; if I were you I would eat it young. It is perfectly edible.

The Developing of Market Garden- ing Southward and its Lesson to the Northern Trucker.

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BY W. F. MASSEY, RALEIGH, N. C.

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The Development of Market Gardening Southward and its Lesson to the Northern Trucker.

BY W. F. MASSEY, RALEIGH, N. C.

Those of us who have been engaged in horticultural matters for the last forty or more years have seen a great development in various directions. When I can first remember it was the general opinion among market gardeners that the supplies of the staple vegetables for the cities must always be grown in the immediate vicinity of the markets where large supplies of stable manure were available. And even when some Jersey men began to grow green peas for the New York and Philadelphia markets with their sweet potatoes, the market gardeners about New York and Philadelphia said that probably they could do this, but that bulky vegetables, like cabbages, must always be grown near by, as they required heavy feeding and would not bear long transportation.

Even when a few venturesome men essayed the work of growing some extra early vegetables about Norfolk, Va., away back in the forties, they found it necessary to supplement the limited supply of stable manure there with manure freighted by water from New York that cost them ten cents a bushel on their shores. And even after the introduction of Peruvian guano the market gardeners near the cities looked askance at it and said that while it might do for the farmers' crop, it would never do for market gardening. I think that it was the late Peter Henderson, when engaged in trucking at Jersey City, who tried the use of guano in a market garden for the first time. The success that attended this trial made him confident that a liberal application of Peruvian guano would answer for a time on the market garden, but he

was of the opinion that every three or four years it would be necessary to return to the stable manure to keep up the supply of humus in the soil in their gardens on high-priced lands that were cropped continually. And under his conditions he was probably right. But gardeners at a distance had found out the value of the Peruvian guano, and on cheaper land they could well afford to crop in rotation with clover and other legumes to take the place of humus-making stable manure. Then for a time it was thought that Norfolk was as far South as the production of garden crops could ever extend, as it was assumed that even if there was railroad transportation further South the cost would be too great to compete with the water-borne crops. True, there had been some effort in the growing of truck crops near Savannah, Ga., before the Civil War, but this was mainly of water-melons and such things as would stand the long travel in ocean steamers. The war brought a sudden check to market gardening in the South, and for a time the Jerseymen had it mainly to themselves. One spring I had the honor to send to New York the first barrel of green peas that was sold there. I had been released on parole and was wearing out my last suit of gray and had to do something. So I rented a poor, old, sandy farm in southern Delaware and tried to grow some truck. I suppose that nowadays there is no first barrel of green peas, or first of anything, since the demands of the market have called in supplies from far and near and the supply is always in evidence.

After the war the market gardeners about Norfolk quickly started again and the culture there attained large proportions, which it still holds, owing to the increased transportation facilities by rail and water both, the water transportation preventing the railroads from extortion. This cheap transportation has been a wonderful factor in the progress of trucking and small fruit-growing about Norfolk, added to a soil and climate exceedingly favorable to the growers. For a time the difficulties of rapid transportation by rail from further South interfered with the development, but the modern consolidation of fragmentary roads into great systems has been one of the most effective agents in the development Southward. Then, too, the growers were learning new methods. For years after the war the steamers

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going South were loaded with seed-potatoes for the planting of the early crop, as it was deemed essential that Northern-grown seed should be used. About 1868, when gardening on the eastern shore of Maryland, I, one spring, tried a small patch of winter-planted potatoes covered with straw. I had a fairly good and early crop, and in digging there were many small potatoes left mixed in the rotted straw. The spring had been an unusually early one for northern Maryland, and being pushed with other work, that piece of land was left for a time undisturbed. When I came later to go to work on it for fall crops I found that the potatoes were sprouting freely, and I concluded to let them alone and merely pulled the big weeds out from them by hand. They made a better crop than the early one. I wrote to friends in Norfolk that I believed they could grow this second crop as a regular thing, and from that the practice started of planting a second crop from the early one. But neither I nor others then realized what this second crop meant for the South, and it was only when some daring man tried the planting of these potatoes in the spring that their true value was discovered, and growers found that they had the best seed-potatoes to be had. Now, few Southern market gardeners plant any Northern-grown potatoes, except for the trial of new varieties. The methods of the treatment for the second crop have been studied so that the crop is now as certain as the early one, and generally more profitable. These second-crop potatoes being dug about the first of December and planted again in February, are out of the ground so short a time that they do not sprout. The Northern potatoes that have been dug early in the fall sprout in the cellars in winter and have the sprouts rubbed off. As is well known, the potato is simply a cluster of stems surrounded by an accumulation of starchy matter, it is evident that when they sprout some of the stored food in the tuber is used up, and when planted they shoot a bunch of sprouts from the lateral eyes on the stems. The Southern second crop grows with the strong growth of the terminal bud, making a strong single stem, instead of a bunch of weaker ones. Another characteristic of the Southern seed-potatoes is their ability to resist spring frosts. This is probably owing to their greater vigor, and the fact that the store of food was not drawn on by sprouting.

But whatever the cause, it is well known that a spring frost in the South that will cut plants from Northern seed to the ground will but slightly singe the home-grown plants. Then, our Carolina gardeners have found another value in the second-crop potatoes. When they are dug they are piled in ricks across the field and covered thick enough with earth to keep out the frost. Then, when the Bermuda crop begins to come in, they are taken up, put into double-headed barrels, and branded with the Bermuda black diamond, and go to market as "New Bermudas." The only fraud is that they do not come from Bermuda, for they are better than the real Bermudas. I have seen returns from these from \$2.50 to \$5 per barrel, and as it is common to make 65 to 75 barrels per acre the crop is reasonably profitable.

The old idea that railroad transportation could never compete with water carriage has long ago been exploded. The great railroad systems have found that their interest lies in giving the most rapid service to the truckers and berry growers in the spring, and with these fast through freights came the extension of the work, aided, of course, by the modern liberal use of commercial fertilizers, for without these the progress could never have been made. Florida found that her dream of oranges all over the peninsula came to an abrupt end with the great freeze, and while some oranges will still be grown as far north as Palatka, the commercial growing must be done far enough south to be free from danger of freezing. Then northern Florida and south Florida, too, engaged more largely in the culture of vegetables, and is making more than she made in oranges. All along the South Atlantic coast there have grown up great centres devoted to certain specialties, as the growers found their soil and climate suited to them. In eastern North Carolina, while there is some trucking done all along the Atlantic Coast Line Railroad, the great centre of vegetable culture is about the city of New Berne, where there is both water and rail transportation. About the little town of Mount Olive, on the Coast Line road in Wayne county, they have a soil consisting of a dark moist loam underlaid with a compact clay. This soil has been found particularly adapted to the strawberry. Further south, in Columbus county, there is a similar soil, and there a settlement of Michigan people has grown up

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from a little colony. They are intelligent people and are devoting their energy to the strawberry with wonderful success. They send the first really good berries that go North, for their fruit is far better than any that comes earlier from further south. Their settlement, Chadbourn, has grown into a prosperous town from nothing, and the growers are making fortunes. Both here and at Mount Olive the berries are now sold for cash at the stations, no growers ever shipping any. The dealers have their refrigerator cars at hand and a wagon drives up, the berries are examined and bid for, put in the car, and the grower takes his check to the bank and gets his money. Last spring over 2,100 refrigerator car loads were shipped from these districts, besides large quantities that went by express. South of Mount Olive, on the same road, is the town of Magnolia. There the soil is a peculiar black sand, perennially moist. But the growers there found that strawberries grown on this soil were always too soft for shipment, and the strawberry was abandoned. But it was found that the moist sand was peculiarly fitted to the growth and perfection of the tuberose bulbs, and gradually they got into growing these on contract with the dealers in the Northern cities, till now the whole supply of tuberose bulbs for Northern and the English markets is produced in this locality. But the tuberose lost a good deal of its popularity from the use of the flowers for funeral purposes, and the price is not now so remunerative as it formerly was. But still there are hundreds of acres planted there annually, most of which are handled by two firms, who have large heated curing barns. The lower price for tuberoses induced them to try other bulbs. Now, in addition to the tuberose, there are grown about Magnolia about fifty acres in cannas, fifty in *caladium esculentum*, twenty in *gladioli*, and large areas in dahlias, *crinums*, *amaryllis*, *narcissus*, with a few Roman hyacinths.

As I have said, the city of New Berne is the great center of the market gardening with vegetable crops. From this point fully 100,000 barrels of early Irish potatoes go North every June and often as early as late May. Immense areas of early peas, cabbages, snap beans, cucumbers and melons are also produced. But the greatest development of late years has been in the line of winter gardening, especially with winter lettuce. The lettuce

crop of eastern North Carolina this winter and spring will be well over half a million dollars. It is the one crop that has always paid well, and the leading growers at New Berne, the most progressive one of whom was born in New Jersey, are wide awake men and are using every means in their power to promote their industry. I rarely go to New Berne, but I find some new development in the trucking line. I visited the growers there recently, and though I have been familiar with their work for many years, I must confess that I was surprised to see the progress they are making. The Northern truckers found out long ago that to compete with those in more favored climes they must use artificial means, and from here to Boston and northward the use of heated glass structures has become a leading feature in the gardening, as wealth increased in the large cities and there were people able to pay fancy prices for the best things out of season in competition with the poorer stuff that comes from far South. So in the upper South they are finding out that they must compete by artificial means with those south of them. Many years ago I was successful in the growing of lettuce in cold frames in Northern Maryland, and I tried to get our growers to see the advantage they have for this culture. But they were scared off by the great cost of glass for large areas, and instead adopted frames covered with cotton cloth. These did very well till an occasional heavy snow came and was followed by unusual cold. Then the cloth was found wanting. But the practice had been so profitable that they have adopted the plan of having a great steam heating plant, and running small steam pipes through the frames under the cloth. If it was necessary to use this steam regularly the cost would soon exceed that of simple glass. But at New Berne they assured me that it is only six or eight times during the winter that the steam is needed to keep the frost out.

Their frames are made nine and a half feet wide and about 150 to 200 feet long, and the ridge poles, cross bars and ends are all removable, so that the frame can be prepared with a plow and mule. With the steam-power came a still further and more important improvement. At the farm of Hackburn and Willett they have 16 acres irrigated by steam pump. The water is carried from the pump in a large main running

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through the center of the plot and high enough to work horses beneath. From this main are one-inch perforated pipes running overhead each way 40 feet apart. Each line of pipe waters twenty feet each way. Six of these acres are in frames covered in winter with cotton cloth, so that the cloth can be drawn down and the whole watered quickly. It is the practice with most of the growers to plant early in the fall a crop of lettuce that is cut out by the first of December, and then the frames are re-planted for the spring crop. But the firm I have mentioned found, as I also found at Raleigh, that this was the cause of a great deal of rot in the spring crop, which usually brings the best price. Hence they plant but a limited area in the fall crop and follow this with early beets, which are now probably up and growing. When I was there, the first of December, they had just finished cutting the fall crop from an acre and a quarter of lettuce, for which they got over \$2,000. In the frames where the crop for late winter and spring is planted they manure heavily with well rotted cow manure, and in order to prevent the hands setting the lettuce plants too deeply, which prevents good heading, they run small ridges with a hand-wheel plow, on which the plants are set. As soon as the lettuce recovers from the transplanting, they scatter in the furrows between these ridges a high-grade commercial fertilizer at rate of 1,500 pounds per acre, and the ridges are then raked down and levelled, leaving the plants just right. When this crop of lettuce is cut out in the early spring, the frames are at once planted to cucumbers and the protection continued till the weather is warm. The cucumbers are shipped North, and when the price is no longer remunerative they are gathered and put into large tanks in brine. I was shown two of these tanks, each of which hold 50 barrels. These are sold to the picklers from the brine, and many retailed to private parties in the town. After the cucumbers the frames are planted in the second crop Irish potatoes and cultivated by mule-power. They then find that they can manure again and go back to lettuce in December. In the frames where the fall crop of lettuce is grown, they sow beets, and follow the beets with Rocky Ford melons, and then back to fall lettuce.

The firm of Hackburn & Willett formerly cultivated about 500 acres in truck crops. But the increasing scarcity of labor through the negroes going off to the railroads and mines and north has compelled them to concentrate their efforts on a smaller area. They now work 45 hands during the winter and as many more as they can get when the spring opens. The three crops of lettuce, cucumbers and potatoes are expected to pay about \$3,000 an acre gross, and it costs about \$1,000 an acre to prepare for the work. When I was there they had just lifted their crop of a second crop potatoes, not all, of course, grown in the frames, amounting to 1,800 barrels. They had about 2,000,000 cabbage plants that they were rapidly setting. I was much interested in their method of setting these. The land is a deep black sandy loam, in fact a reclaimed swamp that is well tilled. The cabbages were being set on ridges with deep furrows between to keep the winter surface water away. The ridges were made and the fertilizer put in the furrow at one operation with an Aspinwall potato planter. Then a home-made machine consisting of two open rollers made of wooden wheels set about a foot apart with cross pieces to mark the distance for the plants on the ridge. There were two of these rollers running on two ridges, and behind them were two sled runners marking the row lengthwise. Then behind the mule that drew this marker came the planters with trowels, and the rapidity with which the negroes set the plants caused me to think they were not well set, for I timed one setting 60 plants a minute. But examination showed they were all right. Some Portuguese laborers are employed and are found very good.

The area in early peas there is also very large. Several years ago the green pea louse came down on them, and I was hurriedly sent for to tell them what to do. I found a field of 125 acres and every plant loaded with aphides. I told them they could do nothing that would not cost more than the crop was worth, and that the only thing to do was to prevent their coming another season, for after they are there it is too late. I told them that in all my experience as a gardener I had found tobacco to be the sovereign specific against plant lice of all kinds, and that as they could buy tobacco stems and dust from the factories

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they should use tobacco stems in manuring the peas and then dust them over with tobacco dust. They took my advice and that was the last of the green pea louse.

I was very much amused not long since at a bulletin from a station entomologist with a cut showing two men, one holding a pan and the other brushing the aphides from the plants into it, and I came to the conclusion that the entomologists do not know it all by a long sight. The man who waits till the insects are there will usually get badly left. Prevention is the only thing with most of these things.

The use of protective means and steam is but the beginning of artificial culture in the South, and it will not be long before real winter forcing is under full sway with heated glass structures all over the garden section of the upper South. The abounding sunshine and the absence of the long dark spells in winter give the southern grower a great advantage over those of the North, while the need of far less fire heat will be the chief advantage. The Norfolk growers are far behind those of North Carolina in this winter frame culture, and the only lettuce they grow is set on ridges in the fall like cabbage plants and sold in fall and spring with the natural advantage of their climate over that north of them. With their cheap freight Norfolk would be an ideal place for winter gardening under glass. I believe that the time is at hand when our growers will be forcing strawberries, tomatoes and pineapples under glass. I have produced tomatoes in greenhouse very successfully and sold them in our home market for three or four times the price of the Florida product sold alongside of them, and I once grew a house of pineapples, which shows they can be grown profitably.

But there is at least one plant with which the South can never compete with you. This is the general commercial culture of the tomato. When I went to North Carolina fifteen years ago last September I was astonished to find tomatoes then selling by the dozen and no more on the market than would be found in a cross roads village in Maryland. I thought I would show the people how to grow tomatoes. But I soon discovered that growing tomatoes in North Carolina was a far different matter from growing them in Maryland, and while you can grow tomatoes

here for the canning houses for six to eight dollars per ton, after fifteen years' experience in the South I would not to-day take a contract to grow them there for fifty dollars a ton. To supply my family with tomatoes for slicing raw during the summer, I need fully 500 plants, while here in New Jersey that many plants would not only supply the family, furnish some for canning, but some for the neighbors. Last winter I made this statement at the meeting of the Maryland Horticultural Society in Baltimore. A gentleman present said, "Why, they grow tomatoes in Florida." "True," said I, "but if the Florida growers could get but six or seven dollars per ton they would soon quit the tomato. They grow them during the early cool season, and get fancy prices for what they grow, but they cannot compete in crop with the Middle States." For years past there have been sporadic efforts to establish canning houses in North Carolina, especially for tomatoes. I have warned them every time that it was useless for us to try to compete with the North in this, and every effort was a failure, so that to-day I do not know of a successful canning house in North Carolina. The chief trouble is the bacterial blight, which we have never found a preventive for. One may have splendid plants, full of green fruit, and expecting soon to have ripe fruit, when in a night they are gone and withered. The only thing we can do is to avoid land where tomatoes or egg plants have been grown in recent years, for the disease is as bad with the egg plant as the tomato. Last summer I had two plots in my garden in egg plants. I bought the plants from the North, to be sure that they were not infected. One plot was heavily manured with manure bought in the neighborhood, and the other with commercial fertilizers. The land, I felt sure, was not infected. But the manure evidently brought the infection, and I lost every plant in the manured plot as soon as they were showing fruit, while in the fertilized plot there was a fair crop. Liming the land seems to check the blight for one season, but no longer. Then, while we may get early tomatoes on well-forwarded plants, they are pretty certain to die with the heat about the last of June or early July, and though one cannot perceive that the heat is any more than here, there is something in it that the tomato will not endure at that stage, and if one has not then some late-sown plants

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to take the place of the early ones he will be out of tomatoes the rest of the season. One would suppose that these tender plants would flourish more in the South than here, but it is not so. Look at the little egg plants that come from Florida—and they are about as large as they would get—and then look at the monsters that you grow in New Jersey, and you can realize the difference. With vegetables and fruits that grow in the open ground I do not know that the South has much advantage over you. We get them earlier, it is true, and sometimes get a large price for them. But when the price falls to a point where you could still make a profit, our growers must stop. And so with these things each section will have its own chance at the market, and nearness to market is the one great advantage that New Jersey has over the South. One thing the South has taught the growers everywhere. This is the use of a light and cheap package. What a cost the old-time strawberry crates, and what a job it was to get them returned; for if they were not returned the whole profit of the fruit was gone. Now, with the veneer packages that the South was compelled to adopt, there is no more worry about packages, and the Southern carrier has simplified the sale of fruits of all sorts.

The latest great advance in transportation is the refrigerator car. Used first in the transportation from California, its use has rapidly extended in the South, and is now used almost exclusively for such things as are benefited by refrigeration, and the refrigerators on fast freight trains have almost entirely superseded the use of the express cars by truckers and small fruit growers, and all along our railroad lines immense ice houses have been established as stations for icing the cars. Last spring, going South on the Atlantic coast line, I met in the strawberry district of North Carolina a train of 43 refrigerator cars loaded with the berries going North for distribution to various points. The South is also teaching the value of selling at shipping points. The great advantage of selling at the shipping points lies in the fact that the dealers know better how to distribute the cars and prevent a congestion and glut at any one point, as it is well ascertained how many cars can be handled profitably in each city, and they go there unbroken and fresh, and the prices obtained by the

growers are more uniform and certain than where each shipped on his own account, and the middle man, instead of being an injury, is a help to the grower, for their interests are identical.

In North Carolina especially there is wonderful capacity for increased production in this line, for there are thousands upon thousands of acres of the most fertile land in the country that only await capital for drainage and transportation to make them gardens of great productiveness.

From the great Dismal Swamp in Virginia and North Carolina south to Cape Fear there is in the coast plain of North Carolina a series of great swamps from 150 to 200 square miles each. These swamps are the highest land in the section, great artesian springs welling up and flowing to the sea and sounds, for all the rivers of the coast country have their rise in the swamps. Lake Drummond, in the Dismal Swamp, is but sixteen miles from Norfolk, and the level of its waters is twenty-two feet above tide at Norfolk. The present canal opens up some fine farms near it, and if the canal was cut through from tidewater level at Norfolk to its outlet in the Pasquotank river in North Carolina, it would drain a body of land that would make the Illinois black prairies look like thirty cents. Wherever there has been any drainage of these swamps the results have been wonderfully profitable. In Hyde county, N. C., the State many years ago cut a canal from Lake Mattamuskeet to Pamlico sound, which lowered the level of the lake a number of feet and opened up a series of splendid farms around it that for many generations have been cultivated in corn, and to-day will make more corn than the black lands of Illinois. Recently this section has been devoting some attention to truck crops that can be shipped by water since they are entirely cut off from railroads, and they are gradually developing in this line. Probably the largest potato grower in the United States is in this county. Last season Mr. Makely, of Hyde, grew 60,000 bushels of early Irish potatoes, and the deep, black, peaty soil has been found well suited to onions and other crops. While Florida, Savannah, Charleston and other more Southern points are developing in the production of garden crops, Eastern North Carolina, from its location nearer to market and its vast area of soils of wonderful fertility, promises soon

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to become, if it is not already, the great truck and small fruit center, and ere long will rival Holland in the production of flowering bulbs for the florists' use. It is known to the trade all over the country that I have for years been experimenting with bulbs at our Experiment Station for the purpose of helping our bulb growers. I have, however, been handicapped by the fact that the soil in our rocky hills about Raleigh is not the best for many of these. My experiments with the Bermuda lily have not been as successful as I hoped, but I am satisfied that in the deep peaty soils of the coast country these will be grown as well as in Bermuda, and I have sent bulbs there for trial. At the Station I have found that the *Gladiolus* thrives wonderfully. Three years ago I bought 100 of Groff's new Hybrid *Gladioli*. This season I have lifted over 15,000, all the product of the 100 started with three years ago. In the fall of 1903 the Department of Agriculture in Washington sent me 150 bulbs of tulips that had been grown in the State of Washington. Last spring I lifted 750 bulbs from these of all sizes, many of them fully as large as the Washington bulbs, which were of very fine size. The various *Narcissus* do not make bulbs quite as large with us as the imported ones, but they force under glass and bloom fully as well, and I believe that in the rich soils of the coast plain they will grow as large as anywhere, as the moisture of the soil there is more uniform. Roman hyacinths can also be produced there in greater perfection than the imported French bulbs, and in skillful hands will soon make their place in the market. At Raleigh I have found that it is necessary to defer the planting of these till the ground is cold, for if planted early in the fall they grow at once and get into bloom by Christmas, and then have the coldest weather of the winter on their tops. I tried the production of these at Southern Pines, in our sand hill country. But there the difficulty was that the sand got hot too early in spring and ripened the bulbs prematurely, so that when forced in New York, while they bloomed earlier than the imported bulbs, they did not make as large spikes. In the moist black soil of the strawberry section they do far better. For a few years past a Hollander has been at work with bulbs on Roanoke Island, in a sandy soil much like Holland, and he is producing bulbs that sell readily

to the northern trade. *Amaryllis Johnsonii* has done finely with me and makes bulbs of enormous size. I was amused by the catalogue of one of the leading New York dealers offering bulbs of this *Amaryllis* started in four-inch pots. It would puzzle him to put one of my bulbs, 13 or more inches in circumference, with a mass of live roots, into a four-inch pot. One hundred of my bulbs shipped to a dealer in Chicago, packed a flour barrel. Already the trade north is looking to Eastern North Carolina for many bulbs, and ere long the industry will develop there till thousands of dollars now sent abroad for bulbs will be spent at home. In other horticultural lines the South is also getting near the front. Piedmont, Virginia, the home of the famous Albemarle pippin, is coming to the front in apples, and by reason of the liberality of the Chesapeake and Ohio Railroad they can ship their apples to England at very low freight. At the Miller School of Albemarle, Va., where I formerly was, the school built a macadamized road to the railroad at the foot of the Blue Ridge, and built the station there. From that little station there have been shipped in one season 127,000 barrels of apples to England. In the rich mountain country of North Carolina, west of the Blue Ridge, is the finest apple country in America. Apples from that section have twice carried off the first prize at Madison Square Garden in competition with the whole country. Two years ago we made a special effort to get out a full exhibit of the mountain apples at our State Fair. I had for thirteen years been judge of fruits at this fair, and I told the fair authorities that it was time some one outside was seeing our apples. So we made a committee on fruits of Prof. Bailey, of Cornell; Mr. Brackett, of the Department of Agriculture, and Mr. Taylor, recently of the World's Fair. All of them attended and were amazed at the display of apples. Mr. Brackett said that such apples are grown in but two section, the Ozarks, of Missouri and Arkansas, and in Western North Carolina, and that North Carolina has the advantage in a very fertile mountain soil, while the Ozark lands are very poor. We measured an apple tree in Haywood county, North Carolina, that girthed eleven feet nine inches and was in perfect health, and there were trees in the same orchard nearly as large. The North Carolina apple region is

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handicapped by lack of railroads. The only line, the Southern, is very illiberal, and it costs more to get a barrel of apples from the foot of the Blue Ridge to Raleigh than it does to get one from Boston. The high plateau country west of the Blue Ridge has also developed an industry in the production of late cabbages and potatoes for the southern markets, and immense quantities are shipped from there every fall to Florida and Savannah and Charleston, where it is difficult to grow them.

In concluding this lengthy paper I would say that, though the South has made great advances in market gardening and other lines of horticulture, we are really at the very beginning of a great development in these lines. We have the soil and the favorable climate, land is cheap and in the greatest abundance, and we need only energetic men with capital to carry on the industry to greater and greater dimensions. There is a disposition everywhere to get white labor to take the place of the negro, and men from the North of the right stamp will meet with the warmest reception. I would add to what I have said in regard to the advantages you have here for the commercial production of tomatoes, egg plants and some other things, that there are some other crops that the Middle States can produce far better than we can in the warmer parts of the South. Currants and gooseberries are perfectly useless in the South except in the cool valleys of the high mountain country. Raspberries, while making moderate crops in moist soils and somewhat shaded locations, can never be grown in quantity commercially with profit. The finer sweet cherries utterly fail except in the elevated and mountain sections, though sour cherries can be grown eastward. I have fine cherry trees of the better varieties, but they do not bear. One tree of Governor Wood did ripen a handful of cherries the last cool summer, but these were the first on a tree over 16 years old. There is no disease on the tree, and it blooms freely, and it is not a matter of lack of pollen, for there are other trees just as unfruitful, and I do not know of any fine cherries grown in our section of the State. Westward, where the country rises to 1,000 or more feet above the sea they do finely. The competition in garden crops in the open ground from the South I do not think will seriously interfere with the profits of the same with

you. The competition that the growers in the Middle States have to fear in the future is the competition that is coming in the upper South in the use of glass for winter forcing. Our abounding sunshine and the absence of the long dark spells that trouble you in winter will give the growers in the upper South a great advantage, for sunshine counts for more than fire heat under glass, and in the upper South less fire heat is needed. There have been and now are on the Raleigh market cucumbers of splendid size and appearance that are retailing for 15 cents, and pay the growers far better than the same cucumbers would pay the Boston growers at 25 cents or more. Mr. Rawson, of Boston, finds that it pays him to use electric light over his lettuce and cucumber houses in the dark New England winter. With a simple sash on a cold frame and mats to keep out frost in extra cold weather, we can grow as fine lettuce as he can in his costly houses. There has been a beginning made in North Carolina, and it will not be long before the energetic growers there will be doing real winter forcing with glass and steam. Their chief difficulty lies in the fact that they have no one skilled in the use of heated glass structures to lead the way, and there is a wide opening there for skilled men with means to push the work.

That is the lesson I want to impress here to-day, that so far as crops in the open ground are concerned, each section of the country has its own share of the market, and I would just as leave undertake the profitable culture of direct crops here in New Jersey as in the South. The competition that you have got to fear is the competition of those who already are using glass as a means of forcing crops out of season. We are going to come into competition with you, and we are going to beat you. We have the advantage of so much cheaper growth.

Last spring, on the same day the first cucumbers from the open ground in the far South were sold on the market with cucumbers grown under glass in North Carolina. The North Carolina cucumbers brought three times as much more than enough to pay the difference in the freight, and much larger prices than the open ground one from the South. So that I say is the competition that is going to interfere with the profitable culture under glass here. We can do it cheaper, but so far as the open

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ground is concerned, I don't believe we have any advantage in the long run, while we may at times get a bigger price. I thank you, gentlemen, for your attention. (Applause.)

The President—You heard this very interesting and instructive address of Professor Massey. There are so many suggestions that are all interesting to our growers here, and if there are any questions that the delegates would like to ask, I am quite sure he would be glad to answer them.

Mr. Collins—I would like to say I don't doubt the gentleman's assertion, but I saw in the paper the other day that Rawson is building two more hothouses. He is a live man.

Professor Massey—Our lettuce, sir, was formerly shipped in barrels, and you would see in the market southern lettuce so much a barrel and hothouse lettuce so much a dozen in carriers. We got onto that. Our lettuce now is going in the lighter package as well as by the dozen. That is, those who shipped in bushel baskets are not selling by the dozen, and those who shipped in carriers got the price of hothouse lettuce, and, if it is in just as good condition, got the same price.

The trouble formerly was that there was too much carelessness in the growth; too much lack of attention, and allowing frost to get in and nip the heads after they are headed. They don't stand much frost after they are headed, but stand a good deal before. They didn't get as good prices, but they are increasing their care in the planting and in the method of shipping, and I think we shipped just as good lettuce as is grown in the hothouses north. We can't grow lettuce in glass-houses with us with any success except the loose Grand Rapids lettuce. In spite of all we can do, if we have glass roofs over our houses, it is too hot for lettuce and we can't head it. We must pull down the sash off of the frame every day the sun shines, and to get head lettuce we have to grow it in frames; we can't grow it in greenhouses.

Mr. Gillingham—You spoke about using tobacco stems for destroying the pea lice. Are they used as a manure under the plants in the row?

Professor Massey—They are used under the row. Our growers very largely have their own fertilizing machinery. They

are using the tobacco dust very largely, as one of the components, what the factories would call the filler. It is really a very good filler. They find now that answers all the purpose without using stems. They use tobacco dust in their fertilizer, and if there is any appearance of aphides, they just glance over the tobacco dust. We get the tobacco dust about 50 cents per barrel.

Mr. Gillingham—Where can it be had at that price?

Professor Massey—From Duke's factory in Durham, N. C. They don't charge me anything; they send it to me. We are doing station work, but they sell it for a very reasonable price, putting it in heavy sacks that hold a barrel. Whether they will sell now for 50 cents a barrel I can't say. It has been bought for that. Those who bought dust very cheaply bought it at local factories where it was more of a waste product. We got it from the Duke's because they dispose of it in large quantities and give us better prices. But that is the most available point—the American Tobacco Company, Durham.

Mr. Phillips—How much does it require?

Mr. Massey—I have never been at all accurate in measuring it. I just dust the plant over. I have used it both ways. It is used as a fertilizer. Our truckers find it answers the purpose there. They are not troubled with the green pea louse any more. They haven't been seriously troubled with it since the first season it came there.

Mr. Phillips—We have a canning factory in South Jersey, near Cape May. The company moved there from Cumberland county and selected that spot, thinking they were going to be clear of the louse, on account of the cool sea atmosphere, but we find the late pea is affected; the early peas are clear. The louse begins to show itself about the time the early peas are going to the factory, and it destroys the late peas, so that we have had to give them up. Now, if there is anything that we can do with tobacco dust in the row, or on the vine, to save this crop I would like to know it.

Mr. Massey—I should be ready to do both, either put the stems in the furrow as a fertilizer, or tobacco dust as a component part of the fertilizer, and then be ready to dust them over on the slightest appearance of the insect.

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Our growers have certainly been successful in keeping it down. We haven't been troubled with it since it first appeared to any extent. Our late peas are always planted first. We plant Marrowfats in November alongside of dead cotton stalks. Our extra early peas are being planted now. They come up before the Marrowfats, and the Marrowfats have never had any attack from the green pea louse.

Report of the State Entomologist.

JOHN B. SMITH, SC.D.

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Report of the State Entomologist.

JOHN B. SMITH, SC.D.

The law as amended, under which the State Entomologist acts, was published in full in the Report of the State Board of Agriculture for 1903, and, practically, that law defines the relation of the officer to the nurseryman and to the farmer and fruit-grower.

As for the nursery trade, that is in better condition in New Jersey now than it has been for years past, and the nurseries, as a whole, are cleaner. The inspection in some neighboring States is so rigid and the organization among the horticultural inspectors is so complete that few men now attempt to ship stock which is in the least suspicious. They have learnt by experience that they are apt to hear of the shipment from New Brunswick very shortly thereafter, for every State Inspector who finds an infested lot of New Jersey stock notifies me of that fact at once. It goes without saying that I return the compliment, and so the real nurserymen, who have a business worth keeping, as a rule, make an honest effort to handle clean stock only.

It is the grower of stock in small lots, for local sale, that is most difficult to deal with, chiefly because in many cases the local fruit grower is willing to buy, even though he knows the stock to be infested, because he can generally get such stock a little cheaper.

However, we blocked the sale of many thousands of trees of that character during the past year and expect to do even better during the season of 1905.

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

CERTIFICATES FOR 1904.

- No. 1—Thomas R. Hunt, Lambertville (limited to strawberries).
 “ 2—T. C. Kevitt, Athenia (limited to strawberries).
 “ 3—Henry A. Dreer, Inc., Riverton (ornamentals, but not limited).
 “ 4—T. E. Steele, Palmyra (shade and ornamentals only and so limited).
 “ 5—Peter Henderson & Co., Jersey City Heights (shade and ornamentals, mostly imported).
 “ 6—Hiram T. Jones, Elizabeth (general).
 “ 7—S. T. Hillman, West Cape May (dealer).
 “ 8—I. D. Cole, Rutherford (dealer).
 “ 9—J. H. Lindsley, White House (dealer).
 “ 10—Elizabeth Nursery Co., Elizabeth (general).
 “ 11—Henry E. Burr, South Orange (general; limited to ornamentals).
 “ 12—E. B. Conover, Fairmount (limited to peach).
 “ 13—Charles Bird, Arlington (shade and ornamentals only).
 “ 14—Julius Roehrs, Rutherford (greenhouse stock).
 “ 15—John McCleary (miscellaneous fruit and shade).
 “ 16—Fred. Menzi, Irvington (shade and ornamentals).
 “ 17—F. & F. Nurseries, Springfield (general).
 “ 18—Edwin Allen & Son, New Brunswick (general).
 “ 19—Theo. A. Ball, Westfield (general).
 “ 20—J. H. O'Hagan, Little Silver (shade and ornamentals).
 “ 21—Wm. B. Ellis, Vineland (blackberry and raspberry stock).
 “ 22—Wm. F. Bassett & Son, Hammonton (general; mostly ornamentals).
 “ 23—W. H. Forristel, Plainfield (shade and ornamentals).
 “ 24—W. G. Eisele, West End (dealer).
 “ 25—Warren Shinn, Woodstown (general; peach and left-over apples).
 “ 26—Arthur J. Collins, Moorestown (dealer).
 “ 27—A. D. Rose, Montclair (dealer).
 “ 28—Red Towers Nurseries, J. J. Phelps, Hackensack (general).
 “ 29—North Jersey Nurseries, Newark (dealer).
 “ 30—Jos. H. Black, Son & Co., Hightstown (general).
 “ 31—Charles Black, Hightstown (general).
 “ 32—Bobbink & Atkins, Rutherford (general; mostly ornamentals).
 “ 33—George A. Steele, Eatontown (general; shade and ornamentals).
 “ 34—O. H. Felmly, Newark (dealer).
 “ 35—J. C. Williams, Montclair (shade and ornamentals).
 “ 36—A. S. Wallace, Montclair (dealer).
 “ 37—S. E. Rogers & Son, Mount Holly (shade and ornamentals).
 “ 38—David V. Higgins, Ringoes (limited to peach).
 “ 39—Chas. B. Horner & Son, Mount Holly (shade and ornamentals).
 “ 40—Stanton B. Cole, Bridgeton (general).
 “ 41—R. D. Cole, Bridgeton (general).
 “ 42—Wm. Henry Maule, Hightstown (dealer).
 “ 43—George Sines, Pomerania (limited to small fruits)
 “ 44—C. A. Bennett, Robbinsville (general).
 “ 45—J. T. Lovett, Little Silver (general).

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- No. 46—W. A. Manda, Inc., South Orange (ornamentals).
“ 47—L. C. Hinck, Montclair (maples and conifers, and so limited).
“ 48—John Casazza, Vineland (limited to dewberry and blackberry).
“ 49—John H. Baird, Englishtown (limited to peach).
“ 50—Wm. M. Simanton, Asbury (general).
“ 51—David Baird & Son, Baird (limited to peach).
“ 52—James McColgan, Red Bank (general).
“ 53—Charles Momm, Irvington (general).
“ 54—Robert A. Chesney, Montclair (dealer).
“ 55—Samuel C. DeCou, Moorestown (limited to shade, ornamentals and small fruits).
“ 56—Samuel C. DeCou, Moorestown (dealer).
“ 57—Hartung Bros., Jersey City (dealer).
“ 58—George A. Shultz, Jamesburg (limited to peach).
“ 59—C. Ribsam, Trenton (dealer).
“ 60—James H. Cornell, Little Silver (dealer).
“ 61—J. F. Randolph, Rutherford (dealer).
“ 62—James H. Cornell, Little Silver (limited to privet).
“ 63—G. O. Gerard, Washington (dealer).
“ 64—John T. Garrison & Sons, Bridgeton (strawberry).

Of these 18 are general, unrestricted certificates and 13 of the firms have a satisfactory fumigating outfit.

Three certificates are for strawberries only, because some States require a certificate of freedom from root lice.

Five were limited to peach stock, because only such was grown.

Eighteen certificates are for shade and ornamental stock only, either because that was the only stock grown, or because the fruit stock was not satisfactory.

Eighteen certificates have been issued to dealers—men who grow no stock of their own, but act as agents for one or more firms, or who simply take orders for anything and buy when they can to fill. As a condition precedent to receiving such a certificate, every dealer has executed an agreement that he will purchase from or handle the stock only of such list of nurseries as I approve. As a matter of course, my approval extends to every nursery holding a proper certificate and which has not been convicted of attempting to evade the law.

Two certificates were limited to blackberries and raspberries, and some of the ornamentals covered stock in part grown under glass.

Greenhouse and florist's stock requires no inspection in our State, but some plants which are grown under shelter here are

hardy further South and on the Pacific coast, and need a certificate to secure admission.

There are some eight or ten nurseries that have been inspected and have not yet received certificates, because the owners have not complied with the requirements of the law. There are almost as many in which the stock is so badly infested as to be unsalable, and for these a certificate has been definitely refused.

During the inspection season last past I was authorized by the Executive Committee to employ a special deputy for two months, and his work consisted, in large part, in assisting nurserymen who, for any reason, could not be trusted to do it thoroughly, to clean up areas found infested. These were mostly cases where there was only a slight infestation, and where the nurserymen asked for assistance because of inability to see the insects when present in small numbers.

During the winter months of 1904 I kept one man in the field for nearly two months inspecting orchards, partly in response to requests from owners, partly in response to a general plan to secure a cleaning up in nursery districts. Several square miles of territory were covered, over a hundred different orchards were examined, and a great many men learned for the first time that their trees were infested and what to do under the circumstances. More spraying was done as the result of this inspection, and many trees were saved that would otherwise have been killed off. The campaign was not so successful as I had hoped, because of the failure of the lime-sulphur washes on apple and pear, but on peach and plum effects were quite satisfactory. Partial failure also resulted because some of the growers preferred to use the caustic soda, and others attempted to combine sulphur and lime with the heat generated by the lime alone.

On the whole, the outcome of this attempt was to bring a large number of men to a realizing sense of the condition of affairs, and the necessity for active work if their trees were to be preserved. A few preferred the easy way of cutting out their trees, and these men deserve credit for their determination to cause no harm, even if we cannot admire their willingness to destroy rather than preserve a tree.

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Quite a number of old, scaly trees were gotten rid of in nursery districts by a frank statement of the case to the owners, though it usually fell to the lot of the nurserymen affected to do the actual cutting down.

There was only one case in which it became necessary to bring a matter to the attention of the Attorney-General, and in that it required only an official note of the briefest description to bring about an immediate compliance with the directions of the Entomologist.

Especial attention has been paid to stock imported from foreign countries during the past year, and on two occasions new introductions of the sinuate pear borer were headed off. This insect has been almost completely exterminated in our State, and lingers only in one small section. It appears in nursery stock now and then, but I have always insisted on the destruction of every infested stick.

The introduced beneficial insects have not done well, and by far the greatest proportion of the earlier increase on the Atlantic coast has been completely wiped out—a point more fully brought out in my formal paper.

During the entire year I have had the assistance of Mr. E. L. Dickerson, who has done much of the inspection work, both in nursery and orchard, and who is now carrying on an elaborate series of experiments with chemicals affecting insect secretions, the effort being to discover a solvent for scales, if such exists. Mr. Dickerson has also looked after the practical work of applying the insecticides tested at points away from New Brunswick, and has made many of the examinations in orchards where commercial work was done and where insecticides other than those of known composition were used.

Finally, much assistance has been given to city and other municipal corporations that have organized to protect their shade trees, and many inspections have been made to determine the best methods of dealing with the pests of such trees.

The President—If there are any questions to be asked now is the opportunity.

Mr. Evans—I would like to ask if scale really destroys shade trees.

Dr. Smith—I will say no to that. There have been some few cases where trees, like small European elms, have been so injured that they were taken out. But a well-established shade tree I have never known to be injured. What I said in regard to dealing with the shade trees in cities has not been against the scale, but against insects in general.

Mr. Woolman—I understand that the scale does not affect cherry trees.

Mr. Smith—It does some varieties. Most of the varieties are exempt. Some varieties are susceptible to the attack, but don't sustain much, if any, injury. I don't think any well-established cherries suffer seriously.

Mr. Roberts—I am wondering whether Professor Smith's remark might not do some harm. I am satisfied that a good many sweet cherries are more or less affected with scale.

Dr. Smith—Yes, that is true. I did not mean to say that no cherry trees were affected. I said some varieties were not subject to attack, others were to some extent; but I do not think any cherry trees were ever killed by this scale.

Mr. Roberts—I am not sure about that. I know they have a good many on.

Modern Dairy Feeds and the Feeding Stuffs Law.

BY DR. EDWARD B. VOORHEES.

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Modern Dairy Feeds and the Feeding Stuffs Law.

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We need no better evidence of the necessity of specific knowledge on the part of the purchaser of feeds than that given in the records of the Experiment Station. Not only does the work that has been done there show the necessity for a broad intelligence in the matter of the preparation of rations, but it shows that it must be accompanied by definite information concerning what constitutes feeds, and also of the functions in nutrition of the various groups of substances contained in them.

THE FIRST INSPECTION.

In 1885 the station made its first inspection and analysis of concentrated feeds, chiefly for the purpose of finding out the variations in composition of the products then on the market. In that year there were found but 25 different kinds of feeds, made up mainly of mixtures of cereal grains, whose feeding value were well established, together with the mill feeds derived in the manufacture of flour from wheat, rye and buckwheat. The only other concentrated feeds on the market at that time which were used in any quantity were linseed meal, cottonseed meal, malt sprouts and hominy meal, though a sample each of pea meal, pea feed and corn bran were represented, which were examined in order to determine their chemical composition and relative position as sources of nutrients. In 1904, twenty years after, the regular inspection resulted in securing, in addition to those mentioned, nearly 100 different kinds of feed, varying widely in their

physical character and in their content and cost of nutritive substance. The principles of nutrition are the same to-day as they were twenty years ago, though in the meantime much has been learned concerning the composition of the different groups of nutrients, the preparation of rations and the specific functions of the nutrients. Neither has the primary object or purpose of feeding changed in this period, though much has been learned concerning the relation of feeds to the production of specific products. With the conditions the same in essential particulars, therefore the question arises, Is there any good reason why the whole grains should not serve to-day, as well as twenty years ago, as the chief source of the nutrients in the rations for farm stock? There is no reason, from the standpoint of nutrition, why the whole grains, together with the refuse products which were available twenty years ago, should not supply the demands at the present time, and in many respects feeds derived directly from home products are superior to rations that may be made up by farmers or dealers from the numerous by-products now on the market.

WHOLE GRAINS DIFFER FROM FEED RESIDUES.

Nature has provided one thing in the constitution of whole grains which is not possessed by any mixture of other materials, consisting of parts of whole grains, namely, uniform and fixed proportions of the pure nutrients, fat, protein and carbohydrates, and which, when used with the ordinary roughage, makes them generally useful and difficult to cause injury from even careless methods of feeding. The chief advantage to be derived from the larger number of the different kinds of concentrated feeds at the present time is that it is possible by means of them to reduce the cost of the ration and to adjust the nutrients more nearly according to what is to be the specific needs in the various purposes of feeding. It is more than likely that the use of feed rations made up of one-third, by weight, of ground corn, ground oats and wheat bran cannot be improved upon from the standpoint of result in total product and effect upon the animal by rations made from the different kinds of feed on the market to-day.

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though I think it can be demonstrated that much cheaper rations may be so derived. If, therefore, it is possible to properly nourish our farm stock by the use of the cereal grains, together with wheat bran and middlings, the feeds of the good old times, what is the cause of the large increase in the number of products? Are the numerous products necessary? Are they due to changes in commercial conditions or to our broader knowledge of the nutritive value of various products?

GLUTEN PRODUCTS.

A careful study of the situation seems to clearly establish the fact that it is not a case of necessity, but that it is due both to changes in the uses made of the cereal and other farm products, as well as to the increased knowledge that we have concerning the nutritive value of materials formerly not used for animal consumption.

The largest increase in the number and kind of feeds has come from the residues derived in the use of corn in the manufacture of starch and sugar, and the next in order by the increase in the number of residues derived from the manufacture of malt and distilled liquors, and to better methods of handling these two classes of refuse products. There has also been a great increase in the number due to the increased production of cottonseed and flaxseed, and to the more complete utilization of the refuse products as a result of the manufacture of oat meal.

The character and composition, and frequently the palatability of these feeds, are in a general way determined by the object of the manufacture of the original grain, whether to take from it one of the important and highly digestible group of nutrients and leave the others, or whether to take the whole of the highly digestible and leave only the hull or husk. In the case of corn, the primary purpose is to remove from it as near as may be all of the starch that is contained in it, or but one of the nutritive substances, hence the total refuse product is richer in protein and fat and poorer in carbohydrates than the original corn, and thus from the standpoint of the feeder a pound or a ton of the entire

refuse would be for feeding purposes worth more than the original corn, and inasmuch as the fat is corn fat and the protein is corn protein, there is no reason known why these actual food compounds should not be, and every reason why they should be, quite as nutritious as in the original product. As already pointed out, however, nature has provided in the whole grain good proportions of the pure nutrients, usually associated with the crude fiber in such a way as to make it a difficult matter to cause injury even from careless methods of feeding. The manufacturer, on the other hand, removes more or less of one of these nutrients, which, therefore, disturbs the proportions of the constituents, and the resultant feed decidedly unbalanced, must be used more carefully, and with other products, if equally good results are to be obtained. In the manufacture of corn, however, the resultant feed product does not, as a rule, consist of the entire residue, or all parts of the corn, except the starch, but a number of feeds are derived from the residue, as, for example, gluten feed, gluten meal, germ meal, germ oil meal, corn bran, etc., all of which possess widely different characteristics in reference to physical character and content of protein, fat and crude fiber. We have, because of the methods of manufacture, and various uses of parts of the residue, practically 15 different brands of what is called gluten feed or meal, which range in protein from 17 per cent. to 42 per cent.; in fat from 2.7 to 18.5 per cent., and in crude fiber from less than 1 per cent. to 8 per cent., thus not only showing a wide variation in nutritive value, but also indicating the necessity of a very careful feeding of the more concentrated substances containing the high percentages of fat and protein, and the low content of crude fiber.

BREWERS' AND DISTILLERS' GRAINS.

The same principles are true in a broad way in reference to the by-products derived in the manufacture of malt or distilled liquors. In the case of malt liquors, barley is the grain used, together with small quantities of rice, corn, etc. The purpose in the manufacture of the liquor is to utilize chiefly the carbohydrate

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substances, hence the by-product feeds are always much richer in fat, protein and crude fiber than the original grain. The by-products from the manufacture of spirituous liquors are derived from all of the cereal grains, with the possible exception of wheat, and as a rule are quite as bulky as the brewers' grains, though likely to be more variable in composition and richer in both protein and fat, and are on the whole relatively cheap sources of the nutrients. Inasmuch, however, as the original grains used contain more crude fiber than is contained in corn, the by-product feeds also contain a higher content of crude fiber, or, in other words, notwithstanding the concentration of the protein and fat in the residual product, it is bulky in character, and thus danger from injury by irrational methods of feeding becomes very remote; the only difficulty likely to be encountered from too large a use would be the danger of making the feed ration too expensive.

COTTONSEED AND LINSEED MEALS.

In the case of seeds, which have been primarily used for their oil, as, for example, cotton and flax, we have residual feed products that are extremely rich in protein and usually quite rich in fat, and from the standpoint of nutritive substances, extremely valuable, but because of their very concentrated character in these respects, must be carefully fed, particularly in the feeding of dairy cattle, as irrational use may result in disorganizing the digestive system, and causing troubles of various sorts. The increased supplies of these products now has not resulted in materially changing their composition, though a much larger number of different brands are upon the market than formerly. Our inspection shows that the variation in protein in standard brands of cottonseed meal, does not vary more than 5 or 6 per cent., or in other words, ranging from about 42 to 48 per cent. of protein. These classes of feeds are not new to our markets, and may be regarded as entirely desirable when properly used, and as a rule they furnish the nutrients required at a lower cost than in the original product. They are characterized, however, with the exception of the brewers' grains and distillery grains, by a much

lower content of crude fiber, and thus must be used in relatively small amounts in the rations, or with a relatively large amount of the roughage of the farm. They may, therefore, be regarded as a distinct and valuable addition to the natural food products of the farm, and to the regular mill feeds in use since the earliest times, because they are richer in the more expensive nutriment protein and fat, than the original products. Whether the farmer shall derive a greater advantage from their use than from the home-grown products depends largely upon his knowledge of their composition and characteristics, and his care in their use.

REFUSE FEEDS OF LOW VALUE.

There is, however, a class of feeds which have been placed upon the market in recent years, now large in number, and belonging to that class which are not concentrated in the sense that one or more of the highly digestible nutrients are contained in them, and which cannot, therefore, be said to have added to the source of supply of desirable products, first, because they do not contain a class of nutrients that the farmer needs to purchase, and second, because the substances themselves are not highly useful. They are derived mainly from the residue in the manufacture of oat meals and consist not of the richer portions of the grain, as protein and fat, but of the poorer portions, the outside hulls, and consisting more largely of crude fiber than the original grain. That is, they contain very low percentages of protein and fat, and very high percentages of crude fiber. In fact, the oat hulls in themselves as a source of nutrients are no better, and not as good, as straw and stalks, the natural waste products of the farm. In this case the object in making a feed is to utilize waste of no considerable value in itself, while in the instances already noted the object is to utilize residues of actual nutrients, and which are of considerable value. Because of the low feeding value of these by-products, because in themselves practically worthless from the nutritive standpoint, the method has been to add a small quantity of other valuable feeds to these, and by attaching high-sounding names to the mix-

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tures, and lower prices than are fixed for high grade products, to encourage their wide use. There may be, and undoubtedly are, conditions where the use of these mixed products would be desirable—as, for example, where farmers do not have a considerable quantity of bulky material, and when the necessity is for bulk as well as for actual nutrition. On most dairy farms and also upon grain farms there is usually an abundance of material of this sort, and for these farmers the purchase of oat feeds cannot be regarded as economical in any particular. In many cases more or less of the concentrated feeds, as cottonseed meal, linseed meal, gluten meal, etc., have been added to the oat hulls in order to increase the protein content and consequent nutritive value, and that some returns may be obtained in their use. Oat hulls contain on the average 1.3 per cent. fat, 30.7 per cent. fiber, 3.4 per cent. protein, and 50 per cent. of nitrogen free extract. Corn stalks contain on the average 1.2 per cent fat, 27.3 per cent. crude fiber, 5.1 per cent. protein, and 46.2 per cent. nitrogen free extract.

Cottonseed meal contains on the average 10.5 per cent. fat, 4.9 per cent. crude fiber, 40.5 per cent. protein, and 25.8 per cent. nitrogen free extract. The oat hulls in themselves are poorer in total nutrients than wheat or oat straw or corn stalks, and are no more palatable and probably no more digestible.

A mixture made up of 1,800 pounds of corn stalks and 200 pounds of cottonseed meal would be richer than many of the oat feeds now upon the market, and probably would be quite as useful as a feed. For example, we have on the market oat feeds containing less than 3 per cent. of fat, 25 per cent. of crude fiber, 7 per cent. of protein and 51 per cent. of nitrogen free extract, and selling for an average of about \$17 per ton; whereas the mixture of corn stalks and cottonseed meal above mentioned would contain about the same amount of fat, 25 per cent. of fiber, 9 per cent. of protein, and 44 per cent of nitrogen free extract. The cottonseed meal would cost not to exceed \$3, making the corn stalks worth on the basis of the selling price of the oat feed over \$14 per ton. The same mixtures may be made with oat and wheat straw. Additions of 200 pounds of cottonseed meal, of linseed meal, or of gluten or other concentrated

feeds would make a mixture as rich in the nutritive substances as the oat feeds, which sell for a relatively high price. These feeds as a class, therefore, cannot be regarded as a valuable addition to the list of feed stuffs now available upon our markets, because they are not rich in needed nutrients, not highly digestible, and because their relative cost is much greater than for products of a better and more valuable character. To this class also belongs cottonseed hulls, or feed, a waste product in itself of no considerable value, and whose claims to usefulness are based mainly upon bulk. The price per ton for them is lower than for wheat bran or middlings, but not as low as cut straw or corn stalks, products of similar character. Too often purchasers have been guided in their selection of feeds by the price per ton, rather than by the relation of selling price to kind and quantity of the nutrients contained in them.

MIXED FEEDS.

There is still another class of feeds, the purchase of which can not be regarded as economical, though there are many instances where these may serve a useful purpose. I have reference to feed mixtures prepared with the idea of supplying balanced rations in connection with the roughage of the farm—corn stalks, hay, etc., and intended for horses, dairy cows and all the various purposes of feeding. In many instances these feeds have been properly prepared; that is, the kind and proportion of nutrients are good, the amount of bulky matter sufficient to prevent any danger from over-feeding, and the chief criticism of them is that they are generally very expensive sources of nutrients. The farmer can make quite as good mixture himself and at a much lower cost. There are, for example, specially-prepared horse feeds, which are undoubtedly well adapted to supply good proportions and right amounts of digestible nutrients, but the difficulty is that the manufacturers do not agree themselves as to what is a well-proportioned horse feed, and the charges for the same over and above that which the farmer himself could have prepared them will range from 15 to 25 per cent. There are no unsurmountable difficulties in the way of the farmer mixing for

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his horses corn, oats, wheat bran and linseed meal and using this mixture with his regular products, or in using such proportions of the more concentrated of these feeds as will enable him, with them, to utilize his stalks and straw and at a much lower cost than if he purchases the specially-prepared feeds. The same is true in reference to dairy feeds. There are no unsurmountable obstacles in the way of the farmer mixing for his cows dried brewers' grains, wheat bran, corn meal, cottonseed meal, etc., in such proportions as to give him quite as good, if not better, rations than those sold under such winning brand names as "Maximum Pabulum Equorum," or "Amicus Bovum," besides enabling him to utilize his own roughage rather than purchasing that for which he has no particular need. Neither should the more sober names of "Quaker" or "Friend," as applied to a poor feed, even though low in price, appeal more strongly to purchasers than the legitimate and proper names attached to regular feed products of high value, though a higher price is attached. It cannot be emphasized too strongly that the purpose in the manufacture of these feeds is largely to utilize refuse products of very inconsiderable value, and that their selling price is higher than the farmer can obtain for quite as good, if not better, products on his own farm in the form of chaff, straw and stalks.

NEW PRODUCTS.

In addition to these classes of feeds which have been mentioned, there are a number of relatively new products which possess considerable value, and experiments are now in progress to determine their place among the various feeds. Of these coconut meal, rice meal and polish, peanut meal and middlings and palmmut meal are representatives which have undoubtedly a high nutritive value, as the original products from which they are derived possess valuable characteristics and the residues must contain a higher content, particularly of protein, than the original product.

Another product, a recent introduction into our markets, is also likely to find a place, as it possesses characteristics of value.

namely, the dried refuse from the manufacture of sugar from sugar beets. This product differs from the manufacture of sugar from sugar beets. This product differs from the ordinary concentrated product in that it is chiefly a carbohydrate substance and may be made useful as a source of succulent material, chiefly, and may well substitute roots or silage. At the price at which it has been sold in the past—\$16 to \$18 per ton—it is one of the most desirable refuse carbohydrate feeds upon the market, being very palatable, highly digestible, and, when soaked, makes a very succulent product, materially increasing the flow of milk.

THE COST OF NUTRIENTS.

Inasmuch as in the feeding of dairy cows, particularly, the chief purpose of most farmers in the purchase of feeds is to procure protein, it becomes, therefore, not only a question of obtaining the nutrients needed in proper form, but a question of obtaining them at the lowest cost per pound, for it must be remembered that in the purchase of a feed, as in the purchase of a fertilizer, the price paid is for certain definite substances. In the feed it is definite amounts of protein, fat and carbohydrates, and in the fertilizer it is definite amounts of nitrogen, phosphoric acid and potash, and this without regard to the name of the feed or to the name of the fertilizer.

In order that the purchaser of feeds may be better informed as to the relation of prices to constituents or substances, the Experiment Station has in its publications grouped the feeds into two classes, namely, protein feeds and carbohydrate feeds. In the protein feeds four sub-divisions have been made, in which the protein ranges from 44 per cent. to 10 per cent., and in the carbohydrate feeds the protein ranges from 10 to 1 per cent. In this classification the protein feeds have been further divided into four groups, and it has been shown that in group 1, ranging from 30 to 44 per cent., the amount of protein secured for \$1.00 ranges from 24 to 29.7 pounds, while the fat in this group ranges from 5.9 to 10.2 pounds, and the carbohydrates from 17.6 to 29.8 pounds, or with feeds averaging \$26.45 per ton, an average of

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25.9 pounds of protein, 7.7 pounds of fat and 27.4 pounds of carbohydrates are obtained for \$1.00.

In group 2, ranging from 20 to 28 per cent., the amount of protein secured for \$1.00 ranges from 16 to 27.7 pounds, the fat from 1.3 to 9 pounds, and the carbohydrates from 34 to 46.5 pounds, or with feeds averaging \$23.54 per ton, an average of 20.5 pounds of protein, 4.1 pounds of fat and 41.1 pounds of carbohydrates.

In group 3, ranging from 15.5 to 19.5 per cent., the amount of protein secured for \$1.00 ranges from 11.6 to 20.1 pounds, while the fat in this group ranges from .9 to 17.2 pounds, and the carbohydrates from 32 to 49 pounds, or with feeds averaging \$23.96 per ton, an average of 14.9 pounds of protein, 4.5 pounds of fat and 34.44 pounds of carbohydrates are obtained for \$1.00.

In group 4, ranging from 10 to 14 per cent., the amount of protein secured for \$1.00 ranges from 8.3 to 12.1 pounds, the fat from 3.1 to 6.9 pounds, and the carbohydrates from 42.4 to 16.2 pounds, or with feeds averaging \$24.15 per ton, an average of 10.1 pounds of protein, 4.1 pounds of fat, and 43.1 pounds of carbohydrates.

It is very evident, therefore, from these data, that not only is there a wide difference in the number of pounds of protein and fat that may be obtained for \$1.00 in the different groups, but that there is a wide range in the amount of these substances that may be obtained from the feeds in the different groups, making it a matter of the very greatest importance that the farmer should determine, first, the character of the feed that he desires, and, second, he should carefully study the relations between the content of nutrients and the selling price. Remembering always that as a rule those feeds which contain as high as 40 per cent. of protein cannot be fed in the same amounts as those which contain as high as 25 per cent. without danger of injury to the animal.

THE DIGESTIBILITY OF FEEDS OF THE SAME CLASS.

Another point which is of importance here, also, is the question as to whether in those feeds belonging to the same group

the amount digested is anywhere near uniform. While it is a fact that there is a slight variation in the rate of digestibility in all these concentrated products, nevertheless it can be safely assumed that the protein and fat at least would show practically as high a rate of digestibility in the one case as in the other, provided they are properly adjusted in the ration. In the case of the nutrients in group 3, which includes a number of feeds with a high content of crude fiber, the relative rates of digestibility would vary widely. As a rule, those containing a high content of crude fiber have a relatively lower digestibility than those which shows a less amount of those substances, though, because of the fact that larger quantities of these may be used, and because the addition of the added bulk is an advantage rather than a disadvantage these may also be assumed to have practically the same rate of usefulness. In this class belongs wheat bran, which, because of its physical character, is relatively more valuable in a ration in proportion to its content of nutrients than those of the same general composition which may have a higher rate of digestibility.

THE CARBOHYDRATE FEEDS.

In reference to the carbohydrate feeds, which include many of the prepared feeds and the oat feeds already described, the variation in content of protein and fat is not so great as the variation in the content of carbohydrates, and because, as already pointed out, these feeds supply, as a rule, those substances which the farmer already has in excess, they cannot be regarded as economical, except in cases where there is a special demand for bulky material, as in the case of dried beet pulp and products of that sort. On the whole, when the whole grains—corn, rye or oats—are not included in the mixture, in the purchase of these the farmer pays exorbitant and in many cases prohibitive prices for protein and fat.

FERTILITY VALUE.

Another matter which should always be taken into consideration in the purchase of feeds, though it should not be a guiding

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factor, is the relative fertility value of the various products, for it must be remembered that as a rule these feeds, which are residues in the manufacture of sugar, of starch, of flour and of oil, are richer in the fertility elements—nitrogen, phosphoric acid and potash—than the whole grains themselves, and much richer than those refuse products which consist of the poorer parts of the entire grain, as oat hulls, cottonseed hulls and corn bran. Every 100 pounds of cottonseed meal, for example, contains on the average:

Nitrogen,	7.14 lbs.
Phosphoric acid,	3.90 "
Potash,	1.82 "

These constituents in the cottonseed meal are, on the whole, quite as available as those contained in commercial fertilizers, and at commercial fertilizer prices, namely, 17.5 cents per pound for nitrogen; phosphoric acid, 4 cents, and potash, 4.25 cents per pound, would cost \$29 per ton. Wheat bran contains on the average:

Nitrogen,	2.56 lbs.
Phosphoric acid,	2.92 "
Potash,	1.57 "

and at fertilizer prizes would cost \$15.42. Or, in other words, in the purchase of these concentrated feeds, the farmer brings to the farm considerable quantities of these constituents, which have an actual or prospective value in the raising of his own crops, and their use must add to the value of the manure pile. It does not follow that the value so fixed upon these constituents would be obtained, nor that the entire constituents would be found in the manure pile, or be serviceable for the raising of other crops. Nevertheless, from the standpoint of the purchase of materials, these relations should be understood, and the relative amounts so furnished should have some bearing on determining whether the farmers shall buy products of this sort at a relatively higher price than for the carbohydrate substances containing less of these particular elements. In the purchase of oat hulls, for example, or the oat feeds largely made up of oat hulls, the content of these

constituents is very much less. In the oat feeds referred to in the previous discussion, we find that the fertilizer constituents contained are:

Nitrogen in 100 lbs.,	1.12 lbs.
Phosphoric acid in 100 lbs., .....	.56 "
Potash in 100 lbs., .....	.69 "

These on the same basis of valuation as the others, would be worth \$4.91. Hence in the purchase of these refuse products, which in the true sense are waste products, the farmer not only purchases his materials at a relatively high cost, but he obtains the very limited quantity of the fertilizer constituents. Much might be said as to the utilization of these products in these respects, but that is foreign to the subject of this paper.

FEED INSPECTION.

In view of the very wide variations that occur, both in the composition of products of the different classes, and also in some cases in the products of the same class, and in many cases of the same name, and the impossibility of determining the actual source of the material by visual inspection, and because of the lack of any definite relation between selling price and nutritive value, laws have been passed in many States requiring that the manufacturers of these materials should affix to each feed a statement of the content of the chief constituents, protein and fat. In this State the law providing for such guarantee and inspection by the State Experiment Station was passed in 1900, and five years' experience shows that the effect of this law has been entirely beneficial to the farmers, the city feeders and the manufacturers of genuine grain products. The farmer may now possess before purchasing definite information as to the composition of the various products upon the market, not only, but the station in the bulletins gives him full information as to the relation of guarantee to selling price, as well as suggestions as to the possible usefulness of the various products in the making of rations. Nevertheless, because as in the case of commercial fertilizers the

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farmers do not, as a whole, demand the guarantees, nor study the relation of selling price to guarantee, the helpfulness of this legislation is not as complete as it should be. The manufacturers, as a rule, do comply with the law. The farmer knows, if he asks whether the product contains ten per cent. of protein and five of fat, or whether it contains 40 per cent. of protein and ten of fat, and can be guided accordingly. Yet, because the question is not always asked, and the guarantee demanded, the dealers are often careless and do not take pains to furnish the guarantee, particularly on goods in bulk, though when so asked by the Experiment Station are able to furnish it.

In other words, the law has been effective for good just in proportion as the farmers have taken advantage of it. The station did find in the beginning of its work a number of serious adulterations; wheat bran was adulterated with coffee hulls, and rice or oat hulls existing in too great proportions in mixed feeds, besides, many attempts were made to evade the effect of the law by placing ridiculously low guarantees upon products that had no particular value. The publication of these facts in the bulletins has been effective in stopping the adulteration, and at the present time the conditions of the feed market are remarkably good, so far as the compliance with the law is concerned, and so far as the products upon the market are genuine in respect to name. That is, farmers can safely purchase any feed, and feel sure that it is the product which it is represented to be. As in the case of commercial fertilizers, however, the purchaser may, even under a full enforcement of the law, be virtually defrauded, by paying exorbitant prices for substances which he does not need, because he does not study his own needs, or the relation of selling price to the guarantee of protein and fat. For these the effect of the law is indirect—the full and direct benefit is only derived by those who study the feed bulletin and act upon its suggestions.

SUGGESTIONS AS TO THE USE OF FEEDS.

It may be that a number of farmers hearing this paper may say that these facts and figures are good so far as they go, but

how does it help me in the purchase of my supplies. In view of the high prices of these various products, and the low price of products, can I afford to buy any of them, or if so, which of these can I buy that will enable me to reduce the cost of a quart of milk or a pound of pork, beef or mutton? It must be admitted, that at present the cost of food is much higher than formerly, relative to the value of product, and a careful study of the situation furnishes but two practical suggestions in the purchase and use of feeds, viz: First, do not purchase waste product, carbohydrated feeds made up largely of oat hulls, and second, while the conditions exist as at present, it is a wise thing to raise more home products, and to utilize, as far as possible, a larger proportion of the more concentrated materials. The cheapest sources of nutrients of the kind that we are likely to need most are contained in the first and second groups, and specifically cottonseed meal, linseed meal, brewers' grains, distillers' grains and gluten meal.

I believe that it is possible for us to increase the roughage in our rations by 10, 20 or 30 per cent., and by the addition of these concentrates to materially reduce the cost of the ration without reducing the yield of milk and without injury to the animal. The chief point in my judgment is to fully distribute the concentrates throughout a large mass of roughage.

In an experiment conducted at the Station it was found that a ration made up of:

Silage,	36	lbs.
Corn stalks,	6	"
Cottonseed meal,	4.5	" costing 12.27 cents,

gave nearly as large returns in milk and butter as one made up of:

Corn silage,	36	lbs.
Corn stalks,	6	"
Wheat bran,	5	"
Dried brewers' grains,	5	" costing 15.77 cents,

or a reduction in food cost per 100 of milk from 66 cents to 54.1 cents. This larger use of the concentrated ration, when carefully distributed throughout the roughage ration, did not injuriously affect the health of the animals. The conditions at the present time also emphasize the importance of a large growth

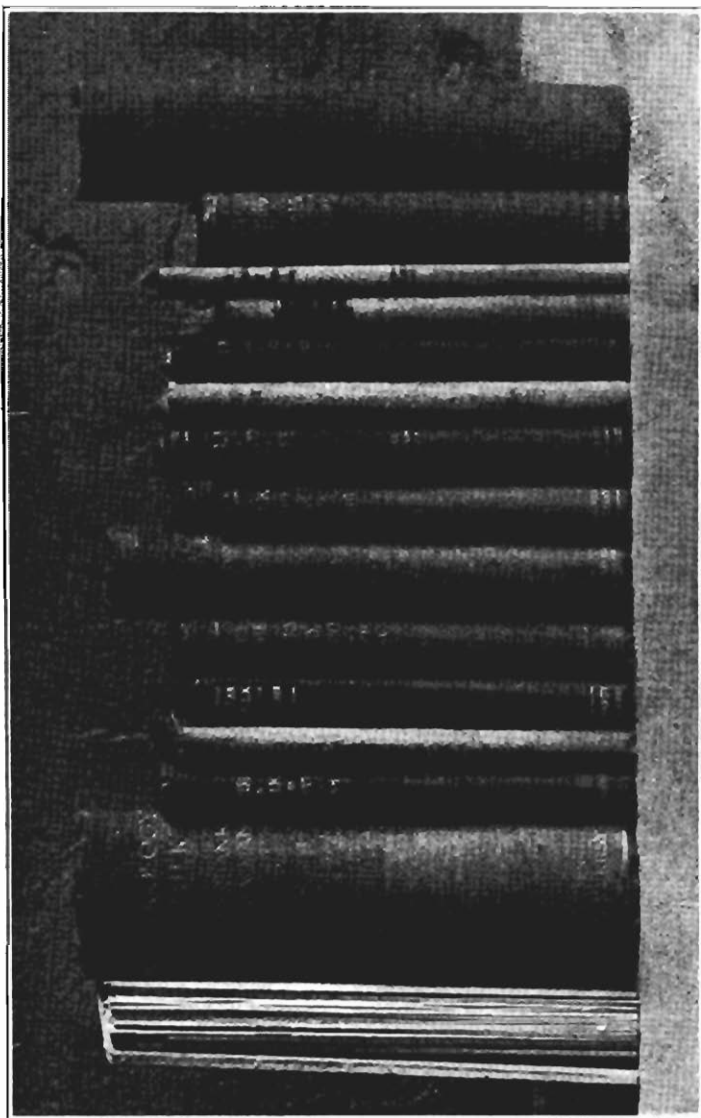
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and use of home-grown protein, the substance most needed to enable a proper utilization of home-grown cereals, corn and oats. It has been demonstrated that alfalfa, cow peas, soy beans, oats and peas, crimson clover and vetches are crops that can be successfully grown and can be substituted for the expensive feeds formerly believed to be so necessary in the ration. These in addition to those of the clovers now grown will reduce the necessity for purchased supplies. In my judgment the remedy for the ills of high-priced feeds lies in the hands of the farmers themselves, if they will but take advantage of the information that they now have concerning the principles underlying the purchase of feeds and the growing of protein crops on their own farms.

The Production and Handling of Milk.

BY PROF. R. A. PEARSON.

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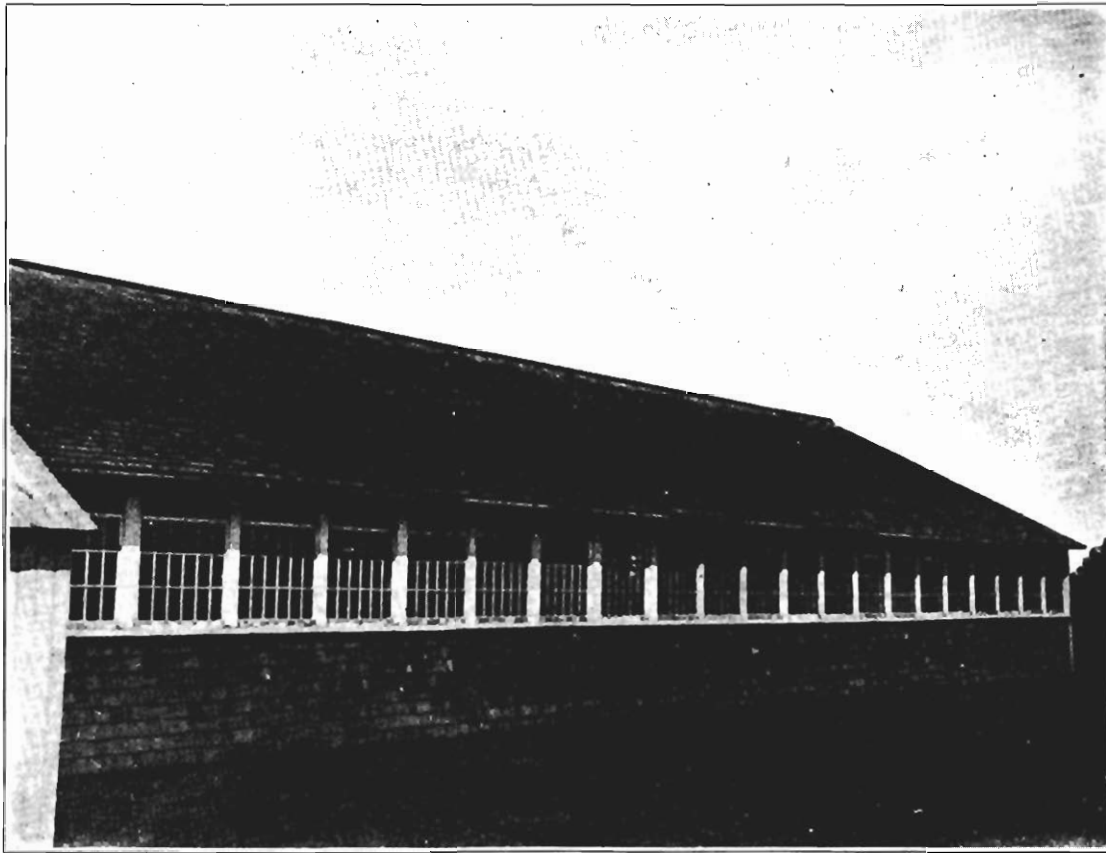
A dairyman's library.



Pamphlets by physicians and others showing the importance of pure milk —another agency helping to create a demand for sanitary milk.



Attractive advertisements of model dairies—one of the agencies helping to create a demand for sanitary milk.



Side view of a well-ventilated dairy stable.

The Production and Handling of Milk.

BY PROFESSOR R. A. PEARSON, CORNELL UNIVERSITY, ITHACA, NEW YORK.

Mr. President and Members of the Board: I consider it an honor to be invited to appear before this representative and influential body. I recognize that you have done an immense good in uplifting agricultural conditions in this State, and in other States as well.

It seems a little like "carrying coals to New Castle" to come into the State of New Jersey to talk upon the production and handling of milk. You have here many authorities of your own upon this subject and if I should attempt to name them I would not know where to stop. Your Experiment Station under the able management of Professor Voorhees has done a great deal towards showing how the economical production and handling of milk can be brought about, and there are a large number of dairies in the State which are showing the same thing.

It was in New Jersey that the idea of a milk commission originated, and it was in this State that a dairy was first operated under the supervision of a milk commission. A large number of high class dairies are located in New Jersey and quite a number of them are now working under the supervision of milk commissions. Lest any one should think, however, that you have reached a perfect state I should perhaps add that I have seen in this State some average and some very inferior dairies also. There is room here, then, for improvement, as there is in every State in the United States.

In the last few years there has been an immense change in the method of producing and handling milk for the market. If you

compare the method of to-day with that of yesterday you will think there is no change worth mentioning, but if you will compare the methods of to-day with the methods of ten years ago you will be astonished to see the large number of new principles that have been introduced into our practical work.

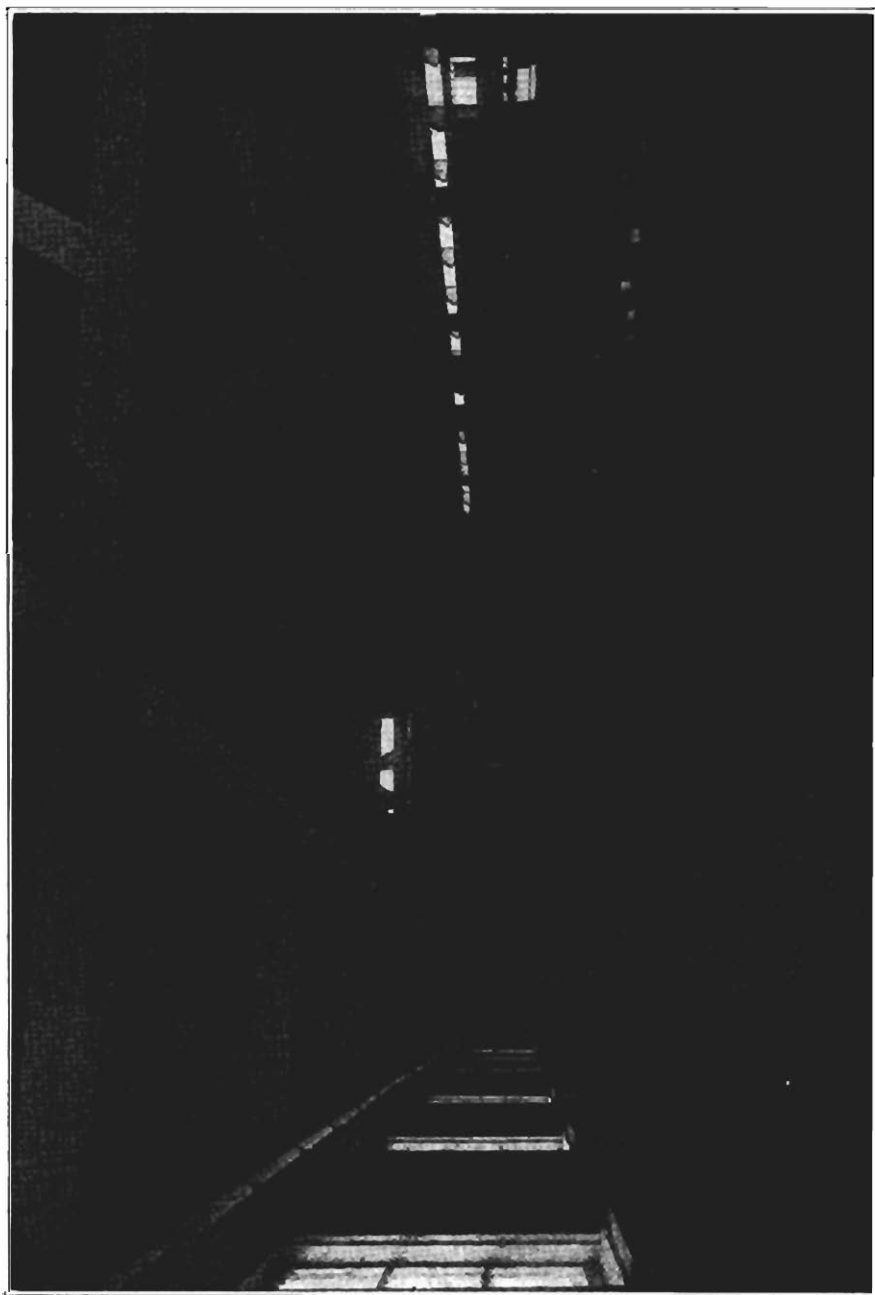
Changes are being made rapidly, and how long they will continue, how far they will be carried depends upon two factors—it depends upon the producers of milk and upon the consumers. How perfect can the producer make his milk? That is the question for him. How much is the consumer willing to pay for better milk? That is the question for the consumer. It is upon these two factors that the improvement of our market milk largely depends.

Improvement of average dairy conditions can be made without any material increase in cost, merely the exercise of closer supervision. More diligent methods will bring great improvement, but if we carry that improvement on to the furthest possible limit, then we will find that the cost will very greatly increase.

We are engaged in a war against microbes, and when we attempt to reduce the number of microbes in milk we are facing a problem which might be compared with an attempt to rid the country of a pest of rabbits. It would be an easy matter to go out and shoot a large number of rabbits, and if this were done we would see some improvement. But the fewer and fewer the rabbits become, the more and more difficult it would be to find and kill them and a high bounty would finally have to be offered for those last rabbits. So in improving our dairy methods. We can easily eliminate an enormous number of bacteria, but the more and more we reduce them the higher and higher must be the reward for their "scalps," and it is for the consumer to say how much he is willing to pay before the producer can say how far he will carry his warfare.

I do not look upon improvements in dairy methods as a reflection upon conditions that have been or that exist now to a very large extent, any more than I look upon the improvements in educational methods found in our splendid universities of to-day as a reflection upon the old log school-house. I look upon our improvement in dairying as an indication that among dairymen





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there are up-to-date men, and they are willing, as leaders are in other lines of industry, to take advantage of new methods for carrying on their work whenever better methods become available and practicable.

It is noticeable that the development of high-class milk business is being carried on without what might be called mud-slinging methods. Look at the advertisements of persons who are engaged in selling other products which they consider of a high grade, and how often, instead of praising their own products and showing what they have that is good, they take steps to run down the product of others. The development of dairying is singularly free from this practice. It shows that the dairymen of to-day are seeking to build upon the new knowledge that they have, rather than by tearing down what others are attempting to do.

Sometimes dairymen think that a large amount of criticism is being directed against them and their work. You read articles about milk as it is sold in cities. Some are true and some are not. We read in the papers that a large number of infants die every year in cities, and that their deaths are often attributed by physicians to impure milk. We read that a health officer in a large city makes a wholesale condemnation of milk that comes into that city. We read of cases where persons are said to have been poisoned by milk, and we read of epidemics of diseases said to have been caused by milk. Statements of this kind, whether they be true or not, have an unfavorable effect upon the dairy industry, because they influence public opinion. And if the public is led to believe that milk is not safe less of it will be used.

So it is in the interest of dairymen to remove all cause for unfavorable criticism that it is within their power to remove. The dairyman should not think that criticisms are being directed against him alone. If he wants sympathy along this line let him consult with those in some other lines of work—for example, the plumber, the physician, the dentist, the druggist, and even now the house-builder. The work of all these persons is supervised to a greater or less extent by laws or ordinances, because the work of all these persons has to do with the public health, and in the last few years, in the last decade especially, there has been a wonderful change in that the public has become more interested

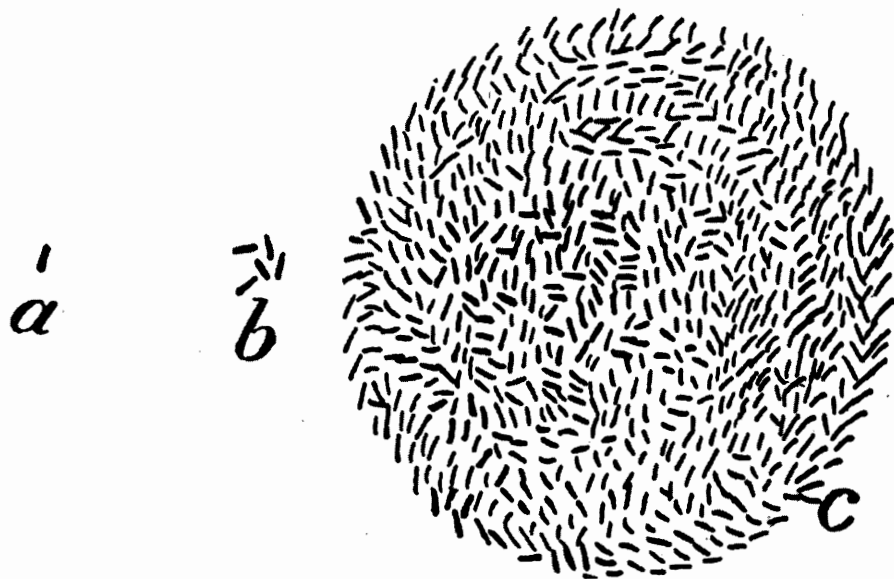
in all public health questions. People discuss milk and criticise it as they discuss other products and industries that affect the public health, for along all these lines we are making great advances. I think that dairymen as a class compare well with any class of men. The other classes are making advances. Dairymen are making advances. The other classes are going to continue to make advances; the dairymen must continue to make advances, if they do not it will be equivalent to standing still, and it will be said that they are occupying a backward position.

Now, I am going to try and show you by pictures some ways in which the quality of our milk can be improved. Some will illustrate conditions which cost extra money. Some will show how the quality of milk can be improved without the outlay of more money.

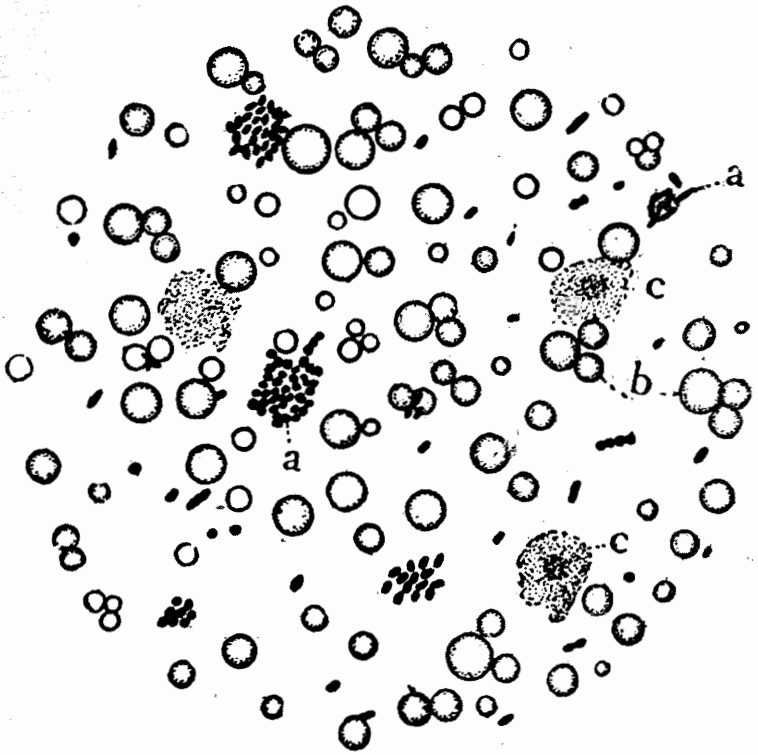
The contamination of milk can be discussed under six heads, and if it were possible we would like to say each one is most important. The milk is free from contamination when it is first secreted in the healthy udder, and it may be seriously affected by contamination from either one or all of the different sources that will be named.

I. DISEASED COWS.

If the cows are not healthy there is much danger of bacteria of disease getting into the milk at the time it is secreted or before it is drawn from the udder. This danger is especially emphasized in cases of tuberculosis. There is only one remedy for this kind of infection, and it is to have healthy cows, and this can be assured only by constant vigilance and the frequent assistance of a competent veterinarian. Two agencies are most important for the preservation of the health of a herd. They are abundant light and abundant ventilation. Plants and animals like sunlight. We do not find corn or wheat growing well where it is kept from the sunlight, and we cannot expect cows to do their best when sunlight is excluded from their stables. Sunlight has the advantage also of being a good disinfectant. Micro-organisms are rapidly killed when exposed to it and well-lighted stables are therefore freer from bacteria than dark ones. A good rule is to



Showing the effect of temperature upon bacteria growth. *a*, a single bacterium; *b*, its progeny in twenty-four hours in milk kept at 50° , 5 bacteria; *c*, its progeny in twenty-four hours in milk kept at 70° , 750 bacteria. Figures taken from an actual experiment.



Milk as seen under the microscope: *a*, bacteria; *b*, fat globules; *c*, pus cells or leucocytes.

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have the cow stable so light that a person can easily read a newspaper in its darkest corner at midday. Cows should be provided with much fresh air, because they consume a large amount of oxygen. When the stable is closed tightly and fresh air is not admitted the same air is breathed over and over again, and sometimes it becomes so foul that the health of the cows is seriously affected. Experience shows that disease may be carried from one cow to another more easily when the stable is not well ventilated than when there is an abundance of fresh air. The best system of ventilation is the one which provides for the removal of air from near the floor, where it is most impure, and the introduction of air near the ceiling. This is made possible by having the outlet flues extending from near the floor upward to the ridge of the buildings and by arranging the inlet flues so that their outer openings are lower than their inner openings, thus preventing the escape of warm air from the stable through them. Another requisite is that the stable walls shall be tightly constructed and there shall be no opportunity for air to flow freely through them or any opening except those in the ventilators. With this system of ventilation sufficient fresh air can be provided to keep the stable free from unpleasant odors and without seriously reducing the temperature in the stables even in the coldest weather. This system is now in use in so many buildings that it is hardly necessary to take the time to discuss its merits. We have only to point to it in successful operation.

II. THE COWS.

Milk may become contaminated within the udder of the cow by bacteria which enter through the orifice of the teat. This contamination extends upward into the udder a greater or less distance, but is always most abundant in the small amount of milk nearest the outlet; thus to a large extent the effects of this source of contamination can be reduced by discarding the first few streams drawn from the teat. Very little loss is caused by this practice because the first milk is poor in butter fat.

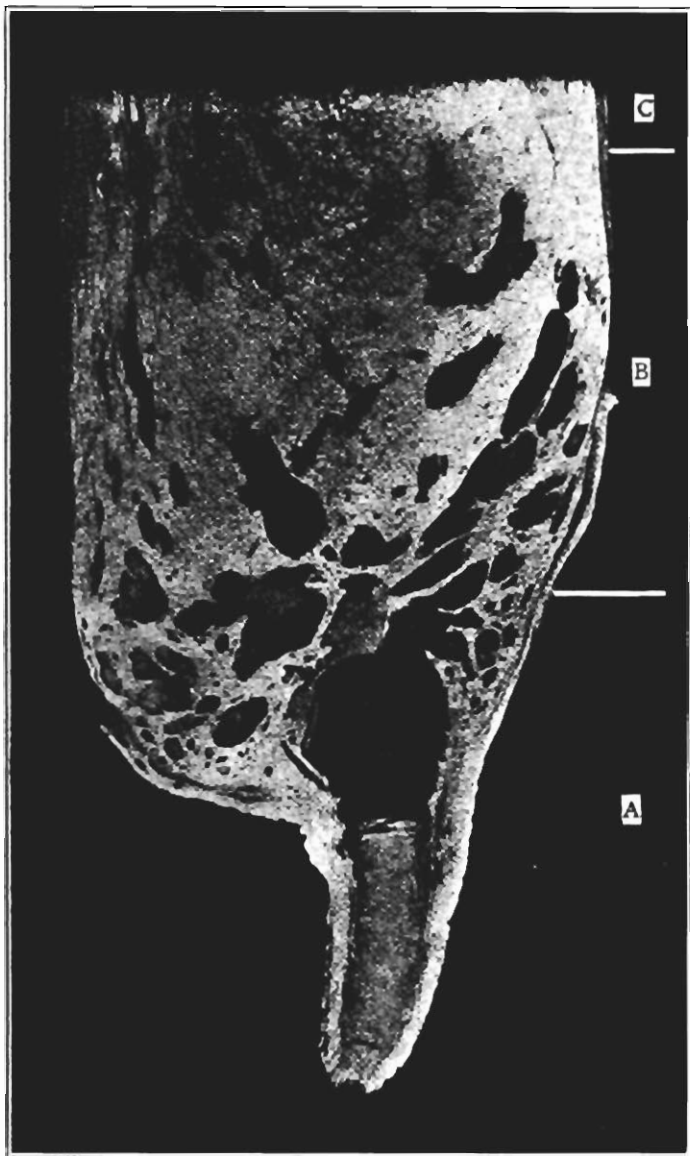
Serious contamination of milk is due to particles of dust and dirt which fall into the milk from the hairy coat of the cow. If

her udder and surrounding parts have not been cleaned countless bacteria enter from this source. Many experiments have shown that the keeping quality, taste and flavor of milk are greatly improved when care is taken to have the cow properly cleaned before she is milked. A bacteriological test furnishes abundant proof that millions of micro-organisms enter the milk with particles of foreign matter which fall into the milk pail. It is next to impossible to keep cows clean unless their surroundings are clean, and this means that the barnyards should be well drained and the stables should be well cleaned daily and bedding should be free from unnecessary dust and decaying organic matter. Too often we think that a clean stable means a costly stable, but this is not the case. A cheap stable well constructed can be kept as clean from the bacteriological standpoint as many of our most costly stable structures.

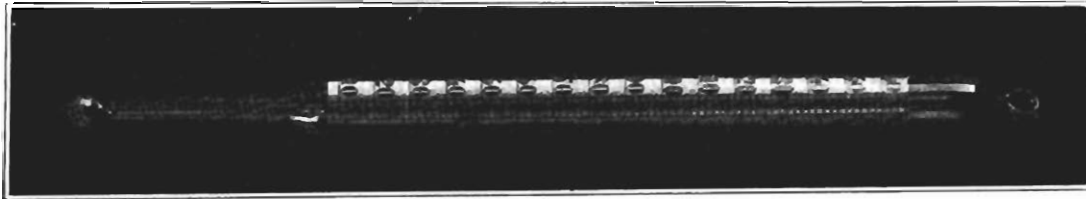
III. AIR.

More or less dust is floating in the air all the time. Just after a shower or a snow storm the air is clean, but in dry weather, and especially when it is windy, there are countless dust particles always floating through the air. Especially in stables, as they are ordinarily cared for, there is much dust in the air. It comes from a loose ceiling or from dry feed which has been thrown from the loft or is being pushed about by the noses of the cows, and it comes from dry bedding. Too often a large amount of dust falls from cobwebs and countless places of lodgment about the building. This source of contamination can be greatly reduced by avoiding the conditions named. By simple precautions the number of bacteria falling in a given time can be reduced from several hundreds to less than fifty. It is a simple matter and costs nothing to feed hay after milking and to bed the cows after the milk is out of the stable, but this means much to the milk.

Although much care is exercised to keep the stable and cows clean and to keep the air free from dust, still some particles of dust and dirt will find their way into the milk and will carry many micro-organisms with them. The number of these may be reduced by reducing the size of the milk-pail opening. If the open top



Some bacteria enter the milk through the orifice of the teat
(Cornell Experiment Station).



The floating glass thermometer is a most useful instrument in the dairy.



The small-top milk pail with visor greatly reduces the amount of dirt which can fall into the milk.

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of a pail is reduced from 12 inches in diameter to six inches, then the area through which foreign matter can fall into the pail is reduced to one-fourth of what it was. The pail devised by R. G. Freeman, of New York City, is perhaps the best available. It is a slight modification of the common milk-serving bucket which has an opening six or seven inches in diameter. At one side of the opening a visor is attached so that it extends upward and inward, thus reducing the vertical opening through which dust particles would fall, but without reducing the lateral opening through which the milk streams enter. The farther this pail is leaned toward the cow the more the visor projects over the opening. It will be objected to by old milkers, because they think at first it is difficult to milk into such a small opening. I do not wish to establish the size of the opening for any person, but advise that it be made as small as he finds it convenient to use. If the opening is reduced from 12 inches in diameter to 10 inches this means a reduction of nearly one-third of the area through which dust and dirt may fall. Few milkers would object to such a slight contraction of the top of the milking pail. When one has become accustomed to a small-top pail he finds it easy to milk into an opening only six or seven inches in diameter. There are few men who cannot deliver a stream of milk into a cat's mouth at a distance of four feet, and if this is possible surely it is possible to milk into a six or seven inch opening almost adjacent to the udder.

IV. UTENSILS.

Utensils are responsible for milk contamination chiefly because they have not been properly cleaned and sterilized. It has been found that milk handled in a pail cleaned in the ordinary way and not sterilized contains over 4,000 bacteria per c. c., while similar milk handled in a sterilized pail contained less than 200 bacteria per c. c. A source of contamination in this class which is often overlooked is the many particles of dust which fall upon utensils that have been cleaned and are awaiting use. The first milk passing over or through them washes off the dust and thus becomes highly contaminated. The first milk from a cooler which

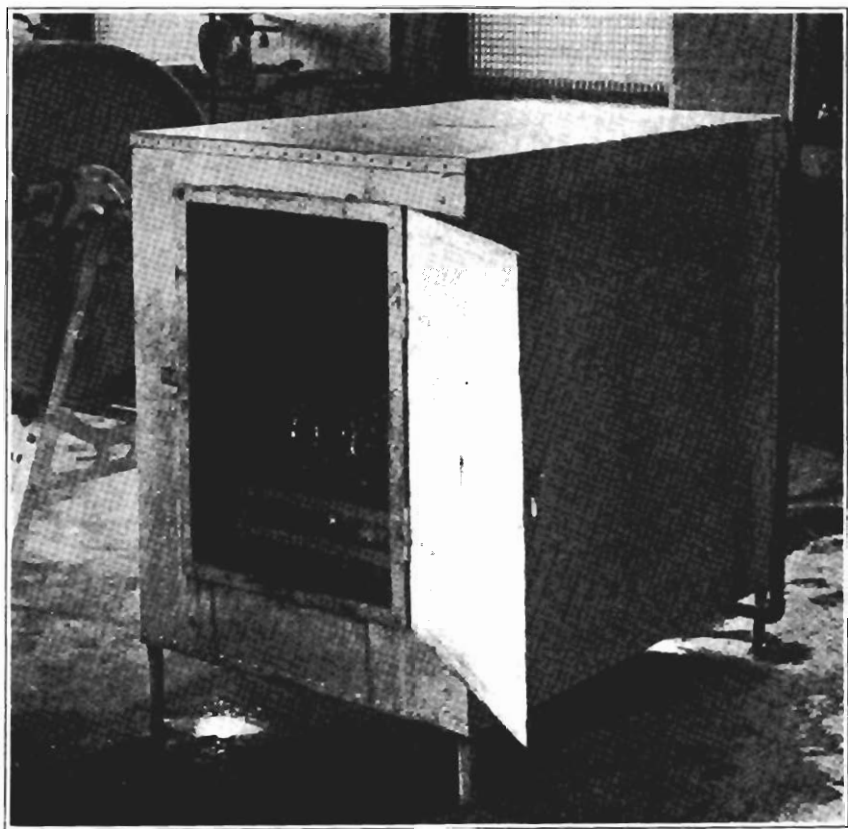
has been washed and sterilized some hours previous contained about 60,000 bacteria per c. c., while a sample of milk taken after the cooler had been rinsed by the passage of 200 quarts of milk contained only about 3,000 bacteria per c. c. If utensils cannot be protected from dust and other contamination after they have been cleaned then they should be sterilized again just before using or rinsed in water that is known to be pure.

V. ATTENDANTS.

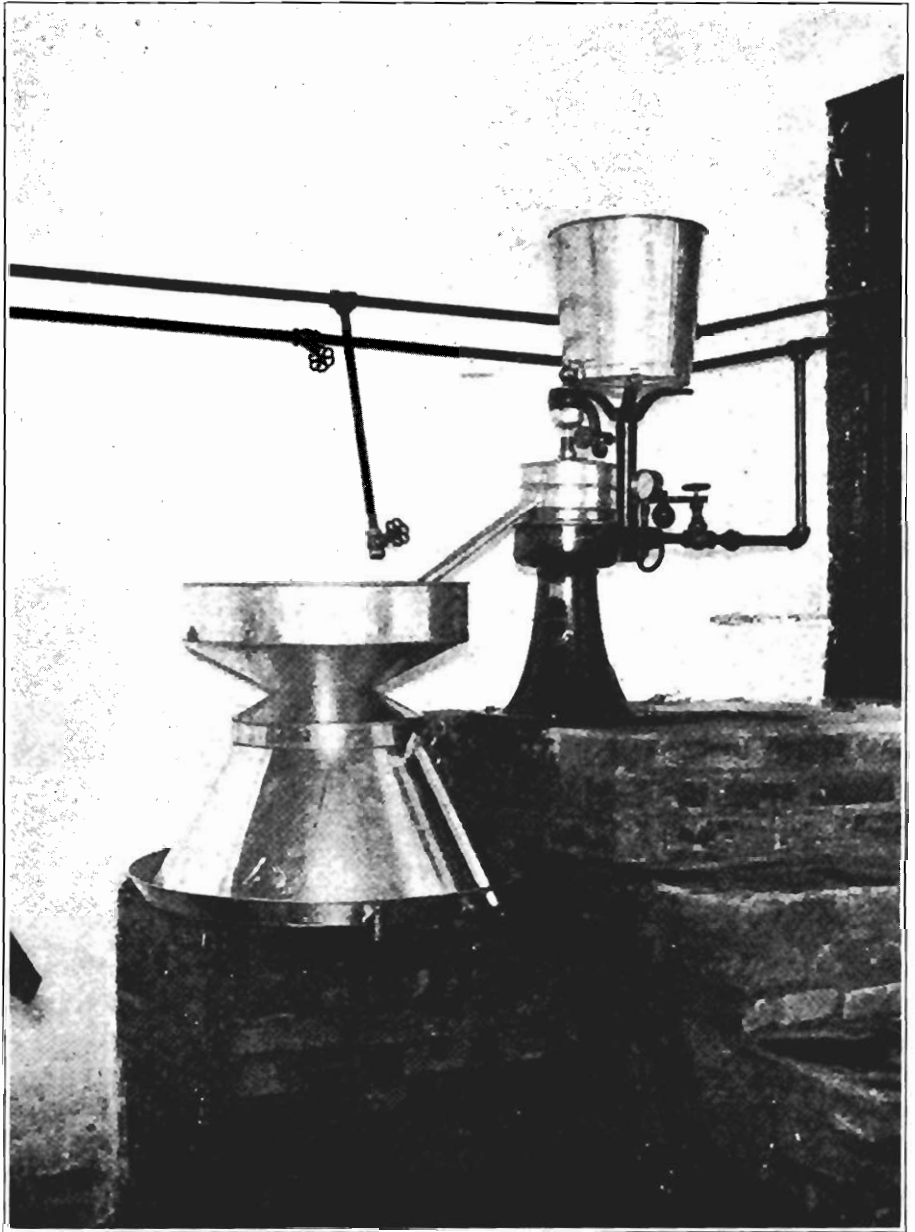
Dust will fall from the attendants' clothes the same as from the cow's coat unless care is taken to prevent. It is an easy matter to have a special, clean, loosely fitting garment for use only when milking. This can be slipped on over the other clothes and will prevent many germs from falling into the milk. The attendant's hands should be well cleaned and he should avoid the dirty practice of "wet milking," which is responsible for enormous contamination. The health of the attendants should be carefully guarded.

VI. HANDLING OF MILK.

As soon as drawn, milk should be removed from the stable air and taken to a clean room used only for handling milk. This room should be located where it is not exposed to contamination. It should be simply constructed with smooth walls so there will be few places for lodgment of dust. Such a room can be provided at an outlay of a very few dollars and very little labor. The milk should be promptly cooled to a temperature lower than 50 degrees, as bacterial growth will then be checked. It is stated that a single organism will develop into 750 in 24 hours in milk held at 70 degrees, while one organism will develop into only five in 24 hours in milk held at 50 degrees. At all times care should be taken to keep milk away from bad odors and unwholesome surroundings. When milk is hauled to the station or creamery in hot weather the cans should be covered by a damp cloth to protect them from extreme heat.



A galvanized iron box for sterilizing utensils with live steam.
Boiling *hot* water is just as efficient.



The milk room should have smooth walls where dust will not find lodgment.

**Work of the Commission on
Tuberculosis in Animals.**

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Work of the Commission on Tuberculosis in Animals.

The Commission on Tuberculosis in Animals was constituted by law May 22d, 1894, its purposes being to eradicate tubercular cattle from the dairy herds of the State and to improve the methods of caring for dairy animals. This law makes the President and Secretary of the State Board of Agriculture members of this commission, giving the President power to appoint five others, making the commission, who serve without pay, seven in number.

A later law, approved March 24th, 1899, adds to the duties of the commission that of inspecting all dairy cows and breeding dairy stock imported into the State.

The Secretary of the State Board of Agriculture is made Secretary of this commission.

The reduction of the appropriation for the year November 1st, 1903, to October 31st, 1904, from \$15,500 to \$12,500 quite seriously crippled the work of inspecting and cleansing established dairy herds. This lack of funds made it necessary to defer action on numerous applications until the next fiscal year. With the appropriation for the current year up to the amount named in the law (\$15,500) it is hoped the commission will be able to attend to all applications.

The law of 1894 has become more and more popular as its provisions are better known and the benefits following its execution are realized.

As the commission cannot, of its own volition, inspect any herd, however badly it may be affected, it is to the credit of our progressive, intelligent dairymen that they are so freely co-operating with the State in its efforts to cleanse our dairies of this enemy to health.

While the sum that any dairyman can receive, under the law, would not compensate him for the destruction of a valuable animal, it is, nevertheless, a help and an encouragement.*

The work of the commission is also helpful in an educative sense. A number of years ago dairying was conducted without much regard to the surrounding sanitary conditions, the purity and healthfulness of the product, or the important place milk and its sub-products, cream, butter and cheese, occupy in the human diet. But in more recent years this business in all of its phases has been subjected to rigid scientific inspection.

Meanwhile dairymen and breeders have been improving their stock. Cows are bred for milk production. They are fed more intelligently and on milk-producing foods. Their stables are models of cleanliness, and the product is handled from the cow to the consumer with a degree of care that insures purity.

But dairy animals are used for food also, and they are subject to tuberculosis, and there are conditions of breeding and stable life that may contribute to the spread of this disease. Conversely there are conditions that will materially assist the dairymen in neutralizing its power and preventing its spread among the members of his herd. The agents of the commission, in the prosecution of its work, have been careful to point out defects in stable construction and suggest improvements, and, if unsanitary conditions existed, the importance of reforming these was also emphasized.

The agencies that have been and are at work for perfecting our milk supply have not labored in vain. The product is richer and

* Extract from the law: "Whenever the state tuberculosis commission shall be called to inspect dairy animals supposed to be diseased with tuberculosis, such person as may be designated by the commission shall proceed to make such inspection and may agree with the owner or owners upon a valuation of such animals as are to be inspected; such valuation shall in each case be made on the basis of the market value of the animals the day the valuation is made; and if, upon examination by the commission, any animals in said herd are condemned to be slaughtered, three-fourths of such valuation so ascertained shall be paid by the State to the owner or owners on presentation of such certificate with the approval of the said commission endorsed thereon; *provided*, such appraisement shall not exceed forty dollars for each animal condemned; and *provided further*, that no compensation shall be made for animals considered by the commission to be of no value."

TUBERCULOSIS IN ANIMALS.

purser when it leaves the producer's hands than ever before. This is largely due to the care and watchfulness of intelligent dairymen who co-operate with the laws of science, of cleanliness and of health. This is good policy, but it is more costly than the slipshod method. And for milk of high grade production, of guaranteed standard and quality, the price to the producer is, usually, too low.

The inspection of established herds in the State has been conducted according to the provisions of law, as requests for examinations were received.

The total number of cattle examined is 2,099. Number condemned and slaughtered, 394. The table herewith shows number of counties visited, with other details, and also the report of the Treasurer of the commission, Mr. Charles Howell Cook :

<i>County.</i>	<i>Total No. Examined.</i>	<i>Total No. Condemned.</i>	<i>Total Sum Paid.</i>
Bergen,	2	1	\$8 25
Burlington,	298	54	1,134 00
Camden,	4	1	13 50
Cape May,	63	13	191 25
Cumberland,	62	16	372 75
Gloucester,	59	20	421 50
Hunterdon,	172	24	514 50
Mercer,	364	77	1,716 75
Middlesex,	40	14	231 75
Morris,	110	14	329 25
Salem,	324	71	1,692 75
Somerset,	265	54	1,319 25
Sussex,	246	27	567 00
Union,	20	4	88 50
Warren,	70	4	62 25
Total appropriation,			\$12,500 00
Total sum paid for cows,		\$8,663 25	
Expenses of inspection,		1,215 32	
Expenses of commission,		334 23	
Secretary, assistant and stenographer,		2,116 00	
Stationery and blanks,		171 20	
			<hr/> \$12,500 00

CHARLES HOWELL COOK, *Treasurer.*

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IMPORTATION LAW.

The examination and test of cattle imported from other States during the year, under Chapter 181, Laws of 1899, is approximately 8,250.

The beneficial effects following the enforcement of this law are quite evident, especially when taken in connection with the work the State is conducting in purging our home dairies of tubercular animals.

To leave the stream of cattle importation free of surveillance would be a virtual invitation to unscrupulous dealers to flood New Jersey with diseased animals of all grades from other States. Indeed, dishonest dealers even now resort to various questionable schemes to evade the law. Some such have been held up during the past year and compelled to conform to the requirements of the law. If honest men obey the law without compulsion, others should be forced to do so.

The Commission is using all available means for the detection of dishonest practices, whether by so-called veterinarians or by dealers or by both in collusion. The law is appreciated by our dairymen.

The *Newark Evening News* of January 14th, 1905, commenting on the purpose and work of the Commission under the heading "Slaughter of Diseased Milch Cattle," says:

THE SLAUGHTER OF DISEASED MILCH CATTLE.

Closely allied to all the other efforts that are now being put forth to check the spread of consumption in this State is the work done by the State Commission on Tuberculosis in Animals, which was organized about eleven years ago. During the fiscal year ending October 31 last this commission condemned and caused to be slaughtered no less than 394 cows, whose milk was being used for domestic purposes, for the reason that they were tainted with tuberculosis.

Eminent scientists may differ upon the question whether human and bovine tuberculosis are practically identical and communicable from cattle to mankind, but there can be no question whatever that milk from cattle having any kind of disease should never be given to human beings to drink, and particularly never to little children. Upon this unassailable ground the law of the State is founded, and by it the commission is warranted in killing all milch cows that are found to be tainted with tuberculosis. From how much danger

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the people of this State have been saved by the slaughter of nearly 400 diseased cattle they may surmise for themselves. Very nearly 2,100 cattle in the different State herds were examined, and about 8,250 head of cattle brought in from other States were carefully inspected to make sure that they carried with them no disease to infect the herds already in the State.

Thus to protect the people from being served with milk from diseased cows the State last year spent nearly \$9,000, in addition to the salaries and expenses of the tuberculosis commission in examining herds and inspecting cattle imported from other States. One of the most difficult duties the State has undertaken is that of stamping out animal tuberculosis. It requires constant, skilful and unremitting vigilance, for there are unscrupulous dealers who would hesitate not a moment to send diseased cattle here, no matter what results might follow to the herds and to the milk supply of the State. The State's work is very valuable, but it should be supplemented by everything that every city can do to insure a constantly pure, wholesome supply of milk, at all seasons of the year.

BOARD OF HEALTH OF THE STATE OF NEW JERSEY,

TRENTON, November 11th, 1904.

To the State Board of Agriculture, Trenton, N. J.

GENTLEMEN: Enclosed is a report in conformity with the provisions of the act approved May 4th, 1886, showing the number of cases of communicable diseases of animals which have been reported to this Board during the year ending October 31, 1904.

Very respectfully,

HENRY MITCHELL, *Secretary.*

REPORT ON INFECTIOUS DISEASES OF ANIMALS.

During the year ending October 31, 1904, the prevalence of infectious diseases among animals was much diminished when compared with the previous year, as the following table shows:

<i>Infectious Diseases of Animals Reported.</i>	<i>1903.</i>	<i>1904.</i>
Glanders,	237	87
Anthrax,	172	26
Actinomycosis,	00	4
Erysipelas,	00	1
Rabies,	11	3
Forage poisoning,	00	2

The following list shows the date of each case of glanders reported, together with the sanitary district in which each case

occurred, the name of the person making the report and the disposal of the diseased animal.

<i>Name of Sanitary District.</i>	<i>Date and Number of Cases Reported.</i>	<i>Name of Person Making Report.</i>	<i>Disposal of Each Case.</i>
Jersey City, ...	Nov. 11, 1903, .. 10	W. H. Lowe, D.V.S.,....	Animal destroyed.
Passaic,	" 14, " .. 1	" " "	" "
West Hoboken,	" 24, " .. 1	" " "	" "
Glen Rock,	" 30, " .. 1	" " "	" "
Jersey City, ...	" 30, " .. 2	" " "	" "
Newark,	Dec. 8, " .. 1	" " "	" "
Newark,	Jan. 9, 1904, .. 1	" " "	" "
Jersey City, ...	" 26, " .. 2	" " "	" "
Newark,	Feb. 3, " .. 2	" " "	" "
Newark,	" 7, " .. 2	" " "	" "
Orange,	" 7, " .. 1	" " "	" "
Bayonne,	" 13, " .. 1	" " "	" "
Belleville,	" 16, " .. 1	J. P. Lowe, D.V.S.,....	" "
Kearny,	" 18, " .. 3	W. Runge, D.V.S.,....	" "
Jersey City, ...	" 23, " .. 3	W. H. Lowe, D.V.S.,....	" "
Newark,	" 23, " .. 2	" " "	" "
Jersey City, ...	" 23, " .. 3	" " "	" "
Jersey City, ...	Mar. 4, " .. 8	" " "	" "
Paterson,	" 5, " .. 1	" " "	" "
Carlstadt,	" 16, " .. 1	" " "	" "
Great Me'dows,	" 16, " .. 3	Owner,	" "
Newark,	" 16, " .. 1	W. H. Lowe, D.V.S.,....	" "
Newark,	" 20, " .. 1	J. W. Lowe, D.V.S.,....	" "
Passaic,	Apr. 2, " .. 1	J. P. Lowe, D.V.S.,....	" "
Passaic,	" 6, " .. 1	" " "	" "
Newark,	" 7, " .. 1	D. C. Bowen,	" "
Cedar Grove, ..	" 10, " .. 1	Raymond Smith, D.V.S.,	" "
Bayonne,	" 21, " .. 1	R. J. Halliday, D.V.S.,..	" "
Bayonne,	May 10, " .. 1	" " "	" "
East Orange,..	" 18, " .. 1	W. F. Harrison, D.V.S.,.	" "
Newark,	" 17, " .. 1	D. C. Bowen,	" "
Jersey City, ...	" 15, " .. 1	" "	" "
Carlstadt,	" 23, " .. 2	W. J. Fredericks, D.V.S.,	" "
Jersey City, ...	July 8, " .. 1	Henry Smellie,	" "
Passaic,	" 9, " .. 1	J. P. Lowe, D.V.S.,....	" "
Bayonne,	" 22, " .. 2	R. J. Halliday, D.V.S.,..	" "
Haledon,	Aug. 6, " .. 1	W. H. Lowe, D.V.S.,....	" "
Jersey City, ...	" 6, " .. 1	Henry Smellie,	" "
W. New York, ..	" 8, " .. 3	W. H. Lowe, D.V.S.,....	" "
Union Hill,	" 8, " .. 2	" " "	" "
Bayonne,	" 26, " .. 2	R. J. Halliday, D.V.S.,..	" "

TUBERCULOSIS IN ANIMALS.

207.

<i>Name of Sanitary District.</i>	<i>Date and Number of Cases Reported.</i>	<i>Name of Person Making Report.</i>	<i>Disposal of Each Case.</i>
Passaic,	Sept. 8, " .. I	J. P. Lowe, D.V.S.,.....	Animal destroyed.
Newark,	" 23, " .. I	David D. Chandler,.....	" "
Passaic,	Oct. 7, " .. I	J. P. Lowe, D.V.S.,.....	" "
Newark,	" 20, " .. 2	David D. Chandler,.....	" "
Jersey City, ...	" 22, " .. I	Henry Smellie,	" "
Jersey City, ...	" 25, " .. I	" "	" "
Jersey City, ...	" 26, " .. I	" "	" "
Jersey City, ...	" 31, " .. I	" "	" "

The following table shows the distribution of glanders by counties for the years 1903 and 1904:

<i>Counties in which Cases of Glanders were Reported.</i>	<i>Year ending October 31, 1903.</i>	<i>Year ending October 31, 1904.</i>
Bergen,	4	3
Cumberland, .....	...	1
Essex,	169	19
Hudson,	40	51
Morris,	1	..
Passaic,	23	8
Warren, .....	...	5
	237	87

Early in June, 1904, reports were received showing that anthrax had appeared among cattle in Cumberland county, and laboratory examination of a specimen from the diseased animal confirmed the diagnosis of the local veterinarian. The supervision of the inoculation of exposed animals, quarantining of premises and proper disposal of carcasses of infected animals, dead of anthrax, was placed in the hands of S. C. Tremaine, D. V. S., of Bridgeton, and his report of the outbreak is herewith submitted:

"To the Board of Health of the State of New Jersey:

"GENTLEMEN—Last April I inoculated a few herds of cattle in the anthrax-infected district of last year in Greenwich township, Cumberland county, and among them a small herd that was to be turned out on the salt meadows belonging to Henry Bacon. Mr. Bacon had lost eight cattle in 1903 from anthrax, and felt it necessary to take this precaution before exposing the ani-

mals to the infected pasture. About two weeks after these cattle were turned out three others were sent to the same meadow by C. J. Fithian of Bridgeton, N. J. About ten days from that time I received word that one of the Fithian cattle had died very suddenly. I immediately drove to the farm to investigate, and, feeling sure this was a case of anthrax, sent a specimen to the State laboratory of Hygiene, and in time received a report which proved the diagnosis to be correct. On the 7th of June I received instructions to inoculate the remainder of the stock on this farm that had not been previously inoculated, consisting of ten cattle, four horses and two mules, and also the stock on the farms adjoining. This was done as quickly as possible. No other deaths occurred in this neighborhood. On the 14th of June I was called to the farm of Elbert Newkirk, in the same township, three miles distant from the Bacon farm, to see a horse supposed to be suffering from bee-sting, but which proved to be a case of anthrax. Six days from that date another horse died from the same malady. On the 22d of June a representative of the State Board of Health instructed the township committee to post notices to the effect that all animals exposed to infection from the disease should be quarantined unless protected by inoculation, and also informed them that the protection would have to be at private expense. I received instructions from the State Board of Health on that date to inoculate, as before, the animals on the infected Newkirk farm and the farms adjoining. This was done, with the result that no more deaths occurred on these farms. I had then inoculated 62 cattle, 19 horses and two mules, which ended my work, as my instructions were to confine the inoculations strictly to animals liable to infection in the immediate vicinity of the disease. Three other deaths occurred from anthrax in Greenwich township, and the animals on three farms were immediately inoculated. No other cases of anthrax occurred in this locality. The report of an outbreak of anthrax was sent to me from Heislerville, Maurice River township, and on the 18th of July I investigated and found that seven cattle had died from anthrax on the farm of Anson Thompson. When the disease first made its appearance several parties pasturing cattle on this farm removed them to their own farms and several of the animals died, and as a result a larger area was infected. I met the township board of health, and they heartily endorsed preventive inoculation and were ready to do anything in their power to stop the spread of the disease. On July 20th I began to inoculate against anthrax in Maurice River township, and inoculated 223 head of cattle, 119 horses and six mules. Twenty head of cattle died within two weeks from the time the disease first made its appearance, and but two deaths occurred after the first inoculation. These deaths were of animals pasturing in a field that had been infected by the death of one of the cattle removed from the Thompson farm. The farmers of Maurice River township gladly accepted the preventive inoculation and spared no pains to dispose of the cadavers under my direction.

Very respectfully,

"S. C. TREMAINE, D. V. S."

The distribution of glanders in the larger cities during the year was as follows: Bayonne, 7 cases; Jersey City, 25; Newark, 15; Passaic, 6, and Paterson, 1.

TUBERCULOSIS IN ANIMALS.

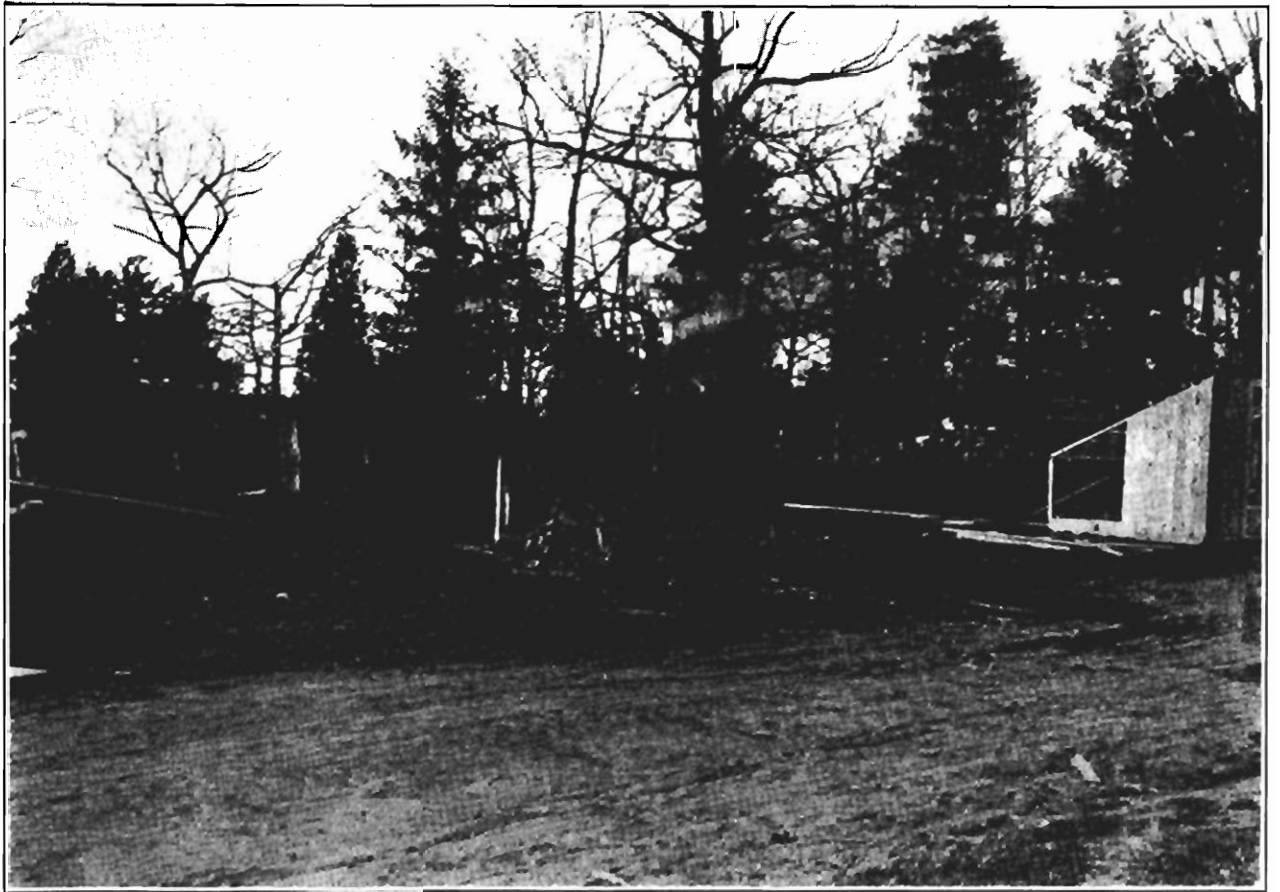
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SUMMARY.

Losses of animals from anthrax, 26; vaccinations for anthrax, 431; animals destroyed on account of glanders, 87; cases of actinomycosis reported, 4; forage poisoning, 2; erysipelas, 1; rabies, 3, and tuberculosis in cattle, 4.

Trenton, N. J., October 31st, 1904.

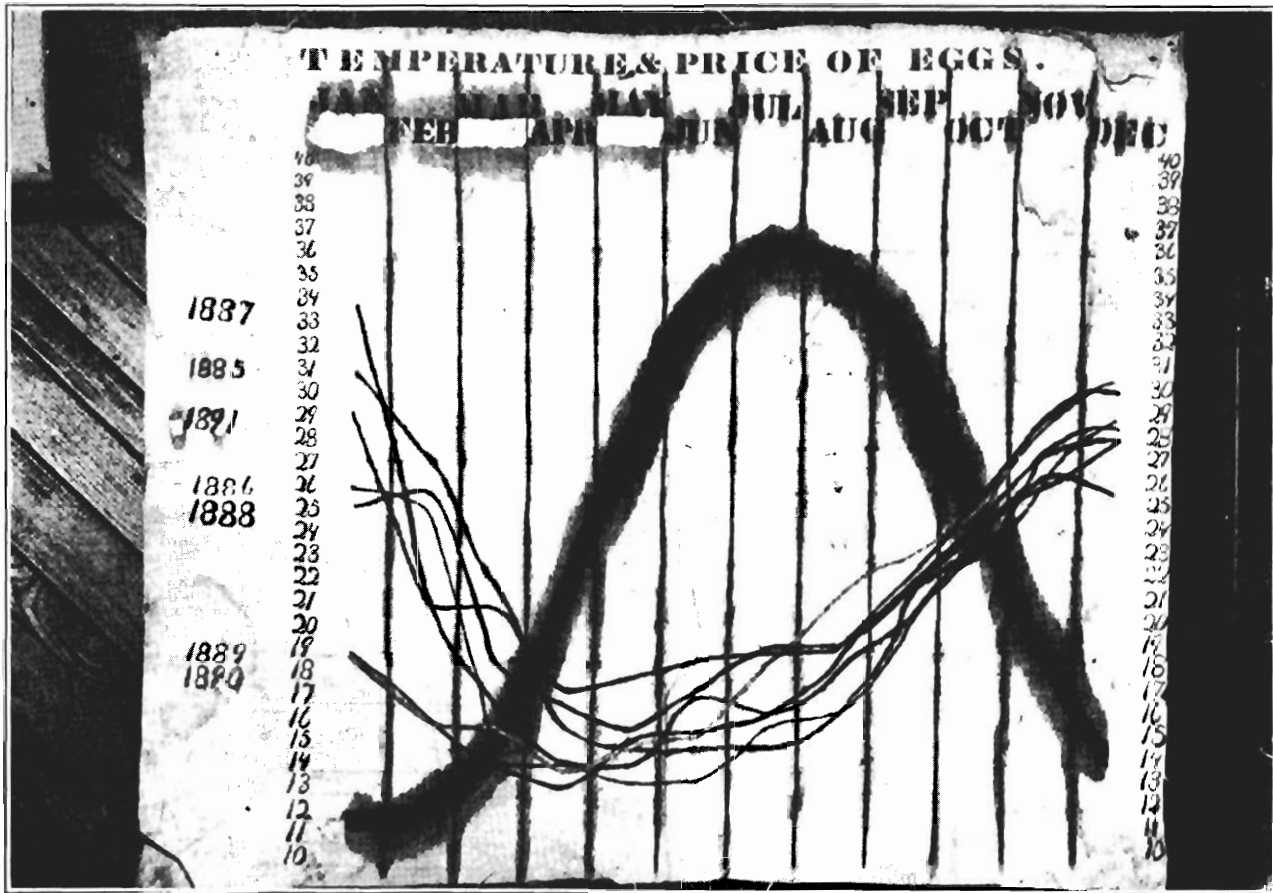
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Poultry Problems.

(211)



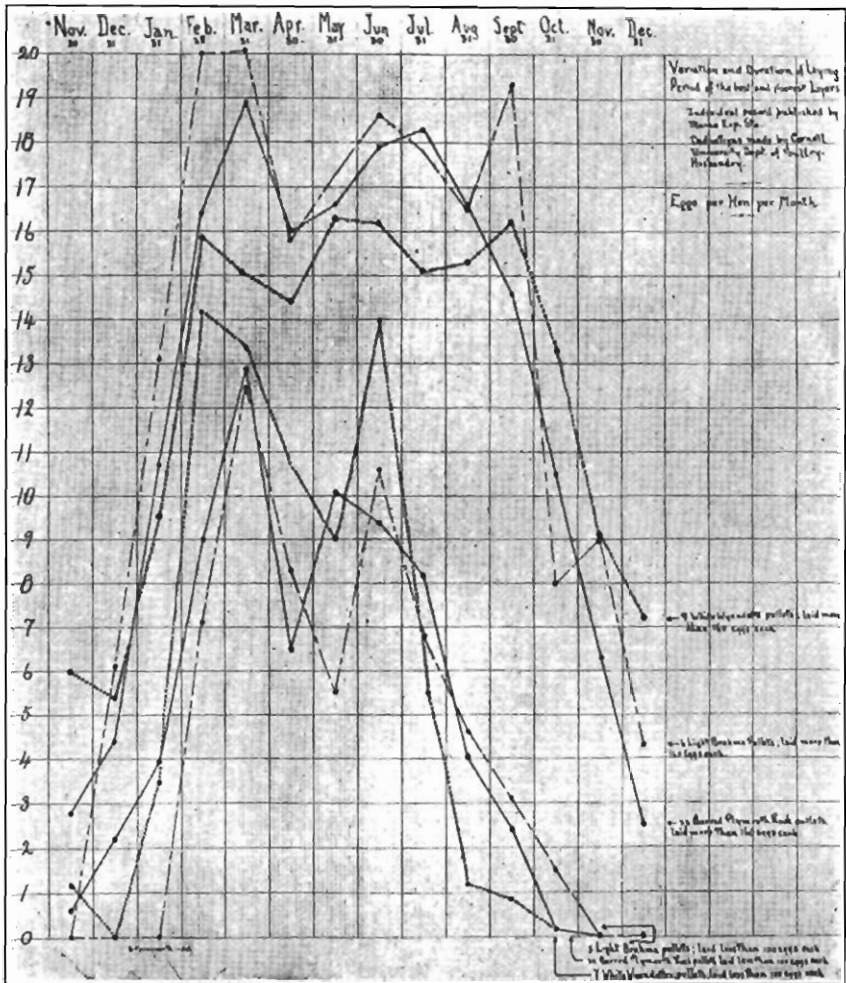


Plate II.

Variation and duration of the laying period of good and poor laying hens.

Poultry Problems.

Extracts from a stereopticon lecture on "Some Poultry Problems by Lime Light," delivered by James E. Rice, assistant professor of Poultry Husbandry, Cornell University, Ithaca, N. Y.

The first slide (see Plate I) is one of a series of charts that has been prepared with a view of trying to represent by plotted curve some of the laws governing egg production; and this curve is important also in that it shows how the laws of egg production conform to or are associated with the laws governing prices. The chart therefore has a two-fold value; it shows the curve of temperature and of prices. In order to know the meaning of the chart it must be understood that vertical lines divide the chart off into months, and lines running horizontally divide it into prices per dozen during a period of years from 1885 to 1891. During these seven years eggs were always high in January. There were two years when they were a little lower in January than at other times, but, with that exception, the price of eggs scarcely varied but a few cents per dozen each month during these seven years, always being highest in January, a little lower in February, lower still in March, lower in April, about the same in May, a little higher in June, and still a little higher each month until December, when they reached the highest point.

Comparing this curve of prices during seven years with the curve of temperature, you see that when the temperature has been the highest the price of eggs has been the lowest, and when the temperature has been lowest the price of eggs has been highest, showing the relationship between temperature and production, which is also according to the law of supply and demand.

This chart (Plate II) was made to show the variation in egg production during a period of a little over a year of three dif-

ferent varieties of fowls, the White Wyandotte, Barred Plymouth Rock and the Light Brahma. The data was taken from the Maine Experiment Station Bulletin, but the charts were prepared from this data in order to find out whether there were any laws that governed egg production as between the poorest and best layers. It is interesting to know when one hen lays more than another, whether the same laws of production may be applied to a large number of hens. Therefore I sifted out of all the records of the Maine Station nine White Wyandotte, six Light Brahma and 22 Plymouth Rock hens that laid over 160 eggs in a year; then sifted out also five Light Brahmas, 22 Plymouth Rocks and seven Wyandottes that laid less than 100 eggs in a year. The charts were then divided off into months to show the variation in egg production for each month. The comparison is the average number of eggs per month laid by each hen. A dotted line represents the egg production of the White Wyandottes, the dash line shows the record of the Light Brahmas and the solid line represents the Barred Plymouth Rocks. During the month of November we find that those that had the best record for the year began laying in November and they laid quite well, averaging five to six eggs for the months of November and December, whereas those that only laid 100 eggs during the entire year only averaged one egg during the month of November and three or four during December, not much better in January, but quite a little better in February. They were always considerably below the best hens, however. In February the hens laying 160 eggs or more per year averaged 15 to 20 eggs, whereas those that only averaged 100 eggs laid only 12 or 13 eggs. In March both good and poor flocks began to drop a little in production, then they began to increase the yield after taking a short rest, as did the better layers. High production continued all through June, July and August and into September, averaging 14 eggs per month for the best hens. The poor hens began to decrease early in the summer, until they were only laying five or six eggs in September and were actually out of business during the month of October, while the others continued and were still giving a good production of seven to nine eggs in November and December and carried their production into the following year. The lesson to be

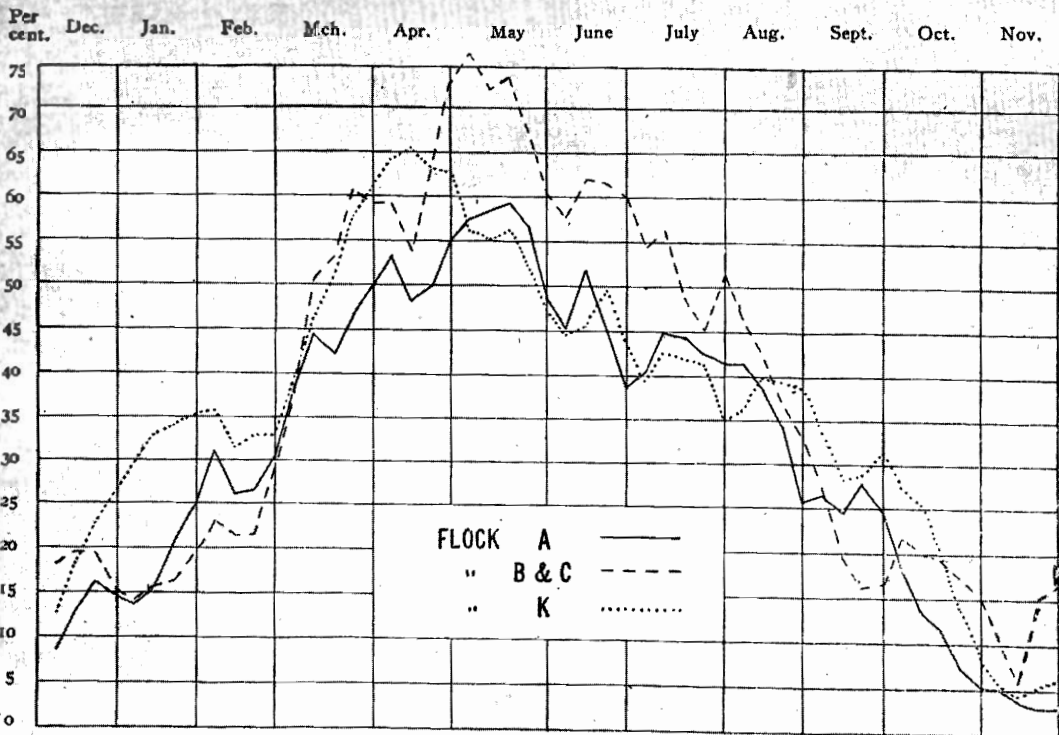


FIG. 204. The percentage egg-production for each month of the year varies with great regularity one year with another, always being lowest during October, November and December, and highest during April, May and June. Observe the wonderful regularity in egg-production of three flocks as shown above.



Plate IV.

The development of the egg, from Duval's book on Embryology.

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learned from this is, first, that the best producers begin early and continue clear through the year, and, second, that while the others lay regularly, they are slow to begin, quick to stop and do not lay as frequently, and after a certain time both good and poor layers take a rest, which is followed by a shorter period of production than when they cease laying entirely. The question of good or poor production appears to be the result of heredity and is dependent largely on constitutional vigor.

This chart (Plate III) represents a plotted curve made by Prof. H. H. Wing to illustrate a bulletin on egg production issued from Cornell Agricultural Experiment Station. It shows the great uniformity with which egg production varies from month to month throughout the year with various flocks. Three flocks are here represented each by a different line. These three flocks were owned by large poultrymen in widely different parts of the State of New York and represent a good many hundred hens in each case. A point to be noticed is that while the men who cared for these hens had different methods of feeding, different methods of housing, and were in different sections of the State, the only thing that was uniform was that they all had White Leghorns. In every case they failed during the month of December to average more than 10 to 15 per cent. production. They did not do much better than that during the month of January. In the month of February they were up to 25 and 30 per cent. In March they all went to 40 or 45 per cent. In April they were about the same. In May they were a little higher, and later they went down each month, until in the month of November following they averaged, for the three flocks, about 8 to 10 per cent. production per month. You will see from this the first great law of egg production, which is that fowls respond to climatic conditions and they do it with a certain regularity in spite of good feeding, the best of breeds and warm buildings. It shows us that with mixed flocks of hens, including young and old, we are unable to get anything like as good egg production in September, October and November as during the warmer months of the year.

This chart (Plate IV.) is to show the development of the egg. The first part of the egg to be developed is the yolk, which starts

in the ovary. This yolk develops from a little bunch of muscular tissue, from which seems to break out little patches and nodules that grow and develop from the size of a pin-head to that of the fully-developed yolk. The yolk is held in a sack, or follicle, resembling the grape pulp within the skin. The follicle is covered over with blood vessels. When the yolk is ripe and ready to be deposited the follicle bursts and allows the yolk to escape into the mouth of the oviduct. There is a very beautiful harmony in nature which provides for all these processes. When the yolk is ripe and ready to be deposited the follicle ruptures and the blood vessels which come up on both sides are not broken, because they fail to cross the suture mark where the rupture takes place. When fowls receive rough handling we get very serious results, because the follicle becomes ruptured prematurely and a clot of blood escapes and becomes encased with the white. When the yolk of the egg has ripened properly and fallen into the ova-sac it will pass on through these many different convolutions of the oviduct. As it passes along it is very much twisted, due to a peculiar twisting motion of the muscles. As the egg passes along two little cords of albumen are formed on either end of the yolk, called the "chalaza," and they are twisted up so that when the egg is deposited they act as a hammock suspending the yolk. They seem to have a tendency so to balance the yolk that when the egg is lying in its natural position the germinal disc will always be on top. The egg occupies about three or four hours in the partition of the oviduct where the white of the egg is deposited. A little farther along the two shell membranes are deposited. Then the egg rests for twelve hours or more in the place where the shell is formed. The glands which secrete the color pigment become more and more depleted as the number of eggs laid increases, so that the pigment in the brown-shelled eggs disappears as the litter goes on. If two of the ovules are developed in the same follicle they will be deposited together and we get a double-yolked egg.

You can stimulate fowls by too much heavy feeding of meat, causing too much deposit of albumen. We also find cases where the fowls have been stimulated to develop the yolks and have not had the material at hand to make the albumen. This results in

the yolk being deposited without any white. In other cases we find the white has been deposited without any yolk. Frequently the shell-making material is deficient, which will cause the egg to be laid with soft shells or without shells.

The shape of the oviduct determines the shape of the egg. In other words, the oviduct forms a mold into which the egg is cast. It will vary in shape, size and color usually with the variety or breed, but generally the shape of the egg is an individual characteristic. There are cases where the egg, in its passage, has been forced along by the muscles behind it, and then, because of some injury, there is a reverse action of the muscles which compels the egg, after the shell is deposited, to go back to where more white is deposited and then come back by the contraction of muscles in another direction to the place where another shell is formed around the first one. I have heard of a third shell having been put upon an egg. The great lesson to be learned from this illustration is that the hen should get very careful and systematic feeding, because the yolk is about one-third fat and two-thirds albumen, whereas the white of the egg is pure albumen and the shell of mineral matter. There are three separate and distinct classes of glands, each secreting a different kind of material, which are necessary to make a perfect egg to develop a strong chicken. It is, therefore, necessary that the hen, in order to do her best, must have a well-balanced and easily-digested food to form the highly-organized egg to produce a perfect individual.

The germinal disc, which is the little white patch that develops on the top of the yolk, will grow to a large size, even if it has not been fertilized, but no blood will be formed unless fertilization has taken place.

This plate (V) is to illustrate the difference in the temperature readings of thermometers placed at different heights on the egg tray of the incubator. One incubator manufacturer recommends that his thermometer be used with the bulb resting on the egg. Another recommends that the thermometer should hang just above the eggs and almost touching them, while another recommends that the thermometer be placed among the eggs with the bulb just below the surface. At the time we began making

these experiments to find out what the difference in temperature would be, as indicated by the placing of the thermometer, the incubator companies recommended running their machines at the same temperature. They all said, in practically the same words, "run it as near 103 as you can." If you follow the directions of the man who said to run with the thermometer above the eggs and run it at 103 degrees, this thermometer will read about two to three degrees higher than the thermometer which rests on the eggs and about three to five degrees higher than the one between the eggs. In fact, we have found extreme readings would be about five to seven degrees higher. We have found even greater differences than these in some tests which we have made. One must therefore conclude that either it does not make much difference within several degrees as to what the temperature of the machine is throughout the period of incubation, or else the incubators where the thermometer is above the eggs have not been giving the eggs enough heat, and that the machines that have the thermometers between the eggs have been giving the eggs several degrees too much heat. When I called the attention of one or two incubator makers to that fact, they would not believe it until these charts were shown to them. As a result of this experiment, at least one incubator manufacturer is running machines and keeping three thermometers in the different positions suggested, to see how they run, and is convinced that the height of the thermometer as frequently placed makes a difference of from three to seven degrees in the actual temperature readings.

Plate VI is the first of a series of plates to illustrate types of colony houses used at Cornell University Poultry Plant. This cut shows the construction of the frame work. They are used for rearing chickens, or for placing the mature stock in later, if desired. They are eight feet square, three feet high in rear, six and one-half feet high in front. The two end sills are made of oak and chamfered to use as runners.

Plate VII shows the building at another stage of construction. Students are seen building houses. The window opening in front has two sashes, one of glass and the other of cloth.

The first two charts show the beginning; this one (Plate VIII)

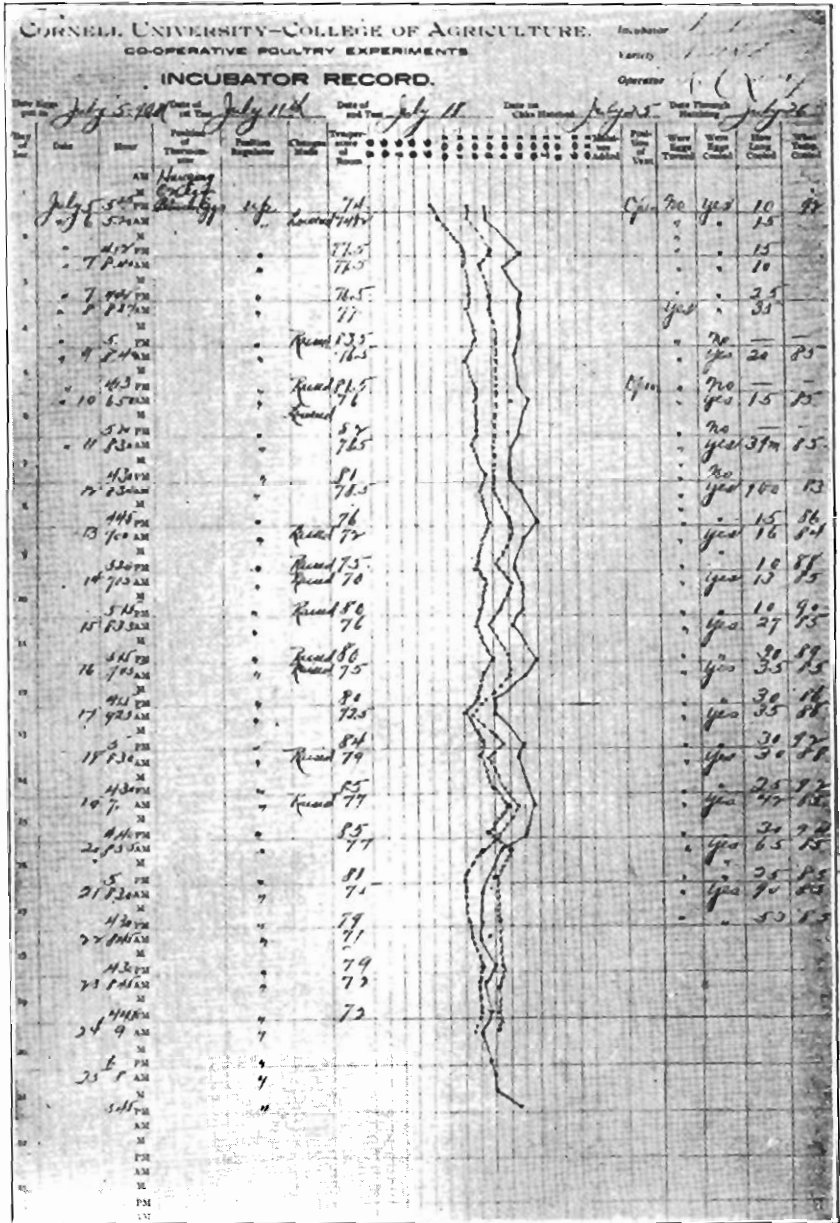
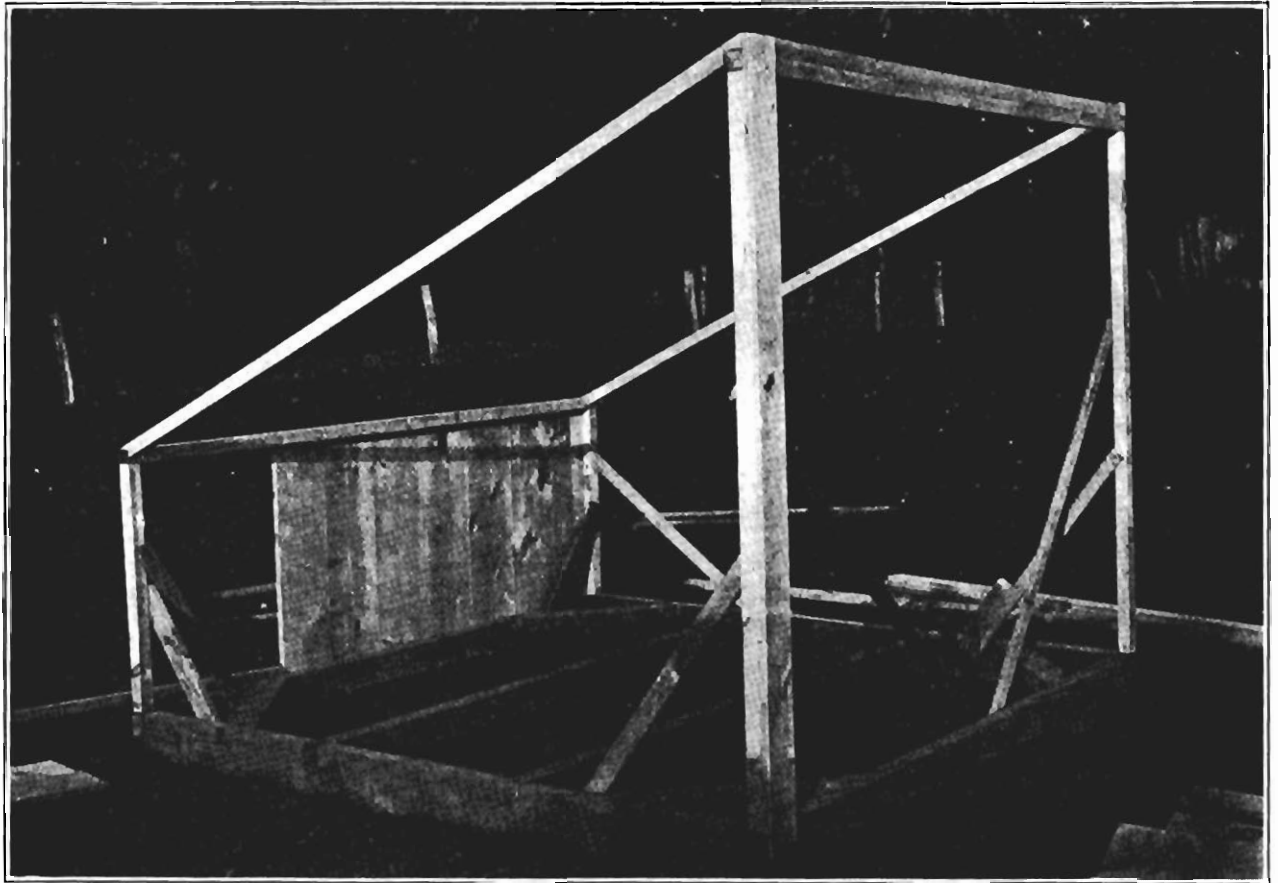


Plate V.

Incubator record, which shows the variation of three thermometers placed at different heights in the machine.



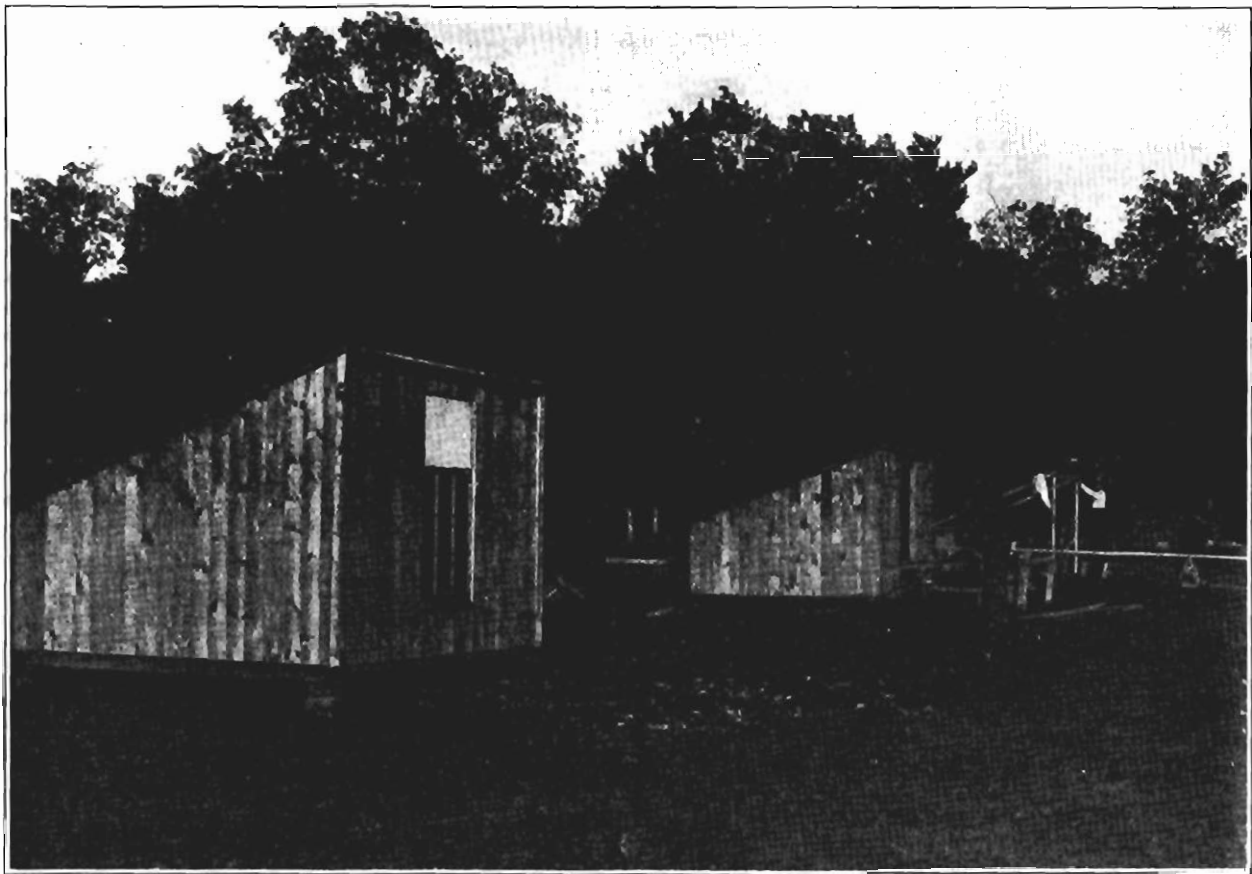


Plate VII. Completed colony house. Students building other houses.



Plate X.

An early maturing pullet. First egg laid when 4 months and 24 days old.
Weight of egg, $1\frac{1}{2}$ ounces. Weight of pullet, $3\frac{1}{2}$ pounds.

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the ending. It should serve to teach the lesson that all brooders are dangerous, and cannot be trusted in connection with valuable buildings. One of the great advantages of outdoor brooders and colony houses is that in case of fire the damage is limited to the one brooder if they are sufficiently far apart. To illustrate the frequency of brooder fires, I can give an instance where five brooder fires occurred within sight of one farm at Yorktown during a single season.

The plum orchard at my home at Yorktown, N. Y., where we raised two years ago between 1,600 and 1,700 White Leghorn chickens, harvested a large crop of plums and grew a good mat of clover the same season, the chickens getting the benefit of the shade, and the trees growing vigorously on the fertility from the deposits. The clover did not interfere with the growth of the plums, and the chickens were screened from the hawks. The plan here adopted was to use the colony brooder houses similar to those shown in Plates VI and VII. They were heated by indoor brooders, which are removable when the chicks are old enough to go to roost. By this plan the chickens can be grown on new clean sod land each season by drawing the colony house from place to place. More chickens can be raised in a single flock and the work can be done more satisfactorily on cold or wet days and the chicks will have more room when they are shut in than they could have in outdoor brooders. For all winter broilers a brooder house with pipe system would be preferable on account of economy of fire and ease of operation at that season.

The first few years after the plum orchard was planted it was kept cultivated to insure proper growth. This view also shows in the distance the remodeled dairy barn for hens. This was a case where the hens scratched the cows off the farm. The use of the barn for wintering laying hens was not successful, however, until we learned that part of the windows ought to have been made of cloth to provide proper ventilation. Hens must have fresh air.

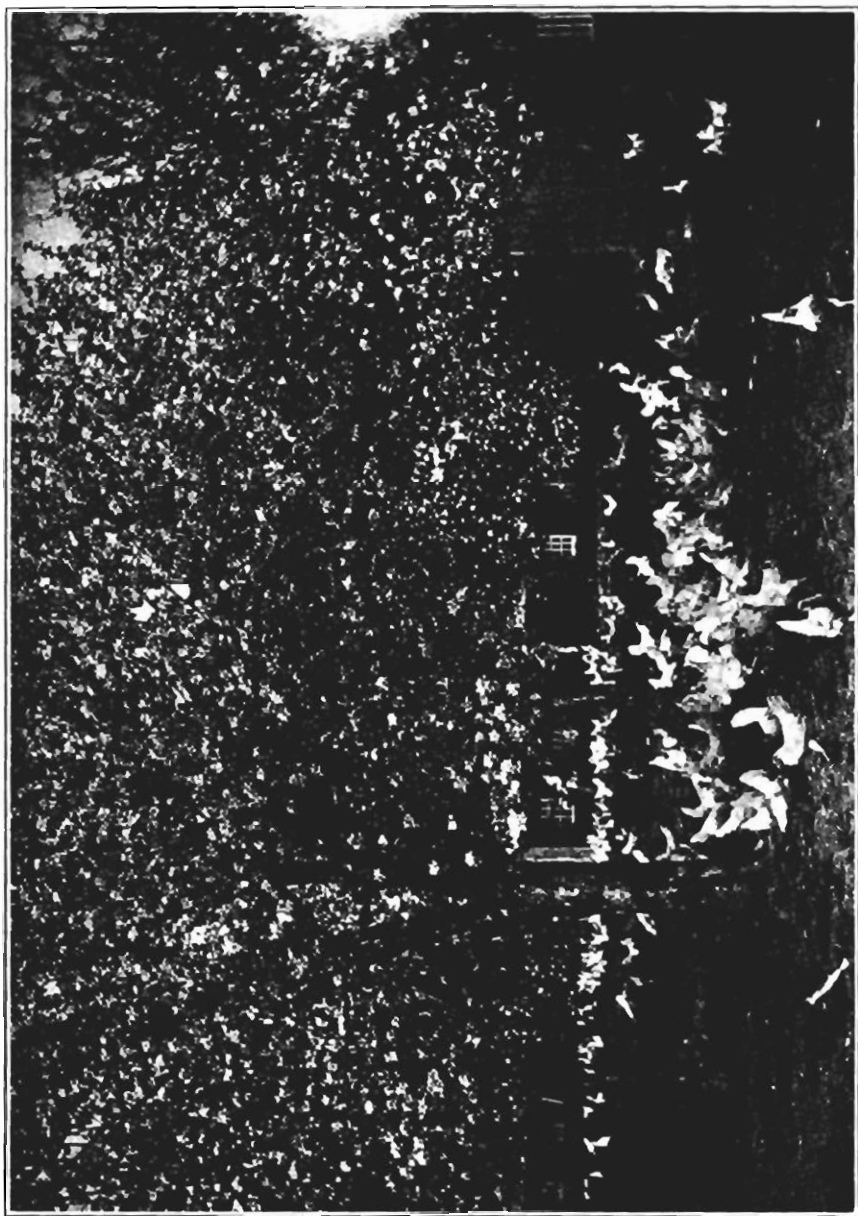
Plate X illustrates precocity in fowls. A pullet which laid her first egg when four months and 24 days old. The second egg she laid weighed one and a half ounces. The fowl herself

weighed three and a half pounds when she laid her second egg. We do not want to encourage early maturity. It is unnatural and only common when chickens are growing too rapidly. In order to retard premature laying of very early hatched pullets we pick out 100 to 150 and put them in a meadow. When they are being retarded they are given good whole grain, such as corn, oats and wheat, but no ground food but a little meat. It is surprising how they will respond to rich egg-producing rations at the time we want them to lay in October and November.

Plate XI shows hens in apple orchard with trees in bloom. This is the ideal place for hens and a good place for apple trees. It looks at times as though some of the apple trees were going to get too much fertility. They are growing so large and have such dense foliage. We have had a good crop of apples every year during the last twelve years from this orchard. I attribute it largely to the fact of having fowls running in the orchard, which provides available food to grow the fruit buds and prevents the wood from exhaustion.

Plate XII shows a fowl with a pendulous crop, hanging down four or five inches below where it should be naturally. It also illustrates a hen with a very large abdomen, almost on the point of breaking down, due to excessive fatness. The former trouble cannot be cured. It is the result of a breaking down and weakening of the tissues and occurs principally among old fowls of the general purpose or meat varieties. Although this particular fowl seems to have been in good condition when killed, she would have died in a few weeks if we had not "killed her to save her life." The crop hung down so far and became so heavy that the fowl had lost power to force feed up into the gullet and so on to the digestive tract.

Plate XIII shows the same two fowls after they had been killed and picked. The hen which showed the heavy fat deposit was one of the heaviest layers in our flocks, as shown by the trap nest records. She was in laying condition at the time she was killed—a fully-developed egg, ready to be laid, was found. Nevertheless, she was so fat that the condition had become almost a disease and she would have died later of fatty degeneration, as others have done.



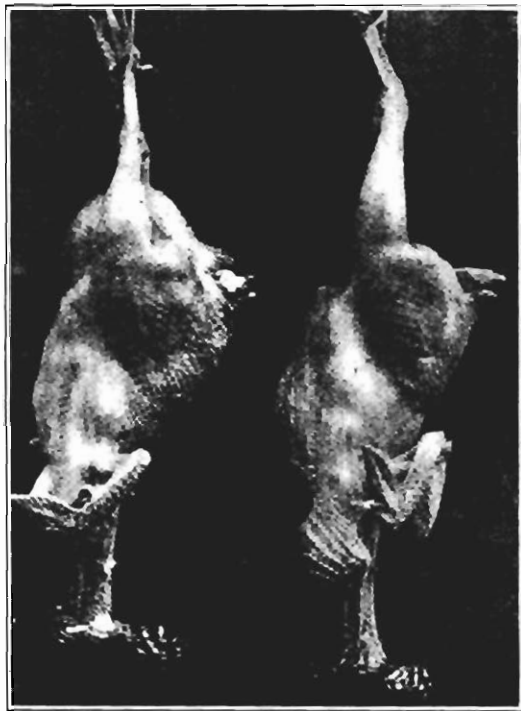


Plate XII.

Pendulous crop on left. Broken-down abdomen on right.

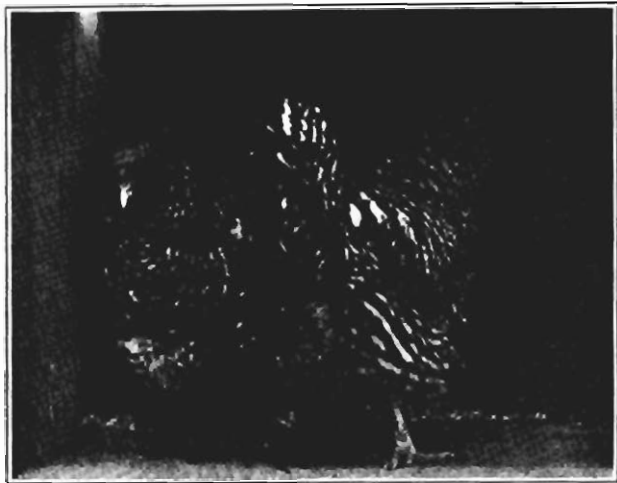
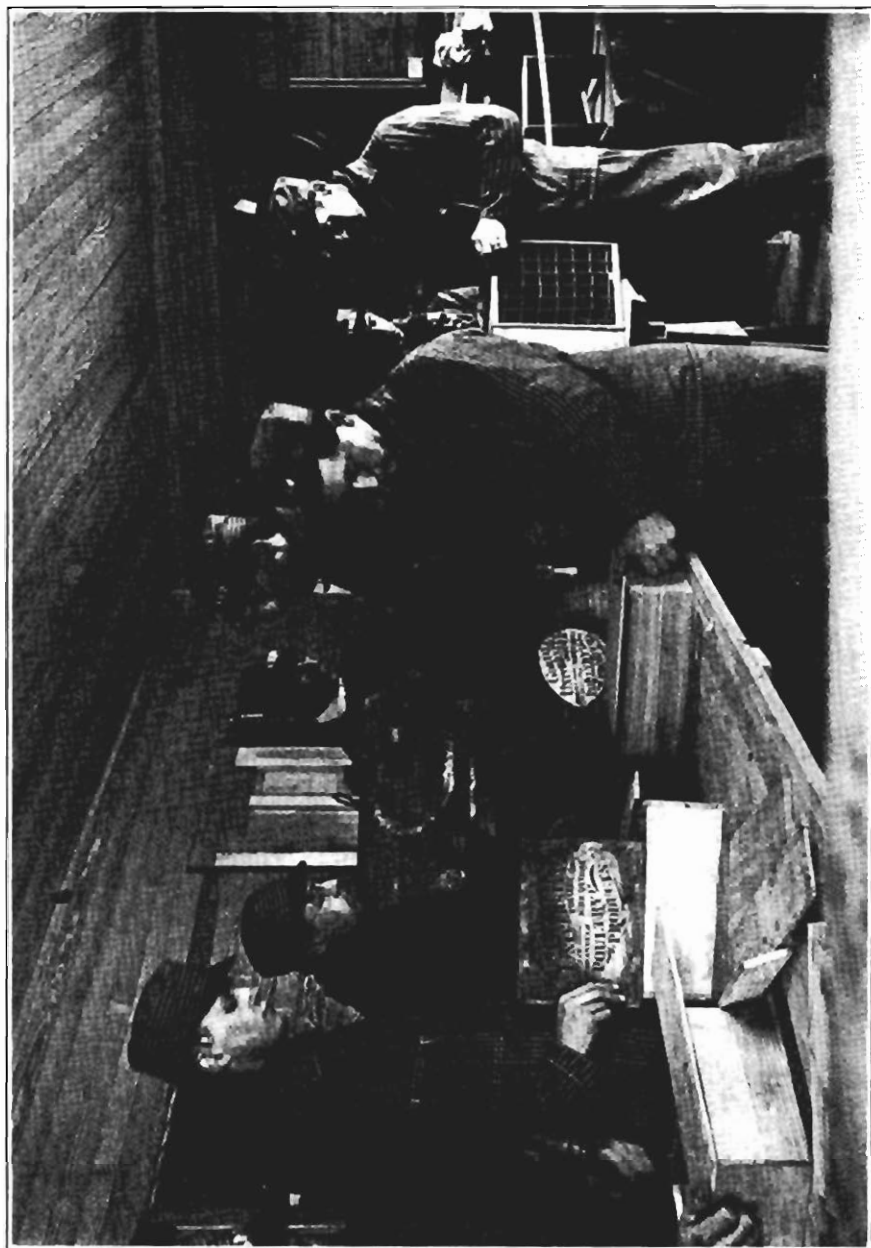


Plate XIII.

Pendulous crop on right. Broken-down abdomen on left.



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Plate XIV illustrates students of the special eleven-weeks poultry course at Cornell University making egg crates to be used in shipping eggs to private families. This type of crate is used with great success and satisfaction in shipping eggs, both to private and wholesale trade. Any person familiar with a saw, hammer and square can do this work. Each crate should be stencilled. A good trade mark is a good advertisement wherever it goes. These crates are made of three-eight-inch Georgia pine ceiling, and are made to hold the ordinary three dozen paper fibers. Sizes are made in multiples of three dozen by making the crate higher; *i. e.*, they may be three dozen, six dozen, nine dozen, twelve dozen, or thirty dozen. The easiest money to be made in keeping poultry is the profit secured by virtue of good marketing. A good, strong, neat crate will add to the selling price.

**Parcel Post—Should it be Introduced in the United States—
Advantages Possible.**

BY H. W. COLLINGWOOD, ESQ.

Parcel Post—Should it be Introduced in the United States—Advantages Possible.

BY H. W. COLLINGWOOD, ESQ.

Mr. President and Gentlemen: I suppose many of us remember how, fifteen or sixteen years ago, the farmers tried to have the experiment of rural free delivery started. Many of you remember how hard it was to get Congress even to try the experiment of delivering mail in the country. I had something to do with that early starting and I know that those men in Congress didn't want to try that at all. The postal authorities told the Congressmen that it would not pay; that farmers did not want it, and that it was a nuisance generally. Finally Congress appropriated \$20,000 to try the experiment. Postmaster Wilson took the money and refused to try it. He simply held it up. Finally John Wanamaker was appointed Postmaster-General and he tried the experiment. Even he, at the time, was a little afraid of it.

Now our political friends when they put up \$20,000 for that experiment found that the farmers of this country, after a taste of free rural delivery, were not satisfied until it was made general.

In order to understand exactly what this parcel post is and what it represents, let me ask you for a few minutes to go over the history of the postal delivery.

Over 500 years B. C., Cyrus, King of Persia, kept mounted men at fixed stations all ready to carry his messages from place to place. Thus this, like many other rights and privileges, originally belonged to king or ruler alone. What we have to-day simply represents what the common people have demanded and obtained by fighting or legislating. While letters were carried

for the king in olden times, it was not until the 12th century in France that an actual letter post was started. To show how the system was kept away from the people I may say that in Germany, which we call an enlightened country to-day, the office of postmaster general was hereditary up to 1806, being kept in one family—that is, that office was kept in the hands of one single family, carried down from father to son just exactly like the king or any other ruler. The office was carried in one family, and you may be sure that the people got very little benefit out of it.

In England royal messengers carried letters in 1250. The system steadily grew until those messengers began to carry messages for the people and transact private business. Elizabeth, Queen of England, was obliged to command these men to carry royal messages, to carry her letters first. They had been making so much money in carrying private messages that it became a very profitable business. Early in the 17th century special routes were established with men in charge who made what they could out of the service. In 1650 Prideaux offered a fixed rent of \$20,000 for the exclusive right to run the English postal system. He made a fortune out of it. He began the plan of farming out the postal service. That was not for the benefit of the people, but for the benefit of some men who wanted a job and wanted a fortune. They put these men in charge and gave them all they could make out of it, and they paid a small price to the government. It was in this way that the plan of farming out of postal services began.

A citizen of London, Wm. Dickwra, began a method of delivering letters in that city for one penny or two cents each. This worked so well that the people who had bought the right to control the postal services went to Parliament and swallowed up this man's private system because it brought so much money to him. Later the English government took the system away from private citizens and made it public, reducing the charges and bringing it down so that the public were really served. The point I want to make is that history shows how private citizens or corporations have organized and monopolized this public service until the government was obliged to go into the business to protect its citizens. In this country the early settlers largely followed

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the English system. The original post-office was the coffee house or other public place where letters were left to be called for and taken over the sea. In 1639 the Massachusetts Legislature decreed that all letters from over the sea must be left at the house of one Richard Fairbanks. He was to be paid one penny for each letter and was held responsible for their miscarriage. In 1657 Virginia decreed that every planter must provide a messenger for carrying letters to the next plantation, that is, suppose you were a farmer in the wilderness and that a man brought three letters for people who live beyond. You were first to provide a messenger to carry those letters on, and in case you did not you were fined a hogshead of tobacco. I wish sometimes we might be fined that way and all the tobacco might be collected and made into a bonfire. The system grew slowly. One of the first acts of the Continental Congress was to lay out post-offices and routes from Falmouth, Me., to Savannah, Ga., that is, diagonally through the country, the principal object being to dispatch government business and educate people as they went along. The service was at first very crude. At first the charge on a letter was six cents for 30 miles, eight cents for 60, 10 cents for 100, and so on up to 25 cents for 450 miles. These high rates partly led to the business of special messengers and express companies who carried mail for less than the government charge, though the post-office department tried to stop it. Finally the postage on a half-ounce letter was reduced to five cents for under 300 miles and 10 cents for more. No attempt was made to carry merchandise except newspapers. In 1855 the rate was made three cents under 3,000 miles and 10 cents over. In 1863 the element of distance dropped out and a regular rate of three cents for half-ounce letters were adopted. Twenty years later a new rate was made for two cents for letters and a classification of merchandise as follows: Second class, regular publications, one cent per pound; third class, transient publications and other printed matter, one cent for two ounces; fourth class or merchandise, one cent per ounce, limited to four pounds. The government had at last recognized that merchandise as well as letters should be carried. They were driven to this position by the extortion of private messengers or express companies, who made

good profits while doing public service for less than the government.

And it has never been changed to this day. While the facilities for transporting mail of all kinds have been wonderfully developed, that classification of merchandise costing 16 cents per pound, has never been touched for twenty years. Every other department of the postal service has been developed, but that one department has never been touched. I can't illustrate that any better than to say, a boy of ten years of age grows fifteen years, and becomes twenty-five years of age. His father gives him a hat and coat, a pair of shoes and a vest, adapted to his growth, but he still keeps him wearing knee pants. I can't give you a better illustration than that, of a boy of twenty-five wearing a hat, coat and shoes, and still wearing knee pants which he wore when he was ten years old.

Now, for twenty years the United States has stood still while every other civilized nation has gone ahead in the public handling of merchandise. There has been a wonderful extension of our system of distributing and delivering letters and newspaper mail, but this has only made the need of a merchandise mail more apparent. Free Rural Delivery puts a farmer within daily call of business men, but the express companies still have a monopoly of carrying packages of over two pounds in weight. While we have been standing still, putting money into the pockets of express companies, England and Germany have been giving their people a parcel and package post.

In Germany parcels up to 11 pounds in weight are carried anywhere in the empire for 12 cents. The weight limit is 110 pounds carried for 60 cents. In other words, if a man wants to send through the German post 110 pounds of merchandise, he can send it, by putting 60 cents in stamps on it, anywhere throughout the kingdom. In Great Britain the weight limit is 11 pounds, which costs 25 cents. In this country the postage rate on merchandise is 1 cent an ounce or 16 cents a pound. The limit is four pounds, costing 64 cents. A 4-pound package of merchandise may be sent to South Africa for 8 cents. In this country it would cost more than eight times as much. To give you an idea how the Germans have worked into this international system, I will

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say that a man in Germany may send a package to this country of four and one-half pounds for 38 cents, and Americans sending a package of equal weight to Germany must pay 60 cents. There is an international postal congress embracing all civilized countries except this country, which gives this low rate of merchandise postage all over the world. This country refused to join that, because Postmaster-General Payne said that was an infringement upon the business of the express company. Let us have the facts, so that we will know just exactly what we are talking about. The International or World's postage rate on merchandise is half that of the United States. In other words, the so-called slow-going countries of Europe are far ahead of us in the transportation of merchandise through the mails.

This has given the express company a monopoly on the transportation of small packages. I recently sent a package weighing twenty-eight pounds to the South and was charged \$2.05 expressage. Two years ago I made contracts to deliver boxed apples by express—twenty-two miles from New York. The expressage at that time was 25 cents a box and I agreed to pay it. Without warning the express rate was raised to 40 cents. I lost 15 cents of the price agreed on for my apples. Every farmer here can tell stories of express extortion. There is no longer any competition and the express companies, having a monopoly, make their own charges. Whenever a bill comes up at Washington for an extension of the merchandise service the express companies kill it if they can. They know very well if a parcel post bill were made law they would quickly be forced to cut their rates in two. They could do this and still make a good profit. Already they give special rates to the great department stores, in some cases carrying packages for 10 cents which would cost the individual 40 cents. In Boston packages are distributed over fifteen miles of territory at 2½ cents each. In New York pound packages are carried miles for one cent. In Massachusetts sixty-pound packages are carried thirty miles and more for 15 cents each, or two for 25 cents. All this is done at a profit, and it shows what a private corporation can do. This makes their extortionate charges seem all the more unreasonable. We have seen how the rates on letters were reduced when the express companies showed how

cheaply they could be carried and yet insisted on charging more than the service was worth. That is just what they have done with the merchandise post. A German farmer can send eleven pounds of merchandise for 12 cents. In order to send it by mail in this country an American must divide it into three parcels and pay \$1.76. An express company offers to carry it for 40 to 60 cents, at an actual cost of, probably, 15 to 20 cents. If the postal bill now before Congress were to pass, this eleven-pound package would be carried anywhere in this country for 25 cents.

Now, farmers are in greater need of this legislation than any other class. Congress will not grant the reform until farmers demand it. The city man can easily make small purchases, for the best stores are close on hand and he has no transportation to pay. Not so a farmer. Rural mail or the telephone puts him within call of the city store, but to the price must be added the cost of expressage, or else the store obtains a special rate, and the express cost to small shippers is increased to make up for it. Any farmer can readily see what this mail service would mean to him if he could send eleven pounds of merchandise anywhere in the country for 25 cents. It would change many of his plans for the better, avoid wastes and give him a chance to obtain supplies just when he wanted them.

The greatest increase in the post-office department is in free rural delivery. The extension of the service has caused a deficit of \$12,000,000, and there are many who talk of giving it up because it does not pay. This parcel post would make the rural service supporting, because 90 per cent. of the increase would be on country routes. It is in such places that people most need package transportation. The wagons, horses and carriers are already in service and paid for. The average load of mail delivered from a rural delivery wagon weighs 20 pounds, while the average business picked up by it weighs two pounds. The average cost of a rural route was about \$50, the average income \$10.50. The total cost of rural service last year was \$12,122,725, the total business originating on such routes was \$2,601,315, a loss of \$9,500,000. The chief reason for this loss was the fact that farmers could not use the mails for carrying merchandise. With a parcels post millions of packages would be stamped and

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carried to farm homes and taken from them. This would more than double the revenues, cut down the loss and simply give the rural carrier a full load instead of a bushel of mail. The free rural service can never be made fully self-supporting until the wagons carry a full load, and this will not be done until packages of merchandise are stamped and mailed.

The English people fought out this principle 60 years ago, when they won a uniform penny post. At that time the cost of carrying a letter any distance in England was 25 cents. Members of Parliament and others enjoyed a franking privilege—that is, by writing their names on their own letters or letters sent by their friends, those were carried free. As in every age, the favored few enjoyed a privilege which made the service higher to the others.

That is all they had to do, to write their name on the back of a letter and it would be carried free. They got into the habit of not only writing their names on their own letters, but also on the letters of their friends. For instance, if I was a poor friend of a Congressman he would write his name on it and it would carry free. The abuse grew until millions of men had their names written on the back of letters and the common people were doing then as they have done since, paying the bill. So in every age a few have enjoyed privileges which made it higher for the others. The story is told about the poet Coleridge who was walking one day and saw a poor woman having a quarrel with a man delivering the mail. He walked up and the mail carrier held in his hand a letter. There was no stamp on it. He said the cost of this letter is 25 cents. I won't give it to you until you give me 25 cents. It was from the woman's brother. She hadn't heard of him for six months. He was far away, and there was the letter held up before her, but she didn't have the 25 cents and could not pay it. The poet, a tender-hearted man, stepped up and said it was a shame that this poor woman should be deprived of that letter. I will pay the 25 cents, and he took out a shilling and handed it to the man. He noticed the woman was not very grateful. As soon as the man was out of sight she scolded him. What did you pay that 25 cents for? I have no doubt he had heard about the man who interfered in a fight

between a man and his wife and they both turned on him. "Why," he said, "I wanted you to hear from your brother." She said, "I heard from him all right." You see that? The high price had driven these people to desperation. She held the letter up like that and she said if there is nothing written in it the understanding between myself and my brother is that it should be a sign that he was well. It was a sign that it was all right, need not pay for the letter. If there was anything in there, borrow the 25 cents and get the letter. There was nothing in that letter and she knew that he was well.

I speak of that to show to what length these people were driven to get around the excessive postal tax. It merely shows what people will do when they are crowded to get around these postal charges and defraud the payment of the mail.

When it was proposed to break this system by taking away the privileges from these rascals that had enjoyed them so long and give a uniform two-cent rate all over England, why the privileged class rose up in arms. One man said there will be such an increase in letters that the cost will be increased ten times, and that no government building could hold such mails. They could not raise the money to handle that volume of letters. Then another class said that it would be so much mail that it would burst the post-office, and they would have to build a new building. Those short-sighted people could not see that their arguments answered each other. Just exactly as the arguments of those who opposed the parcel post answer each other to-day. For if the amount of mail was increased, so would the revenue be increased. If a man carries three letters at 25 cents apiece, a penny apiece made it possible to carry 500, and the same man could carry it and he got from \$4 to \$5. If the rural wagon now carries 10 pounds it can carry 150 pounds and the same man and the same horse and the same wagon can do it, and the revenues are more than doubled, so that farmers themselves, if given the privilege of doing so, will wipe out this deficit and make the free rural service pay for itself.

That is the answer to the "won't pay" argument of those who oppose this bill. They cannot get around it; they cannot touch it.

No improvement in the postal service has ever paid at first.

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If the American people had waited until profit was sure before starting any postal reform we would still be paying from six cents to 20 cents for mailing letters. The government is not expected to make money out of its citizens, but to give them fair service as near cost as possible. The extension of merchandise post would double the revenues on rural routes in less than a year.

Another argument made against the parcel post is that it injures the business of the express company. When a business becomes an extortion it deserves to be injured, to be knocked out. (Applause.)

When letter postage was reduced from five cents private express business was injured. That is true. The business of the eastern farmer was injured by the building of the Erie Canal, or by trunk railroads with government help, which were built across the continent and brought produce, grain and other things from free government land to this market. That hurt us. Did we get up a revolution? Did we fight and growl and say that the government was killing us? No; we went to work and began putting in new crops, and many of us have lived to know that the new crops are paying us better than the production of stock, cattle and grain which our farmers grew 50 and 60 years ago.

The express companies charge more than their services are worth. In connection with the railroads they have killed out competition and driven thousands of small companies and individuals out of business. I don't think this argument that their business is going to be hurt is worthy of consideration, in view of what they have done and what they are doing.

Another argument sometimes made is that the parcel post will create a great army of clerks, more politicians. Few if any new clerks will be needed. The bulk of the business will be done by rural mail carriers who at present have a small load in their wagons. Which do you think more dangerous to the liberties of America, a few hundred mail clerks, or a powerful and rich express lobby at Washington working in the dark to influence legislation. I say the more we can get those things out in the open, where we can put our finger on the politicians, the better it will be, if we must be ruled by politicians at all.

In his last message President Roosevelt said: "The government must in increasing degree supervise and regulate the workings of the railroads engaged in interstate commerce, and such increased supervision is the only alternative to an increase of the present evils on the one hand or a still more radical policy on the other. In my judgment the most important legislative act now needed as regards the regulation of corporations is an act to confer on the Interstate Commerce Commission the power to revise rates and regulations, the revised rate to at once go into effect and to stay in effect unless and until the court of review reverses it."

I believe that nine out of ten thoughtful Americans recognize the truth of that statement. Public service and public utilities must come more and more into the hands of the people. In no other way can we avoid extortion and secure fair treatment. The parcel post is a necessity for farmers. Some of them were indifferent to free rural delivery when it was first suggested. Now they would fight if an effort were made to take it away. After six months' trial of a parcel post they would wonder how they ever got on without it. The time is ripe now to work for it. The only way to obtain it is to bring personal pressure to bear upon Congress. To begin with, every man here should write three letters, one to each Senator and one to the Representative, asking them to vote for the bill now before Congress.

Gentlemen, I suggest that we get right after this thing and stay after it until we get it. (Applause.)

Report of New Jersey State Grange.

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BY GEO. W. F. GAUNT, W. M.

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Report of New Jersey State Grange.

BY GEO. W. F. GAUNT, W. M.

Officers and Members of the State Board: It is a source of great satisfaction to me to be able to report the order in the State in a very prosperous condition. It matters not whether we view it from a financial standpoint, gain of membership, new Granges organized, or from the point of interest taken by the members throughout the State. There is a marked improvement along all of these lines. There have been thirteen new Subordinate Granges and one Pomona organized during the year. Our gain in membership has been nearly 2,000 earnest and active Patrons of Husbandry.

There have been four new Grange halls erected during the past year, which is an evidence of permanency of the order in the localities where these Granges are situated. I have been informed that quite a number of our new Granges are preparing to build in the near future. This is as it should be. All Granges should own their own halls. That family is more closely bound together by home and household ties that gather nightly around its own hearthstone and beneath its own roof-tree, so that Grange is more firmly established that meets within its own walls. It is evident from the information at hand that there never was a time in the history of the order in New Jersey when the demand for organization among farmers was as great as at the present.

The National Grange took position and unanimous action on each of the following subjects:

1. Further extension of the delivery of mails in the rural districts, and that the service be placed on the same permanent footing as the delivery of mails in the cities and the appropriations

to be commensurate with the demands and the benefits of the service.

2. Provide for postal savings banks.

3. Submit an amendment to the constitution providing for the election of United States Senators by direct vote of the people.

4. Submit an amendment to the constitution granting the power to Congress to regulate and control all corporations and combinations, preventing monopoly and the use of their corporate power to restrain trade or arbitrarily establish prices.

5. Enlarge the powers and duties of the Interstate Commerce Commission, giving it authority to determine what changes shall be made in, or practice to be discriminative or unreasonable, and their findings to be immediately operative and so to continue until overruled by the courts.

6. Regulate the use of shoddy.

7. Enact pure food laws.

8. Provide for the extension of the markets for farm products equally with manufactured articles.

9. The enactment of the anti-trust law, clearly defining what acts on the part of the corporation would be detrimental to public welfare.

10. The speedy construction of a ship canal connecting the Mississippi river with the Great Lakes and the Great Lakes with the Atlantic ocean.

11. Revising the fees and salaries of all Federal officers and placing them on a basis of similar service in private business.

12. Provide for parcels post, telephone and telegraph in the mail service.

13. Provide for National and State aid to improve the public highways.

NATIONAL AID TO ROAD BUILDING.

A discussion of matters pertaining to the welfare of the rural sections of the State would be deficient without reference to our roads. No class of people has a greater direct interest in the roads of the country than those of which this organization is composed, and none have a better right to be heard upon the

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matter. We are of the opinion that roads, like railroads, should conform to the business which they are called upon to handle. It is not my intention to discuss this as a State issue, but from a National standpoint, as our State already stands first in the number of miles of improved roads by State aid, a fact of which we all should feel proud.

The National government has expended large sums of money in improving rivers and harbors and proposes to spend \$200,000,000 in building an Isthmian Canal, all of which receives the hearty approval of the agricultural classes. By a careful investigation it is shown that it cost to carry the products of the country to railway stations, etc., \$900,000,000. Careful and conservative estimates show that good roads would reduce this cost at least one-half, or a saving of \$450,000,000 annually. The legislative committee of the National Grange examined all of the bills introduced on the subject of road building. No bill meeting the full approval of the committee, they prepared a bill on the subject, which was introduced by Congressman Currier, of New Hampshire. Later a conference was held by the authors of all the bills introduced and an agreement was reached to support the Currier bill, with slight changes. With these changes made the bill was introduced in both House and Senate and is scheduled to come up for early action in the present session of Congress. This bill provides for an appropriation of \$24,000,000 for the years 1905, 1906 and 1907, to be divided among the States and Territories upon a basis of population, providing an amount equal to that assigned each State and Territory is appropriated by them for a similar purpose. The expenditure is to be made by State authorities under such rules and regulations as may be established by a National Highway Commission of three, to be appointed by the President.

The bill will have the earnest support of the legislative committee of the National Grange, public sentiment is very strong in its favor, and its benefit to rural sections of the country is unquestioned. The prospect for its enactment is encouraging. This measure will have the earnest support of the State Grange, also the Pomona and Subordinate Granges. Every farmer in the State should write their Representatives in Congress and the

United States Senators urging them to work and vote for the passage of the Grange good roads bill No. 10,765. The success of this measure depends largely upon the interest taken in it by the farmers of the country.

THE GROUT LAW.

The Grout law, regulating the manufacture and sale of imitation dairy products, which was enacted through the influence of all farmers' organizations, has received much strength through the recent decision of the Supreme Court, declaring it illegal to use palm oil in manufacturing oleomargarine without the payment of 10 cents a pound tax. A vigorous attempt will be made by the oleomargarine interests before the present session of Congress to repeal or disqualify this law and such attempt should be promptly and vigorously met by the representatives of the agricultural and dairy interests of the country. The note of warning has been sounded. I caution you to be vigilant and watchful. Keep in close touch with all matters pertaining to legislation and let your Representatives and United States Senators know you are opposed to having this law repealed, which many of you here at this meeting gave valuable assistance in having enacted.

PARCELS POST.

The National Grange has placed itself squarely on record as favoring the establishment of parcels posts. It would seem that this reform should be pushed forward with increased vigor in securing the passage of House bill No. 7,874 to establish parcels posts, the twin sister of rural mail delivery. T. C. Atkinson, Master of West Virginia State Grange and chairman of the Committee on Resolutions, in his report endorsing this measure said: "As Americans we pride ourselves on our progressive government; yet all of us are familiar with the fact that most of the European governments have vastly better mail facilities than our own. Most of us know that large parcels, which could not be

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sent by mail from one United States post-office to another, even at the high rate of 16 cents a pound, are delivered in this country by the post-office department at much lower rate when they are sent from certain European countries to our own. The service which our government will not perform for its own people at any price it does for foreigners at rates low enough to satisfy all reasonable advocates of a parcels post in this country. We would emphasize the fact that the rural mail service now has the machinery for a most efficient parcels post system. We declare it as our conviction that the parcels post is inevitable. The rural mail carrier is equipped to deliver parcels of merchandise, up to about 15 pounds in weight, at a very small additional cost to the post-office department. The rural delivery system is incomplete without the addition of provisions for the delivery of parcels.

“We would not advocate a parcels rate that would drive the express companies into bankruptcy, or that would be less than self-sustaining; but we do insist that the people, and especially the country people, have a right to demand of Congress an extension of the usefulness of the post-office department. It is the business of the government to serve the people in all proper ways. The post-office department is in a special sense the people’s department of the government. It exists for all and to serve all with equal fairness, with equal liberality and with increasing efficiency.”

FORESTRY.

Year by year the destruction of the forests of our State continues with apparently little thought of those who are to follow after us. We are pleased to note that many States are co-operating with the government in reforesting lands unsuited to cultivation.

The importance of this matter to agriculture and our country can hardly be overstated. Destructive floods, the conserving of fertility, modification of climatic conditions and the needs of succeeding generations all demand the preservation of our forests.

THE GRANGE AS AN EDUCATOR.

Again the Patrons of Husbandry exert an influence upon the educational life of the people. The rendering of its ritual, the transaction of its business confer upon those who participate a practical education of service in all the avenues of life, an education which fits them better for the manifold duties of citizenship. Its members exalted high in the councils of State and Nation, or bearing themselves proudly as sovereign citizens, are better officers and citizens because of their connection with the fraternity, unless they have closed their hearts and minds to its inspiring influence. They are better able to see the right and judge the wrong. They are stronger to contend for the masses in every conflict for popular liberty. They are better prepared in every way to be the conservers of society, the bulwark of the State; for the order educates for usefulness, not destruction. Its lessons remove the narrowness of thought, false opinions and pernicious ideas of class, that the mind of its members, upon the fidelity with which it cares for those united by its invisible bands, upon the purity and force of its ideals. But keep the order true to its principles, keep before the membership high ideals, and it will grow and encompass this grand and glorious country of ours. So long as men standing without its portals and the selfishness and greed of the world can look to our Granges and see them filled with men and women of honesty, integrity, and sobriety, can note that they dwell together in harmony and peace, that the strong support the weak, that the rich are helpful to the poor, and that the influences which emanate therefrom are for good, just so long will they seek admission to the order with all the anxiety and ardor with which a sailor, storm-tossed upon the ocean, seeks admission to the quiet, restful harbor.

CO-OPERATION.

Every advance in the world's progress has been made by the combined efforts of men exerted through organization.

In the infancy of the human race the necessities of mankind compelled them to associate for mutual assistance and protection.

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Much, very much, has been accomplished to benefit our order and mankind by co-operation as practiced in the Grange. All republican governments are the result of co-operation under their constitution and the acts of the Legislature. Christian religion is advanced by co-operation in the form of churches. All fraternal organizations, public schools and colleges are the result of co-operative efforts. Co-operation as used and applied in our order is for the improvement and advancement of our interests along the lines that will develop a higher, broader, happier and better life, and not confined, as some outside our order have seemed to think, to mere purchase or sales of commodities. This is but an insignificant factor in the great work of co-operation.

The business features of buying and selling are but the incidents growing out of the organization. It is conceded by all that there should be an exchange of products in the various localities of our country and between the citizens of the different States of the Union. They need the products of other States to supply the wants of civilization, and some method of exchange should be devised without subjecting the products to all the expense of the present system. The members of the Grange more courageously grapple with this problem. Conditions will never become better until the farmers devise better and more economic methods than now in use. The principles involved must be kept before the farmers of the United States until they are successfully applied. Then, and not till then, will agriculture take its rightful position and wield the influence that it is justly entitled to in the councils of the nation and with the industrial activities of the country.

THE RURAL TELEPHONE.

There is nothing that is more in popular favor in the rural homes of our country than the telephone. For some years the farmers have felt the need of this service, but were deprived of it on account of excessive charges. But thanks to the independent movement which has been started within the past eight years, almost every enterprising farmer in our land can soon be placed in touch with his grocer, butcher, his friends and neighbors, at a

nominal cost. Your physician when needed in the dead hours of the night can be called at a moment, thus securing to you his services without the long drive to town. In some localities rural companies have established fire alarm calls, certain rings being designated for this purpose. You can readily appreciate the vast importance of this when you stop to consider that help can be secured from miles around at a moment's notice. He also can be in touch with his commission merchant and have in a few moments the market price of the products that he is marketing, which will enable him to send his products to the best market. By the extension of the rural telephone farm life will be made more attractive to our young people. The isolation will be broken up and the long winter evenings can be spent at home talking to our friends and neighbors. For the information of our Patrons we find there are about 3,000,000 independent telephones in operation in this country.

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 Cumberland—ROBERT PEACOCK, Deerfield, Cumberland county
 Camden—JOHN M. GARWOOD, Haddonfield, Camden county
 Cape May—A. T. D. HOWELL, Dias Creek, Cape May county
 Essex—GEORGE E. DE CAMP, Roseland, Essex county
 Gloucester—AARON B. SOMERS, Mullica Hill, Gloucester county
 T. WOOD WYNE, Thorofare, Gloucester county
 Hunterdon—JOHN T. COX, Readington, Hunterdon county
 BURRIS SNYDER, Pittstown, R. F. D., Hunterdon county
 Mercer—THEODORE CUBBERLY, Hamilton Square, Mercer county
 Morris—A. M. WEBB, Hanover, Morris county
 Monmouth—FRANK W. POTTER, Imlaystown, Monmouth county
 C. C. HULSART, Matawan, Monmouth county
 Middlesex—ARTHUR E. PERRINE, Cranbury, Middlesex county
 Salem—SAMUEL H. MOORE, Woodstown, Salem county
 Sussex—RICHARD M. HOLLEY, Lafayette, Sussex county
 Union—WM. DUBON, Elizabeth, Union county
 Warren—NICODEMUS WARNE, Broadway, Warren county
 Somerset and Ocean—T. Q. TAYLOR, Robbinsville, R. F. D., Mercer county

SUBORDINATE GRANGES.

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
1	Pioneer,	John E. Stults, Cranberry, Middlesex co.,.....	C. H. Edwards, Prospect Plains, Middlesex co.,	Mrs. Carrie Wilson, Cranbury, Middlesex co.
2	Pearl Ridge,.....	G. Ulmer Foulks, New Egypt, Ocean co.,.....	Joseph H. Woodward, New Egypt, Ocean co.,..	Catharine S. Jobes, New Egypt, Ocean co.
3	Hammonton,	A. J. Rider, Hammonton, Atlantic co.,.....	A. J. King, Hammonton, Atlantic co.,.....	Miss Adelaide Brewster, Hammonton, Atl'c co.
5	Swedesboro,	Harry C. Howey, Swedesboro, Gloucester co.,..	Caddie J. Gill, Swedesboro, Gloucester co.,...	Rebecca L. Gill, Swedesboro, Gloucester co.
8	Moorestown,	Levi L. Dudley, Moorestown, Burlington co.,..	Caroline B. Zellej, Moorestown, Burlington co.,	S. Lucy Satterthwaite, Moorestown, Burl. co.
9	Woodstown,	C. Howard Davis, Woodstown, Salem co.,.....	Carrie R. Atkinson, Woodstown, Salem co.,...	Ella B. Moore, Woodstown, Salem co.
11	Vineland,	Charles Chalmers, Vineland, Cumberland co.,..	Ann Chalmers, Vineland, Cumberland co.,.....	C. M. Burge, Vineland, Cumberland co.
12	Ringoes,	Geo. B. Hartpence, Ringoes, Hunterdon co.,...	John Q. Holcombe, Ringoes, Hunterdon co.,...	Stelford Clawson, Rocktown, Hunterdon co.
16	Hopewell,	L. F. Glaspey, Shiloh, Cumberland co.,.....	W. S. Bonham, Shiloh, Cumberland co.,.....	Susie D. Harris, Shiloh, Cumberland co.
18	Cumberland,	J. Henry Bacon, Greenwich, Cumberland co.,..	Morris Goodwin, Greenwich, Cumberland co.,..	Anna T. Goodwin, Greenwich, Cumberland co.
20	Fenwick,	William Padgett, Harmersville, Salem co.,...	Anna E. Harris, Harmersville, Salem co.,.....	Mollie E. Finlaw, Harmersville, Salem co.
26	Harrisonville, ...	Henry Edwards, Woodstown, Salem co.,.....	Mrs. L. M. Morgan, Woodstown, Salem co.,...	Mrs. Belle Kirby, Harrisonville, Gloucester co.
29	Elmer,	John M. Woolman, Elmer, Salem co.,.....	William B. Newkirk, Elmer, Salem co.,.....	Anna S. Wentz, Elmer, Salem co.
32	Bridgeport,	S. Lewis Kille, Bridgeport, Gloucester co.,...	David R. Black, Swedesboro, Gloucester co.,...	Anna Holdcraft, Swedesboro, Gloucester co.
36	Medford,	Arthur E. Prickett, Medford, Burlington co.,..	James W. Haines, Medford, Burlington co.,...	Sarah J. Dudley, Medford, Burlington co.
38	Haddon,	Wesley R. Stafford, Ashland, Camden co.,.....	Daniel W. Horner, Merchantville, Camden co.,	Amelia E. Bates, Haddonfield, Camden co.
39	Mantua,	Virgil Eaches, Mantua, Gloucester co.,.....	Hiram S. Leap, Wenonah, Gloucester co.,.....	Debbie Kirkbride, Sewell, Gloucester co.
40	Windsor,	Charles E. Rue, Windsor, Mercer co.,.....	James F. Meeker, Windsor, Mercer co.,.....	Mrs. John W. Rogers, Windsor, Mercer co.
43	Hope,	W. Dubois, Bridgeton R. F. D. 4, Cumber'd co.,	P. L. Wheaton, Bridgeton R. F. D. 4, Cumb. co.	Edward Perry, Bridgeton R. F. D. 4, Cumb. co.

SUBORDINATE GRANGES—CONTINUED.

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
50	Pemberton,	Geo. W. Lundy, Birmingham, Burlington co., . .	H. R. Lippincott, Pemberton, Burlington co., . .	Mrs. John Forsyth, Pemberton, Burlington co.
51	Mullica Hill, . . .	Nathan S. Lloyd, Mullica Hill, Gloucester co.,	W. H. Munyan, Mullica Hill, Gloucester co., . .	Anna G. Gaunt, Mullica Hill, Gloucester co.
52	Deerfield,	Alex. Woolman, Elmer R. F. D. 2, Cumb'd co.,	Wm. Van Lieu, Deerfield, Cumberland co.,	Wm. H. Van Lieu, Jr., Deerfield, Cumb'd co.
57	Centre Grove, . .	Wm. H. Taylor, Millville, Cumberland co.,	John Taylor, Millville, Cumberland co.,	Jacob Zimmerman, Millville, Cumberland co.
58	Columbus,	A. J. Gauntt, Jobstown R. F. D., Burlington co.,	Bessie E. Bunting, Burl. R. F. D. 3, Burl'n co.,	A. E. G. Haines, Columbus R. F. D., Burl. co.
59	Thorofare,	Ellise Reed, Thorofare, Gloucester co.,	R. W. Clement, Paulsboro R. F. D. 2, Glou. co.,	B. D. Clement, Thorofare R. F. D., Glou. co.
60	Courses Landing,	Mortimer Ware, Sharptown, Salem co.,	Helen D. W. Richman, Sharptown, Salem co., . .	May S. Ware, Sharptown, Salem co.
64	Pennington,	A. H. Burroughs, Pennington, Mercer co.,	Ira Stout, Pennington, Mercer co.,	John Fleming, Pennington, Mercer co.
73	Ewing,	John V. Green, Trenton Junction, Mercer co., . .	W. H. Cadwallader, Trenton R.F.D. 1, Mer. co.,	E. L. Cadwallader, Tren. R. F. D. 1, Mercer co.
78	Wantage,	S. A. Sprague, Sussex, Sussex co.,	Mrs. Evi Vandruff, Sussex, Sussex co.,	C. E. Stickney, Sussex, Sussex co.
79	Hamilton,	W. D. Hulick, Trenton R. F. D. 2, Mercer co.,	Mrs. M. M. Nutt, Hamilton Square, Mercer co.	Caroline Allinson, Yardville, Mercer co.
81	Friesburg,	H. M. Loveland, Cohansey, Salem co.,	John D. Horner, Elmer R. F. D. 3, Salem co., .	Mrs. P. M. Padgett.
85	Williamstown, . .	James Taggart, Williamstown, Gloucester co., . .	And. N. Ross, Sicklerville, Gloucester co.,	Mrs. E. C. Ritchie, Williamstown, Glou. co.
88	Locktown,	H. H. Fisher, Sergeantsville, Hunterdon co., . . .	Gardner J. Fisher, Sergeantsville, Hunter'n co.,	Louisa Suydam, Locktown, Hunterdon co.
90	Blackwood,	J. T. North, Blackwood, Camden co.,	C. C. Stevenson, Blackwood, Camden co.,	Maria Stetser, Blackwood, Camden co.
92	Monmouth,	D. H. Jones, Freehold, Monmouth co.,	Watson F. Conover, Freehold, Monmouth co., . .	Wm. Campbell, Freehold, Monmouth co.
96	Hightstown,	W. H. Thomas, Cranbury R. F. D. 4, Mid'x co.,	W. H. Perrine, Hightstown R. F. D. 1, Mer. co.	Gert. Davinson Cranbury, Cohansey, Salem co.
98	Allentown,	Emerson Yard, Allentown, Monmouth co.,	W. B. Burtis, B. 73, Allentown, Monmouth co.,	Mrs. L. Hunt, Davis Station, Monmouth co.

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SUBORDINATE GRANGES—CONTINUED.

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
101	Sergeantsville, ..	Percy W. Bush, Stockton, Hunterdon co.,.....	Wm. E. Rittenhouse, Sergeantsville, Hunt. co.,	John W. Port, Sergeantsville, Hunterdon co.
104	Livingston,	J. H. M. Cook, Caldwell, Essex co.,.....	Rev. W. H. Burrell, Livingston, Essex co.,...	H. H. Haven, Livingston, Essex co.
105	Morris,	A. M. Webb, Hanover, Morris co.,.....	Wm. A. Howell, Florham Park, Morris co.,...	Mrs. Robert Sanders, Hanover, Morris co.
106	Kingwood,	Wesley J. Thatcher, Barberton, Hunterdon co.,	E. B. Huffman, Barbertown, Hunterdon co.,...	Katie B. Thatcher, Barbertown, Hunterdon co.
107	Caldwell,	A. E. Hedden, Verona, Essex co.,.....	F. C. Goble, Verona, Essex co.,.....	C. B. Crane, Caldwell, Essex co.
108	Roseland,	Geo. E. DeCamp, Roseland, Essex co.,.....	Hattie M. Condit, Roseland, Essex co.,.....	Mary J. Condit, Roseland, Essex co.
110	Warren,	John S. Baylor, Broadway, Warren co.,.....	Mae Oberly, Broadway, Warren co.,.....	H. J. Beers, Stewartsville, Warren co.
111	Mickleton,	J. Omer Heritage, Mickleton, Gloucester co.,..	W. Heritage, Swedesboro R. F. D. 1, Glou. co.,.	Mary L. Haines, Mickleton, Gloucester co.
113	Pohatcong,	D. C. Donnelly, Springtown, Warren co.,.....	Hattie A. Donnelly, Springtown, Warren co.,...	John R. Seigle, Finesville, Warren co.
115	Hurffville,	C. A. Van Meter, Sewell R. F. D. 3, Glou. co.,	L. B. Kier, Sewell R. F. D. 1, Gloucester co. ..	Ray Morgan, Grenloch, Gloucester co.
116	Rocksburg,	John H. Young, Belvidere, Warren co. R.F.D.,	Warren Herman, Belvidere, Warren co. R.F.D.,	Irvin Miller, Phillipsburg R.F.D. 2, Warren co.
117	Washington,	Samuel T. Bowman, Washington, Warren co.,	Mrs. Jos. Bodine, Washington, Warren co.,....	Henry Race, Oxford, Warren co.
119	Oak Grove,	Wm. L. Scott, Quakertown, Hunterdon co.,...	Wm. R. Race, Pittstown R. F. D. 1, Hunt'n co.,	B. Snyder, Pittstown R. F. D. 1, Hunterdon co.
120	Spring Mills, ...	M. W. Angell, Milford, Hunterdon co.,.....	Mary E. Woolf, Milford, Hunterdon co.,.....	Wm. Kinney, Milford, Hunterdon co.
121	Stewartsville, ...	Harris A. Godfrey, Stewartsville, Warren co.,	John C. Boyer, Stewartsville, Warren co.,.....	Mrs. George Hagar, Stewartsville, Warren co.
122	Aura,	J. Flecker Gardiner, Aura, Gloucester co.,.....	J. M. Carter, Aura, Gloucester co.,.....	Anna Denelsbeck, Aura, Gloucester co.
123	Cross Keys,	James A. McWilliams, Sicklerville, Glou. co.,..	Edw. B. Gaunt, Cross Keys, Gloucester co.,...	Richard Evans, Sewell R. F. D.3, Gloucester co.
124	Grand View,	Thomas B. Hampton, Croton, Hunterdon co.,..	Augusta Higgins, Flemington, Hunterdon co.,.	Wm. E. Cornog, Flemington, Hunterdon co.
125	Riverside,	D. H. Agans, Three Bridges, Hunterdon co.,..	J. S. Dilts, Three Bridges, Hunterdon co.,....	John R. Foster, Three Bridges, Hunterdon co.

SUBORDINATE GRANGES—CONTINUED.

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
126	Delaware,	Wm. C. Addis, Delaware R. F. D. 2, Warren co.	F. R. Addis, Delaware R. F. D. 2, Warren co.,	Jas. I. Cook, Delaware R. F. D. 1, Warren co.
127	Iona,	F. J. Van Valin, Porchtown, Gloucester co.,	Mrs. M. J. Marsh, Malaga, Gloucester co.,	Mrs. H. A. Buttrick, Malaga, Gloucester co.
128	Cape May,	Frederick Keins, Dias Creek, Cape May co.,	A. T. D. Howell, Dias Creek, Cape May co.,	Laura B. Howell, Dias Creek, Cape May co.
129	Bergen,	Charles C. Basley, Maywood, Bergen co.,	John C. Banta, Ridgewood, Bergen co.,	Mrs. D. P. Palis, Ridgewood, Bergen co.
130	Franklin,	A. A. Yeomans, Wyckoff, Bergen co.,	Mrs. A. A. Yeomans, Wyckoff, Bergen co.,	Lewis S. Van Blarcom, Wyckoff, Bergen co.
131	Rancocas,	Tylee B. Engle, Rancocas, Burlington co.,	Nancy M. Leeds, Rancocas, Burlington co.,	Hanna D. Engle, Mt. Holly, Burlington co.
132	Cold Spring,	J. P. MacKissic, Cape May City, Cape May co.,	Richard Reeves, Fishing Creek, Cape May co.,	Mrs. Minnie Bate, Eldredge, Cape May co.
133	Hickory,	William Bird, Pattenburg, Hunterdon co.,	Anson B. McCrea, Pattenburg, Hunterdon co.,	J. R. Bowlby, Pattenburg, Hunterdon co.
134	Vernon Valley,	A. P. Shaw, Vernon, Hunterdon co.,	E. T. Stidworthy, Vernon, Sussex co.,	C. L. Giveans, Vernon, Sussex co.
135	Ramsey,	J. D. Carlough, Allendale R. F. D. 2, Bergen co.	Dora Coe Gurney, Allendale R. F. D. 2, Ber. co.	Dr. C. P. Deyoe, Ramsey, Bergen co.
136	Lincoln,	J. F. Bomm, Westwood R. F. D. 2, Sussex co.,	F. J. Ludwig, Westwood R. F. D. 2, Bergen co.,	W. H. Bomm, Westwood R. F. D. 2, Bergen co.
137	Mountain View,	W. D. Haggerty, Sussex, Sussex co.,	Dean S. Haggerty, Sussex, Sussex co.,	D. C. Howell, Sussex, Sussex co.
138	Berlin,	A. H. Hurff, Berlin, Camden co.,	X. F. Ottiger, Berlin, Camden co.,	Mrs. Barton, Berlin, Camden co.
139	Upper Township,	E. D. Burley, Tuckahoe, Cape May co.,	W. S. Shaw, Tuckahoe, Cape May co.,	Elizabeth Wallace, Tuckahoe, Cape May co.
140	Montague,	Oscar Van Auken, Port Jervis, N. Y. R. F. D. 1,	Mary O. Rundle, Port Jervis R. F. D. 1, N. Y.,	George Hooker, Port Jervis R. F. D. 1, N. Y.
141	Pascack,	Edw. M. Lyman, Park Ridge, Bergen co.,	John J. Brickell, Park Ridge, Bergen co.,	Charles Bowen, Montvale, Bergen co.
142	Olive Branch,	L. H. Stemler, Matawan, Monmouth co.,	J. S. Cranford, Matawan, Monmouth co.,	C. C. Hulsart, B. 82, Matawan, Monmouth co.
143	Delaware Valley,	Edw. Snook, Layton, Sussex co.,	Geo. E. Hursh, Normanock, Sussex co.,	C. A. Dalrymple, Layton, Sussex co.
144	Saddle River,	J. Nelson Carlock, Westwood R. F. D. 2, Ber. co.	T. N. Woodruff, Saddle River, Bergen co.	F. Storms, Saddle River, Bergen co.

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SUBORDINATE GRANGES—CONTINUED.

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
145	Wayne Township,	R. M. Torbet, Paterson R. F. D. 1, Passaic co.,	H. M. Berdan, Paterson R. F. D. 1, Passaic co.,	William C. Steele, Pompton, Passaic co.
146	Egg Harbor,.....	Henry Tferffer, Egg Harbor City, Atlantic co.,	Clothilda Schirmer, Egg Harbor City, Atl. co.,.	.....
147	Wrightstown, ...	Roshia Thompson, Wrightstown, Burlington co.,	Samuel S. Fort, Wrightstown, Burlington co.,..	Anna Thompson, Wrightstown, Burlington co.
148	Stanton,	Josiah Cole, Rowlands Mills, Hunterdon co.,...	Levi K. Cole, Stanton, Hunterdon co.,.....	John P. Smith, Stanton, Hunterdon co.

Statistical Tables---Farm Crops.

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STATISTICAL TABLE OF FARM CROPS AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	CORN.			WHEAT.			RYE.			OATS.		
	Product compared with last year—per cent.	Average yield per acre—bushels.	Average price.	Product compared with last year—per cent.	Average yield per acre—bushels.	Average price.	Product compared with last year—per cent.	Average yield per acre—bushels.	Average price.	Product compared with last year—per cent.	Average yield per acre—bushels.	Average price.
Atlantic,	200	30	\$ 65	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bergen,	80	40	70	.....	.....	\$ .92	60	.....	\$ .70	60	.....	56
Burlington,	200	45	50	80	15	1 00	90	20	80	100	30	40
Camden,	100	40	50	70	15	1 00	100	20	70	.....	.....	.....
Cape May, .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cumberland,	175	65	55	110	18	1 00	.....	.....	.....	110	40	50
Essex, .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gloucester,	120	50	56	92	18	1 05	75	12	75	.....	.....	.....
Hunterdon,	150	30	60	80	12	1 05	110	14	60	110	28	35
Mercer,	120	38	56	75	16	1 20	100	15	75	70	33	30
Middlesex,	200	35	60	100	12	1 15	100	15	70	100	32	38
Monmouth,	100	56	50	85	21	1 20	85	16	70	.....	.....	.....
Morris,	75	50	.....	50	13	1 15	60	15	90	100	45	40
Ocean, .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salem,	150	45	55	110	15	1 00	.....	.....	.....	.....	.....	.....
Somerset,	100	50	60	75	20	1 25	75	20	70	100	40	40
Sussex,	95	.....	60	90	18	1 00	90	18	65	125	40	40
Union,	75	30	60	.....	.....	.....	75	18	70	.....	.....	.....
Warren,	80	40	45	70	20	1 10	80	18	70	90	40	35

STATISTICAL TABLE OF FARM CROPS AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	BUCKWHEAT.			HAY.			WHITE POTATOES.			SWEET POTATOES.		
	Product compared with last year—per cent.	Average yield per acre—bushels.	Average price.	Product compared with last year—per cent.	Average yield per acre—tons.	Average price per ton.	Product compared with last year—per cent.	Average yield per acre—barrels.	Average price per barrel.	Product compared with last year—per cent.	Average yield per acre—barrels.	Average price per barrel.
Atlantic,				150	2	\$15 00	200	50	\$2 00	150	50	\$2 00
Bergen,	120	15	\$0 70	100	1	20 00	200		2 50			
Burlington,				100	1	15 00	90	50	1 50	100	40	2 00
Camden,				70	1¼	14 00	100	75	1 50	100	60	1 75
Cape May,												
Cumberland,				110	¾	16 00	75	30	1 60	120	35	1 50
Essex,				70		17 00	83	45	1 75			
Gloucester,				100	1¼	13 00	100	20	1 50	100	52	1 75
Hunterdon,	175	20	60	100	1½	15 00	110	65	2 00			
Mercer,				125	1¼	17 00	150		1 60	100	40	1 80
Middlesex,				100	2	15 00	100	70	1 25	100	50	2 00
Monmouth,				75	1½	16 00	125		1 70			
Morris,												
Ocean,				125	1¼	18 00	90	30	1 25	125	40	1 75
Salem,			60	100	1½	14 00	100	40				
Somerset,	50	15		120		15 00	105		1 50			
Sussex,	95	20	70	100	1½	19 00	80	60	2 00			
Union,				80	1	18 00	90	25	2 00			
Warren,												

FARM CROPS.

STATISTICAL TABLE OF FARM CROPS AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	APPLES.			PEARS.			PEACHES.			GRAPES.		
	Product compared with last year—per cent.	Average yield per acre —barrels.	Average price per barrel.	Product compared with last year—per cent.	Average yield per acre —barrels.	Average price per barrel.	Product compared with last year—per cent.	Average yield per acre —baskets.	Average price.	Product compared with last year—per cent.	Average yield per acre —pounds.	Average price per pound.
Atlantic,	125	75	\$2 50	250	100	\$1 00	100	25	\$1 50	100	2,000	\$0 03
Bergen,	25	.	.	120	.	.	.	.	.	25	.	.
Burlington,	100	80	1 25	150	40	60	100	200	70	110	2,000	03
Camden,	70	.	.	100	.	.	.	.	.	100	5,000	02
Cape May, .....	.	.	.	.	.	.	.	.	.	.	.	.
Cumberland,	110	100	1 25	105	100	1 00	100	300	65	.	.	.
Essex, .....	.	.	.	.	.	.	.	.	.	.	.	.
Gloucester,	105	50	1 00	100	65	1 00	.	.	.	82	.	05
Hunterdon,	100	20	1 00	.	.	.	.	.	.	.	.	.
Mercer,	60	30	1 25	50	.	.	.	.	.	.	.	.
Middlesex,	75	.	2 00	100	.	.	.	.	.	.	.	.
Monmouth,	50	.	2 00	15	.	.	25	.	1 10	100	8,000	.
Morris,	25	.	2 25	25	.	.	.	.	.	100	.	.
Ocean, .....	.	.	.	.	.	.	.	.	.	.	.	.
Salem, .....	.	.	.	.	.	.	.	.	.	.	.	.
Somerset, .....	.	.	.	.	.	.	.	.	.	.	.	.
Sussex,	50	75	1 50	40	.	1 25	15	.	1 25	50	.	02½
Union, .....	.	.	.	.	.	.	.	.	.	.	.	.
Warren,	20	.	1 50	60	.	2 00	5	.	1 00	50	.	03
Warren,	90	100	70	75	.	1 20	50	.	70	84	.	03

STATISTICAL TABLE OF FARM CROPS AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	STRAWBERRIES.			RASPBERRIES.			BLACKBERRIES.			WATERMELONS.		
	Product compared with last year—per cent.	Average yield per acre—quarts.	Average price per quart.	Product compared with last year—per cent.	Average yield per acre—quarts.	Average price.	Product compared with last year—per cent.	Average yield per acre—quarts.	Average price.	Product compared with last year—per cent.	Average yield per acre.	Average price per hundred.
Atlantic,	50	1,000	\$0 07	100	1,500	\$0 10	10	300	\$0 10			
Bergen,				80								
Burlington,	90	900	06	75	700	08	50	1,000	08	100	100	\$14 00
Camden,	65		08									
Cape May,												
Cumberland,	80	500	04½									
Essex,												
Gloucester,	85	1,400	08							65	6	9 50
Hunterdon,												
Mercer,	75	1,200	06									
Middlesex,	100			100			50					
Monmouth,	100	5,000		100	1 000		100	1,500		100	25	
Morris,	100									50		
Ocean,												
Salem,												
Somerset,	100		12	75		10	40		15			
Sussex,												
Union,	50		08									
Warren,	60		10	50		08	40		10			

FARM CROPS.

STATISTICAL TABLE OF FARM CROPS AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	CITRON MELONS.			CUCUMBERS.			CABBAGES.			TOMATOES.		
	Product compared with last year—per cent.	Average yield per acre —baskets.	Average price per basket.	Product compared with last year—per cent.	Average yield per acre	Average price per basket.	Product compared with last year—per cent.	Average yield per acre.	Average price.	Product compared with last year—per cent.	Average yield per acre —Tons.	Average price per basket.
Atlantic,				100			125	4,000	\$4 00	200	5	\$0 75
Bergen,				100	100		65			150		
Burlington,	150	300	70 25	100		70 50	75	2,000	2 00	50	10	25
Camden,												
Cape May,												
Cumberland,	200	200	20				100	1,000	5 00	200	8	
Essex,												
Gloucester,	170	450	25	100	500	15	70	3,100	1 85	92	11	25
Hunterdon,												
Mercer,							80	2,100	2 50	50	5	25
Middlesex,												
Monmouth,	100	400		100			80			100	10	
Morris,	100			100			75					
Ocean,												
Salem,										150		25
Somerset,						40	75		5 00	70		35
Sussex,												
Union,							100	4,000	3 50	75	6	25
Warren,							95	5,000	2 50	100		25

STATISTICAL TABLE OF FARM STOCK AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	HORSES.		MULES.		COWS.	
	Total number compared with December 1st, last year, per cent.	Average price between 3 and 7 years old.	Total number compared with December 1st, last year, per cent.	Average price between 3 and 7 years old.	Total number compared with December 1st, last year, per cent.	Average price between 3 and 7 years old.
Atlantic,	100	\$150 00		\$200 00	100	\$50 00
Bergen,	100		100		100	
Burlington,	100	150 00	105	200 00	90	45 00
Camden,						
Cape May,						
Cumberland,	100	140 00	100	100 00	100	30 00
Essex,						
Gloucester,	100	140 00	90	150 00	100	40 00
Hunterdon,	100	160 00			100	40 00
Mercer,	100	170 00	90	165 00	100	40 00
Middlesex,	100	65 00	100	75 00	100	45 00
Monmouth,	100	150 00	100	175 00	100	40 00
Morris,	100		100		100	
Ocean,						
Salem,	100	140 00	100	140 00	100	50 00
Somerset,	100	115 00	100	125 00	100	55 00
Sussex,	100	110 00			105	45 00
Union,	100	80 00			100	50 00
Warren,	100	140 00	50	130 00	50	40 00

FARM CROPS.

STATISTICAL TABLE OF FARM STOCK AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	VEAL CALVES.		SHEEP.		LAMBS.		SWINE.		TURKEYS.		CHICKENS.		WINTER WHEAT.	WINTER RYE.		
	Total number compared with December 1st, last year, per cent.	Average price per pound for season.	Total number compared with December 1st, last year, per cent.	Average price per head for store sheep.	Total number compared with December 1st, last year, per cent.	Average price per head for spring lambs.	Total number compared with December 1st, last year, per cent.	Average price per pound December.	Total number compared with December 1st, last year, per cent.	Average price per pound November and December.	Total number compared with December 1st, last year, per cent.	Average price per pound November and December.	Area sown compared with last year—per cent.	Average condition December 1st.	Area sown compared with last year—per cent.	Average condition December 1st.
Atlantic,		\$0 07					100	\$0 08		\$0 25	100	\$0 14			100	100
Bergen,	100		100		100		100		100		100					
Burlington,	90	06½	100	\$5 00	100	\$6 00	100	06	75	25	90	18	100	100	105	100
Camden,																
Cape May,																
Cumberland,	100	06½					100	08	95	16	100	13	100	125		
Essex,																
Gloucester,	100	05					95	06½	75	25	95	20	100	100	100	95
Hunterdon,	100	06½	100		100		105	06½	100	22	110	14	100	100	100	100
Mercer,	90	06½					100	06½	75	22	100	15	100	100	100	100
Middlesex,	90	07	100				110	07½	70	25	100	14	100	90	110	85
Monmouth,	100	06½	100	5 00	100	5 00	100	06	100	25	100	14	90	100	110	100
Morris,	100	07							25	25	80	14	120	75	100	85
Ocean,																
Salem,	100	06½	100		100	5 00	100	06½	75	25	110	20	115	150		
Somerset,	100	07	100	5 00	100		100	08	40	26	100	18	100	100	110	100
Sussex,							105	08	80	20	100	09	100	95	100	97
Union,	100	06					100	07			100	12		100	100	100
Warren,	70	06½	50	5 00	50	4 50	40	07	30	20	50	10	90	70	80	85

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Atlantic County.

OFFICERS FOR 1905.

President, JOSEPH BUTTERHOF,Egg Harbor City
Vice-President, J. E. HOLMAN,Hammonton
Secretary, VALENTINE P. HOFMANN,Egg Harbor City
Treasurer, FREDERICK FIEDLER,Egg Harbor City

DELEGATES TO STATE BOARD OF AGRICULTURE.

L. H. PARKHURST, for one yearHammonton
V. P. HOFMANN, for two years,Egg Harbor City
Alternate, JOSEPH BUTTERHOF,Egg Harbor City

DIRECTORS.

J. E. HOLMAN, Fruit Shippers' Union,Hammonton
HENRY PFEIFFER, Germania Fruit Growers' Union,Cologne
CHARLES KRAUS, Atlantic County Agricultural and Horticultural
Association,Egg Harbor City
L. H. PARKHURST, Hammonton Grange,Hammonton
CARL SCHIRMER, Egg Harbor Grange,Egg Harbor City
WILLIAM KARRER, At-Large,Egg Harbor City
HERMAN SCHIRMER, At-Large, Mullica township,Egg Harbor City

REPORT

BY THE SECRETARY.

The annual meeting, combined with Farmers' Institute, was held at Hammonton, on December 22d, 1904. The attendance was good and some parts of the county were well represented.

The interesting subjects discussed were: "Production of Early Tomatoes and Raspberries," "San Jose Scale and How to Treat It," "Discussion of Fruit Pests," "Asparagus Production for Home and Market," "Nature and Functions of Soil Humus and the Proper Feeding of Farm Crops," "Some Things Every Horse

Owner and Driver Should Know," "Questions on Care of the Dairy Cow and Pig," "Poultry, Egg and Squab Production" and "Helps and Incentives to Do Better Work," by a number of well-versed speakers selected by the State Board of Agriculture.

GENERAL REMARKS.

The backward spring and following rainy season considerably impeded the work of farmers, and also proved detrimental to many leading farm crops, as berries and fruits, whilst in hay, cereals and potatoes the yield exceeded those of previous years.

Blackberries yielded a very poor crop, the canes being mostly winter-killed; strawberries fared slightly better; raspberries fared the best, as the excessive moisture seemed to be in their favor; cranberries yielded only one-third of a crop; grapes suffered severely from grape rot repeated and frequent sprayings seemed to do but little good, as the rains destroyed its effects.

Apples and pears were more bountiful than in the previous year. Peaches were a complete failure.

Corn exceeded the expectations of all; one of the best crops of many years was harvested. Sweet potatoes received more attention than usual, and has proven to be one of the most remunerative crops raised in our light soil.

A lesser amount of forest fires, of smaller extent and committing less damage, occurred last season. The general condition and health of farm animals was better than in previous years.

A general complaint of difficulty in obtaining farm help was manifested; predominating causes for same being vicinity of larger cities, and also the mosquito pest, which drives away unacclimated help.

The consensus of farmers of this county is that the game laws should be so amended as to allow farmers to destroy such animals as are damaging their crops and fruit trees. The shooting of quail should be prohibited, as they are found to be one of the greatest aids to farmers in destroying injurious insects.

Bergen County.

OFFICERS FOR 1905.

President, SAMUEL R. DEMAREST, JR.,Hackensack
Vice-President, GEORGE R. BAYLISS,North Arlington
Secretary, HARRY I. ANGELL,Etna
Treasurer, ABRAM C. HOLDRUM,Westwood

BOARD OF DIRECTORS.

FREDERICK M. CURTIS,Harrington Park
 CHARLES C. BASLEY,Maywood
 MALCOM H. ANGELL,Etna
 JOHN C. VANS AUN,Maywood
 JOHN F. BOMM,Westwood
 WM. BRANDENBURG, JR.,North Arlington
 TEUNIS A. HARING,Hackensack
 JOHN BEAVER,North Arlington

DELEGATES TO STATE BOARD.

MALCOM H. ANGELL,2 years
 SAMUEL R. DEMAREST, JR.,1 year

REPORT

BY THE SECRETARY.

The Board held six meetings during the past year.

On June 16th, 1904, a meeting was held at the farm of Millar Brothers', at North Arlington.

A variety of fruit and truck farming is carried on at that place, and at the time of the meeting, a very fine crop of rhubarb was being picked for market. This farm is well equipped with a number of improvements, among them being a first-class repair

shop, with forge and a variety of tools for repairing broken farm implements. This feature might well be imitated by many other farmers in this county to their advantage.

On August 3d the Board met at Doriskill farm, near Closter. There are but few dairy farms in Bergen county, and this is one of the largest. About 100 milch cows are kept here, and about the same number of younger cattle. About 700 quarts of milk are sold from this place daily. About 500 hens are kept, chiefly White Leghorn and Plymouth Rock. Honey of a fine quality is also produced here.

An Institute was held at Hackensack, on November 23d, 1904, when a number of excellent speakers were heard. The address of C. W. Broadhead, on the care of the horse, was one which should be heard by every County Board and Grange.

All the Granges in this county report an increase in membership, interest and attendance.

While the weather conditions during the season of 1904 were not first-class, the farmers here had a fairly profitable season.

Hay was about an average crop.

Peaches were a total failure.

Pears very good.

Apples poor in all sections.

Cabbages were below the average.

Tomatoes very fine.

Cucumbers good.

Strawberries were poor in most sections.

Potatoes are reported as very good in most sections.

No one seems to have had any success as yet in raising alfalfa in this county.

Burlington County.

OFFICERS FOR 1905.

President, HENRY D. CULIN,Hainesport
Vice-President, FRANKLIN ZELLEY,Moorestown
 **Secretary and Treasurer*, B. P. WILLS,Mount Holly

* Elected at a special meeting, held February 13th, to succeed the late Henry I. Budd, deceased.

DIRECTORS.

J. HARVEY DARNELL, Mount Laurel Farmers' Club,P. O., Masonville
 T. SHERMAN BORDEN, Cooperstown Farmers' Club,P. O., Beverly
 CHARLES I. HOLLINSHEAD, Medford Grange,P. O., Medford
 ROBERT TAYLOR, Columbus Grange,P. O., Columbus
 GEORGE W. LUNDY, Pemberton Grange,P. O., Birmingham
 ALBERT HAINES, Moorestown Grange,P. O., Masonville
 HARRY WRIGHT, Rancocas Grange,P. O., Burlington

DIRECTOR-AT-LARGE.

HORACE ROBERTS,Moorestown

DELEGATE TO STATE BOARD OF AGRICULTURE.

SAMUEL S. FORT, two years,Wrightstown

REPORT

BY HENRY I. BUDD.

The annual meeting of the Board was held at Mt. Holly, in connection with a Farmers' Institute, on December 10th. In spite of the severe storm the meeting was one of the best and most interesting meetings held in Mount Holly for a long time.

The following subjects were discussed:

"How New Jersey Farming Compares with the Farming in the West," by Joseph Engle, Jr., H. I. Budd and Emmor Roberts.

"How to Maintain Paying Prices During Years of Excessive Production," was discussed by various members.

"How to Provide Sufficient Labor to Properly Work Their Farms," was also very exhaustively discussed by Messrs. Emmor Roberts, Leon Collins, David Griscom, Samuel S. Fort and others.

"Some of the Latest Improvements in Dairy Breeding, Feeding and Care," was interestingly portrayed by Dr. Edward B. Voorhees, of the New Jersey Agricultural Experiment Station. His address was highly instructive to dairymen.

Prof. J. C. Lipman gave a valuable talk on "Soil Bacteria and Their Work, and the Proper Feeding of Farm Crops."

H. W. Ridgeway, of Gloucester county, gave an interesting talk on "Asparagus Production," showing how to select varieties, plant, grow and market this valuable product.

The following resolution was passed:

"WHEREAS, Powerful influences are at work to repeal the Grout Bill; be it
Resolved, That it is the unanimous sense of this Board that our Members of Congress use their vote and all their influence to prevent its repeal or modification."

CROP YIELDS AND CONDITIONS.

The climatic conditions for the growth and maturity of crops have, during the past season, varied from one extreme to the other, favorable periods being succeeded by unfavorable and vice versa. At times the crops were unduly stimulated, at others severely retarded.

The above conditions checked the development of the grass crop, but were favorable to the growth of winter grain. A large army of grub worms made much extra work for the farmer in re-setting tomatoes, sweet potatoes and lima beans. The cool, dry weather greatly shortened the berry crop and caused much tree fruit to drop.

The early plantings of both corn and potatoes resulted in failure in many cases, the seed being damaged so that it failed to sprout;

in consequence, many farmers had lighter crops because the later plantings did not have time to mature.

During July the temperature and moisture were most favorable and all crops not perfected made rapid growth. Especially was this true of corn. Hail storms did some damage during this month.

In August the heavy rainfall and hot sun caused the vines of tomatoes, potatoes, melons, pickles and lima beans to blight badly, scalded corn, damaged oats and second cutting of grass, rotted grapes and plums, but improved the pasturage and made sure the catch of newly seeded grass.

The weather during September and October was exceptionally fine for seeding and the gathering of crops. And the clear, cold days of November were taken advantage of by the farmer in harvesting a large crop of corn in good condition.

From every section come complaints of the great scarcity of farm help. One writer says, "It seems almost impossible to get anyone to work indoors or out. Nobody wants to come out on the farm." We shall have to shorten farm operations or import farm laborers. The government records show that the number of immigrants each year is many hundred thousands, notwithstanding which farm labor in the East grows scarcer yearly. This class of labor flocks to the West because the railroads send them, their destination being determined before they leave Europe. In view of these facts why would it not be a paying scheme for our Eastern farmers to organize an emigration bureau and employ agents to visit the agricultural sections of the old countries and present the claims and advantages of New Jersey, for undoubtedly our location is the best for profitable farming, owing to its close proximity to the large centers of population; yet when our farms come into the market, there are few purchasers for them on account of the scarcity of hands to cultivate them. On the other hand, thousands of Western farms have been and are being sold for high prices because the supply of farm labor was both good and plentiful, thus the undeveloped sections in the northwest and southwest of our country are being rapidly brought under cultivation.

Wheat and Rye.—On account of the late sowing in the fall of 1903, and early freezing, wheat and rye made a thin stand. Where early sown, the crop of grain and straw was fine. As the Western crops were light, the price of both is unusually high.

Hay.—Some of the best grass meadows this year produced the poorest crops, while some of the lightest land had a full average crop. Although the most of sod was well set, cool nights and deficient rainfall, at the critical period of development, stunted many fields; the average was not more than half a crop. Second crops were good, but frequent showers damaged much of the hay in the harvesting. There is very little for sale.

Oats, on account of the cool weather, gave the largest yield for years, but they were much damaged in the harvesting by frequent rain storms.

Winter grain, where sown in season, has made good progress. The ruling high prices have induced a larger acreage of it in the place of grass fallow.

Milk.—The average yield of milk per cow has been less than in previous years. The high price of feed stuffs has induced lighter feeding. The prices have been slightly lower where not kept up by combination. Last year's shortage of corn and grass necessitated the purchase of much feed at high prices. These, combined with the difficulty of obtaining men milkers, have induced many farmers to sell their cows. There is a growing tendency on the part of many of our best farmers to abandon the dairy.

Corn on most farms was the largest crop for years, averaging from fifty to seventy-five bushels per acre. Although, on some high land the frequent rains and hot suns impaired it so that the yield of grain was only fifty per cent. of a crop. Heavy wind and rain in September shredded the fodder badly, prostrated the stalks and thus made the crop very expensive to gather.

Apples were a good early crop and sold for remunerative prices. Fall and winter apples of a few varieties were a large crop, but sold for low prices. Many thousands of bushels were threshed from the trees by September storms and found a market, at ten cents per bushel, at the jelly factories and cider mills. The

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price did not pay for the gathering. Many trees are dying from the depredations of the San Jose scale.

Keiffer pears were a good crop, but prices were so low many were not gathered; those that were, sold at ten cents a basket. Many were put in cold storage and others pressed into cider. Much of the fruit was badly infested with San Jose scale. The lime, salt and sulphur wash proved a failure on both apple and pear trees.

Grapes were a moderate crop and rotted badly.

Cranberries were not more than forty per cent. of a crop. Frost, hail, heavy storms, fire and worms greatly shortened the fruit yield. Only a few favorably situated bogs had a full crop. The price was less than that of last year. A late frost in the picking season softened one-quarter of the berries that were still unpicked.

Plums were a large crop but rotted badly.

Cherries were one-half of a crop.

Gooseberries have led in price and profit all other small fruits, selling for ten cents a quart at wholesale, while other small fruits were a drug at six and eight cents per quart.

Early Tomatoes were a moderate crop; second early a good crop; late for canning almost a failure. The vines, while having an unusually large and bright growth, did not blossom but suddenly blighted. Although the canneries gave eight dollars per ton, their best supply was the second early, the greater portion of which they obtained because the prices were so low in the city markets that it did not pay to ship them.

Citron and Watermelons were a fair crop. The vines blighted during the middle of the season, thus destroying the later market value of the fruit.

Pickles in many sections were almost a failure. In the height of their bearing the vines blasted. The few patches escaping the blight produced well and proved quite profitable.

Asparagus was a moderate crop; sold for high prices. Rust still prevails.

Cabbage a large crop; badly infested with worms; largely rotted while waiting for a market. One to two cents per head was the prevailing price.

Boiling corn was a large crop; prices non-remunerative.

Sweet Potatoes were a good crop, with quality and shape the best; prices reasonable.

White Potatoes were two-thirds of a crop; considerable rot; at digging time the prices were low; later they were selling for fair prices.

Peas were a good crop; sold for low prices.

Lima Beans.—A large acreage planted, much affected with mildew, molding and blight. Sold for moderate prices.

On account of the scarcity of old corn, there has been a shortening of the pork production. Many of the hogs were marketed early when only half fat.

Turkeys were almost a failure; scarce and high in price.

Chickens have been difficult to raise, especially those hatched in incubators. Want of profit, on account of high price of grain, has prevented them from receiving the usual attention.

Eggs have been scarce and high in price the whole season.

The squab industry slightly increased each year and is the most profitable part of the poultry production.

Boiler duck raising is not on the increase.

The market conditions for nearly all kinds of perishable products have, during the period when farmers must realize or waste, been most unsatisfactory. Although the average crop has not been to each individual excessive, yet for months, only low prices could be realized, whole loads of assorted truck selling for ten cents per five-eighths basket. The purchasers seemed to be possessed with the idea that all produce must sell low and the markets acted as if there were concerted action to depress prices. The result has been that hundreds of truck farmers have not realized enough to pay for the fertilizers used; consequently many are planning to change their crops. Perhaps the usual song that in a presidential year all must, on account of the uncertainty of the result, take no risks, may have had something to do with the general sluggishness of the market.

Spraying.—There will have to be some new destroyer discovered before the ravages of the San Jose scale can be arrested. The scale has destroyed the peach orchards; this season its effects have been most marked in pear and apple orchards. In all parts

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of the State large groups of trees, in many apple orchards, have died from its workings, and the fruit of Keiffer pear trees has been scarlet with the scale. The salt, lime and sulphur mixture, even with the addition of caustic soda, has failed to even check, much less destroy this pernicious insect. Our professors in the Experiment Station are wide awake to this condition of things and are experimenting with a view of finding some more effective remedy.

CLIMATIC HISTORY OF BURLINGTON COUNTY, N. J., IN RELATION TO AGRICULTURE, FOR THE YEAR 1904. BY THOMAS J. BEANS.

	Temperature.			Rain and Melted Snow—Inches.	Snow—Inches.	Number Days 0.01 In. or more of Rain Fell.	Number of Clear Days.	Number of Partly Cloudy Days.	Number of Cloudy Days.
	Maximum—Degrees.	Minimum—Degrees.	Mean—Degrees.						
January,	56	—9	24.1	3.02	12.8	11	10	6	15
February,	59	0	25.6	2.40	7.6	8	11	5	13
March,	68	15	38.5	3.83	5.7	15	9	8	14
April,	79	25	48.3	2.61	0.2	5	5	13	12
May,	92	40	63.5	3.23	.....	8	14	12	5
June,	94	46	68.9	3.07	.....	12	10	7	13
July,	92	52	72.4	5.68	.....	17	8	12	11
August,	89	48	71.1	7.08	.....	10	11	6	14
September,	88	32	65.9	5.84	.....	7	9	8	13
October,	84	25	52.6	4.00	.....	6	18	6	7
November,	63	18	40.9	2.04	8.6	8	8	12	10
December,	53	1	27	2.93	18.1	15	10	6	15
Year,	94	—9	45.9	45.73	53	124	123	101	142

The latest killing frost in Spring, April 23d (28°); the earliest in autumn, September 22d (32°), making 152 days for out-of-door growth of tender vegetation. The rainfall was abundant, and, mainly, nicely timed throughout the year, the supply, 45.73 inches, being nearly the average of past 40 years (45.74 inches) in our county.

The winter of 1903-04 set in early, and was continuously cold, freezing water-pipes at the depth of three feet, and nature woke in the spring from an uninterrupted winter's sleep like a "giant

refreshed." Because of frost in ground plowing began late. Conditions were favorable for germination of seeds and setting out of plants saving much expense. The gales of April 16th to 19th and 20th drifted sand and destroyed many peas.

Strawberries had heavy blossoming, few of which were killed by frost, and its crop of fruit was good as was that of raspberries.

The cherry crop was a heavy one.

Cantaloupes started well; had healthy vines and foliage, and the fungous and insect enemies do not like healthy plant juices. There was little of insect depredation throughout the season, but a violent wind and rain storm as the vines were spreading, another when they were loaded with fruit, tossed about and injured the vines. But in spite of this, their quality was the best we have had.

December, since its third day, has had snows quietly deposited without drifting, affording shelter to grain and grass and a long period of splendid sleighing.

The year of 1904 was of singular beauty. Her trees were continuously verdure of vivid green and healthy radiancy. Her fields were not brown-tinted for an hour. Her summer temperature proved above 94°. It was so pleasant throughout it was not necessary to leave Burlington county homes for climatic pleasures. A long Indian summer with its quiet charm introduced a December without rude winds, wearing decorous drapery of snow.

Our cultivated plants, with civilization's affinities and relations, have civilization's artificialities and limitations and are perhaps more sensitive to extraneous influences than are plants in a state of nature. We can discern but not define the workings of forces outside the line of man's endeavor. Most notable are the distinctive features that constitute the individuality of the year 1903 and that of 1904 in regard to plant productivity and healthy vigor as illustrated by our corn and vine crops in their respective years. This 1904 impulse of robust vitality and reproductive energy has been felt and noted not only in our county, but I quote: "Farmers in western New York still talking of size and perfection and keeping qualities of their apples of past season," so of other places. But New Jersey seems to have felt the impulse even

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beneath her waters, for Maurice River Cove reports: "Climatic conditions of the summer of 1904 were of such a character as to produce a phenomenal growth of oysters. To an ordinary sized oyster shell hundreds of smaller oysters have grown. There had been such failure of natural growth for several years that thousands of dollars had been spent for seed from Virginia."

NEW JERSEY STATE LIBRARY

Camden County.

OFFICERS FOR 1905.

President, H. H. BELL,Mt. Ephraim
Vice-President, R. COOPER MORGAN,Blackwood
Secretary and Treasurer, DANIEL W. HORNER,Merchantville

DIRECTORS.

MR. AND MRS. M. C. BROWNING,Merchantville
MR. AND MRS. ALBERT DEWES,Collingswood
MR. AND MRS. R. COOPER MORGAN,Blackwood
MR. AND MRS. JOSEPH REXON,Audobon
MR. AND MRS. JOHN M. STETSER,Chews
MR. AND MRS. JOHN GARWOOD,Ashland
MR. CHARLES BARTON,Marlton
MR. AND MRS. C. C. STEVENSON,Blackwood
MR. AND MRS. R. W. JAGGARD,Blackwood
MR. EDWARD DOBBS,Mt. Ephraim

DELEGATE TO STATE BOARD OF AGRICULTURE.

CHARLES BARTON (two years),Marlton

The twenty-first annual meeting of the Camden County Board of Agriculture was held at Haddonfield, November 18th, 1904. The meetings of the Board and of the Farmers' Institute held in this county not only show an increased attendance, but also a greatly increased interest. A disposition to look beneath the surface has taken possession of our people. The spirit of inquiry is spelled with a big "S," and I feel to say that it is appreciated by the scientific men sent here on Institute day, as was evidenced by their remarks. Surely the school house on the hill is getting in its work. The world moves and the "Sun" do move with it. I mention a few of the subjects that received attention at our annual meeting: "The Season of 1904," "The Value and Economical Use of Wool Waste as a Fertilizer," "The Legal Status

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of the Automobile," "Some Experiments in Soil Inoculation," "The Use of Bordeaux Mixtures upon Truck Crops." The variety of crops grown in Camden county particularly fitted our people for an intelligent discussion of the subjects named and brought out experiences not to be gotten in any other way. In every community there are practical men following the paths blazed by the lights of science, and it is the aim of our directors to enlist the services of these men, who are not afraid of being called "cranks," get their experience before the meeting, thereby raising the standard of our order of exercises.

Immediately after the dinner provided by the good ladies connected with our meeting it was our good fortune to listen to an address upon the "Legal Status of the Automobile," by the Hon. H. S. Scovel, of Camden. The fact that the improved road to Atlantic City lies for a great distance within the limits of Camden county, and the fact that the running of automobiles upon this highway is frequently characterized by recklessness and without regard to the law, making traveling upon the same with horse and carriage dangerous, had the effect of bringing out a large number of indignant people, who applauded Mr. Scovel's effort to have a law enacted that imposed greater restrictions upon the "benzine buggy," as it was called in a communication to the Secretary, which, after Mr. Scovel's address, was read to the audience. I quote one verse. Though from Paris, Maine, it seemed to be fully appreciated here:

You may talk about the locust,
 Or the scale from San Jose;
 Of the rust and blight and mildew,
 And the tons of damaged hay;
 Not a curse has come among us,
 Going fast or going slow,
 Like this horrid benzine buggy
 That we meet where'er we go.

Reversing the usual order the Farmers' Institute this year was held at Blackwood, and to Blackwood's credit it must be said that this section fairly outdid itself. An elegant lunch was provided by the ladies and the event, independent of its educational features, served as the occasion of a reunion to our people. The

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program was all that could be asked for. The speakers were interesting and well informed.

A portion of this county was severely visited the past summer by a destructive hail storm, which, of all the hail storms the oldest inhabitant recollects, was the worst. I doubt not it will have the effect of driving some of our farmers out of the business, as in some instances the earnings of a lifetime were swept out of existence. The San José scale prevails here, and seems to be on top yet, though it is hoped that persistent efforts by the fruit grower will reveal something that will make man the master of the situation. Fungous diseases still continue their ravages where unchecked by remedies, which it is demonstrated, if properly applied, can keep the most of these diseases well in check.

Cape May County.

OFFICERS FOR 1904-1905.

<i>President</i> , DR. E. H. PHILLIPS,	Cape May City
<i>Vice-President</i> , J. D. LUDLAM,	South Dennis
<i>Secretary</i> , J. W. PINCUS,	Woodbine
<i>Treasurer</i> , VOLNEY VAN GILDER,	Ocean View

DIRECTORS.

HARRY LEAMING, Lower Township,	Cold Spring
HOWARD HOFFMAN, Lower Township,	Cold Spring
FRANCIS HARRIS, Middle Township,	Rio Grande
WINFIELD COOMBS, Middle Township,	Goshen
HON. F. LUDLAM, Middle Township,	South Dennis
HON. J. D. LUDLAM, Dennis Township,	South Dennis
WASHINGTON VAN GILDER, Upper Township,	Petersburg
H. P. MICKLE, Upper Township,	Petersburg
J. SPEECH, Cape May Borough,	Eldredge
MICHAEL BROWN, Cold Spring Grange,	Cold Spring
RICHARD LLOYD, Dias Creek Grange,	Dias Creek
E. H. BURLEIGH, Tuckahoe Grange,	Tuckahoe

DELEGATES TO STATE BOARD OF AGRICULTURE.

RALPH SCHELLENGER (two years),	Green Creek
J. W. PINCUS (one year),	Woodbine

REPORT

BY THE SECRETARY.

The Board has held, during the past year, two regular meetings, besides two special ones in co-operation with Granges.

The regular meetings were held on December 17th, 1903, at Woodbine, when the annual Farmers' Institute was also held. The special meetings were held—one in March, at Cold Spring,

in co-operation with the Cold Spring Grange. This meeting was devoted to addresses by Messrs. F. Schmidt, R. M. Washburn and J. W. Pincus, of the Woodbine Agricultural School, on "Fruit Growing," "Dairying" and "Fertilizer," respectively; the addresses were followed by discussions. A meeting at Tuckahoe, in co-operation with the Grange, was held on December 3d, 1904. Here Mr. A. R. Merrill, of the Woodbine Agricultural School, read a paper on "Swine Dairy," and J. W. Pincus spoke on "Commercial Fertilizers," and Dr. E. H. Phillips spoke on "Dairy Knowledge."

The election of the officers did not take place till December 23d, 1904, at Woodbine, when the Farmers' Institute was again held. In general, I can notice that the Granges have stimulated the interest of our farmers in the agricultural meetings, and I am sure that at the near future, as our Granges get stronger and more numerous, we shall have greater attendance and more enthusiastic meetings.

GENERAL STANDING OF AGRICULTURE.

The season of 1904 was a very peculiar one. It was a late season, with quite sufficient amount of rainfall at the beginning, but with unusually small rainfall during August, September and October.

Corn, owing to the poor quality of seed, did not come up well, and had to be replanted several times. In general, the season was quite favorable to corn, although the lack of rain during the later part of the season and the severe September storm reduced the yield somewhat.

An interesting fact in connection with growing of corn was observed at Woodbine, on the Agricultural School Farm.

Two bushels of Pedigreed Corn—Boone County White—was obtained from Illinois, and it is remarkable what influence good seed has. This corn came up better than other. During its growth it attracted everybody's attention. It produced a heavy yield of seed and stalks. While the pedigreed seed is much more expensive, it is worth while for every farmer to buy some of it.

The hay crop was quite good. The second crop, however, was very poor, owing to droughts.

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Crimson clover was practically a failure, as the severe winter of 1903-1904 killed it out.

The frost killed the fall-planted alfalfa, also on the Woodbine School Farm.

The other forage crops—peas and oats—did quite well; so did cow peas.

Potatoes yielded fair crops. The potato beetles were very late in making their appearance, but afterwards they appeared in such large numbers that they made up for their lost time.

Sweet potatoes produced fair yields, but black rot was reported in several localities.

Tomatoes yielded good, early crops, but the late crops for canning were not very heavy.

Keiffer pears, as usual, bore a full crop. Other varieties of peas, however, gave scanty crops.

Apples were not very plentiful and not of very good quality.

Peaches bore slightly more than last year, but were somewhat injured by the severe frost of last winter.

Plums bore heavily, but rotted before fully ripe. Of the small fruit, blackberries were completely frozen to the ground, and there was no crop to speak of.

Gooseberries, currants and raspberries were also injured, but yielded small crops. Strawberries produced fair yields.

Grapes yielded quite well. There is a good demand at a fair price for grapes for making unfermented juice, and several farmers in Woodbine are thinking of increasing their vineyards.

DAIRY.

There is not enough milk produced in the county to supply the needs of the summer resorts. Considerable milk is brought on train from neighboring counties, but the general complaint is that the milk is of the poorest quality. There is a good opportunity here for some experienced farmers to dispose of large quantities of milk.

The demand for eggs and poultry is very great and the prices are very good. Eggs are selling at 40 cents a dozen.

Cumberland County.

OFFICERS FOR 1905.

President, ANDREW MILLER,Bridgeton
Vice-President, ARTHUR SEABROOK,Deerfield
Secretary and Treasurer, CHAS. H. DUNSAFE,Cedarville

DIRECTORS.

W. S. BONHAM,	BUTLER PAGE,	CHAS. H. DUNSAFE,
MORGAN SMALLY,	FRANK GOODWIN,	ARTHUR SEABROOK,
JEREMIAH CHAMBERS,	D. H. BURG,	J. S. TURNER.
JOHN T. WHITAKER,		

DELEGATES TO STATE BOARD.

A. H. WILSON,1 year
W. S. BONHAM,2 years

REPORT

BY THE SECRETARY.

The Board has held two meetings this year. On February 25th the annual meeting, when the above officers were elected to serve for the ensuing year, the attendance was fair. The second meeting was held April 7th, and was called for the purpose of discussing the growing of tomatoes, the price per ton and also to take some action in regard to the grower having some security for his money when tomatoes were delivered.

The meeting was full of life and vim and a hopeful feeling prevailed among the farmers that the year of 1904 would be a prosperous one to them.

In discussing the growing of peppers quite a number took a part. Men who were successful in growing peppers gave their opinions freely, which made the meeting interesting and instructive. The result of the discussion was that the pepper was a plant that would blossom and grow until very late in the fall or

until frost. Raise the plants under sash and get them early and a good paying crop would be the result. Many of the farmers thought that peppers did not necessarily need rich ground, and that they would do fairly well on ground on which some other crops would be almost a failure. Some were of the opinion that peppers at 40 cents per barrel would pay better than tomatoes at \$12 per ton.

CROP REPORT.

Corn crop good, far above the average. One farmer of Lawrence township said that he had fully twice as much corn this year than he had ever had before. Many farmers had to build new cribs.

Wheat—Fair crop.

Oats—Good; would average 40 bushels to the acre.

Hay—Satisfactory to most of the farmers.

White Potatoes—Early, good, extra.

Late Potatoes—Not up to the average.

Sweet Potatoes—All right in regard to crop, but prices were low.

Apples—Crop heavy and prices good first of season, the Roadstown pippin bringing 30 cents a basket in August. The farmer is indeed fortunate who has a number of those trees.

Peas—In plenty; prices fair.

Peaches—Heavy crop; prices were all right for good fruit, but hardly satisfactory for the small.

Strawberries—Hurt very much by the weevil; 50 per cent would be a low estimate of the damage done to this crop. Prices about the same as last year.

Citron Melon—Much better than last year, with prices all right.

Cabbage—Crop light; hurt very much by the worms.

Tomatoes—The best crop for years, with the price \$8 per ton.

Peppers—The crop immense, but prices so low that hundreds of barrels were left to rot in the fields.

But notwithstanding this fact, take the farmers throughout Cumberland county, they have no reason or just cause to complain. Take the county as a whole, the farmers have had a prosperous year.

Essex County.

OFFICERS FOR 1905.

President, CYRUS B. CRANE,Caldwell
Vice-President, ISAAC S. CRANE,Chatham
Secretary, J. H. M. COOK,Essex Fells
Treasurer, GEO. E. DeCAMP,Roseland

DIRECTORS.

A. E. HEDDEN, F. C. GOBLE, WM. DEICKS, SR., J. B. WARDE, A. W. FUND.

DELEGATES TO STATE BOARD.

MARCUS W. DeCAMP, (two years), A. W. FUND (one year).

The Board has held four regular meetings the past year, with the usual attendance and interest.

The meeting of February 11th was devoted to the subject of fruit culture, and points of interest gathered by our delegates at the State Horticultural meeting were reviewed and discussed. The sentiment prevailed that trees grown at home, or in the vicinity, were more reliable and gave better results than those obtained from distant nurseries.

The meeting held March 18th was largely occupied with the discussion of the game laws and the rights of farmers to protect themselves against the ravages of birds and rabbits. It was resolved that the Board take action to test the constitutionality of certain existing laws. Arrangements were also consummated for the purchase of fertilizers and seeds.

The meeting held December 7th was the twentieth annual meeting, the Board having been organized and regular meetings held since December 16th, 1885.

In addition to the regular business of the annual session, the President's and Secretary's reports were of interest, as they in-

dulged in reminiscences of the history of the society and the beneficial influences the organization had exerted upon the agricultural development of the county.

The Secretary gave a summary review of the organization, its past and present membership, etc.

The President, C. B. Crane, spoke as follows:

“Gentlemen of Essex County Board—We meet once more in annual session to take up the work for which our Board is organized, and to continue our efforts for practical information in the line of progressive farming. The facilities for information now afforded the farmer are such that no one need be ignorant regarding the essentials for raising good crops, and success must depend largely on the application of the abundant information, also upon good management, taught by experience, aided by a favorable season.

“Our experience in growing crops the past year has been in the main encouraging to the farmer. A kind Providence has given to us a favorable season for most crops. Some drawbacks have, however, been met, especially with corn, as where planted on low ground the spring was too wet, which delayed planting, and an untimely frost has again damaged the crop to some extent.

“The necessity for good drainage and early planting are taught us year after year, and especially the last two seasons.

“The Board at its last annual meeting took up the subject of river drainage, which was fully presented by Mr. C. M. Harrison, and some hopes were revived that, through the agency of the Paterson Flood Commission, some relief might be obtained for our suffering land owners, as their plans of action seemed to promise some relief to our low meadows, but their report gave us no prospect of adequate relief. Later developments seem to indicate that there is more prospect of permanent overflow than of well-drained meadows. The interests of Paterson and the East Jersey Water Company are not in harmony with those of our plowed-land owners.

“Our meetings, while they have been fairly well attended, and of interest and profit to those present, yet do not have the numbers and encouragement by farmers generally that they should. The State is expending large sums of money for the benefit of

farmers, and they should show their appreciation by improving the opportunities given them to become more progressive. The addresses of President Voorhees at the State Board meetings last winter were full of valuable suggestions to all raising crops and milk. We advise the growing of more fodder crops, such as clover, alfalfa, cow peas, etc., such as feed the soil as well as the cows, and the discussions of our County Boards along these lines are resulting in experiments and actions which will doubtless bring good results.

“The Board has held four meetings during the past year, and had reports and discussions of the topics presented at the State Board meeting. A detailed report of them will doubtless be given by the Secretary.

“Once more we have been favored by Secretary Dye with a Farmers’ Institute, and it may truly be said one of the best of the many good ones that we have enjoyed. After a very sensible talk on “Progressive Farming,” Secretary Dye gave us a programme, with both excellent subjects and speakers, and all must have gone home with food for thought and a desire to apply the suggestions given.

“An American bird, possessed of large appetite and courage, seems to have caused quite a breeze in our State and county meetings. In its pursuit of a living it has been so regardless of the rights of fruit growers in some parts of our State as to somewhat endanger their living, and legislation designed to allow the fruit grower to protect his property has been attempted and failed. Whatever the wisdom of the proposed laws, the principal involving the right of the fruit grower to protect his crops from the depredations of birds, squirrels or rabbits is sound, and legislation that in some way will secure to the grower his rights, and also prevent him and others from abusing them, should be secured.

“Again we have to record the loss of a prominent member of our Board, Mr. S. H. Burnett. Although beyond four score in years, he was faithful in attendance and prominent in discussions, with a bright mind and a large experience in general affairs as well as agriculture. Widely known and respected, he will be greatly missed in this part of our county.

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Let us, as progressive farmers, make the most of our opportunities, by experimenting and testing the advice Institute speakers have given us. Give our crops, as well as ourselves and our animals, good balanced rations, and aim to grow such crops as will feed the land and at the same time reduce the expense of feeding our cows, and thus minimize the cost of production, and working along these lines we will hope to reach success in the near future.”

Gloucester County.

OFFICERS FOR 1905.

President, JOSEPH T. CARTER,Mickleton
Vice-President, ELMER CLEMENT,Thorofare
Secretary, BENJ. HERITAGE,Mickleton
Treasurer, WM. H. BORDEN, R. F. D., No. 1,Swedesboro

EXECUTIVE COMMITTEE.

THEODORE BROWN,Swedesboro
 LEWIS MORGAN,Woodstown
 MARY WOLFERTH, R. F. D.,Clarksboro
 EDITH K. WHITE, R. F. D.,Sewell
 JAMES CARTER,Thorofare

DELEGATES TO STATE BOARD.

ALEXANDER P. OWEN (two years),Mickleton
 JOHN TONKIN (one year),Thorofare

GRANGES REPRESENTED.

Number Members October 1, 1904.

	Males, 126	Females, 106	Total, 232
Swedesboro, No. 5,	51	42	93
Harrisonville, No. 26,	30	30	60
Bridgeport, No. 32,	109	91	200
Mantua, No. 39,	157	132	289
Thorofare, No. 59,	92	63	155
Williamstown, No. 85,	113	46	159
Mickleton, No. 111,	114	100	214
Hurffville, No. 115, .....	...	...	...
Cross Keys, No. 123,	47	22	69
Iona, No. 127,	25	16	41
	864	648	1512

REPORT

BY THE SECRETARY.

Our constitution provides that "there shall be four stated meetings during the year, viz: The annual meeting, to be held on the first Monday in December at 2 o'clock P. M., in Patrons Hall, Mullica Hill; the other meetings to be held on the first Monday in March, June and September at 2 P. M., at such places as the Association may decide."

In compliance with this provision, four stated meetings have been held annually, but all of them at Mullica Hill until recently. In the sixth month (June), 1903, it was decided to make a trial of holding other than annual meetings at different places, the next one to be held at Mickleton, which, with one exception, proved to be the largest one ever held. Since then meetings have been held at Paulsboro, Mickleton and Harrisonville, with large attendance. At the last five meetings the number in attendance was 70 per cent. greater than that at the five next preceding ones, an argument in favor of the change.

During the past year the executive committee has prepared a full program as heretofore, to which, through the county papers and the Granges, wide publicity has been given.

There have been three Institutes held during the year—one at Mullica Hill, two days; at Clayton and Williamstown, one day each—all under the direction of Secretary Dye, and were largely attended. Much interest was manifested in the various subjects presented by local as well as by speakers from a distance.

In the western portion of the county the annual Institute has been held alternately at Mullica Hill and Swedesboro during the last ten years. The largest hall available is procured and at times it is overcrowded. Such was the case at the one recently held at the former place, at which about half of the auditors were ladies.

During the two days on which it was held the Grange of that place, aided by a neighboring one, provided three free meals for all who attended its sessions. This has been the generous prac-

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tice at both places for years, and it is a very great accommodation and one that is highly appreciated, especially by outsiders. The time allotted to the recess affords a favorable opportunity for social intercourse and for forming acquaintances with one another, as well as for partaking of the bountiful repasts which are thus freely furnished and well served.

The Grange's annual picnic at Alcyon Park was held August 10th and 11th, and was attended by a very large concourse, variously estimated by the daily papers. Interesting addresses were made by Hon. Aaron Jones, of Indiana, Master of the National Grange, P. H., and Mrs. F. M. Southland, of Massachusetts.

The exhibits of fruits and vegetables of various kinds were exceptionally fine. There were products of the dairy and kitchen, as well as a great variety of fancy needlework, etc., with some live stock. The machinery embraced almost every conceivable form ever found on the farm, from the large traction engine to a carriage jack, and from a steam artesian well drilling machine in operation to an apple parer. This feature of the picnic is increasing in magnitude from year to year, hence we infer it pays those having such goods to sell to exhibit them to the thousands convened for pleasure and profit.

On the evening of July 1st the most destructive hail storm that has visited this section during the last sixty years at least crossed the county from the southwest to the northeast and continued for ten minutes. It was about two miles in width, but it was much more destructive near the middle of its pathway, where it completely destroyed some crops, such as early tomatoes, citrons, etc. All kinds of fruit were also practically destroyed or rendered worthless. White potatoes had already made about half a crop, and although the vines remained green, yet the potatoes ceased to grow. Sweet potatoes were put almost out of sight, but a portion of the plants sprouted from the root again, and such hills generally produced a good crop. Uncut wheat was threshed almost clean and the heads mostly lay flat on the ground and could not be gathered, as the mower clipped them off. Some attempt was made to gather the straw for bedding.

Forward corn that would almost hide a horse was so nearly

destroyed that it produced only about ten per cent. of what it otherwise would have done.

Outside of the hail belt the corn crop was the best in years; as much as one hundred bushels of shelled corn per acre has been reported, but severe wind storms in ninth month damaged the fodder somewhat where not in shock.

There is now much less winter grain sown than formerly, as it is generally found to pay better to sow clover and timothy after early potatoes, tomatoes and other early crops, as a good "catch" is more certain than to sow timothy with wheat and clover the following spring, besides the advantage of getting two crops of hay a year earlier than by the former method.

It is now quite a rare sight to see a field of oats in the western half of the county, and buckwheat is unknown here.

Grass never looked more promising than in the early spring, but dry weather later caused a short crop. The second crop, however, was heavy; but wet weather damaged much of it in being harvested. On account of so many farms being devoted almost exclusively to truck, there is always a ready home market for hay at prices in advance of those in Philadelphia.

Early white potatoes are a leading crop in portions of the county, yield fair, and prices generally remunerative.

Apples were a full crop, but prices were so low—except for extra fine fruit—that large quantities rotted on the ground. Pears were also a full crop. Bartlets sold well, Keiffers very low. Where there were healthy trees peaches produced a good crop. Some orchards in which the fruit was not thinned were badly broken from being overloaded. Prices good. Grapes and berries, comparatively few grown, and in comparison with ten years ago, there are now few watermelons raised. To a less extent the same may be said of cantaloupes. In the latter case due largely to aphides and blight. Cucumbers and cabbages are also minor crops.

Early tomatoes have become one of the leading crops in recent years. The yield was heavy, prices fair at the opening of the season; but later on the markets were glutted and there was no sale for many thousands of crates at remunerative prices and they rotted in the fields. Many observing growers believe this

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unfortunate state of the markets was largely produced by improper methods adopted in the grading and packing of the fruit. If this be true, those who depend so largely upon this crop might with profit to themselves study well the proper grading and packing problem. Growers who have given this subject their close attention for years have established a large trade for evenly graded and properly packed tomatoes, and while some of their neighbors have found no market for a considerable portion of their crop, these growers have found a ready sale at remunerative prices for all that were marketable.

I think no attempt has ever been made to ascertain how much produce is annually hauled in wagons from this county to the Philadelphia markets, but during the truck season there are hundreds of loads almost daily, and many boats also carry large quantities.

The following figures, kindly furnished by the division freight agent of the West Jersey and Seashore Railroad show what has been shipped from the county over that road:

Early tomatoes, 441,446 crates in 1904.

Cantalopes, 58,685 crates in 1904.

Peppers, 33,329 barrels in 1904.

Sweet potatoes, 114,992 barrels in 1903.

White potatoes, 10,010 barrels in 1903.

Of the above amounts, there were shipped from Swedesboro 381,789 crates of early tomatoes and 76,483 barrels of sweet potatoes.

From a branch of the Reading Railroad, which taps the chief white potato district, no report has been received.

Several new free delivery mail routes have been established during the year, which prove a great advantage to every community reached by the system.

The People's Rural Telephone Company has introduced the telephone into the homes of many farmers during the last few months, and the system is being extended into various communities. Those who have it now wonder how they ever got along without it.

For general farm work colored laborers from the South are almost the only help obtainable. A portion of this is very satis-

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factory, but much of it is the reverse. In some localities it was more abundant the past season than the previous one. In trucking districts wages vary from \$20 to \$25 per month, with board, and from \$25 to \$35, without, from eight to nine months in the year.

Indoor help is exceedingly difficult to obtain and much of it, when obtained, is of an inferior quality; consequently, many farmers' wives are overworked from sheer necessity, to obviate which is an unsolved problem.

Hunterdon County.

OFFICERS FOR 1905.

President, E. M. HEATH,Locktown
Vice-President, FRANK TROUT,
Secretary, WM. W. CASE,Baptisttown
Treasurer, F. J. TOMLINSON,Pittstown

DIRECTORS.

H. F. BODINE, Hunterdon County Pomona Grange.
 JNO. Q. HOLCOMBE, Ringoes Grange.
 WM. B. HOCKENBURY, Locktown Grange.
 JOSEPH HAGERMAN, Sergeantsville Grange.
 ELLIS B. HUFFMAN, Kingwood Grange.
 WM. SCOTT, Oak Grove Grange.
 M. W. ANGELL, Spring Mills Grange.
 JOSIAH PRALL, Grand View Grange.
 W. H. OPIE, Riverside Grange.
 URIAH SUTTON, New Jersey Fruit Exchange.
 A. B. ALLEN, Hunterdon County Peach Exchange.

DELEGATES TO STATE BOARD.

E. M. HEATH, two years,Locktown
 JAS. LANE, one year,Readington

COMMITTEE ON FRUIT STATISTICS AND REPORTER TO STATE BOARD.

WM. W. CASE,Baptisttown

Other organizations in county:

NEW JERSEY FRUIT EXCHANGE.

President, JNO. T. COX,Readington
Secretary, MORRIS STOCKTON,Pattensburg

HUNTERDON COUNTY PEACH EXCHANGE.

President, A. B. ALLEN,Flemington
Secretary, P. M. MECKLING,Pittstown

REPORT

BY THE SECRETARY.

Two regular meetings have been held by the Board during the year just closed—in August and November. The August meeting was held at Three Bridges, the New Jersey State Beekeepers' Association taking part by special invitation. The meeting was well attended by an interested audience. The Secretary read a paper on the "Busy Bee," and J. H. M. Cook, of Caldwell, N. J., in behalf of the Beekeepers' Association, spoke at length on "Bees and Honey."

The November meeting was held at Flemington, and was mainly devoted to business of the Board and canvassing crop conditions.

Farm values increase but slowly, if at all, and good farms may be purchased for a small fraction of the value of the buildings thereon. With the advent of the trolley and stone roads, now assured, we hope for a better condition of things and an upward trend of land values.

The season of 1904 has been one of luxuriant growth and bountiful crops, and but for the early severe frosts of September 22d and 23d, the corn crop would have exceeded all previous records; as it was, quite a large percentage of corn was caught in the milk and seriously damaged thereby. Ice formed on still ponds on both nights mentioned, and the tomato crop was frozen out of existence. Such frost damage so early in the season is unprecedented, all garden truck perishing in mid-season.

FRUIT.

The fruit crop, with few exceptions, was normal, and the loss from robins and other birds was not felt as in 1903, when they took practically all. Black cherries hung full and wasting far into August; the apple crop, though large, was far from remunerative, selling for only from 70 cents to \$1.00 per barrel delivered at the station. Mr. Cyrus Risler marketed 1,400

bushels for 50 cents per hundred pounds, a price by no means princely. The ravages in apple orchards by the San Jose scale is becoming appalling. In the eastern end of the county, vicinity of Readington, the orchards have been so destroyed that farmers have had to import their winter supply of apples from more favored localities.

A serious condition confronts the fruit grower. Spraying results are far from satisfactory; some kill scale and trees as well; others, as lime, salt and sulphur, do good, but in case of the apple, while holding the pest in check, drive it to the new growth and fruit, which it ruins.

The proceedings of the Horsham, Pa., Farmers' Club implies that so far no proposed remedy is at all satisfactory, and the hopes entertained for relief from the Chinese lady bird have not been realized.

About December 1st my attention was called to a badly-infested plum tree, which, during the months of August and September, was taken possession of by a horde of small black insects about one-sixteenth of an inch in size, and which seemed to counteract the destruction of the scale. Many of the colony were hibernating nicely in recesses of the bark December 15th. The tree will be carefully watched and specimens sent to specialists for identification and life habits.

Since this is the first time I have heard such an insect referred to, I have some hopes, though feeble, that here may be the beginning of the elimination of the pest, though it is barely possible that the insect is there for some other purpose.

Already has the peach practically disappeared because of its ravages, and pears and plums are following.

Nearly all members of the rosacæ family are susceptible, and many forest trees, especially gums and shrubs, are as susceptible as fruit trees.

FARM STOCK—HORSES.

At present there is a large opening for horse-breeding in Hunterdon county, if the right kind of stock is bred. That it would pay is shown by the business conducted by Mr. E. W. Opdycke,

of Frenchtown, who sold at his sales stables in that place between January 19th, 1904, and September 22d, 1904, more than \$68,000 worth of horses. The great majority of these were selected stock from the West, and they averaged more than \$200 per head.

Besides Mr. Opdycke, J. R. Johnston, of Flemington, and A. S. Case, of Three Bridges, import several carloads of horses each year, which find a ready sale to farmers and others in need of first-class stock.

I firmly believe that Hunterdon county farmers, if they will, can raise at a large profit horses equal in every way to those imported from the West, but they cannot do so until they discard the notion that good horses can be bred from scrub stallions and broken-down mares.

CATTLE.

The dairy herds of the county are being bred better each year, and scrub cows are less than formerly. Good cows command ready sale at from \$30 to \$50 per head, the price averaging fully \$40 per head.

Sheep are becoming less every year, owing to dogs and other causes. They are a money-making animal and should be found on many more of our farms. In sympathy with the dairy herd, hog-growing is increasing every year, and herds of from fifty to one hundred head are not infrequent in the county.

POULTRY.

Egg production is rapidly on the increase and large poultry-houses and finely-bred flocks of Leghorns, Plymouth Rocks and other standard-bred fowls may be seen, and on a great many farms produce far more money than is received from the milk and pork combined. It is safe to say that the increase in the number of hens in the county each year is fully 10 per cent. Mr. John G. Lane, of Frenchtown, between April 1st and December 1st, purchased more than 35,000 dozen eggs, and there

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are several well-established egg routes that collect (each route) nearly or quite as many as does Mr. Lane. They also furnish one of the chief commodities for barter at the numerous general and grocery stores throughout the county, while the cockerels and surplus hens find ready markets at our larger towns, from where the dressed fowls are shipped in immense quantities to the larger cities.

Mr. S. O. Heath, of Kingwood township, from 450 hens for year ending August 31st, 1904, sold eggs per month as follows:

	<i>Dozens.</i>	<i>Amount.</i>
September,	270	\$59 40
October,	90	21 60
November,	90	21 60
December,	30	9 00
January, 1904,	30	10 80
February,	150	33 00
March,	270	46 80
April,	505	90 90
May,	772	138 96
June,	580	106 05
July,	486	96 24
August,	307½	66 24
Total	3,570½	\$700 59

No account made of eggs set to raise 1,000 chickens or used in house.

Compared with Mr. Heath's report for August 31, 1903, it shows a net increase in prices of eggs, wholesale, of about two cents per dozen, or 10 per cent. higher average than for the year previous against a loss of 10 per cent. in price of dairy products.

Turkeys scarce; flocks fewer and smaller year after year, although prices are double what they were a dozen years back. For Christmas markets turkeys were scarce at from 23 to 26 cents per pound, dressed weight. Geese, ducks and other poultry are more neglected every year.

THE BUSY BEE.

The very severe winter of 1903-04 proved fatal to fully 80 per cent. of the bees throughout the State. The loss was a heavy

one to both apiarist and horticulturist, and notwithstanding the past season was one of the best on record, it will take several years to repair the losses sustained.

TOMATOES.

The frosts of September 22d and 23d brought a most promising tomato pack to an abrupt end and left many hundreds of tons of fruit rotting in the fields.

Everitt & Scarborough, of Lambertville, packed 70,000 No. 3 cans previous to that date, while the cannery at Ringoes did not open for business at all.

DAIRYING.

In general dairying is holding its own, although from scarcity of provender several creameries report less milk receipts than a year ago.

Mr. C. R. Peterman, proprietor of the creameries at Cherryville and Oak Grove, reports receipts of 1,188,663 pounds of milk at the former place, against 1,213,685 pounds last year, and of the latter 917,840 against 910,830 pounds last year, and the price falling from 27¼ cents per pound for butter fat to 24¼ cents, a loss of three cents a pound, over 10 per cent, in price. Locktown also shows a loss of three cents per pound, more than 10 per cent. Much milk is also shipped by rail to the large cities at a total loss of skim milk to the farmer. Ten per cent. loss in price in the milk product is seriously felt by the producer.

Everittstown creamery received for year ending October 31st, 1904, 1,033,016 pounds of milk, against 1,203,597 pounds last year, and like all the other creameries shows a decided loss in size of product, but paid 24 cents per pound for butter fat, against 25½ cents last year, being a decline of only approximately 6 per cent. from last year's value.

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REPORT OF THE WORKING OF LOCKTOWN CREAMERY FOR THE YEAR ENDING OCTOBER
31ST, 1904, AS TAKEN FROM THE BOOKS BY GEO. W. HOCKENBURY,
SECRETARY AND SUPERINTENDENT.

	Number of pounds of milk received.	Number of pounds of butter made.	Butter sold for	Skim milk sold for	Average test of all milk received.	Price paid per pound for butter-fat.	Average price per cwt. for milk.
1903.							
November, ...	143,018	7,031	\$1,709 95	\$72 08	4.30	\$0 26	\$1 12—
December, ...	126,131	6,567	1,776 49	72 25	4.49	29	1 30+
1904.							
January,	125,266	6,457	1,755 97	61 20	4.42	29	1 28+
February,	125,388	6,396	1,826 49	63 88	4.46	30	1 34—
March,	118,839	5,872	1,653 30	63 15	4.33	30	1 30—
April,	122,944	6,021	1,558 95	63 95	4.31	27	1 16+
May,	163,253	7,822	1,733 68	78 55	4.15	24	1 00—
June,	186,238	8,898	1,706 35	94 15	4.04	21	85—
July,	163,525	7,765	1,515 53	84 50	4.01	21	84+
August,	161,161	7,697	1,539 64	85 98	4.10	21	86+
September, ...	157,534	7,433	1,559 67	80 95	4.16	22	92—
October,	148,620	7,159	1,687 77	73 45	4.39	24	1 05+
Total,	1,741,917	85,118	\$20,023 79	\$894 09			
Average, ...					4.18	\$0 25 $\frac{1}{3}$	\$1 08 $\frac{1}{2}$

GAME LAWS.

The unjust game laws still exist and place the farmer at the mercy of destructive wild animals and so-called sportsmen who protect (?) game for ten months of the year for the sake of heartless and wholesale slaughter for the other two. As it now is, no matter how destructive they become to crops, farmers dare not, under the shadow of jail or fine, defend their property. A colony of squirrels cared for and protected for years became so destructive this fall to apples and nuts that I applied to the game warden for a permit to protect the crops. He refused the permit. It is needless to say that soon after November 10 the colony was exterminated, but not till after they ruined every

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nut. Deer become nuisances in South Jersey and rabbits are a nuisance everywhere, and from early snows and the prohibiting of their slaughter while snow is on the ground millions will winter to become fearful pests next summer, and the farmers will have no redress till November 10, 1905. As illustrating the bird knowledge of the hunter, one near here this fall illustrated his prowess with the gun by showing proudly five pheasants (?) he had bagged. They proved to be *guineas*. He thought that as they flew from his dogs they must be wild, and shot them accordingly.

New Jersey game laws are a disgrace to the principles of American free government and will ultimately have but one result, an organization of outraged farmers throughout the State who will tolerate no trespassing on private property for any purpose whatever by the sportive or any other element.

Mercer County.

OFFICERS FOR 1905.

President, D. C. MCGALLIARD, White Horse
Vice-President, JOHN V. GREEN, Wilburtha
Treasurer, I. J. BLACKWELL, Titusville
Secretary, FRANKLIN DYE, Trenton

DIRECTORS.

J. W. HENDRICKSON,	CHARLES BLACK,	W. N. CUNNINGHAM,
WM. D. HILL,	H. H. HUTCHINSON, JR.,	FERDINAND BLACKWELL.
D. C. MCGALLIARD,	J. F. ALLINSON,	

DELEGATES TO STATE BOARD.

J. M. DALRYMPLE, two years, Hopewell
 THEODORE CUBBERLY, one year, Hamilton Square

REPORT

BY THE SECRETARY.

The County Board has held two interesting meetings during the past year. The attendance and interest at the annual meeting, March 10th, was much better than in recent previous years.

President D. C. McGaillard made a very encouraging address. He "believed that the knowledge obtained at our meetings during the year has equaled, if not exceeded, that of former years, while the fraternal feeling engendered among men having a common interest, striving to advance the intelligence and general prosperity of each other, is worth the time and effort consumed. The farmer develops the great agricultural resources of our country.

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“Many farm because they love country life and enjoy the surroundings of nature, but the majority follow it as other people follow their occupations, that is, with the idea of making money or a living, for the whole world wants cash, and few men despise money or a living who are able to make it, while the farmer who succeeds in winning a fortune from the soil commands our admiration, and we ask what magic power he employs to make the earth yield for him her products in such abundance.

“Some contend that any one can farm, but to make farming a success requires a reflective mind and a willing hand, for with all the improved machinery and the appliances of agricultural chemistry, labor is indispensable to success.

“I have found in my experience that the most successful farmer is the one who finds out what his farm is best adapted for. In looking among the successful farmers you will find it is not always the one who raises the best crops that makes the most money. The cost of production must always be considered. The most successful farmer is the one who understands managing his farm by raising the most with the least expense.

“A short time ago a neighbor told me that in fattening calves by a proper feed, and in giving them his personal care and attention, he had raised the profit from \$30 to \$60 per head in three years' time. There has been an increased interest in farming and many farms that have been on the market for sale have been taken up at fair prices, and there seems to be a disposition for people to invest in farms that in previous years have been lying idle.

“One of the most serious problems that the farmer has to contend with is the labor question. There is a growing scarcity of the right kind of farm help. For illustration, when I first started farming forty years ago I had a man who worked as a farm hand for me for 18 consecutive years. The class of help the average farmer gets these days cannot be depended upon.

“I feel proud in the fact that I am a Mercer county farmer. In order to make farming pay a man must enter into it with a determination to succeed. Personal attention, thorough inspection of every crop is essential. There is as much in the man as in the farm. Select the best breeds of stock, give them proper

care and you will find a reward for your labor. Plant only the best seeds, and in sowing them remember Ben Franklin's maxim, that 'if you would be well served, serve yourself.'

"Rural mail delivery has proved a success and greatly benefited the farmer. Heretofore his mail and newspapers came to him bi-weekly and even weekly; but to-day he receives his daily newspaper and mail regularly every day with Uncle Sam's increased mail facilities.

"And now, fellow members, in conclusion let us maintain an interest in this Board, so manifested in the past. Let us pursue our calling faithfully, trusting in an overruling Providence that He who controls the affairs and destinies of nations may so guide and order that we as farmers may receive a reward for our labor. Our years are swiftly passing by; one by one the familiar faces are leaving us, and soon we too shall lay aside our implements and be gathered in the great harvest beyond.

The Treasurer, I. J. Blackwell, spoke at length on the labor problem.

Henry Pfeiffer, of Atlantic county, addressed the Board on "Fruit Production," and J. H. Wolsieffer, of Egg Harbor City, spoke on "Poultry and Egg Production." All the addresses were based on careful, intelligent experience, and were full of valuable suggestions.

The autumn meeting was held in connection with the Farmers' Institute at Pennington, December 3d. This was the largest meeting yet held by the Board, with interest sustained through the three sessions.

The subjects treated were: "Gain and Loss of Nitrogen in the Soil," "Importance of Pure Seed," "The San Jose Scale and How to Treat It," "Care of the Horse," and "Essentials to Success in Dairying"—subjects of immediate importance to the farmers of the county.

A delegate to the State Board for two years was elected at this meeting, and the crop report herewith presented was submitted and adopted.

It is as follows:

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<i>Crop.</i>	<i>Acreage.</i>	<i>Bu. Per Acre.</i>	<i>Total No. Bushels.</i>	<i>Average Price.</i>	<i>Total Value.</i>
Corn,	22,000	38	836,000	\$0 56	\$468,160
Wheat,	12,000	16	192,000	1 20	230,400
Rye,	4,000	15	60,000	75	45,000
Oats,	10,000	35	350,000	30	105,000
Hay (tons),	23,000	1½	34,500	13 00	448,500
White Potatoes,	1,800	95	171,000	70	119,700
Sweet Potatoes,	200	105	21,000	60	12,600
					\$1,429,360
Miscellaneous vegetables,					612,956
Milk,					466,284
					\$2,508,600

The above estimates, based upon actual yields and prices, give an increase above the production of 1903 of \$167,520 for the county.

There are other sources of income that cannot, with the present facilities for collecting statistics of farm products be accurately determined. These are horticultural and market garden crops, small fruits, poultry and eggs, veal calves and pork.

The values of the farm stock, horses mules, milch cows, and other cattle will reach a total of \$1,027,273.

Some of the leading dairies in the State are located in Mercer county. Its proximity to the large central market—Trenton—and its numerous railroad facilities for shipping elsewhere, with so much of its land exceptionally well adapted for the maintenance of dairy stock for the production of milk, make it in every respect an ideal location.

But not only dairying flourishes. All crops adapted to this latitude here find the soil and conditions best suited to their requirements. A glance at the above table will show this statement to be correct. Intelligent management, sufficient capital (which need not be necessarily large) and enough of efficient help are needed requirements to success.

Furthermore, Mercer county, for various reasons, is a very desirable section of the State in which to live. Its schools are numerous and well managed. With these must be included the State Normal and Model Schools. Churches are provided and

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supported for the needs of all Christian people in the county. Her improved roads are exceptional, affording facilities for transportation of produce and for light driving unexcelled. New trolley lines are penetrating the more populous centers each year, affording opportunity for rural residents to take advantage of libraries, lecture courses, musical entertainments and shopping facilities in the city, not possible a few years ago.

And, on the other hand, retired farmers can reside in the city and yet make daily visits to their farms by trolley, thus keeping in close touch with their farming affairs. Good neighbors add much to the enjoyment of one's life, and the rural population of Mercer county is composed of good citizens—intelligent, progressive, social, and those refining influences which, wherever introduced, make for the improvement and elevation of the home life, are increasingly evident in the farm-homes of Mercer county.

Farmers are taking renewed interest in agricultural organizations throughout the county, notably in the Grange or Patrons of Husbandry. Some of the dormant Granges have been reorganized, and new ones have been created, so that there are now five of these organizations within the county in active operation.

The canning industry should be encouraged and increased. The Hopewell Valley Canning Company, reported by John M. Dalrymple, Esq., located at Hopewell, reports: Sixty-three acres under cultivation. Adverse weather conditions reduced the yield to five and three-fourth tons per acre. The price received by the farmers was \$8 per ton. The total pack was 145,000 cans and the price received for them \$11,500.

One grower had a yield from two acres for which he received \$244.

The Pennington Canning Company, reported by Mr. Elmer D. Wagner, Secretary, is as follows: "Number of acres contributing to the factory, 65; average number of tons grown per acre, 4; price paid per ton for tomatoes, \$8; total number of cans packed, 98,000; total net value of canned goods, \$7,319.40.

"In the way of an explanation, I wish to say that many of our growers gathered more than seven tons per acre, especially those who got their plants out early. Those getting their plants out

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late lost tons of tomatoes by the frost and this reduced the average to four tons per acre.

“Two of the greatest drawbacks we have to contend with are: First, the scarcity of peelers, which will not permit us to put up more than one-half the number of cans per day that our machinery is capable of doing, and, second, the inability to get our growers to get their plants out early. If we could overcome those two difficulties tomato-packing with us would become a very profitable industry.”

Hon. J. Warren Fleming, in behalf of the Titusville Fruit and Vegetable Canning Company, says: “That, owing to lack of help on farms, our company found it impossible to get sufficient produce grown to warrant the operation of our factory during 1904, hence our plant has remained idle and the conditions do not improve.”

Middlesex County.

OFFICERS FOR 1905.

President, D. J. PERRINE,New Brunswick, R. F. D. No. 2.
Vice-President, SEWARD APPLGATE,Helmetta.
Secretary and Treasurer, WM. FITZ RANDOLPH,New Market.

DIRECTORS.

H. E. PERRINE,Prospect Plains.
CHARLES EDWARDS,Prospect Plains.
WM. H. DEBOW,Prospect Plains.
A. S. APPLGATE,Cranbury.
SEWARD APPLGATE,Helmetta.
A. PIERSON,South River.
WM. OBERMAN,New Brunswick.
W. H. GILES,Dayton.
DE HART VOORHEES,Franklin Park.
FRANK HART,New Brunswick.
W. T. WOERNER,New Brunswick, R. F. D. No. 1.
LEWIS D. WALKER, JR.,New Brunswick, R. F. D. No. 1.
GEORGE ISHAM,New Brunswick, R. F. D. No. 2.
N. D. RUNYON,Stelton.

DELEGATES TO STATE BOARD.

R. F. P. VON MINDEN (two years),New Market.
DEWITT GILES (one year),New Market.

REPORT

BY THE SECRETARY.

The Board has held four meetings during the year—in February, May, August and the annual on November 19th. On February 27th, Prof. John B. Smith, State Entomologist, gave an address on "Injurious Insects and the Various Pests that Annoy the Farmer," which was very instructive.

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On May 21st, George W. F. Gaunt, Master and H. F. Bodine, Secretary of State Grange, favored us with their presence and spoke on Grange matters. Middlesex county has no Grange organization, but it is hoped that one will soon be started.

The August meeting was poorly attended, owing to a heavy flood.

At the yearly meeting the time was mostly taken in the election of officers and the preparing of the annual report. The officers named at the head of this report were elected for another year.

The past year has, on the whole, been a fairly prosperous one for farmers. Prices have been, as a rule, higher than former years.

Corn was an excellent crop. The early frost cut the fodder, but most of the crop was so far ripened as not to be damaged. Some late-planted fields suffered and did not mature.

Potatoes were a good crop and brought good prices. Large yields are reported in lower part of county.

Milk has been rather more scarce than in former years, the price being no higher than when feed prices were much lower. There is a tendency on the part of dairymen to produce less. The use of New York stable manure is on the increase. Clover hay finds ready sale to dairymen, who do not produce enough for their own use, at good prices from \$16 to \$18 per ton.

Rye is being raised more extensively, owing to high price of straw.

Fruits—Apples, a fair crop, prices good. Pears, abundant. Peaches, a total failure.

Poultry prices above the average.

Monmouth County.

OFFICERS FOR 1905.

<i>President</i> , DANIEL JONES,	Freehold.
<i>Vice-President</i> , JOHN R. PARKER,	Freehold.
<i>Secretary</i> , D. AUG. VANDERVEER,	Freehold.
<i>Treasurer</i> , JOHN B. CONOVER,	Freehold.

EXECUTIVE COMMITTEE.

JOHN H. DENISE,	Freehold.
WM. H. REID,	Tennent.
H. V. M. DENNIS,	Freehold.
C. C. HULSART,	Matawan.
GEORGE L. DUBOIS,	Tennent.

DIRECTORS.

EDWARD A. SEXSMITH,	Wall.
JOHN H. DUBOIS,	Freehold.
GARRET B. CONOVER,	Englishtown.
JOHN L. ELY,	Holmdel.
GEORGE W. PATTERSON, JR.,	Ardena.
JACOB B. CONOVER,	Englishtown.
WILLIAM M. CONOVER,	Colt's Neck.
C. C. HULSART,	Matawan.

DELEGATES TO STATE BOARD OF AGRICULTURE.

D. D. DENISE (one year),	Freehold.
DANIEL JONES (two years),	Freehold.

REPORT.

BY THE SECRETARY.

Two meetings were held during the year. The first on February 27th, 1904, at the Court House, Freehold. Reports of delegates to the State Board of Agriculture and State Horticultural

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tural Society were read. An address was delivered on "Organization" by C. C. Hulsart, Matawan, N. J. Other topics discussed were "Potatoes, Selection of Seed, Cost of Growing, etc.," "Right Time to Sow Clover Seed," "Spraying for Blight, etc."

The annual meeting was held on November 26th, Officers were elected for the ensuing year. Prof. E. B. Voorhees delivered an address on "Alfalfa." Topics discussed were "Cutting and Shredding of Stalks for Bedding," "Spraying for Fruit Diseases, Leaf Blight and Scale." Other meetings have been held in several parts of the county by Institutes, under the direction of the State Board, the Monmouth County Fruit Growers' Association and the Monmouth County Horticultural Society.

CONDITION OF CROPS.

On account of the extremely cold winter much injury was done to grain, clover and fruit trees. Many peach buds and trees were killed. The weather during March and April was cold and unfavorable to germination and growth, and much injury was done by frosts to fruits April 20th and 22d. Asparagus yield, 100 per cent.; prices good. Corn yield, 100 per cent.; price 50 cents. Wheat, 85 per cent.; price, \$1.20. Rye, 85 per cent.; price, 70 cents. Many farmers sell in sheaf here to the hay press for \$18 per ton. Hay, 100 per cent.; price, \$15 per ton. Potatoes, 100 per cent. A great many potatoes are grown here and sold to buyers, who come here from all parts of the country. The average price here the past season was \$1 per barrel on board the cars in bulk. The variety mostly Giants. Sweet potatoes, 100 per cent.; price, \$2 per barrel. Watermelons and citron melons, 100 per cent. Cucumbers for pickles, 100 per cent.; prices very low. Cabbages, 80 per cent. Tomatoes, 100 per cent. The yield of peas, lima beans and spinach was very large and fine quality. A very large quantity is canned here at Freehold. Apples, 50 per cent.; price, \$1.50 to \$2.50 per barrel. The high winds during September blew off one-half the crop. Pears, 15 per cent. Peaches, 25 per cent.; average price,

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\$1.10 per basket. Grapes, 100 per cent. Strawberries, raspberries and blackberries, a full crop, with good prices. Plums, 100 per cent.; very low prices. Cherries not grown as much as formerly. Many trees have been cut down on account of the robins taking all the fruit. Cranberries, 50 per cent. Currants and gooseberries, good yield. The injury done to fruit trees by the San José scale has been very great. A great many trees have been taken out. The fruit growers need a sure remedy for the scale, without damage to the trees.

LIVE STOCK.

Not much change in condition of live stock. Good horses for farm and road work command about \$150 each. Mules are higher; worth \$175 each. Farmers do not raise their own horses, but buy them from dealers, who bring them from the West and South. There are several large breeding stock farmers in the county, who breed for speed or fancy stock. More farmers are selling milk to the shore trade, who formerly fattened calves. Turkeys are scarce and high, 25 to 30 cents per pound. Chickens, 14 cents. There are several poultry and duck farms; one near Freehold, where several thousand ducks are raised and sold when six weeks old for 20 cents per pound.

GENERAL REMARKS.

White, native farm-hands are getting fewer every year. They prefer to work in factories or towns. A great many farmers have to employ colored help from the South, mostly from Virginia and Carolina. They make very good help. Very few Italians are employed on farms in this county. Wages are from \$16 to \$18 per month, with board, and \$1.50 per day, without. The number of silos are increasing with those who sell milk. There is an increasing demand for farms. The past year has been a very prosperous one for the farmers.

Morris County.

OFFICERS FOR 1905.

President, LYMAN J. FISH,Afton.
Secretary, WILLIAM F. ELY,Madison.
Treasurer, WESLEY D. HOPPING,Hanover.

BOARD OF DIRECTORS.

S. E. YOUNG, JOHN CLIVER, JOHN J. MITCHELL, WILLIAM JAMES, W. B.
 LINDSLEY, EDGAR C. HOPPING, JAMES COOK, WILLIAM H. LITTELL,
 FRANK P. COOK, N. D. GOBLE.

DELEGATES TO STATE BOARD.

S. E. YOUNG,One year.
 W. B. LINDSLEY,Two years.

At the last annual meeting the Board authorized the Secretary to call two or three meetings the coming year, to be held at the County Hall in Morristown at whatever time arrangements could be made for speakers and the use of the hall.

On January 30th Prof. John B. Smith, of the New Jersey Agricultural Experimental Station, lectured on the San José scale to the largest audience the Board ever had, men coming from all parts of the county showing branches in many parts affected with the scale. Professor Smith gave a full history, from the introduction of the scale into this country, and what must be done and how applied to prevent the destruction of our fruit trees, and which was published in full by some of the papers, stating that the farmers of Morris county were treated to one of the most interesting and instructive addresses ever given to them.

At the annual meeting held this year the Board was requested by many from different parts of the county to have the same re-

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peated, and it was decided to have the Secretary make whatever arrangements he could in having Professor Smith and other speakers address the Board the coming year and discuss matters for the benefit of the farmers and those interested.

Ocean County.

OFFICERS FOR 1905.

President, C. M. RORER,Cassville.
Vice-President, PATRICK DAVITT,Toms River.
Treasurer, H. R. WILLS,Toms River.
Secretary, CHARLES R. GRAHAM,Red Valley.

DIRECTORS.

ALFRED JENKINS,Cassville.
C. C. REED,Cassville.
J. C. CASLER,Cassville.
A. B. CLUTE,Toms River.
EBENEZER APPLGATE,Toms River.
H. R. WOOD,Lanoka.

DELEGATES TO STATE BOARD.

C. R. GRAHAM (two years),Red Valley.
C. M. RORER (one year),Cassville.

REPORT

BY THE SECRETARY.

The Board arranged for four meetings during the year, when some of the members met to discuss topics relating to their business. One subject was the failure of pollenization of small fruits and its causes. It was decided that the destruction of trees in which the honey bee makes its home and the severe winter has so diminished their number that it has caused a great loss to fruit growers in this section, strawberries, cranberries and huckleberries faring the worst.

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The farmer has nothing to complain of, except though his own neglect, as the year has been good for all crops, which have yielded about 80 per cent.

People from the cities are getting tired of city life and are buying abandoned farms, which they think a better investment than four per cent. for their money.

With better transportation facilities, improved roads, better mail facilities and parcels post there will be more encouragement to home seekers, as there are thousands of acres of land, cheap and finely located and adapted to farming, fruit growing and trucking, and along small streams acres of land which is natural to cranberries.

Some of the finest Kieffer pears grown in the State are grown in the northern part of our county on light land not adapted to other fruits. The heavy lands produce good hay and grain.

The quail should receive more protection, as one quail will do the farmer and fruit grower more good than a dozen robins.

Salem County.

OFFICERS FOR 1905.

President, GEORGE H. KIRBY,Woodstown.
Vice-President, SAMUEL FLITCRAFT,Woodstown.
Secretary, GEORGIE A. DUELL,Woodstown.
Treasurer, JOEL BORTON,Woodstown.

EXECUTIVE COMMITTEE.

EDGAR C. MOORE, C. FRENCH MOORE, HENRY GARDINER, JESSIE L. COLSON,
 M. D. DICKINSON, with the President, Vice-President
 Secretary and Treasurer.

DELEGATES TO STATE BOARD.

M. D. DICKINSON (two years),Woodstown.
 GEORGE H. KIRBY (one year),Woodstown.

REPORT

BY THE SECRETARY.

The Salem County Board of Agriculture has held four quarterly meetings this year, with a very good attendance, especially of ladies. The four meetings have been held in Woodstown, the first being in conjunction with the Institute, January 29th and 30th, which was an especially interesting meeting. The subjects which have claimed the attention of the Board have been of practical value: "The Planting and Care of Young Fruit Trees," "The Shipping and Marketing of Produce," "The Rural Telephone," etc.

Two of our members having visited England during the year have given us excellent reports of their trips. "A Visit to Guelph Experiment Station, with an Account of the Practical Work

Done There" was a very interesting talk, and "What Is the Ideal Training for the Young Girl in the Home" was the subject of a most excellent paper by Mrs. Mary E. Lawrence, of Salem.

We have made an effort to ascertain the exports of our county, but have met with very poor success, each canner and shipper being averse to letting the amounts be known. Can report the amount of milk shipped in 1903 as 11,500,000 quarts. Hope there will be better success another year.

Farmers living on the rural free delivery routes are much pleased, and it looks now as if the county will all be included in these routes in the near future.

The rural telephone is as yet in its infancy, but farmers are becoming interested and think by next year we can report them in successful operation.

The San Jose scale is infecting many of the fruit trees, and unless farmers can be awakened to the necessity of spraying, fruit growing will soon be a thing of the past.

Somerset County.

OFFICERS FOR 1905.

President, HON. LOUIS M. SCHENCK,Somerville.
Vice-President, BERNARD MEYER,Finderne.
Secretary and Treasurer, ARTHUR P. SUTPHEN,Somerville.

DIRECTORS.

Bedminster,.....C. M. WYCKOFF,Bedminster.
 WM. C. LANE,North Branch.
Bernards,.....G. S. VOORHEES,Baskingridge.
 FREEMAN STELLE, JR.,Millington.
Branchburgh,.....A. A. CORTELYOU,Neshanic Station.
 JAMES VAN DYKE,South Branch.
Bridgewater,.....WM. J. LOGAN,Somerville.
 BERNARD MEYERS,Finderne.
Franklin,.....A. V. D. POLHEMUS,Franklin Park.
 GEORGE B. RANDOLPH,Weston.
Hillsborough,.....JOHN GROENDYKE,Finderne.
 JACOB D. QUICK,South Branch.
Montgomery,.....CHARLES HOWELL COOK,Belle Mead.
 HEUSTON LABAW,Harlingen.
North Plainfield,.....CHARLES F. DEBELE,Plainfield.
 HUBERT P. PHILLIPS,Plainfield.
Warren,.....WM. H. ROGERS,Wachung.
 JOHN C. COOPER,Warrenville.

DELEGATES TO STATE BOARD.

JOHN GROENDYKE (two years),Finderne.
HUBERT PHILLIPS (one year),Plainfield.

REPORT

BY THE SECRETARY.

Three meetings have been held during the past year. The annual meeting was on January 9th, at which the President presented his annual report. This, as usual, was full of practical

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suggestions to the members. I note a few paragraphs: "Raise grain for consumption. Do not plow more land than you can manure well. Give the boys more encouragement. Give them a good education. Teach them the value of money. Give them some money to spend once in a while, for a boy without money feels weak. If you are able, send him to college, where he can take a course in agriculture. Make your farm pay and he will be likely to stay."

Arthur F. Randolph gave an interesting report of the proceedings at the annual meeting of the State Horticultural Society, after which the members entered into a general discussion of ways and means for the destruction of the San Jose scale.

The second meeting was held April 16th, and was largely attended. Mr. L. R. Thurler, of Plainfield, had prepared a paper entitled "The Production of Market Milk," which, on account of the illness of Mr. Thurler, was read by Rev. Dr. Cranmer. Mr. Thurler says: "Pure market milk can only come from dairies conducted on sanitary principles."

Judge L. H. Schenck read a paper prepared by Herbert P. Phillips on "The Silo, an Absolute Necessity of the Farm." A general discussion followed the reading of these valuable papers. Judge Schenck spoke of the importance and necessity of organization of farmers and milk producers for their protection, and for the purpose of obtaining fair prices for their products. He said the price of milk was fixed by the New York Milk Exchange, the greatest of all trusts; that the majority of farmers send their milk to the creameries, and they in turn ship it to the Exchange, which fixes its own price. Fred. A. Pope, Esq., of Somerville, a member, was called upon and made an interesting talk on raising poultry for profit, which brought out considerable discussion and valuable information. A collation of ice cream and cake in abundance was served. This feature once or twice a year is highly recommended to County Boards. It is inexpensive and seems to produce a fraternal feeling among the members and a sort of desire to come again.

The third meeting was held October 15th. The address was made by Prof. John B. Smith, State Entomologist, on "A Year's Experience with Insecticides." The meeting was largely at-

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tended and the members kept the Professor busy answering questions. The address was very interesting and instructive.

Reference to our annual report of crops shows a material increase in the production and prices of farm produce over last year, which is most encouraging to our farmers. The price of farms is no higher than a year ago, but there are fewer farms for sale. The demand for improved roads increases, nearly 50 miles of macadam roads having been built in the county, and the Freeholders have paid for the same without bonding the county or increasing the county debt.

Sussex County.

OFFICERS FOR 1905.

President, THOMAS C. ROE,Augusta.
Vice-President, D. C. HOWELL,Beemerville.
Secretary, GEORGE A. DICKERSON,Branchville.
Treasurer, W. D. HAGGERTY,Sussex.

DELEGATES TO STATE BOARD.

THEO. M. ROE,One year.
GEORGE P. MCDANOLDS,Two years.

RÉPORT

BY THE SECRETARY.

The above officers were chosen for our County Board of Agriculture at the annual business meeting of the Board held in connection with the Farmers' Institute at Branchville, December 1st. Our farmers are showing somewhat more interest in the Board than heretofore, and we are anticipating a more prosperous year than ever before.

Considerable interest was awakened by the talk on the Grange at the Farmers' Institute last winter, with the result that some new ones have been organized and several more are being talked of, which we think will help to keep things moving in the right direction, and we predict a much more prosperous condition for the agricultural affairs of our county than the present time shows.

There has been no marked change in the trend of affairs in the county since last year. The production of milk is going on as usual in advance of other branches, and we think with more gratifying results than a few years ago. The New York Milk

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Exchange price has kept up with and sometimes a little above that fixed by the Bordens and other firms which pay the same; so that as far as the price is concerned it matters little where the milk is sold, but many of the farmers object to the contract which the Bordens make with their patrons.

The dairy industry is doing a great deal toward establishing the fertility of our soil so heavily drawn upon by the injudicious cropping in times gone by. The large amounts of commercial feeds that are used to supplement the home-grown feeds and fodders tend to make more valuable manure, and most of the farmers of to-day have from two to four times the number of cows kept by their ancestors, so the amount of the manure is so much greater; and realizing this fact, careful thought is being given as to how best to make use of this product. The problem is thus solved by many of our leading dairymen: Feeding the cows in the stable, providing cement gutters and using plenty of absorbents to take up the liquid portions of the manure, then applying it to the fields as soon as possible after it is made. The loss by the elements is thereby reduced to the minimum. It is gratifying to note the change such a system will make in the condition of one of these worn-out farms. Then too we notice the clovers and other legumes being used more and more each year. The common red clover is the leader, as it seems to be the most easily grown, but the crimson, alsike, white, and especially alfalfa are being introduced by degrees, both for their value in feeding and the beneficial effect upon the soil. There are a few good stands of alfalfa and several are still trying to get it. Ensilage and roots, especially the turnips, are being largely used. We are glad to see more feeds grown at home, as it lessens the use of the commercial feeding stuffs, many of which are adulterated with seeds of various obnoxious weeds and other still more dangerous substances.

In dairy stock improvements are being made chiefly by the use of better sires and raising calves from the best cows. Then, by giving these calves proper care, they make better cows than can be had from the drover, and at less cost. As little attention is given to butter-making, the Holstein-Friesian is the breed preferred by most of our dairymen. But we see a few herds of

SUSSEX COUNTY.

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Ayrshires and still an occasional small herd of Jerseys, the latter being preferred for butter.

These dairy farmers are also taking great pride in the stables for their cattle, providing for proper light and ventilation, and, at the same time, making them tight enough to exclude the cold. We hear of only an occasional case of tuberculosis and other contagious cattle diseases, which speaks well for a county in which so many cattle are kept.

The most serious problem our dairymen have to solve nowadays is that of farm help. Good help is very scarce and high-priced, \$18 to \$23 per month and board being paid for good, single men.

Aside from the dairy stock, we are raising a few colts, and we are glad to note that sires of a class well suited to the work of the eastern farmer are now being used in preference to those of a light road type, which have been so much in favor during recent years.

Swine is slowly increasing, but not having the skim milk or buttermilk to feed them, they are still far behind in number, compared with the days of butter-making.

Sheep, too, are very scarce.

A number of Angora goats were introduced during the past year, chiefly for the purpose of subduing obstinate brush lands, at which they have proven a success.

The poultry business is still progressing. The ever-increasing demand for fresh eggs, both local and in our city markets, makes poultry-raising for egg production very profitable. Quite a good many incubators and brooders are in use and are found profitable, as the chicks can be secured so much earlier than by the old way. The surplus cockerels are then ready for market while the prices are good, and the pullets begin laying early in the fall, before the cold weather sets in.

The summer people coming to our lakes and towns furnish a ready market for the young fowls not needed for the home use.

With the products of the field we can say that the past year has been fairly prosperous for us. The rainfall was more evenly distributed throughout the growing season than during some

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years past, supporting the pastures and other growing crops well, except during a few weeks in the warmest period.

A great deal of the corn had a late start, owing to bad seed and a cold rain just after planting, but, generally speaking, made a good growth of stalk and grain, and though the late plantings were killed by frost, the crop was up to the average of recent years, and some report the best yield in a long time.

Oats was a good crop, but heavy rains at the time of harvesting caused some loss.

The hay crop was not quite up to the average, some think owing to the severe winter preceding.

New seedings of grass are looking fine as winter closes in, due, in some measure, to not being pastured closely during the fall, but allowed to grow a good top.

Winter grains are not looking very well, owing to late sowing, in most instances.

Potatoes were a good crop, not much affected by blight, or other diseases, and good yields of marketable tubers are reported.

As to fruit, the season has been a favorable one, except in a few districts, where the buds were blasted by frost. Only a few peaches are grown on a large scale, as in recent years, though quite a good many young trees are being set along with other kinds of fruit, such as pears, plums, etc. Besides these, nearly every farm has a good patch of berries to supply the home and a few for the market.

Apples have been abundant this year, but the price has been so low and shipping packages so scarce and high that large quantities of apples have been fed to the cows, it proving to be more profitable than marketing them.

Spraying to prevent the ravages of the San Jose scale and other enemies of the fruit grower is being practiced by some of our most extensive growers. The lime, salt and sulphur wash has proven very successful in the case of the scale.

It seems to the writer that there are better times in sight for the farmers of Sussex county.

The young folks do not show quite so strong a desire to leave the farm, which makes the home-life more pleasant for all, and

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with the Grange to assist in making the social and educational, as well as the financial side more agreeable, we hope to hold fast to the rising generation and show them that there are good things and yet better things in farm life. It is plainly to be seen that there is already more of a tendency to make the farm home comfortable and attractive, and if one will but look and compare our farm homes with those of neighboring counties in this State and others one can but see at a glance that our houses and surroundings, scenery, climate and all other things, natural and artificial, that go to make life pleasant are far in advance of most districts where the people are engaged in agricultural pursuits exclusively.

The telephone, too, of which our county can boast of a Farmers' Union Company, adds much to the convenience and pleasure of farm life, since it is within reach of nearly every farm, and with several rural free delivery routes, we have nearly all the conveniences of the village and city life, with none of its pinched up quarters, bad air and evil influences so dangerous to the young life of our country.

Let us all join together and keep these good things going, and we will, indeed, make Sussex a county to be proud of.

Union County.

OFFICERS FOR 1905.

<i>President</i> , E. P. BEEBE,	Elizabeth.
<i>Vice-President</i> , D. G. FINK,	Westfield.
<i>Secretary</i> , F. E. WOODRUFF,	Cranford.
<i>Treasurer</i> , OGDEN WOODRUFF,	Elizabeth.

EXECUTIVE COMMITTEE.

J. D. MAGIE,	Elmora.
D. G. FINK,	Westfield.
D. T. MAGIE,	Lorraine.
And the President and Secretary.	

DELEGATES TO STATE BOARD OF AGRICULTURE.

F. E. WOODRUFF (two years),	Cranford.
J. L. HEADLEY, (one year),	Union.

ALTERNATES.

E. P. BEEBE, GEORGE HEADLEY.

The Union County Board of Agriculture has held eight meetings during the year, which have been attended by a larger number of members than for several years past. We have added four new members to our roll, and the interest in the meetings has increased. We have been trying to get the young farmers interested in our Board, and with partial success. January 21st our two delegates to the annual meeting of the State Board made their reports. Among other subjects discussed at our meetings were the following: "Fruit Spraying," "Manures and Fertilizers," "Potatoes and Tomatoes." The San Jose Scale is on the increase in our county, as is also spraying.

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CROP REPORT.

The past season has been a fairly good one for farm crops, excepting fruit. The corn crop was injured somewhat by the early frost which struck it before cutting time. The yield was about 70 per cent. of last year. Little grain is raised in this county, but mostly truck and dairy products. Hay was a fine crop, yielding 100 per cent., and a great portion of the crop was harvested in fine condition during the early season, but much was damaged by rain later. The potato crop yielded 80 per cent. Many fields were affected by blight, but little rot was reported. It being the off year for apples, the crop was light, which was 20 per cent. of last year. Peaches were never known to be so scarce. The unusually cold winter killed most of the buds and some of the trees. Cabbages yielded 100 per cent., but the price was very low. Tomatoes, 75 per cent.; the early frost ruined a large quantity which had not matured.

Warren County.

OFFICERS FOR 1905.

President, WILLIAM C. ADDIS,Delaware.
Vice-President, NICODEMUS WARNE,Broadway.
Secretary, WILLIAM EUGENE OBERLY,Broadway.
Treasurer, JOHN ALBERTSON,Delaware.

DIRECTORS.

HENRY PURSEL,Phillipsburg.
WILLIAM H. BAMERS,Hope.
SAMUEL REED,Mt. Hermon.
A. D. ROSEBERRY,Belvidere.
AZARIAH FREY,Stewartsville.
P. B. MARTIN,Blairstown.
FRANK HOUSEL,Broadway.

DELEGATES TO STATE BOARD.

JAMES I. COOK (two years),Mount Hermon.
SAMUEL REED (one year),Mount Hermon.

REPORT

BY THE SECRETARY.

Our Board has held four meetings during the year. The membership has increased and there is a manifest growing interest among our regular attending members. They are ready to accept the situation and work for better conditions.

Poultry raising and general subjects pertaining to farming were discussed. Poultry raising seemed to be one of the most important and interesting topics, there being no farm complete without poultry. Hens are profit gatherers, utilizing much waste

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grain and other products that would be of little value, manufacturing them into salable eggs and flesh.

Thoroughbred fowls are worth more for profit than the common mixed fowls. Scrub fowls don't pay.

For winter egg producers hens must moult early. We can control the period for a hen to moult by proper methods and feeds. Hens cannot make eggs unless their foods contain egg elements. An egg is 64 per cent. water, hence it should be supplied regularly. Cut fresh green bone and clover hay contain egg elements in much larger proportions than most grain feeds. Our large increased poultry business is now three-fifths as great as the whole dairy product of this country. Regardless of the weather, climate or season they can be relied upon to supply the great and increasing demand.

Farming interest has increased the past year, as the farms that have been abandoned are now occupied. People attending our agricultural meetings are realizing the advantages of an independent, great and noble farm life.

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