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PUBLIC DOCUMENT No. 18

THIRTY-EIGHTH ANNUAL REPORT
OF THE
SECRETARY

*Compliments of
James F. Brown
Secretary*

PRINTED BY ORDER OF THE LEGISLATURE

State of Connecticut
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Hartford Press
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1904

TO HIS EXCELLENCY

ABIRAM CHAMBERLAIN

Governor of Connecticut :

In accordance with the provisions of an act creating the State Board of Agriculture, I have the honor to submit herewith the Report for the year ending December 31, 1904.

JAMES F. BROWN, *Secretary.*

NORTH STONINGTON, December 31, 1904.

STATE BOARD OF AGRICULTURE.

1903-1904.

HIS EXCELLENCY ABIRAM CHAMBERLAIN, *ex officio*.

APPOINTED BY THE GOVERNOR AND SENATE.

	Term Expires
CHARLES L. TUTTLE, . . . Hartford, . . .	1905
JAMES F. BROWN, . . . North Stonington, *	1905
CHARLES E. CHAPMAN, . . . Westbrook, . . .	1907
IVERSON C. FANTON, . . . Westport, . . .	1907

APPOINTED BY THE GENERAL ASSEMBLY.

Hartford County, . . .	EDMUND HALLADAY, Suffield, . . .	1905
New Haven County, . . .	D. WALTER PATTEN, North Haven, . . .	1905
New London County, . . .	JAMES B. PALMER, Jewett City, . . .	1905
Fairfield County, . . .	SEAMAN MEAD, Greenwich, . . .	1905
Windham County, . . .	N. G. WILLIAMS, Brooklyn, . . .	1907
Litchfield County, . . .	EDWIN G. SEELEY, Roxbury, . . .	1907
Middlesex County, . . .	W. L. DAVIS, Durham Center, . . .	1907
Tolland County, . . .	CHARLES A. THOMPSON, Melrose, . . .	1907

OFFICERS OF THE BOARD.

GOVERNOR ABIRAM CHAMBERLAIN, *President ex officio*.

EDWIN G. SEELEY, . . . Roxbury, . . .	<i>Vice-President.</i>
JAMES F. BROWN, . . . North Stonington, . . .	<i>Secretary.</i>
CHAS. A. THOMPSON, . . . Melrose, . . .	<i>Treasurer.</i>
Dr. E. H. JENKINS, . . . New Haven, . . .	<i>Chemist.</i>
Dr. G. P. CLINTON, . . . New Haven, . . .	<i>Botanist.</i>
Dr. W. E. BRITTON, . . . New Haven, . . .	<i>Entomologist.</i>
N. S. PLATT, . . . New Haven, . . .	<i>Pomologist.</i>

Auditors.

SEAMAN MEAD D. WALTER PATTEN CHAS. E. CHAPMAN.

1905

REPORT.

AGRICULTURAL FAIRS IN CONNECTICUT, 1904.

Delegate.	Name.	Place.	Date.	Secretary.
C. E. Chapman	New London County	Norwich	Sept. 13-15	T. W. Yerrington
Seaman Mead	Windham County	Brooklyn	Sept. 6-8	J. B. Stetson
I. C. Fanton	Beacon Valley	Naugatuck	Oct. 13	Wm. L. Lloyd
C. L. Tuttle	Berlin	Berlin	Sept. 21, 22	W. W. Christian
C. A. Thompson	Branford	Branford	Sept. 27-30	J. P. Callahan
W. L. Davis	Chester	Chester	Sept. 27	Edgar W. Lewis
J. F. Brown	Colchester Grange	Colchester	Oct. 6	C. E. Staples
E. G. Seeley	Danbury	Danbury	Oct. 3-8	G. M. Rundle
D. W. Patten	Farmington Valley	Collinsville	Sept. 7, 8	E. A. Hough
E. Halladay	Granby	Granby	Sept. 28, 29	C. H. Deming
Seaman Mead	Greenfield Country Club	Greenfield Hill	Sept. 20-22	Mrs. D. B. Adams
C. E. Chapman	Guilford	Guilford	Sept. 28	Robert De F. Bristol
I. C. Fanton	Harwinton	Harwinton	Oct. 4	Lewis O. Catlin
J. F. Brown	New Haven Co. Hort. So.	New Haven	Nov. 8, 9, 10	Patrick Keane
E. G. Seeley	New Milford	New Milford	Sept. 13-16	J. E. Hungerford
C. A. Thompson	Newtown	Newtown	Sept. 27-29	R. C. Mitchell
N. G. Williams	Orange	Orange	Sept. 5, 6, 7	A. D. Clark
J. B. Palmer	Putnam Park Association	Putnam	Aug. 30, Sep. 1	A. D. McIntyre
C. L. Tuttle	Rockville Fair Associat'n	Rockville	Sept. 27-29	H. D. Noble
W. L. Davis	Simsbury	Simsbury	Oct.	George C. Eno
N. G. Williams	Stafford Springs	Stafford Spr'gs	Oct. 4-6	C. F. Beckwith
J. B. Palmer	Suffield	Suffield	Oct. 4, 5	A. F. Warner
C. A. Thompson	Union (Monroe, etc.)	Huntington	Sept. 21, 22	S. T. Palmer
D. W. Patten	Union (Somers, etc.)	Somers	Sept. 21	M. Hamilton
Seaman Mead	Waterbury Driving Co.	Waterbury	Sept. 20-22	N. W. Heater
J. F. Brown	The Horseshoe Park Ag- ricultural Association	Willimantic	Sept. 20-22	T. R. Sadd
N. G. Williams	Woodstock	So. Woodstock	Sept. 12-14	L. H. Healey, N. W.
D. W. Patten	Wolcott	Wolcott	Oct. 12	E. M. Upson
W. L. Davis	Conn. Dairymen's Asso'n	Hartford	Jan. 3d week	J. B. Noble
E. Halladay	Conn. Pom. Society	Rockville	Sept. 27, 29	H. C. C. Miles
				Shelton Ellington Pequabuck Hartford Milford

FARMERS' INSTITUTES IN 1904.

The following extract is from the last annual report of the Board:

“The plan of conducting Farmers' Institutes which was early adopted by the Board of Agriculture, and has long been followed, was to submit a list of speakers and subjects to the Granges, Farmers' Clubs, Agricultural Societies, and others interested in rural pursuits throughout the State, and invite these local organizations to select the date and the speaker best suited to the convenience and supposed needs of the locality. The expense of speakers and advertising under this plan was borne by the Board of Agriculture, and Institutes were held as far as practicable wherever desired.

“Following established custom at the opening of the year under review an attractive list of speakers and subjects, which appears in the last annual report, was widely distributed, and in response to invitations Institutes were held in various parts of the State, with results that were helpful and stimulating.

“In the meantime the Dairymen's Association and Pomological Society, representing the two leading agricultural interests of the State, were each conducting Institutes along its special line of work, and these lines frequently overlapped each other and even more frequently were found to blend with the more general agricultural interests of the State.

“While this independent action has been entirely free from even the suspicion of any friction, it has been attended with what Dr. Jenkins well characterizes as ‘a good deal of lost motion,’ and it has long been felt that some more economical plan should be adopted.

“Accordingly, at the opening of the Institute season of 1903-'04, a conference was held at Hartford by the Committee of the Board of Agriculture on Farmers' Institutes, with similar committees from the Dairymen's Association and Pomological

Society, and after a full and free interchange of views the secretaries of the three organizations were elected a committee to cooperate in the conduct of Institutes for the coming year.

“ This committee has entered upon its duties in the confident expectation that the results will fully justify the change that has been made.

“ It must never be forgotten, however, that no system of Institute work can be successful that does not include the coöperation and hearty support of the local community in which and for which it is held. We, therefore, invite all who are interested in up-to-date methods to lend a hand in promoting the work of Farmers' Institutes throughout the State.”

Pursuant to the plan above outlined an average of at least three Institutes was held in each county in the State, with results that seemed to fully justify the new method which had been adopted.

In order further to promote the work of Farmers' Institutes the Board of Agriculture, at a meeting held in New Haven May 11th, elected Prof. L. A. Clinton, Director of Storrs Experiment Station, a delegate to represent the Board at the annual meeting of the American Association of Farmers' Institute Workers to be held at St. Louis, Oct. 18-20, 1904. Prof. Clinton attended the convention, and the following report and suggestions have been received from him. So far as applicable to our conditions I trust these suggestions may prove helpful in promoting this important work.

STORRS AGRICULTURAL EXPERIMENT STATION.

STORRS, CONN., November 4, 1904.

COL. JAMES F. BROWN,

North Stonington, Conn.

My Dear Col. Brown :

I wrote you a few days ago and promised to report to you concerning the convention of Farmers' Institute workers held at St. Louis, and in accordance with that promise I submit the following report.

The convention was attended by Farmers' Institute workers representing every section of the country. The most marked feature of the convention was the reports upon the way Institutes are organized in some of the States. In the reports from Minnesota, Illinois, and Michigan, and some of the other States as well, and especially Canada, we find that they are thoroughly organized, and that in each county they have their standing Farmers' Institute committee. This committee has charge of securing the hall for the Institute, of advertising the Institute, and in seeing that all the local arrangements are made. This local committee is a permanent one and holds over from year to year, and care is taken that this committee is selected from the most prosperous farmers in the county; men whose word carries weight, and whose connection with the Institute would impress the other farmers of the county of the quality of the work which would probably be done by the Institute. It was made evident that in order to carry out a campaign of Farmers' Institute work as it should be carried out there should be one man who should make it a special duty to arrange for the Institutes, to arrange for the speakers, who can, even during the summer, be on the lookout for men who are making a success of their work on the farm and get these men to come to the Institute the next winter and tell other farmers how they do it. The most successful Farmers' Institute worker is, probably, the one who has made a success on his own farm, and a man in whom the farmers of his county have confidence.

One feature of the Farmers' Institute work which I find has been developed in many of the States, and one which has been almost entirely neglected in Connecticut, is the special educational work for the women of the farm. In Ontario and Illinois as well as in Minnesota this side of the work has been thoroughly developed. The women have their special lecturers, or one session of the Institute is given over to work which has to do with the household, such as improvements in cooking, the proper ration to feed children, etc. It is found that not only the farmers' wives and daughters eagerly embrace the opportunity afforded for this instruction, but the women of the city are coming to attend these Institutes, and both realize that they can get great good from the meetings. Thus there is being a bond established between the women of the city and the women of the country, and an opportunity is given to them to exchange ideas, and both are improved thereby.

One of the most remarkable examples of the good results from Farmers' Institute work is found in Ontario. A few years ago the farmers there were engaged in growing products for shipment to the American markets. When the American tariff wall was raised the agricultural interests were completely stunned for a time. The attention of the farmers was, however, called to the profits in the production of bacon, and they were given information as to the foreign demand for this product and a new industry has been built up. This has largely resulted from the general dissemination of information through Farmers' Institute methods.

The agricultural college of the State has a work to do which no other institution can do, and yet in the dissemination of popular agricultural information the Farmers' Institute does a work which the agricultural college cannot do.

I should like to see Connecticut one of the leading states in Farmers' Institute work. It is not at present. With our limited area and the facilities for reaching various points in the State, I can see no good reason why we should not have this State thoroughly organized in Farmers' Institute work. As the great western States have organized by counties we might organize by townships; or, if it seems wiser at first to organize by counties, I believe that we could find three or five wide-awake farmers in every county who would be willing to serve as an Institute committee. These farmers are well acquainted with the needs of the locality, and would be able to secure an attendance at the Institute which could not be secured in any other way.

I recommend to you and through you to the Board that an effort be made to place the Farmers' Institute work in this State on a little more systematic basis than it has been in the past. The needs of the various localities of the state should be carefully studied, and then speakers should be brought to these localities who can give special information along the lines where information is needed.

Yours very truly,

L. A. CLINTON.

AGRICULTURAL CONVENTION AT HARTFORD.

The annual midwinter meeting of the Board of Agriculture was held in Unity Hall, Hartford, Dec. 14, 15, and 16, 1904, in accordance with the following programme. Owing to a severe blizzard which prevailed at the time, the attendance was less than usual, but the stenographer has preserved a full record of the addresses and discussions, and it is hoped that these will not be lost by the thousands of our farmers all over the State to whom copies of this report will be sent.

A part of the fine agricultural exhibit of the State at the Louisiana Purchase Exposition was returned in time to be shown at the convention and was highly commended.

The Connecticut Agricultural College, as well as both the Experiment Stations, presented valuable exhibits along the lines of instruction and investigation in which they are engaged.

Prof. Gully of the Agricultural College made an extensive exhibit of fruit from the cold storage plant of the college, which attracted much attention. A full list of exhibits, prepared by Mr. N. S. Platt, Pomologist of the Board, will be found at the close of the report of the convention.

PROGRAMME.

Wednesday, December 14th.

10.30 A. M. INVOCATION.

Rev. Rockwell Harmon Potter.

ADDRESS OF WELCOME.

His Honor Wm. F. Henney,

Mayor of Hartford.

RESPONSE BY

His Excellency Abiram Chamberlain,

Governor of Connecticut.

- 11.00 A. M. ADDRESS — "The Country Boy."
By President F. S. Luther,
 Trinity College.
- 1.30 P. M. ANNUAL MEETING OF THE CONNECTICUT SHEEP BREEDERS' ASSOCIATION.
- 2.00 P. M. INTRODUCTORY ADDRESS.
By Mr. F. H. Stadtmueller,
 President Connecticut Sheep Breeders' Association.
- 2.15 P. M. ADDRESS — "Sheep."
By Mr. L. B. Harriss,
 Lyndonville, Vermont.
- 3.00 P. M. ADDRESS — "Money in Lambs."
By Mr. Joseph E. Wing,
 Mechanicsburg, Ohio.

DISCUSSION.

- 7.30 P. M. ADDRESS — "Observations in the Orient." Illustrated with Stereopticon.
By Hon. E. J. Hill,
 Norwalk.

Thursday, December 15th.

- 10.00 A. M. ADDRESS — "Reserve Power in Housekeeping."
By Miss Martha Van Rensselaer,
 Cornell University, Ithaca, N. Y.
- 11.00 A. M. ADDRESS — "Diseases of the Potato in Connecticut."
By Dr. G. P. Clinton,
 Connecticut Agricultural Experiment Station, New Haven
- 2.00 P. M. ADDRESS — "Thoroughbreds versus Mongrels, from the Farmer's Standpoint."
By Mr. Maurice F. Delano,
 Millville, New Jersey.
- 7.30 P. M. ADDRESS — "The Geology of Connecticut as Related to its Water Supply." Illustrated with Stereopticon.
By Professor Herbert E. Gregory,
 Yale University, New Haven, Connecticut.

Friday, December 16th.

10.00 A. M. ADDRESS — "The Care and Cultivation of Tobacco in the Connecticut Valley."

By Mr. W. F. Andross,

East Hartford, Connecticut.

DISCUSSION.

2.00 P. M. ADDRESS — "Agriculture in the Public Schools."

By Mr. Fred Mutchler,

Connecticut Agricultural College, Storrs.

DISCUSSION.

Lcd by Mr. Henry T. Burr,

Principal Normal School, Willimantic.

7.30 P. M. ADDRESS — "The Louisiana Purchase Exhibition."

By Hon. Charles Phelps,

Rockville, Connecticut.

Music will be provided at intervals.

A Question Drawer will furnish ample opportunity for presentation and discussion of any subject of interest to the practical farmer.

To make this feature of the meeting profitable, bring in your questions and take part in the discussions.

Ample facilities will be afforded for the exhibition of Fruits and Flowers, Grain and Vegetables, Butter and Cheese; and the bountiful harvest just gathered warrants the hope that there will be a generous exhibit. Mr. N. S. Platt, Pomologist of the Board, will give his personal attention to this feature of the programme.

Articles for exhibition may be sent, properly labeled, by express, at the expense of the Board, to the Secretary at Hartford, to arrive on Tuesday, December 13th.

RAILROAD ARRANGEMENTS.

The N. Y., N. H. & H. R. R. Co. has provided certificates which, when countersigned by the Secretary, will entitle the holder to return over any of its lines at half rates. These certificates must be shown when purchasing tickets at railroad stations in Hartford.

HOTEL ACCOMMODATIONS.

The headquarters of the Board will be at the Allyn House.

A committee of the Board will be at the Allyn House to furnish delegates and others such information as may be required.

Gov. ABIRAM CHAMBERLAIN,
EDWIN G. SEELEY,
CHARLES L. TUTTLE,
JAMES F. BROWN,

Committee.

NORTH STONINGTON, Nov. 25, 1904.

REPORT
OF THE
PROCEEDINGS OF THE CONNECTICUT STATE
BOARD OF AGRICULTURE
AT
HARTFORD, CONN., DECEMBER 14, 15, AND 16, 1904.

MORNING SESSION.

HARTFORD, CONN., December 14, 1904.

Convention called to order at 10.45 A. M. in Unity Hall, Hartford, by Secretary James F. Brown.

Secretary BROWN. The hour having arrived, the convention will be opened with an invocation by the Reverend Rockwell Harmon Potter of this city.

Rev. R. H. POTTER. Let us pray. Almighty God, our Heavenly Father, Thou returnest the seasons unto the children of men. It is Thy covenant that summer and winter, seed time and harvest, shall not cease from the face of the earth. We give Thee thanks that Thou hast given unto men the fulfillment of this Thy pledge through the generations that are gone, and we can gather before Thee in trust that Thou wilt keep that faith with Thy children. Bless, we beseech Thee, those who cultivate the soil. Give unto them rich fruitage from their labors. Bless them in their homes and in their toil.

Remember, we beseech Thee, with favor this commonwealth. Let Thy grace be given unto those who are in authority, and grant, we beseech Thee, that in the hearts of the people righteousness may be found, and in the homes of the people purity and truth may abide, and that unto all men may be

given a desire for upbuilding Thy kingdom in the earth, and for the coming of justice and brotherly love among all men.

Hear us in this our prayer; guide, we beseech Thee, Thy servants as they deliberate together; and keep us all in Thy keeping, and lead us all in Thy way, unto the glory of Thy holy name. Amen.

Secretary BROWN. You are now invited to listen to an address of welcome by his Honor William F. Henney, Mayor of Hartford.

Mayor HENNEY. Mr. President, members of the Connecticut State Board of Agriculture, and friends: I esteem myself very highly honored and privileged today in being permitted to be here, at the invitation of your Secretary, to say a word or two of welcome to you on behalf of the City of Hartford. I do it with the greater pleasure when I recall that this Connecticut State Board of Agriculture is a highly representative body. That it is designed to be such is clearly indicated in the statutes, for, as I understand it, it is made up of twelve men, selected one from each Congressional district and one from each county in the State. Territorially, certainly, nothing could be more representative than a board made up in that way. The State of Connecticut is indebted to the agricultural interests, to the farmers of the State, for a great many things, and the city of Hartford is indebted to the farmers of the State for a great many things. The State of Connecticut has for its Governor today the Honorable Abiram Chamberlain, who has told me over and over again that he began life as a farmer's boy. Here in the city of Hartford we have very many of our most prominent men who are fond of talking of the days of their boyhood, when they were brought up on the farm, and we are particularly fortunate in that one of our most representative and distinguished citizens was himself a farmer boy, and is now the able and distinguished president of Trinity College. If I had no other inducement to bring me here today, officially, to say a word of welcome to you, that fact would be amply sufficient.

There must be something, it seems to me, about this business of farming, that is uplifting, pure, noble, and good, because I find that wherever a boy has been bred upon a farm, no matter what position in life he afterwards occupies, no matter how wealthy he may become, no matter what his affiliations and associations and occupation may be, he always reverts, with a sort of feeling akin to homesickness, to his early life spent upon the farm; and today you will find in the metropolis of our country, down in New York, in every great railroad corporation, in every great banking institution, in every great law office, in every great doctor's office, a boy who in his leisure moments is constantly referring, with almost inexpressible longing, to the days he spent upon the farm. And I have often thought that whatever other assets these men may acquire in their distinguished careers, they feel that there is one asset which they had as farmer boys which has been of very much more importance to them than most anything else, and that is, the asset of strong bodies and the vigor which comes from the strong, manly life that they lived in the open in their boyhood days. I remember when I was a boy in the high school that there was a poem published which appealed to the whole country and created a great sensation. It was a poem by a well-known New England poet, and it was entitled "Snow-bound." You all remember it. It was a story of a country farm, a New England farm, and the poem told the story of the incidents that happened on that farm on a single winter's day. It depicted a very, very tremendous snow storm, a snow storm that we do not have in these days, and depicted the howling winds and the drifting snow. It depicted the scene within the farmhouse and the family gathered there waiting for the storm to abate. It depicted the work of the men and boys after the storm had ceased, and it depicted the gathering around a great fireplace in the farmhouse in the evening, and showed completely the home life of the country boy (Whittier), when he was employed upon his father's farm. I remember how that poem

appealed to the people of this whole nation. And it appealed to them because high up in all the great positions of the country were men who knew that he had told the story correctly.

Now, it is the business, as it seems to me, of this Board of Agriculture, under the statute creating it, to stimulate and encourage these young men to stay upon the farms, not to go out into the cities, not to go to New York or to come to Hartford, but to stay right at home and develop the farms, which, in many instances, are a family heritage for many generations back. In order to do that you have got to do a great deal of practical work, because a man's first business in this life is to earn his bread and butter. In order to retain the boys upon the farms we have got to teach them how to make farming pay. In other words, you have got to teach farming intelligently, and until that can be done, until the business of farming is a paying proposition, your boys will go away from the farm to the cities, simply because it is a question of earning a livelihood. Now, this State Board of Agriculture is endowed with a great many powers, and I hope in the future it will be endowed with a great many more. It has an appropriation annually, and I hope that that appropriation will be largely increased, because I can see that with the intelligent work that this Board is doing we are going to have a different impression put upon this question of farming in Connecticut. No one can tell the amount of good work you have done in improving Connecticut farming. You have relieved the farms of Connecticut of numberless pests. You have provided for lectures showing the best methods of farming, you have organized farmers' clubs and farmers' organizations, and you have given to the social life of our country communities a stimulus which we cannot but feel must redound in great good and prove very helpful in making the life of the farmer attractive.

Now these powers that are given to you by the State of course bring corresponding responsibility. I understand by the statute you are required to hold at least one meeting here in the

City of Hartford, and I assure you that you could come to no community where your presence will be more welcome. I bid you welcome today to Hartford, not only because of what you represent, but because of what you are individually, and because of the vital interests which you are trying to stimulate and cultivate, that of this great industry upon which the welfare of so many of the human race depends. I bid you a general welcome, thrice welcome, to the City of Hartford. May your stay here be not only pleasant but highly profitable, and may you be abundantly blessed in all your intelligent efforts to obtain the ends at which you aim. I thank you, gentlemen, for your attention. (Applause.)

Secretary BROWN. Mr. Mayor and ladies and gentlemen: On behalf of the State Board of Agriculture I desire to return to his Honor the thanks of the Board for this cordial welcome which he has extended to us. I am sure that no one in this audience regrets more than I do the absence of the genial Governor of the State, who was assigned upon the programme to respond to this address of welcome, but for some reason he is not present. I don't know whether to consider myself a substitute or a drafted man. I know that forty years ago, when they sent substitutes and drafted men down to the front, we paid very little regard to them, for they were very little account as a rule, but I do want to say that this Board highly appreciates the welcome which his Honor the Mayor has extended to us, and I want to say, further, that there is no antagonism between the country and the cities in the State of Connecticut. It is the growth of the cities of the State that has made farming in Connecticut possible and prosperous, and the more numerous such cities as Hartford become the more prosperous will the agriculture of the State become.

Now, I know you do not wish to have me keep you from the rare treat which awaits you in the next speaker. I have great pleasure in introducing to you President F. S. Luther of Trinity College, Hartford, who will address you on "The Country Boy."

THE COUNTRY BOY.

By PRESIDENT F. S. LUTHER, of Trinity College,
Hartford, Conn.

Mr. Mayor, Mr. Secretary, and ladies and gentlemen: I think the last speech that I heard on this subject of "The Country Boy" was one that was delivered some years ago, and not very many years ago either, on grounds then leased, but now belonging to the Windham County Agricultural Association. It was at their annual fair and cattle show, held in Brooklyn. I do not mean Brooklyn, New York, but Brooklyn, Connecticut. The fair was held there at that time, as it has been held, I believe, every year but one since somewhere about 1850. That speech was delivered by the Honorable Lafayette Foster, a distinguished citizen of our commonwealth, and afterwards, if not then, a Senator of the United States. I wish I could remember the whole of that speech. If I could, and could repeat it to you here, you would have a good one this morning. But I do remember one sentence that appealed to me very powerfully. He said, and I had to be lifted up to see him over the crowd, "I know what it is to drive the cows to pasture on a cold morning." And I recall, with a feeling which I know many of you here will share with me, how my mother looked up into my face and said, "There, do you hear that?" One thing more he said, that also appealed to me, and to which neither my mother nor my father did call very special attention. Speaking of the goings on of the farm day in that time, and telling how, after dinner, the men loafed awhile under the trees in the yard, if it was summer, having their nooning, he spoke of how somehow the boy upon the farm never got any nooning. I wish I had had nerve enough to turn to my mother and say then, "There, did you hear that?" But after all, nooning or no nooning, the boy upon the farm usually managed somehow to have a good deal of fun in the old days on the Connecticut farm. And as a distinguished Hartford citizen, who died about four years ago, said in what has always seemed to me the very best of his writings (and I refer to Charles D. Warner), in his little volume "Being a Boy," it is undoubtedly the case that any farm would come to grief pretty quick that did not have the boy on it, for he is the one that does everything that nobody else is willing to do. How many of the things that the boy

used to do are not done at all any more in these days. Turning the grindstone for grinding scythes during haying. There are no more scythes. Are there any grindstones? If so, who is to turn them? And it has been pointed out, I think by Mr. Charles D. Warner, in the same book, that it is an inevitable indication that an old man has reached his second childhood when he is asked to turn the grindstone. There are a few things, and only two or three, in my life, of which I am proud, and I think the proudest experience of my life was this one, when as a boy I developed a precocious ability to grind the scythe, and especially when my father said to me "I believe you can grind a scythe better than I can do it." From that day he turned the grindstone and I ground the scythes. I am quite sure that I have never since done anything quite as well as I used to grind scythes, and nothing ever gave me such sincere and unalloyed pleasure as to bear hard upon the stone and see my father wonder what made that stone go with such difficulty. (Laughter.) But that old farm life, and that old village life in the Connecticut country towns, and in the New England country towns, what a splendid thing it was. I do not know whether there have ever been any finer people than the farmers of Connecticut, of the generation that has gone or that is about disappearing, unless it be the farmers who are gathered here today. The life that the old-fashioned farmers lived was full of hardships, and how on earth some of the work was done I cannot see! There was not very much money in it, and the farmers seldom had any considerable amount, even for them, except once or twice a year, and especially in the fall, when the farmers sold their pork. I do not know how many hundreds of dollars in actual cash passed through the old leather pocketbooks, those old worn leather pocketbooks with a strap around them, that everybody used to carry in those days, but there is one thing that I am sure of, and that is, that in the houses there was culture—books and reading, an appreciation of the high things of life; an understanding of the intellectual life; an interest that the schools should be the best possible, though I must say if we take the glory of reminiscence from them they were not very good schools, but in the interest that the schools should be the best that they could be under the conditions, an interest in the support of the churches, and an ardent desire that if there was, here and there, a bright boy or

girl, he or she should not lose the chance that belonged to them. But somehow things were done and accomplished. There were pleasant days, easy days, amid culture, refinement, and education. Books were few, too few, compared to our day, but there was the Old Farmers' Almanac, with the string through the corner, which always hung up by the chimney, and out in my section of the country, at that time, that was always found until you passed over the dividing line, which lay somewhere between Brooklyn and New London, south of which you always found Daboll's Almanac. In these old farmhouses you always found the *American Agriculturist*, the New York *Tribune*, or, as we always used to call it, Greeley's paper; possibly a magazine or two, Rollin's "Ancient History," and two or three religious books, depending upon the religious convictions which your father happened to entertain, and that was about all, except Godey's or Peterson's, which were dear to the hearts of the women folks in determining the character and architecture of their Sunday bonnets and various other things. That was about the ordinary run of reading in the farmhouses, but, oh, my, how everybody did read it! How you knew everything, from the first advertisement on the paper cover, even in the corners of the first page, clear through to the very last thing.

I spoke or alluded just now to the religious convictions of our fathers. And I tell you they had them for keeps. A man was a Congregationalist or Baptist or Methodist, or in my section, in rather rare cases, an Episcopalian, and, whatever he was, he was pretty sure to say so. There was no hiding of his convictions. And they used to condemn each other with an enthusiasm and perversity that was worthy of all admiration for its intensity, if not worthy of imitation in its results in the community. People in those days studied theological questions, and the boys listened to them and braced themselves up to fight with each other in behalf of their fathers' convictions. It was a great thing for a boy to have an excuse for a fight. He always wanted one. I am bound to say, however, that I have heard more sincere and able discussions of theological questions in a certain red wheelwright shop which used to stand in the town of Brooklyn, Conn., and the building is there yet, though the red paint has long since disappeared, than I have heard since, and I have had quite as much to do with theologi-

cal discussions as anybody ought to be allowed to have. The reason why was that the people really cared. They thought that their life hereafter was somehow dependent upon their conclusions in these great, tremendous questions. If they were mistaken, as, personally, I think they were, for after all the great thing in life is to live correctly, rather than to believe in any certain philosophical belief or principle, nevertheless it was a fine thing for those old fathers and grandfathers of ours that they cared about the great things of life; that it was a matter of importance to them whether certain philosophical propositions, having to do with the advance of the human soul, were or were not true. It helped them to bear the trials, sorrows, and prejudices of life. It kept their eyes open and their faces towards the morning. It helped them to see things if not in their reality, to see at least and understand some of the affairs of every day life, yet deserving of their high energy and calling for the best there was in them. Now, in such an intense civilization as that, in a society made up of people that did care, there grew up the country boy of fifty years ago and more. Those were the days before the advent of the Village Improvement Society, when the grass on the village green grew unvexed by the lawn mower, when it was tumbled and pitched aside by a pair of boys and girls hurrying to and fro from their schools, and perhaps mown after haying was done by some thrifty soul, who, if he could get a few tumbles of hay despite the boys, thought himself well off. There is a beauty in that as we look back at it, I am sure there is a beauty in it, and a glamour of beautiful reminiscences over it, if we could see it again as it used to exist, see the grass on the green and in the village fields, where we, as boys, used to lie and dream; in those fields that were open to everybody in the old New England village, adjoining and surrounding the principal New England village church. What a flood of tender recollections comes to us when we endeavor to think of those happy days. What a pleasant thing it was, when you and I were little, to lie down in that tall grass and to study with the exquisite eye of youth the red top, so like an oak tree if you got it near enough to your eye. How many air castles have been built by you and me as we have lain there in the grass watching through the stalks for some stray, mysterious message from fairy land, and thinking of great days to come. Ah, those were glorious

castles that we built on those old days, lying there in the grass. Do you remember that old game, when, with a little girl or a playmate, you sat in the grass and you and she each pulled the stalks over and put a thumb and finger at the bottom and ran it up towards the end until there came one little drop of sap upon the end of the grass, and then you and your friend touched the two ends together, and the one that got both drops won? What a foolish little game, and yet how pleasant it was, especially when you won, if you had nerve enough to understand and take what you were entitled to afterwards. You cannot play that any more, now that the lawn mower has come.

We have in almost every village a fine gymnasium. Was there ever a gymnasium like a barn floor? Is there any apparatus that can compare in effectiveness with that which we had there? We have now, in gymnasiums, carefully knotted ropes, or ropes with pegs put into them, at convenient intervals, up which the youth may climb. There were no knots or pegs in our ropes. If we needed anything like that we had a tight rope, or a rope extending from a beam, and the climber had no such assistance in going up, and if he fell, in case of accident, he always fell upon the hard barn floor, and not in some friendly net. But now, gentlemen, those days are gone, not only for you and me, but for everybody. That particular kind of village life, that particular kind of country life, that special form of farm life, is not coming back. It is idle to think of recalling it. It has passed away. We see nothing today but the beauty and the glory. We think of the poetical side of it. We read with a lump in our throats and moisture in our eyes that beautiful poem already alluded to, that sweet song of Whittier's, for we can realize its beauty, for many of us have had that same experience when we were "Snow Bound" in the long ago.

But there was something beside beauty. There was a lot of hard work in those days. It was hard to get up in the morning, and hard to go out into the fields on frosty days and not fall. Machinery did not do so much for man in those days as it does now. Good or bad, sweet or bitter, easy or difficult, it has gone and gone forever. The best kind of New England life disappeared, as it always seemed to me, with the civil war. There are not many of us here who can remember that, except as boys, and I imagine that there are but few here who were

even boys at that time. But those who were children, when the trumpets were sounded, can remember when our young men and youth marched away and so few of whom came back, and some of you can remember the women going up and down our streets with tense set faces, waiting for the tidings of loved ones, which too often, in sad form, came too quickly. That is what the war was to us. When it was over and our young men, those who served, came back, there was a change in the whole spirit of our civilization and of our life. The spirit of adventure began to awake. The spirit of travel came on. A desire to break away from the narrow confines of our New England farms came over our young men. Knowledge of vast prairies of the west, and remembrances of the riches of the gold fields of California, discovered shortly before the war, and an understanding of the greatness of our country, which had been increased during their absence, was borne in upon them, and gave rise to a spirit of restlessness and discontent with the life that they had been living. All of these things affected the youth of our country at that time, and it has always seemed to me that that was the beginning of the deserting of New England farms. It was that which started that series of events which has resulted in that long list of unoccupied farm-houses that so many of us know where to find in the old districts which once were the homes of sturdy farmers a generation ago. And again, also, the enormous development of agricultural machinery has made farm life a very different thing. The trolley car later came, followed by the lawn mower, so that the villages have changed, and though the differences of theological opinion, to which I alluded, have disappeared, yet there has not been left any intensity of conviction about anything that would make the strong, sturdy characters that we had a generation ago. Those strong, sturdy characters are coming again, and will be once more around us and be found among these rock-bound hills of New England. I feel confident of that.

One thing more, it seems to me, must come back, if New England country life is to be what it was before, and that is, a sincere respect for, and a sincere, earnest desire to engage in real hard work. Now, gentlemen, you and I can remember that to do a job of work well, and to do it faster and better than anybody else, was, in our time, a thing to be boasted of. I recall very well how the farmers of the hamlet where I lived

broke the Sabbath one day by spending Sunday noon talking about a remarkable feat of a certain fellow, a large, husky, powerful farmer, who husked and put into the wagon a remarkable number of bushels of corn the day before. Now, today, I am afraid that farm hands would rather tell how few bushels of corn they have managed to husk and get into the wagon, rather than how many. Now, is not that so, gentlemen? Is not the spirit of pride in work, to a very large extent, gone out of our people? Is not that one trouble with the New England farmer? I admit freely, and I am glad of it, that nobody on the farm needs to work with his hands as hard as we had to do a generation ago. We are using now the powers of the lower animals, and more and more, also, the material forces of nature. The electric battery, and the power of electricity, the power of the winds and the streams, and the power that is in our wood piles and our coal bins, to do the work of life, and less and less are the big body and strong muscles of man necessary for the accomplishment of daily tasks. But, gentlemen, farmers, men, just so sure as there goes out from the hearts of men a respect for the accomplishment of tasks in the best way that they can be done, just so sure as men cease to take pride in doing their work well, just so sure as we cease to admire successful achievement, just so certain as man comes to think that the opportunity of his life will be found in avoiding work, rather than in doing work, just so sure will the civilization of the country and the State go down and not up. I have no faith whatever in the man who leaves the farm because he feels he will find an easier life somewhere else. I do not think he will. I hope he will not. It seems to me that we must develop more and more that ideal spirit in man which rejoices in accomplishing things for their own sake. I have a deep respect, a high feeling, for the chap that husked that tremendous lot of corn on that Saturday so many years ago in Brooklyn, Conn. He is a better man than anybody who dodges work and who leaves the farm because he desires to look for some easier task. That is also one of the great troubles with our schools, that so many go there feeling that if they are taught a little bookkeeping, a little typewriting, a little more mathematics perhaps than somebody else knows, that somewhere and somehow they are going to escape the serious responsibilities of life, and are going to be able to make an easy living. It is a mistake. They are not going to.

In fact they are going to lead less worthy lives and actually take away from the human race something for what they were put into this world to give it. No, gentlemen, farming in New England will regain something of its old pre-eminence, something of its old joyousness, when there comes into the minds of our young men an increased respect for work and a greater love for the actual doing of things. Any man who has four or five big marks on his hands, which show that he has done hard work, if he has the idea in his mind that those marks are not a badge of honor, he is not a good American. I do not mean to discredit the head-work of the world. I do not mean to say that. I do not mean to say that the responsibility of overseeing, and the government and mastering of industry, is not a mighty task, but I do say that the trouble with the farm, if there is any trouble, is that which exists today in our factories; is the trouble that exists today in every avenue of human effort, and that is, that the American boy has lost his enthusiasm for work. If there was anything in the country boy of a generation ago, about which I have tried to say a few words to you; if there was anything that was truly worthy of admiration, it was his general notion that it was a fine thing to be able to do a good deal; a fine thing to be strong, a fine thing to see to it that nobody cut his corners when he was mowing, a fine thing to be proud that he could spread hay as fast, or faster than five men could mow, a fine thing to pitch as large a tumble of hay upon a wagon as his father, a fine thing to be able to mow away hay as fast as anybody could pitch it to him. That was the great characteristic, which meant something to a country boy if he was worth anything. If that has gone out today, if the boy of today, whether in the country or in the city, has lost that feeling which should make him proud of being able to accomplish work, then not only are there going to be deserted farms, but there are going to be deserted shops. I do not believe in anything of that sort. I believe that the spirit of our boys is all right; that their enthusiasm for work really exists as strong as ever, if we will only teach them something like that. There is the salvation that we need, the salvation of our country, the glory of our country, which we are going to have in its boys and in its girls, in those boys who are willing and intend to do whatever their generation calls upon them to do; who intend not to shirk the work, but to do it.

Now there are a great many other things which I might say under this subject, which would be of possible interest to farmers, but I observe by the programme that I am down to occupy the time between eleven o'clock and half past one. I hardly think any of you will care to hear me talk that length of time. I am not here to go into general details of the boy upon the farm, nor do I mean to tell you in detail exactly how to do the work about the farms. I will leave a little something for you other gentlemen. I do, however, want to say this, gentlemen, that the thing that is going to make the farms profitable is a lot of hard work. That is the great thing that we should seek to arouse and to cultivate. If our boys lose that they do not deserve to be on the farms; they do not deserve to dwell in this country. Somebody was introduced once by a speaker in this way. The president of the meeting said that Mr. So-and-so is here. "I have great pleasure in saying that we shall now listen to a lecture on fools by one—of my best friends. (Laughter.) To which the lecturer responded, "I am not nearly as big a fool as the gentleman who just spoke—would have you believe."

Well, you have had a short talk on the country boy by one who is especially proud of the fact that he was a country boy, an old Windham county boy, and who values that experience as a country boy in a country village and on a country farm, beyond everything else in his life. It is the greatest advantage, it seems to me, that any boy can have. I would like to tell you something that President Elliot of Harvard said to me the other day. We happened to be together at a meeting. He was advocating what, to some, were rather objectionable features of our preparatory schools, and he said something like this: "I think the preparatory school may naturally be expected to give every boy at least a taste, a sip, of every kind of knowledge, so that when he comes to college he shall know what kind of studies he likes and what kind he does not like. There were some who seemed to think that was expecting a good deal of the school." After thinking it over I said, "Dr. Elliot, I am inclined to think you are right," but as I look back to my days in the country school, in a country town, it seems to me, while I was by no means extraordinary, that I got a good deal more than a sip of various studies. I got something not to be had in the ordinary school. Beyond all that, in the country

school I did get a taste for pretty much all kinds of knowledge. I know that I got a little of the sciences, I read a little history, and I imbibed something of philosophy, something of the common branches and of other things, which created a taste for greater familiarity with human knowledge. Then said Dr. Elliot, with that beautiful smile of his, "You were brought up on a farm. You had great good fortune. All the efforts of the schools today," said Dr. Elliot, "all the manual training, and all this kind of scientific nature study, and all those kinds of observational studies, are directed towards the one end of trying to find some substitute for those things that came naturally, as a matter of course, into the life of the country boy on a New England farm. We may succeed in doing it, but so far I do not believe we have." Certainly that was an opinion worth considering.

Well, while it is a splendid thing to live in close connection with nature, and to work with her in the fields, as was our opportunity in the old days in the country life, it was a good thing, and it still is a good thing, for the boys and girls. Happy are they that grew up in those surroundings, and blessed was our lot, that we studied the mechanics of the wood-saw, the axe, and the crowbar, to say nothing of the toy mill and water wheel. Happy were we that we learned respect for the great beliefs of mankind in our fathers' smithy or blacksmith shop. Happy were we that we breathed the fresh air of the country and took into ourselves the strong breath of the hills, and blessed were we because we had a chance to wander over the hills and under the skies. Blessed are we as we look back now to those days, all glory tinted, out of which has gone every recollection of everything that is hard or toilsome, or difficult to be borne. It is all splendid now. Heaven grant that it may be equally splendid as our children look back, fifty years hence, to their early days in this dear land of ours. (Applause.)

Mr. GOLD. Mr. Chairman, may I be allowed to say a word at this time?

Secretary BROWN. With pleasure.

Mr. GOLD. Mr. Chairman, I have listened with high appreciation to the address which we have had upon the country boy. I am glad to hear from Brooklyn, Conn. Particularly glad.

When I started upon my farm life I looked around the State hunting for somebody to help me in trying to advance the agriculture of the State, and I struck upon one of those Brooklyn boys, or he was looking for me, I will not say which. He came from Rhode Island originally, but settled in Brooklyn. Henry A. Dwyer, the first secretary of the State Agricultural Society, was from Brooklyn. And just those conditions which we have heard discussed by the speaker, when they discussed great theological questions in the blacksmith shop, I found existing there in Brooklyn, when I spent a Sabbath day with my friend Mr. Dwyer. In his family there were two teams got ready every Sabbath day to go to church. One of them went to the Congregational church, and the other team went to the Episcopal church. While that was one point, here is another: There was this rivalry between these two institutions, and discussion ran high, on which the members of these two societies came together as one. There was an old deacon there in the Congregational church who was a watchmaker by trade, but who was an ardent cultivator of flowers. A wonderful cultivator of flowers. He was poor, but he managed to live. There was also an Episcopalian minister there, who had a small salary, and also a lover of flowers. He built a greenhouse with his own hands, and raised there the most beautiful flowers found anywhere in that part of Connecticut. Those two men, while they were theologically apart, and often discussed these matters, were as one in their common admiration and their love of the culture of flowers and in the pleasing effects that flowers bring to the people where they had an opportunity to distribute them. Either one of them would hitch up his horse and drive three miles to carry a bunch of flowers to a sick lady, and they would often get together to show each other their choice productions. They were as happy in the enjoyment of that pleasant social intercourse that brought them together as they were in their works and achievements of life. The old deacon in his last days made a happy strike in agriculture, which relieved him of

all his debts and allowed him to die above board. He cultivated the gladiolus when it was first introduced here. He had a magnificent bed of them, and many thousands of plants were sold in advance of nurserymen, greatly to his advantage. About the same year the Early Rose potato was first brought into cultivation, and he cultivated several acres of that. And those Rose potatoes and the gladioli brought him out of debt, free and above board, so that he was enabled to pay his debts and die in comfortable circumstances. That was in Brooklyn.

In my early correspondence with my friend at Brooklyn, our postmaster, when I sent a letter to Mr. Dwyer upon one occasion, held it back because he thought I had made a mistake in addressing it "Brooklyn, Conn." He said I had addressed it to Brooklyn, Conn., instead of addressing it, as I should, to Brooklyn, N. Y. He would not send it off until he had inquired to know whether I had not made a mistake. That was the knowledge of Brooklyn in our part of the State at that time.

But I found in Brooklyn, through Mr. Dwyer and this old deacon and this Episcopalian clergyman, through their cultivation of flowers, that it made, all through the town, a good deal of difference when you put conditions upon the general farms throughout the State. I want to bear this testimony at this time, to my appreciation of getting some information with regard to the early days of Brooklyn, Conn.

Secretary BROWN. I am sure, gentlemen, you all share with me the great surprise I have felt at having the country life of forty years ago so eloquently depicted by a college president. We did not expect that a college president would have so much early knowledge of farm life in Connecticut.

Another thing, I have nowhere and at no time heard expressed so clearly and so conclusively the causes which have been at work to depopulate the rural towns of Connecticut, as it has been depicted here this morning by President Luther. We know of the changes that took place forty years ago, when so many of our young men went to the front never to return,

but those who did return had seen the larger life; had had a wider outlook, so that they became adventurous, and the farm life of Connecticut was too narrow to content them. There dated from that time the decline of the value of New England farms, and the decline in the population of our rural towns. And the other reason so clearly and forcibly expressed by President Luther was that at about the same time came the introduction, so largely, of improved machinery. Those two things, to my mind, have been most potent factors in reducing the population of our rural districts and causing the desertion of so many of our rural farms.

That completes the programme for this morning, but I want to say that during the intermission there will be a meeting of the sheep breeders of Connecticut in this hall.

This afternoon we shall be furnished with music at the opening of the convention. The convention will now stand adjourned until two o'clock.

AFTERNOON SESSION.

Convention called to order at 2.00 P. M., Secretary Brown in the Chair.

Secretary BROWN. We have prepared some music, and if you will come to order the first thing on our programme this afternoon will be a song.

(Song and music by quartette.)

Secretary BROWN. We are to have now an introductory address by Mr. F. H. Stadtmueller, president of the Connecticut Sheep Breeders' Association.

THE DECLINE OF THE SHEEP INDUSTRY IN CONNECTICUT.

BY PRESIDENT F. H. STADTMUELLER,

Of the Connecticut Sheep Breeders' Association.

Mr. Chairman, and ladies and gentlemen: I have felt that no more fitting theme as an introductory for this meeting,

which seems to be devoted particularly to the sheep interests of the State, could be made than one which would briefly review the history of the decline of the sheep industry in the State of Connecticut, and it is to that subject I invite your attention.

The decline of sheep husbandry in Connecticut affords a good illustration of the effect of economic influences upon an agricultural industry. The forces which produced this decline were so slow in their operation as to be practically imperceptible at the time of their fulfillment, requiring the lapse of considerable time to clearly define the primary causes, and few people have ever thoroughly understood them. A brief review of economic phases in the past century does not take long to disclose the reasons of this decline. To facilitate the presentation of these facts, I will not confine myself to exact dates, but will refer in a general way as to times and periods in the discussion of the subject.

In the fore part of the last century, up to about 1840 or 1850, sheep were maintained upon the farms of New England primarily for the production of wool, the wool being needed for the production of clothing, blankets, etc., required by the farmers and others. At that time the common practice was to make the cloth at home, including, practically, every detail of the operation, from the growth of the wool to the finished clothing. Towards the end of this period, owing to the extension of the law of division of labor, the manufacture of cloth and various preparations of the wool necessary to the manufacture of cloth, was gradually diverted from the farm to the shop. Coincident, or closely following the period of the development of the manufacture of woollens in mills, the revolution of transportation facilities began by the use of locomotives and steamboats. This opened vast tracts of fertile land for the abundant production of staple agricultural products in our country, while large and extensive territories throughout the world were entered and opened by other civilized nations. Owing to the increased facilities of transportation, whereby both the markets for the disposal of products and acquisition of the raw material were greatly extended, particularly the last, the manufacture of woollens developed rapidly. That is a point that should be borne in mind. The market, by the acquisition of the raw material, was extended more rapidly; that is, the

field of acquisition was extended more rapidly, or was taken so generally, that it developed with greater rapidity than the field for the market for the disposal of the product.

Farmers still continued, for a short time, to grow practically about the same quantity of wool, but it was not long before isolated instances developed where the husbandman found that the maintenance of the few sheep that had formerly been necessary to produce the wool for his clothing, did not nick well with the economic administration of his affairs. Moreover, the manufacturing enterprises of our State were practically in their infancy, and the consuming population was not of such dimensions as to cause or lend any assistance of any importance to the phase of meat production as a source of revenue in sheep husbandry. The result of which was that within a decade or two following this movement, the whole progressive school of farmers soon realized that it had become more economical to relegate the manufacture of homespun material to the factories and buy cloths, thus utilizing the energy heretofore required in this production in further avenues affording greater remuneration. Thus the sheep industry of New England naturally decreased, and the keeping of sheep was gradually abandoned from farm to farm, until throughout Connecticut the industry practically declined into utter insignificance as an agricultural enterprise, compared with its importance at the opening of the century.

During the next thirty years, from 1860 to 1890, two great economic changes took place, which restored the sheep husbandry again to the class of possibly profitable agricultural enterprises in Connecticut. One of the changes has been caused by the rapid increase of our consuming population, which has very materially stimulated the demand for meat, compared with that existing in the days of former prosperity in the sheep industry, while the other is the very great shrinkage which has taken place in land values throughout the greater portion of Connecticut. The latter condition was brought about largely by the extensive railroad development, and particularly that in the western States. This has had a most depressing influence upon agricultural values in Connecticut, so that today thousands of acres are lying idle, and are nominally of such insignificant value that it is hardly necessary to establish ownership and title thereto.

Those of you who listened to the very fine explanation of the causes for the condition of agriculture during the past twenty or thirty years in our State, as made by President Luther in his exceedingly able address this morning, will discern a possible disagreement between Dr. Luther and myself in regard to the causes of that decline in Connecticut. Dr. Luther disagrees with me in so far as the influence which he placed upon the war and the return of the troops from the south developed a spirit of restlessness, he dating the decline of agriculture in New England, or in Connecticut, at the time immediately following the civil war. His date and mine substantially agree in time, but I believe man, ever since his existence, has been restless, and has been prone to wander and seek new fields and new territories, and that is rather more due to the tremendous railroad development which ensued shortly after the war, and which, of course, greatly increased the facilities for getting away. I believe that distinction should be made.

Hence, under these conditions, with cheap land and the best markets in the country at our doors, there can be no doubt but that the time has arrived when sheep industry can again be profitably undertaken in our State.

It is exceedingly interesting to observe, in passing, that these two exciting causes of the decline of sheep husbandry, namely, the growth of manufacturing, of transportation, have eventually done much to produce conditions favorable to its reestablishment, although on a different basis. Formerly wool was the primary object, the meat having been of secondary importance. Now meat is the primary consideration, with wool as a by-product.

One great obstacle is offered to this development, namely, dogs. As sheep husbandry declined, and sheep, relatively speaking, became extinct in this State, few years were required before the existing generation of dogs did not know what sheep were. This is a perfectly natural result, and not fraught with any particular element of danger, until such time when sheep husbandry might be renewed as at present. It is not difficult to imagine that under these circumstances, as soon as any given person would proceed to keep sheep, it would simply be a question of time ere he would be confronted with discouragement by the loss and damage following a visit from or an inva-

sion of dogs, for dogs are so common that it is inconceivable for anybody sustaining a flock of sheep in Connecticut for more than a week or so before being discovered by some dog or other. This dog, wherever or whoever it might be, upon beholding sheep would simply recognize therein the discovery of some new creature, and would proceed to exercise its abilities to demonstrate whether sheep were to be classed as game and sport for it, or whether they were animals endowed with equal or superior qualities to those possessed by itself. We all know what the result has been, and invariably must be as long as two such opposing forces as exist in sheep and dogs are brought together. However, the importance of the dog question has obtained undue prominence by reason of the opinion that the decline in the sheep industry was occasioned by the ravages of dogs. This is perhaps a pardonable view for judgment, limited to and based upon present occurrences, but, as has been indicated, it is nevertheless erroneous. The most practical solution of the dog phase of this problem rests upon proper fencing. Here again economical changes come to the shepherd's aid by the great reduction which has taken place within recent years in the cost of fencing material. Moreover, much assistance may be had to encourage the reestablishment of the sheep industry by the attitude assumed by town officials in the adjustment which has taken place over the question of damages occasioned by dogs. In the past the action of the average selectmen in settling damages, as required by our statutes, for losses occasioned by dogs, has been controlled by one motive only, namely, to adjust the damages upon as low a basis as possible — upon as low a basis as he could possibly force the sheep owners to accept without seeking to obtain greater and more just compensation before the courts. The selectmen, as a rule, were perhaps justified in this attitude, because of the shrinkage of agricultural land values, and because the towns where this has been most extensive must have suffered materially from the diminishment of their grand lists, which, in turn, diminished the resources of the town.

Moreover, the time has arrived when it appears that it would be better policy for town officials to assume as liberal a course as possible in the adjustment of these claims for damages to sheep, caused by dogs, for in so doing sheep husbandry will be encouraged, and that encouragement will result in the reestab-

lishment of the industry of sheep husbandry and afford one of the successful methods now before us of reëstablishing land values on large areas throughout the State. This being done it will naturally enhance the prosperity of the towns. Thus the reëstablishment of the sheep husbandry in Connecticut must now be done primarily for meat, and secondarily for wool, and an incidental factor of the whole matter will be the reëstablishment of agricultural land values in many portions of our State.

DISCUSSION.

Secretary BROWN. Mr. Stadtmueller is ready to answer any questions which you may put to him. I certainly congratulate him upon the way in which he has presented his case. It has been so clearly demonstrated that there is no room for argument against its acceptance.

We will now listen to some music before we discuss the sheep question further.

Music.

Secretary BROWN. We have with us this afternoon a gentleman from Vermont, which, as you know, has a great reputation for its wool and its sheep. This gentleman has just been abroad for the purchase of thoroughbreds, and knows the sheep question from end to end. I have the pleasure of introducing to you Mr. L. B. Harris of Lyndonville, Vt.

SHEEP.

By L. B. HARRIS of Lyndonville, Vt.

Mr. Chairman and Ladies and Gentlemen: I am a little hard of hearing and so do not know what has been said heretofore. I wish I did, because the sheep question in Connecticut is a difficult one, and I would like to know what the other fellows have said about it. In human affairs I have found that usually the thing that is is for the best. We have seen a town meeting voting what you knew would ruin the whole community if carried out, and yet we have seen everything that the mob has done come out right in the end. They usually land on their feet and come out all right.

Now, for the sake of argument, let us assume that it is best for Connecticut that it did get out of the sheep industry. I do not believe that, but it may be it was best, and may be it is best yet. I suppose there is one cow to every six sheep that has disappeared, and it may be there is a cow for every sheep that has disappeared. I hope there is. I should not be surprised if there are two cows in Connecticut for every sheep that has gone out of the State, so that agriculture has gone along; not on my line of agriculture — and it is distasteful to me that it has not done so if that be the fact — yet, on the whole, there has probably been an advance in some other line.

Now, when you go home, if you live out of town, you look out over the fields and you will see, all over Connecticut, more so than in most of the States, weeds that are above the fifteen inches of snow which has fallen. Those weeds have gone to seed, and they have not done anybody any good. I believe that to be true of Connecticut, and any State in the Union where that is the case. It would have been better if the land had been cultivated with some useful plant, if something of that kind had been grown where those weeds grew. Of course, that is self-evident; but that was not done, and it is not likely to be done nowadays as much as it ought to be done. Therefore, the weeds are there. Now, there is a time in the life of almost every weed that it is good food for sheep. If you will take a flock of sheep out of the barn, which is the worst place a flock ever was put in, by the way, and if you were to drive them out of the ordinary New England barn, and drive them onto one of these fields into the snow, you would find that they would immediately begin to eat these weeds until they got their stomachs full. And another thing about it, those weeds would make good mutton. There is hardly a weed in existence but what, at some time during its life, or at some time during the year, is not good food for sheep. So on the face of it, while there are many of them that are not good food for milch cows, as many of you know, yet there are a great many of them that are excellent food for sheep. So I think you will agree with me that it would be profitable to feed all the weeds that we can, especially in view of the fact that the weeds agree with the sheep, and the sheep take to the weeds. We could not quarrel about that. I believe, furthermore, it will be profitable to feed all sorts of plants to sheep.

There is hardly any edible plant that grows in our climate but they can use. In fact I would be willing to buy a farm in Connecticut today, and run in debt for it, and run in debt for my stock and my tools, and rely entirely, as a means of getting out of debt, on my prospects of what I could get out of it by farming the sheep. I know I could pay the mortgage, because I have done it.

Now, I am not going to ask you to let me discuss mutton alone, though even that is more than I can handle, in the limited time allowed me, as it ought to be. The Secretary wanted me to discuss sheep. I suppose I shall have to. But I am going to talk a little about mutton too. He said I had got to discuss sheep, but I have got the advantage of him now. Now, for the next half hour, while I have got the advantage of the Secretary, I can say what I have a mind to. I am going to try to tell you something interesting about sheep, but really my heart is in two things. I want to teach you that every man of you that raises sheep should raise rape. If I can make five of you put in a piece of rape another year I shall do as much good as a man usually does in this business, because it will be a step in the right direction. Another thing that I want to teach you, and I am sorry there are no more of the women folks here to hear it, and that is, how to kill a sheep, and how to take care of it after it is killed, and how to cook and how to eat mutton. If I could get three or four of you here to understand this matter, so that the next time you buy a piece of mutton, instead of putting it into a milk pan you will put it in the cellar and hang it up in the proper way, then I have accomplished one of my objects in coming here. If I can make you understand that mutton is not fit to eat until it has been killed at least six weeks, then I have made a great step towards bringing you up out of barbarism into the enlightenment of a better day. Mutton properly aged, properly killed, and properly cooked, is the least harmful of any meat, and the cheapest. Now, before I take up these two questions, I want to lay down the financial proposition. And this is a good audience before which to do it. I do not know how it is going to be disseminated out among the poor, because they are not here. You gentlemen that are here are well-to-do, you do not have to work very hard, and I think you have considerable leisure on your hands. I think that statement covers this audience, as a rule, and in consequence of that

there is a good deal of responsibility resting on you to inform the other fellows that are not here. Really, they are the ones most in need of information and instruction.

Now, we will assume a young man, twenty-one years of age, starting out as a farmer. Of course, he has got to have some capital, and if he takes another branch and divides his capital, of course, he will require more than if he devotes all of his funds to one branch. But if he will go to work and be diligent, in a few years he can have considerable capital by following, in the main, what I am going to tell you. Now, here is an important thing. I might talk here a month, and I could not make a good shepherd out of a man that is not a good shepherd naturally. Shepherds are like poets, they are born, and unless you know when you see a sheep what is going on in that sheep's head — and it has got the smallest head of any four-footed animal, and they know less — but unless you know what that sheep wants, do not go into the sheep business. Now, last year I wanted some ewes. I saw a farmer who said to me that he had some in his flock. I said to him, "I will be at your house at nine o'clock tomorrow morning, and I wish you would gather them up so I can run the flock over and see what you have got." He said he would. When I got there I found that he had the flock shut up in a cow stable, had not ventilated it in any way, and it was packed with sheep. Now, that flock of sheep, if it had been good for anything in the first place, never would have been good for anything after that. In a moment of thoughtlessness he ruined his flock of sheep, if there had been any ruin to it. I am afraid there was not much worth to it before he shut it up. Anyway, it was useless for me to purchase any of the flock, for they were not adapted to my purposes, and I do not buy that kind of sheep if I can help it. The simple fact was he did not know how. He had run behind every year. Now sheep will not stand a lack of air. They have got to have it. They have got to have it all the time. Neither will they stand a damp place. Now, I know you will say, "I know of such and such a man, who is called as good a business man as you ever saw, and he keeps them in his barn cellar." That simply goes to show, my friends, that that man is an excellent shepherd, except perhaps in that one particular. If he would use greater care with his flock I would wager he would have a great deal better flock of sheep. But we must

get back to our young man. First of all, he must have some natural adaptability and love of sheep husbandry, and he must have some definite plan as to the way in which he proposes to carry on the sheep industry. There are many ways in which it can be done, but there is usually but one right way. It may be by selling his mutton and lambs, or the yearlings or two year olds, or by the wool alone. Now, the first and most important thing is for him to start right. He must choose his flock. Let him choose anything he likes, in the way of variety, but make sure to get good stock, and to get good stock he must know sheep. Of course, he must have a farm to put them on. Your Secretary tells me that there is lots of land in Connecticut, eight or nine miles away from the railroads, which can be bought very reasonably. Now, in starting a flock I should buy, perhaps, one hundred ewes. There, as I intimated to you a minute ago, is one of the most difficult things in sheep husbandry. It is no easy matter, I can tell you, to pick up one hundred ewes and not get some with some disease, or something bad about them, to be carried into your flock from the purchasers. When you go out to pick them up be very careful of whom you buy your sheep. Be sure that the wool looks thrifty, and does not look dead. Most any disease that a sheep is apt to have shows itself in the wool, to a man who knows. You can see it in the wool quicker than any place else. Be sure the wool looks lively and bright, and make sure that the eyes have a good appearance, because if you happen to get a few sheep with some eye disease you may ruin the rest of your flock. I did worse than that once. I bought some sheep with tuberculosis and ruined my whole flock, and I am pretty sure, I think, in buying sheep, too. It is a serious thing to buy sheep and put them on your farm. A mistake at that time may mean a heavy loss, so be very careful of whom you buy. Buy of some man that is responsible, and on whose representations you can rely. So let us suppose that our young man starts out to buy one hundred ewes. He ought to get them for three twenty-five, that are good enough to start with. Then he ought to have two good bucks, that might cost three hundred dollars. He ought to get good enough at that price. Then he ought to have about four hundred dollars to invest in tools and matters of that kind. Altogether it would run up to, say, about two thousand dollars as the total necessary investment. Then on top of that

he ought to have a wife that could do the work indoors, and he should never hire a day's work. He should do it all. He should not hire a butcher when he wants to kill any of his lambs or some of the flock to take to market, nor should he hire a sheep shearer when shearing time comes. If he wants to make money he has got to work. He should build his own buildings and take care of his own flock. Do it all himself. Now, I am going into this more particularly because I am exactly describing what I know a young man to have done. Now, he must have a ram, and he should take more pains in the purchase of his ram than he did in the purchase of the ewes. The main thing is to get a strong masculine character. I do not know of a better way of judging a ram, of deciding whether a ram is good stock or not, unless you can have him for two or three years, than by putting your hand on the back of his head and giving him a sudden blow like that. If he resists your blow well and strongly, do not question at all but he is a good ram. That is the general rule. It has not always proven true, but, as a general rule, that can safely be depended upon. On the other hand, if he ducks his head or his back at the pressure of your hand, do not touch him. Do not get too big a ram. Also make sure to get one with a good chest development. I should advise, in sheep and in the ram, that both should have what is classed as "metal wool," because this young man has got to do his own haying, and his sheep have got to rough it a little. He has got to attend to his own crops, and do it all himself. He cannot drive his flock up every time it may be a little wet. With very coarse wool it will lie down on the back, and the water gets in and under it and into the skin, and the effect is bad.

Now, as to the food on which to keep his sheep; first, I should put in at least six acres of oats. He can do it if he is a worker. He should, also, put in at least three acres of rape and three acres of turnips. That is the first thing. One man can do it. The oats he should cut up when they are dead ripe. Cut them when they are dead ripe, and feed them on the trough. A poor man cannot afford to purchase a threshing machine.

Now, he has no shelter for his sheep, and he may have no fences that are good against sheep. Of course, barbed wire is the only thing he can use. There is more or less to be said

about that as a good thing to use, but, on the whole, it is about the only thing that he can depend upon nowadays. There is a little trick in fencing against sheep that I would like to explain to you. I never have been able to account for it, but I know it is true. A sheep will sometimes work its way through a barbed wire fence, however thick it is, and especially lambs will, if it is rigid, but if it gives a little to pressure when the sheep rubs against it he will not touch it. So where your lands will admit of it, put your posts fifty feet apart, or even more, as far as you can. Treat your fences liberally with a lot of staples. You must use about eight wires. I use nine. It is better to have the wires set rather thickly, in order to feel that you have got your sheep and lambs all in your pasture, but use just as good fence posts as you possibly can. It will, of course, help to diminish the cost, and will hold the sheep better than where you erect a rigid fence.

The question of shelter is exceedingly important. An open shed, one that opens to the southeast or south, or in some localities even to the east, is, of course, an ideal place for sheep. But I would prefer a good tight board fence, that is constructed high enough to give them shelter when they need it. That will carry them through the winter better than any barn cellar, for, as I said before, it is highly essential that the flock should have plenty of air. Anything that will break the wind is enough. Now, a sheep is more susceptible to draughts than any other animal. No animal will take cold quicker than a sheep will, nor will any other animal stand as much weather, but they must have a dry place in which to live. Sheep will not thrive if you keep them in a low, damp place. They want a dry, airy place. I have given no attention to getting my sheep under cover for the last eighteen years. They run, substantially, over the same place in the winter that they do in the summer. Some of you may not agree to that, but it is no new way, and I think experience shows it is the right way. So the question of buildings on this farm that our young man starts off on is of small moment. They need not cost much. A thatched roof is all right for the open shed. An ideal roof is the thatched roof. It is all that is necessary. Anything that will break the wind from the northwest, and also some sort of winds from the south. There are two or three days sometimes when the flock should be protected from the south;

kept out of the way of south winds. Sometimes they blow raw, chilly, and damp, and then the flock should be protected. So it is well to see that the sheep pen or the shelter is arranged with that in view.

There is another thing we have got to take into consideration. There is but one breed of sheep in the world that will not pack itself into a great cluster and literally smother themselves, and only one breed in the world that knows enough to get on the windward side of the hill. So we have got to furnish brains for our sheep. It takes less work and more good judgment to take care of sheep than any other animal.

Now, if the lambs sell well, and the wethers are to sell well, you must have a good market. You must watch the prices and know how to sell to advantage. With one hundred ewes, if a man will be careful in marketing his sheep, or the wool, he can, in a few years, pay the mortgage on his farm. He certainly can do it. And in a very short time he can double his flock. It is quite within the possibilities in Connecticut to carry six hundred sheep on one hundred acres of land. I do not advise that, although I do more than that, I should not advise a man to aim for that at first, but it is easy to carry six sheep to the acre and do it without much trouble. I know men who carry nine. That shows simply what can be done. So, in a few years our farmer, if he is careful and frugal, can own his place and be fore-handed.

Now, let us take up the question of procuring food for the flock. I have been in this business thirty-two years, and my experience certainly ought to count for something. I know this, that up to the present time a farmer in Connecticut should not have fed his sheep anything in the way of artificial feed. Sheep today, in this snow, are getting their living, and can do it very readily. You cannot do that with cattle, and there are only two or three other things that you can do it with. But I want to talk with you a little about rape. I will confine myself at present to rape. Now, it does not hurt rape to eat part of the plant in August. That may surprise some of you, but it is a fact. Furthermore, it is fully as good today, after it has been frozen, as it was before. In fact, for edible use it is better after it is frozen. It is a wonderful plant. You can raise thirty tons to the acre. You should not attempt to raise less than that. It never should be planted before the 22d of June, and from that

time on to the 10th of July. About the 20th of June is right. That gives you all the spring to harrow your ground and get all the weeds killed. You should fit the land for rape, as well as you would for cabbages. Of course, rape is of the same family. It must be rich land, and your rape will enormously exhaust your land. But rape, if you properly handle your crop, will help, in a measure, to refertilize the land. Rape is usually fed on the ground. It can only be fed to good advantage on the ground, so that your sheep will enrich the ground again, and they will not trample it to injure it any. They work from the side and take the ground clean as they go. Many newspapers and many writers on the subject say you must exercise great care for fear of their eating too much. I do not think that is true, unless we depend on rape for part of the year and then deprive the flock of it for a few days and then turn them in. Possibly they may overeat under such circumstances, but I think if we turn them in in the natural way, after the grass begins to grow better in the fall, they will then go at it very lightly. I have never known sheep to eat too much under those circumstances. I presume later in the season, if you were to take your sheep away and deprive them of it for two or three days, and then turn them in, they would hurt themselves. Another thing: always keep a box of salt in the field where your rape is. Do that in the summer and in the fall, and I think it is a good plan.

Now, as to the cultivation of rape, it matters little how you cultivate it, whether broadcast or in drills, but unless you have cleaned your land free and clear of weeds it is better to sow it in drills, and then cultivate with a horse when the fourth leaf comes out. I often sow it broadcast. A very little seed is as good as more. A pound to an acre is as good as twenty pounds. Twenty pounds does no more. A pound to the acre, if you had a man who would sow it fine, would be just as good as a larger quantity. The crop should be ready for the sheep in the fall, when the fall feed gives out. There is no feed, artificial or otherwise, with which you can make such good mutton, in a given length of time, as you can on rape alone. I feel perfectly satisfied of that, although some of my friends dispute it, but I have tried it and I feel quite sure that is correct. Furthermore, I feel perfectly satisfied that there is no mixture of grain that will make such good mutton, in a given length

of time, as will rape alone. I think the experiments which have been tried in shipping sheep long distances are in favor of the rape-fed sheep over grain-fed. I think the Ontario experiment station sent lambs — I will not be sure whether it was lambs or sheep — to London, and the rape-fed sheep stood the shipping the best.

The leg of mutton which I have here I happened to have on hand, and I brought it along to illustrate this point. This was a yearling wether. That is a sample of some mutton that was made entirely on rape pasturage. While I do not exhibit that quarter as a model leg of mutton, yet I do suggest that you will not find many better. It was made entirely on rape, and without any grain whatever. Of course, the strong point, and one of the points in connection with the raising of rape which I wish to emphasize before you, is that it is a great saving in your grain feed from the time your pasturages begin to give out until now. That is the first point, and another point is that it is a capital feed on which to make first-class mutton. In my opinion there is none better.

Following rape, I should have plenty of turnips, because there is a time in our climate when rape goes back on us and it is about this time of year. Sometimes it holds on until the middle of the winter. My sheep are on rape today, but you should have turnips to follow the rape, if you can. Of course, corn ensilage is an excellent feed for sheep, but there is nothing, in my judgment, like the plain, old-fashioned, rutabaga turnip with which to follow up your rape. White turnips constitute one of the best feeds sheep can have. White turnips will feed very well up to a month from now — up to about the middle of January. You can raise white turnips if you want to plant them in August, but after the middle of January white turnips do not hold very good. I should feed always whole turnips to sheep with full mouths. Of course, with lambs you must have the turnips cut. I think an old ewe likes her turnips best whole. There is no harm in cutting them at all, but I think an old sheep likes them whole the best.

Now, with the farm such as I have described, and equipped as I detailed before you, our young man is in pretty good shape to start off in the sheep business. I should not advise that he turn off all his lambs the first year. He should carry them until the second year to begin with. After a while per-

haps he could afford to do that, but for the first year it is better for him to carry them over if he can. Of course, he wants to increase his flock, and he should save about twenty per cent. of his best ewes and lambs for that purpose. Then, of course, the following year he gets a good fleece, and that helps to equalize the cost of carrying them over. Unless he is in urgent need of the money, the first year I think he should be willing to deny himself and raise sufficient crops to carry the sheep through until the second year. He will be better off for it in the end. However, that is a matter for him to determine at the time. You cannot lay down any hard and fast rule in regard to that. Every man must be governed according to his own circumstances to a large extent.

Well, suppose that fall is coming on; our young man wants some meat for his family. There is no place where he can get such good meat as right in his own flock. Of course, mutton is a winter meat. It is not particularly a summer food. Lamb is more like a summer food. He can take a good wether, and if slaughtered and cared for properly, no better meat can be had. Just let me give you a few directions in regard to that. Do not feed it anything for twenty-four hours before slaughtering. You will forget what I say about that now unless I bring that out clearly before you. Let me tell you why that is. It is because the undigested food in the sheep's stomach, when it is slaughtered, is apt to flavor the meat. That is why it is best to fast the sheep before killing. Whatever you feed the sheep that remains undigested in the first stomach is apt to flavor the flesh if you kill it while it is undigested, but if you wait until it is digested and gone into the other stomachs, you get no bad odors in the flesh. You can give the sheep water if you like. Dress the sheep in a perfectly plain way. Do not try to embellish it with any fancy ornamentations, such as you see upon some carcasses that are hung up. Of course, you should not kill in fly time, but wait until the flies are all gone, until well along in November. Now, if your house cellar will keep meat without mould appearing on it, you are all right. After you have slaughtered your sheep if you will then hang your carcass in a cellar and take decent care of it, it will be all right to hang there until the next April, if you wish to have it, and it will grow better every day. It is not fit to use at all until it has been there a month. I used to think that the reason that milk

soured in the pan was because it had to, but it does not. It is not a natural condition for milk to ever sour. I used to suppose that meat spoiled because it had to. But it was because I did not know anything about it. Investigations, however, have shown that milk need not ever sour, neither need meat ever spoil. Now, take this very quarter of mutton here, by way of illustrating. The first thing to do is to fasten back these loose pieces on the flank, so that the air can get in. Then if you were to hang it up in this room it never would spoil. There never would be any bad smell from it, but if you left it all night where I have left it here, it would spoil in twenty-four hours, or if you left two pieces of the flesh touching each other in a loose way, so that the air could not get in, it would afford a place where decay would commence. But if you hang it where the air can get at it, it will never spoil. Why? Because the air sears it over, dries it, and the microbes that are said to make all the trouble cannot get hold to do their work. It should never be kept moist. The moment it becomes moist it gives the microbes a chance to get a foothold. If it is dry it will never spoil. But suppose you leave it hanging up, and this blue mould that we sometimes hear about makes its appearance upon the meat. Do not let that frighten you. A small amount of it does not do any harm. You eat blue mould in other things and there is nothing unhealthy about it. If this blue mould gets started in some place on the quarter, where it has become a little moist, if you will carry the quarter out and lay it on a sawhorse, with the open space towards the sun, it will immediately kill it. Furthermore, a few drops of the oil of bergamot on the stone in the bottom of your cellar will kill anything of that kind which may be in the air. An ideal place in which to keep mutton would, of course, be in the back yard, where there is a free circulation of air, but, of course, in our climate we cannot do it, because of the extreme variability of the weather. Furthermore, I am afraid that some of our lady friends would not be able to bring themselves to think of doing such a thing as that. They think you must have some artificial place, but that is a mistake. A quarter of mutton hung up in the air would keep for a long time perfectly pure and sweet, whereas, if it was put in the refrigerator in a very short time it would not be fit to eat. I do not know why that is so, but I know it to be so. A little amount of mould may

gather, but it does not amount to anything, and as I said a minute ago, it is nothing that you need be afraid of. You throw that away anyway. If it troubles you just take a dry cloth and wipe it out. It will never mould on the outside after the air has had an opportunity to sear over and harden the surface of the carcass of the sheep. Mutton is a little different from any other meat in that the air hermetically seals the flesh, and it cannot get in and bring about the bad results which sometimes take place. It is only where it can gather moisture on the inside that we need fear danger.

Now, after it has been hanging for a month or six weeks, then the housewife can begin to use it. First she should begin by sawing or cutting into the flanks here and cutting out these pieces for stews. Then, next, the neck should be sawed off and cut up into pot roasts, and then gradually work up into the body. If the carcass is ripe to hang, as I have indicated, within six weeks there will be a chemical change take place in the fat of the sheep, so that it will not cling to the knife; neither will it cling to the roof of the mouth, and it will be as wholesome and sweet as any butter. People say they do not like mutton, but most folks say that simply because they eat mutton before it is fit to eat.

I want to tell you how to cook a leg of mutton. One way to cook it is to put it in a boiler with salt and water, and keep an account of the amount of water you put in. Boil it until you think fifty minutes more will finish it, and then put in a little red pepper, and put in one cup of rice for every five cups of water that you have in it. Cover it up and let it boil sharply for fifty minutes. Do not take the cover off. The important thing is not to take the cover off, because if you do you may burn your rice. But you can cook it in a tin pail if you wish to, and as long as you keep the cover on and boil it fast I will guarantee you cannot burn your rice. You simply pour the rice in and cover it right up and boil it as fast as you can. If you will do that I will guarantee that you will have as delicate a dish as can be eaten. Of course, skim off all the fat before you put in the rice. And then you do not care how fat the mutton is.

The limits of an ordinary cellar or front room used for storage purposes must always have a first-rate place in which to keep mutton. I do not think that the temperature amounts

to so much as people sometimes think in keeping meat. An ordinary front room is an excellent place in which to keep mutton as long as you keep it hung up and pay attention to these few points that I have been speaking of. So that every man must have about his house somewhere a suitable place in which to cure his mutton, if he wishes to enjoy some of the choicest meat ever made to eat.

Now, after you have killed your mutton you will find that it will not stand you in over seven or eight cents a pound, whereas, if you went out into the open market you would have to pay eighteen or twenty cents, I suppose, in Connecticut. There is quite a difference. Quite a saving. But you see that a farmer can have some of the very best meat for his table at a very reasonable cost if he will only exercise good judgment and carry out these plain little practical points that it is necessary to observe. If he will do that he can enjoy at his table such meat as is seldom found. Corned mutton is most excellent, but it should be given age before you corn it. If you do not, the fat will taste bad, and the lean will have no flavor.

Now, I do not believe in carrying a small flock of sheep on a dairy farm. There is a point I want to discuss. Some of you will be very successful, perhaps, in doing that, but I want to say to you that the buildings of an ordinary dairy farm are very unlike what a sheep wants, and if you have the cows, giving them your principal attention, you are taking away things from the sheep and giving them to the cows. The sheep get neglected. I believe if you are going to keep sheep it is best to keep a sheep farm and pay entire attention to it. Although for fancy purposes, if you want thirty or forty sheep around, that is another thing. Ordinarily, however, it is much better to pay particular attention to one particular line. But if you go into it do not be afraid to keep a lot of sheep. If you can do better with one hundred and twenty-five sheep than you can with a hundred, you can do better proportionately with a thousand than you can with a hundred. You must provide facilities, however, for properly taking care of a large flock. I believe myself that you can do better with five thousand sheep than you can with fifty, proportionately, and I will tell you why. If a man only has a few sheep they are apt to be neglected, and he will not take the care of them that he will where he has a substantial investment in his flock. If a man keeps

about twenty-five sheep around his barnyard they will get kicked and knocked around by the other stock, and comparatively little attention is paid to them. But even then there is usually a corner into which they can escape, and they will be fairly successful. If, however, he has a large flock he will pay more attention to them, proportionately, and he will make more money. There is this to remember, however. A man ought not to think that he can keep a hundred sheep in a space adapted for twenty-five. That, of course, is modified by the circumstances and care which may be bestowed on the flock. It is quite frequently the case that a large number of sheep can be kept upon a small area of land, and be kept there profitably. It is not an unusual thing at all, in places where intensive farrowing is carried on, for twelve hundred ewes to be kept in one flock on a comparatively small area. And the fact is you can do better with them because you can afford to have a man with the flock all the time and have them carefully watched and taken care of. In fact the best sheep I have ever seen were in large flocks. Do not be afraid, therefore, if your circumstances are such that you want to go into extensive sheep breeding, do not be afraid of a big flock, but use your multiplication table when you provide quarters for them. If you have ten sheep to feed you should provide trough room for twenty sheep. They will do enough better to pay for it. As I said before, sheep do not know very much. While there may be room enough for the whole ten at a trough built for ten, yet one will persist in crowding others out, and some will get too much and others will not get enough. They do not know any better. They will crowd into one corner, or into one particular place at the trough, and pretty soon some of the sheep will get discouraged and will not get up to the trough to get their share. When you go into the sheep business you should have sufficient trough space, so that when a sheep is crowded out of one trough it can turn around and go into another. So, if you have room for twenty, while you do not have but ten sheep, you can make sure that all can get their share. I think, therefore, it is a good rule to lay down, that you should provide just about double the trough space. If you have ten sheep, provide room for twenty. If you have a thousand sheep you should provide trough room for two thousand. Keep up that ratio and you will be all right.

There is another thing: I never would feed in a sheep rack.

I do not like it. It has been twenty years since I have used any kind of a sheep rack. I feed in winter on clean snow. I feed between times on the clean ground. In feeding grain I know a great many people use a trough ordinarily, but if you have a clean piece of ground, where it can be scattered, they will pick up every kernel of it. I should feed whole grain, if I had to buy grain. Now, it is a difficult thing for a man to handle, if he doesn't know how to feed without a feed rack, but he soon gets onto it, and I believe after a man has become accustomed to using the other way he will like it better. Just let me illustrate that a little to you; we will say here is our sheep pen at the barnyard. It is simple enough. Commence near the pen and feed on the clean snow. Do not feed on the dirty snow, but shake it along the edge of the clean snow. Of course, they will gradually trample it down and the snow will become dirty, but all you have to do is to extend your circle. Just keep feeding along on the edge of the clean snow. Then when the next storm comes go back to the shed again. You can always feed on the clean snow, and there is no way in the world that you can get so much feed into sheep as by feeding over the clean snow and giving them an opportunity to gather it up. Never allow them to leave any. Do not feed them a lot of herd's grass hay or timothy, or whatever you call it here. Do not feed them a lot of that kind of stuff that they cannot eat. If you do it will be wasted. Feed it to them gradually, and give it to them in such quantities that they will clean it all up. Make them eat it up clean. In feeding chopped corn-stalks and feeds of that character, apply the same principle. Do not allow them to leave a single piece. Make them eat it all up clean. It takes a little experience and judgment to start off with, but if you are careful you can soon gauge the amount of feed which they need, and by feeding on the clean snow, and on the ground, there need be no waste whatever, and in doing it you can make your sheep thrive much better than you can if you use a rack. I think that sheep ought to have some food of that kind, of course. I give them clover. Clover hay is the best hay, but any mixed hay is all right for hay. Also, any sort of weeds is all right for sheep, and they will make better mutton on it than they will on finer grades of feed. Sheep need water. That is, they require moisture. If they cannot get any moisture it affects them quicker than any other animal.

As I suggested in the opening, they must have some moisture once in forty-eight hours, and it should be left where they can get at it. I doubt, however, if the flock will ever touch water to any such extent as some of our friends think. I have reason to know that they do not. Still, without water, in a perfectly dry place, where they could get neither dew nor water, they would die much quicker than the ox or horse.

Another thing: it is important to keep salt before your sheep all the time. If I had a flock of sheep out on the mountains and could only get to them once a week, I should make it a point to salt them at least once a week. It is better, however, to have a box of salt in the field where they can get at it. If your sheep have not had any salt for some time, and it is then given them, they are apt to overeat it. But if you keep a box in the field, where they can get it when they want it, they will never overeat.

Another thing, of course, which is a great element in the success of sheep breeding, is to have a good market. You must have a good market. I apprehend that Hartford and New Haven are as good markets for sheep as exist anywhere. But you must have a good market, and then you want to deal with reliable dealers. I would not send a poor sheep to market. It pays to put only a first-class article into the market. Turn out a good article and the people will soon find it out, and you will be getting good prices for your mutton.

There is a gentleman here who is to follow me, who will instruct you on the question of lamb raising. That is a branch of the business that I know very little about. Therefore, I have avoided that subject. I know of many men who have been very successful, and in Connecticut today I think an old-fashioned flock of sheep, from which you can turn off part of your wethers, and turn off an annual supply of wool, with some lambs, will abundantly repay you for your labor.

Now, just a word or two in closing on the subject of diseases. You may think of all the ways you can to prevent it, and do everything you can to keep disease out of your flock, and yet sometimes it will strike you in spite of all you can do. That is quite true, however, of any live stock. I do not know that sheep are more likely to be stricken with disease, or are more susceptible to disease, and I am rather inclined to think perhaps they are not so much so as some other domestic ani-

mals, yet the presence of disease is something which you must be eternally on the watch for. There are some diseases which it seems to be almost impossible to get rid of. In England they cannot get rid of the foot rot. They cannot get rid of the big liver. Neither of those diseases ever trouble you much in Connecticut, but in all European countries they are more or less prevalent. It has been said that sheep could not be kept to advantage on damp, low lands, such as they have in Holland, but they have never given up the sheep industry in Holland. That is a country where they make every available piece of ground bear something. And, of course, water is all around it. And somehow or other they make the industry pay even there. So, too, in England. England has its fields that tenants are paying as high as seven fifty per annum rent per acre. They pay almost as much in the way of rent as your farm is going to cost you per acre. And yet, under such circumstances they raise sheep, raise splendid mutton, which they put upon the market and get fancy prices for. They have to get them in order to pay those enormous rents, but their method of sheep farming differs quite radically from ours, in that they keep a good many more sheep to the acre. There are a good many lessons which we can learn from the way they carry on the industry over there, and there is no reason why you cannot do well in the sheep industry and make it pay just as well as they do. It seems to me that you farmers in Connecticut have a good opportunity before you. As I understand it, you have plenty of land which can be used for sheep raising, and you have upon all sides of you plenty of good markets. It seems to me, also, that you are in no danger of very serious competition, so that you will most always be able to get good prices. It is not the sheep that are raised on the far western plains that are going to compete with you. You need have no fear of that. You can also sell your wool here and make a bigger profit on it than the farmers in the far west. It costs seven cents to get a pound of wool from Albuquerque to Boston, and you may be sure that the railroads will look out for their end of it and see that they charge enough, so that those farmers cannot compete with you, at any rate, seriously enough to crowd you out. There is room enough for all.

So far, I have discussed the subject from the poor man's standpoint, or from the standpoint of the man who has not the

money to go into the raising of pure bred, high grade, sheep. But I want to say a word on that question, because some of you may have an inkling to do that.

Now, in all of the great sheep raising countries of the world, where they run immense flocks, they cannot raise those flocks without constant infusion of new blood, because the climate is so dry that they cannot keep the quality in the wool. After a few generations the Colorado merino wool is as dry as a husk, and they have to use kerosene oil on their shears to keep them from sticking. So that every few years, and in fact all the time, those breeders have to draw on the eastern States, and on the middle States, for stock rams. So that in a dry place you do not want to go into merinos, neither would I advise the other extreme, the going into what is called one of the middle wools. There is no question, from a business standpoint, but what the business can be made profitable with that kind of sheep, but exactly as it is in other lines, you must know your business. You must know how, for the first few years especially, to handle the matter with a good deal of judgment. You must know how to build up your stock, you must know how to get good stock to sell, and to do that you must get good stock to begin with. Of course, the cheapest way, if you want to start off with fancy sheep, with English sheep, is to go to England and buy your sheep, and bring them over, and then you have got a foundation for the flock that is substantial, and which will give you a higher reputation in your community. I do not know of a more agreeable occupation, or one that is more likely to result well financially, than the breeding of pure bred sheep, but success in that depends entirely on the quality of your stock, on the output of the rams every year, and do not forget the important fact that among such kind of sheep fresh blood frequently is a necessity.

Even in Australia, a country which is noted for the extent to which the sheep industry has been developed, they cannot raise their own foundation stock. For two or three generations their rams are found to be all right, but they must have more new blood every little while, and in that way there is constantly being created a field for the introduction of pure bred stock.

Now, gentlemen, I have taken up more time than I intended to take in the discussion of these questions. I do not pretend

to know all there is about the sheep business, but I have learned a lot in my experience, and I would like to have any questions asked and I will do my best to answer them. Do not expect too much of me, however, for I am getting old, and I sometimes forget to bring out points that I intended to. Now, I hope that you will fire anything in the wide world that you have in your minds at me, and I will try to discuss your questions fairly, and answer them if I can.

I thank you, gentlemen, for your kind attention.

Secretary BROWN. I simply want to say that while Mr. Harris has had the advantage of me for the last hour, I am going to get back on him now. I told him that he could not discuss the question of mutton until we had sheep, and that, therefore, sheep should be the subject of his discourse. But, like the minister when he takes his text, it usually doesn't matter what the text is, he is bound to give us the same kind of a talk. And so it has been with Mr. Harris. He got back onto mutton, although his subject was sheep.

Now, after this very practical talk that Mr. Harris has given us, I know that some of you must have questions that you would like to ask him, and I hope that you will.

Mr. YALE. I would like to inquire about rape. What kind of rape is the best to raise? I have been raising the Dwarf Essex, and my sheep seem to like it very fairly well. I would like to inquire, however, if there is any better variety.

Mr. HARRIS. The Dwarf Essex is grown the world over, and is regarded as a very good quality.

Mr. YALE. Does that grow large enough?

Mr. HARRIS. Yes, the Dwarf Essex is practically used the world over. I have just landed from England, and over there, this year, the farmers are raising more kale than they have ever done before. Still, I did not find any of them that said it was better than rape. So I laid considerable stress on rape.

Mr. HINMAN. The gentleman said that his sheep are eating rape now. Does his rape stand high enough so as to stick out above this snow?

Mr. HARRIS. Yes. If you cultivate your rape fields right

you can drive a Jersey cow into it and not be able to see her back in the field.

Mr. SEELEY. A few words before we take up the next topic. We have heard the favorable side of sheep raising. I want to know something about the unfavorable side. We have got today, in the State of Connecticut, thousands of acres of sheep land back on the hills. We have been putting it largely into dairy farming, but those backlands, away on the hills, will not make milk very much longer, of the standard quality demanded nowadays, and the consequence has been that there has been a gradual withdrawing of our dairy herds from those sparse lands. Consequently, as the years have gone by sheep have commenced to roam over those sparse lands to a large extent, but I do not think that the industry compares very favorably with what this gentleman has been telling us in regard to sheep raising. I fully concur with many of his remarks, and I agree fully with him when he spoke about a man running a farm with so many sheep and so many cows, and running it all himself. That is the only way to make any money. And I am glad he has been thinking of those old men that lived 'way back fifty years ago, that did lots of work and saved their money. That is where they got it. I do not know whether the boys will ever do as their fathers did or not. I do not imagine that they will. I expected to see a large crowd of young people here today, and I am sure it would have been a great benefit to them if they could have heard what our speaker has told us. It would also show them what our fathers did in years past. I myself have been through just that kind of experience. I can remember about how we used to go out on a frosty morning, barefooted, and run and stand in place where an old cow had got up, so as to get our feet warm. I am afraid that the boys nowadays would not be willing to do as some of us have had to do.

Now, my question is, how can we make these back hill lands, these poor cheap lands, available today? As I view it, one

method is to use them for sheep culture, but there are some very serious drawbacks to sheep culture in Connecticut. We want to know how we can make sheep pay on these back hill lands, and particularly without interfering with our dairy interests. I think there is just one thing we want to do. We have got to grapple with this question, and we have got to bring about conditions where we can raise sheep. We want to get back to sheep raising. There is no question about that. Why, I can remember when a farmer in my town used to have a large flock. I have known my father to have five hundred. They used to make money, and they saved money, and the boys today, I think, are spending it. I do not think there is any doubt about it. They used to make sheep farming pay, and I am sure we can do it again. It seems to me that the young men of today are not alive to their opportunities. I know, of course, it is some work to take care of a flock of sheep, but it can be done, and done profitably. You can turn off lambs and sell mutton, the old sheep, and sell the wool, and in fact everything that comes from sheep is most always cash, and there is everything about it to encourage sheep raising. I concur in about all that this gentleman has been telling us, but he has taken a very favorable outlook of the sheep industry. He spoke about the good land being devoted to that industry, where you could keep a large number of sheep to the acre. It has got to be pretty good land to do that, and, of course, our hill lots will not do it. But it seems to me if we can encourage the boys to see what can be done in this line that most any of us, even on our small New England farms, can keep from twenty-five to fifty, or one hundred sheep, right along, and with our general farming, and dairy farming, it will make a more diversified industry, which will interest the boys and help to keep them at home.

Now, then, the great question is as to how we can improve our farming, so we can get sheep husbandry back in the State of Connecticut, and upon a paying basis. That is the question.

In regard to that, I would like to say just one word. I have had some experience, and it seems to me that one of the first things we need is a little more strict legislation on the dog question. Back in the town where I live the selectmen have come to this conclusion, and have for about twenty-five years back, that they will simply pay for the sheep that are killed, and not those that have been bitten and injured, while the law says that a farmer shall be paid his damage. Now you can easily see where that has led to. Perhaps in a flock of fifty sheep there may not be but half a dozen killed, but it may be that the flock has been chased and worried and scared by dogs, and injured, so that it is a long time before it gets back to its normal status. May be they have been chased and they are scattered for miles, and perhaps you are obliged to spend one, two, three, four, five, and six days in a week in looking after them, and perhaps with a man or two, and perhaps never find them all then. That is the way things have been going on. It is wrong, and it is time it was stopped. The consequence has been that farmers in Connecticut have not cared to go into the sheep business. I do not blame them. And it has resulted from what I believe is an entirely mistaken policy upon the part of our selectmen. It seems to me that they ought to pay all the damages. I thoroughly believe in that, although I should have to help pay it myself. And there are a good many other things connected with it in regard to which it seems to me we ought to have a little more strict legislation and thereby encourage the reestablishment of this important industry in the State of Connecticut.

And then another thing I want to speak of. We have got to have a change in regard to this dog question. It is very often the case, as we pass along the roads, to see two or three dogs lying around a house, and in a good many cases the people who own the dogs are not able to pay for any damages that they do. What are we going to do about it? Why, the town has to pay it. There are lots of those dogs that do not pay a

cent into the treasury, and our town authorities do not follow the matter up, and consequently there are a lot of dogs on which no taxes are paid whatever. And a good deal of that is due to the fact that lots of people think more of their dogs than they do of the development of the sheep industry. And that is one of the first things we have got to do. We have got to get the sentiment in the State of Connecticut on the side of the sheep breeding question stronger than it is on the dog side. The dog sentiment today stands first. In a case I know of there was a man that had three sheep killed by a dog. The man who owned the sheep shot the dog. The man who owned the dog appeared and he says, "Here, you shot my dog." "Yes," he said, "he had been chasing my sheep." "How much do you call your sheep worth?" He told him the amount, and the owner of the dog pulled out the money and paid him. Then he turned around to him and he says, "Now I want you to pay me for my dog." "But your dog killed my sheep." "Well, that is all right, I admit that the dog killed your sheep, and I paid you for your sheep, but that dog is my property and I want you to pay me for him, because you shot him." "How much do you ask for your dog?" "One hundred dollars." "I won't pay it." What was the result? The result was he was forced to go to law and finally had to pay for the dog and the expenses for fighting the suit. Now, gentlemen, under such circumstances as that there is certainly no encouragement for a farmer in Connecticut to go into sheep raising. We have got to have a change in that situation. So long as the dog sentiment stands first you are simply driving sheep husbandry right out of the State as fast as you can. We want to get the sentiment on the side of the sheep business. It seems to me if we can do that it will overcome a good deal of the difficulty we are at present laboring under, and will thereby help us immensely along that line.

Mr. STADTMUELLER. Mr. President, I would just like to emphasize the remarks of the previous speaker and point out

briefly the necessity for the existence and organization of the Connecticut Sheep Breeders' Association. The lack of sentiment in favor of the sheep industry can be overcome only through some organization like that. It seems to me that such an organization is a paramount necessity if we are to develop in Connecticut the necessary sentiment to reestablish sheep industry. Now, I think it is true that as farmers we are a little too lax in espousing organizations to protect our personal interests. Modern industries are built up along lines of such close connection that farmers must get together in their various interests just the same as any other, and especially be ready to protect themselves. Nobody is going to protect them, and nobody is going to protect the sentiment in favor of the development of the sheep industry except the men that are interested in it. You are not going to have any dog fancier do it, and you are not going to have anybody who is not interested in sheep. That is not to be expected, and we might as well give up all thought of it to begin with. It has got to be done by the sheep men themselves. We are the ones that must develop that sentiment. And in my judgment it is all our own fault that such a low state of sentiment in favor of the sheep industry exists in Connecticut at present. We must not complain, but I certainly feel that we have had ourselves to blame, in a large measure, for the situation which exists, but let us remember that and try, through the Connecticut Sheep Breeders' Association, to develop that sentiment again.

Now, as to the matter of town officials adjusting damages. As was remarked in my address, I believe very much could be accomplished if we had a good strong organization of sheep breeders, which would keep the breeders in this State active and interested in the matter, and prompt them to approach the town officials in cases where damages are to be adjusted. If we had an active membership that would notify the officials of the Sheep Breeders' Association of such cases, and let the officials of the association get into touch with the selectmen,

or if such members would ask them to assist them in such cases, and go out and meet the selectmen and explain the matter to them, that there are more ways than one of looking at this question, I am quite sure it would result in great good. You cannot blame the town officials for being anxious to keep down the expenses of the town. It may have been a short-sighted, or a long-sighted, policy, according to the point of view you take of it, but be that as it may, it is up to you, as sheep breeders, to show our selectmen the error and to bring about a better condition of affairs. Otherwise, do not complain if our selectmen keep on the way they have been doing. I believe and have faith that the average selectman of the State of Connecticut, if this matter is properly unfolded to them, and it was disclosed to them that through the encouragement of the sheep industry will come one of the means, if not the only means, of reëstablishing land values, and that through the reëstablishment of land values will come the reëstablishment of the grand list, and thereby the income of the town increased; and that the only feasible way, the most direct way and the most practical way, of putting the business of the town upon a good basis, will come, in part, by encouragement of the sheep industry, I believe, as I say, if that matter is fully explained to our selectmen they will coöperate heartily in what we wish to accomplish.

We want a liberal interpretation or allowance for damage to sheep. Every one has got to work for it. We cannot get it through legislation. All we need is faith in the work, and to put our shoulders to the wheel and go to work and get it. If we do not we never will get it.

Mr. HINMAN. I must disagree, Mr. President, in one respect, with what has just been said. It is not pay for the sheep which have been killed that we have got to look out for. The whole trouble about this matter is simply this: you cannot regulate the dogs until you can get the farmers to stand together and take united action; until you can get the farmers (and I am sorry there are not more here that are sheep men),

until you can get the farmers of Connecticut, until you can get the farmers in the General Assembly that is to meet next month to fight for a law that shall take care of the dogs, as they do in some States. If you can get the farmers in the General Assembly to stand up for a law that will take care of the dogs, that will settle the question. But so long as three-fourths of them will vote right against their own interests on such a matter as this, there is nothing that can be done in Connecticut. The very last time there was a bill brought up, our president said if you can get the dog fanciers and the sheep breeders to agree, we can get it through, but there was no use in talking about that. And yet it was a bill that ought to have been passed. There was no objection to it from anybody, because it was so simple and square and honest a bill that nobody could do anything against it, but when it came up to the farmers of the General Assembly they fought it as squarely as they ever fought anything on earth. The farmer loves his dog. You can do what you please, and you can say what you please, but until you can get the farmers of Connecticut to allow the men that keep sheep the same privileges that they allow those who keep dogs, it is absolutely useless to talk.

Good mutton we can raise in Connecticut. There is no question about it. We can raise the best in the world in Connecticut. I was up at Mr. Gold's, some years ago, and he asked me to dinner. He said to me, "Will you have a little of the mutton, Mr. Hinman?" I said, "Why, yes; I am fond of mutton myself." After I had got rid of the first piece he said, "Will you have a little more?" And I said, "Mr. Gold, it seems to me you make a mistake in calling that mutton. It seems to me you should have asked me if I will have a little more lamb. That tastes more like lamb to me than mutton. When it comes on winter, then, if you ask me if I will have a little more mutton, I should think that was appropriate." He turned around, and he said, "Charles, how old was that old ewe?" The fact was it was an old Southdown, which had been

fatted nicely, and it was nicer than any lamb I ever ate in Hartford. It was raised on the Litchfield county hills, and it had not been shipped all over the country before being prepared for eating. It was as nice mutton as I ever ate in my life, and if he had not inquired of Charles how old it was I never should have known but it was lamb. We have got the best land in the world to keep sheep on, because it is sheep land, and it is land exactly adapted for what sheep want. The only objection, and the only hindrance in the way of the development of that business is the dogs, and we cannot get rid of the dogs until the farmers of Connecticut say so.

A MEMBER. Mr. President, I would like to hear about the raising of lambs. I would like to hear the gentleman speak that was going to speak on lambs.

President SEELEY. The gentleman is going to speak on lambs now. I was just about to introduce him to you. We have brought a gentleman from Ohio, who is now going to address us on the lamb question. His address will follow right in and supplement the one made by the gentleman from Vermont. It gives me great pleasure to introduce to you Mr. Joseph E. Wing of Mechanicsburg, Ohio, who will speak to you on the subject of "Money in Lambs."

MONEY IN LAMBS.

BY MR. JOSEPH E. WING of Mechanicsburg, Ohio.

Mr. President, Ladies and Gentlemen: It gives me a great deal of pleasure to come here and speak to you today, even though I am somewhat unacquainted with the conditions prevailing in your country. Of course, I have read a great deal about your abandoned farms, and I did not know exactly just what condition New England agriculture was in, so I came down here today with a great deal of anticipation, thinking I would see something of the far-famed New England country towns, but I have not seen very much. I came down from Canada, and on the way down from Montreal, through Vermont and Massachusetts, I saw but very little of your land, but I have been charmed with what of New England I have seen.

Now, about "Money in Lambs," and how to get it out of them. I am very sorry there are not more young men here to hear me. It seems to me your New England farmers, in view of what I have been told, have a great opportunity before you, and perhaps some of these things that I will say may be of advantage in helping you to develop that opportunity. Of course, it is almost impossible, especially before a New England audience, to say anything new, and I do not know whether I can really do much good or not. But I am going to tell you how we carry on this branch of farming in Ohio, and if you can apply it to your conditions here in Connecticut I should be glad. If you cannot, I am only sorry that I have wasted my time and yours in coming here.

Perhaps, to make what I shall say to you later a little clearer, I should say something first about the conditions that obtained on the farm where I first undertook the business of lamb raising. Thirteen or fourteen years ago I came back to Ohio from the far west. I had a good position in the west. I was manager of a large cattle ranch, and I had a pretty good position; with a good outlook for the future. I came back to my old home in Ohio because my father had gotten old and wanted me to come home. When I had been there my father and I had been sort of partners on the farm. We had sort of grown up together, and when I was a little boy he made me his confidant, and I knew how to do all sorts of things. So when I went west I was pretty well equipped in the knowledge of farm work, as it was carried on in Ohio. It was certainly a great advantage to me. I became rather restless and left my home in Ohio and went out to the far west, and lived there for a number of years. Then I got a letter from my father telling me that he wanted to have me come back to the old farm. So I gave up my position and came back to Ohio. You have your problems here. We have our problems out there. Your farms are being deserted, they tell me. Your farms are not productive, especially on the hills, they tell me. Our farms present some discouraging features, as I shall detail to you a little later. When I came home to that old farm I found the same conditions there, almost, as existed when I went away. I remember as though it were yesterday, the day I stepped off the cars in 1889. It was just about this time of year. Just

about a week later than today. It was the day before Christmas. I remember how happy I felt when I stepped off the cars and started off toward the old home of my father. I started to walk over the four miles, going home to my father's farm, and it was with a feeling of elation that I kept discovering upon every hand things with which I was familiar in my boyhood. I remember how happy I was to see it all. And I remember very well how happy I was when I stepped on an old bridge and saw the water running beneath, and saw the little fish darting here and there, just the same fish, it seemed to me, that I had left there when I went away. And it seemed to me as if they were there to welcome me back to the old home. And when I got near the old place I stood there gazing on my old father's farm, and how familiar and fresh everything appeared to me. It seemed to me like getting back to heaven. After the first raptures of home-coming were over, my father said to me, "Let us go out and look at the place." We went out, and oh, how the old farm had changed. My father had changed, too. I could hardly think it was the same place. We used to think it was a fairly rich farm, and that we were fortunate in having such a good place, but somehow or other it did not seem to look just the same any more. Years before I used to think it looked so big, but after coming back from those great plains in the far west, oh, how small it did appear to me! I never shall forget how it came over me, and it did not seem as though I should be able to adjust myself to those new conditions. There was the barn that I used to think was so large, and I well remember how proud I was the first time I filled that barn with hay. I began to think what I could do, and the more I thought of it the more restless and discontented I became. I tried not to show my discontent, but my father saw that I was restless, and he said, "My boy, now I suppose it is true that you did a great business in the west. I suppose it is true, as you say, that you had two thousand head of cattle to look after." I do not believe that the old gentleman ever believed it was true. But I remember very well how he went to the shelf and took down his account book. He was a New Englander himself. He always kept an accurate account of everything. If he owed a man that man got it. If that man owed him anything he got it too. He showed me that old account book, and showed me the hay he had cut, the wheat,

and all he had sold off the farm that year. Footed it up, and the total amount—how much do you think it was? A little less than seven hundred dollars. Why, my heart sank like lead. I had given up a place that paid me a salary a great deal better than that. And I thought, "What have I come home to a farm for where the whole receipts are less than seven hundred dollars a year?" I did not know what I should do. What do you suppose the first thing I did was? I simply had to make up my mind to make the best of a bad matter and see what could be done. I said I have got to go to work and do all the work myself. I have got to get up at four o'clock in the morning to feed and harness the horses, milk the cows, and clean the stables, and do all this drudgery. Got to do it all myself, because I cannot afford to keep a hand on a farm that only yields a total of seven hundred dollars a year. Father saw how I felt about it, and he said, "My boy, I used to make more money when you were with me before, but times have changed. I am getting old, and hired men are no good any more." It seems to me that I have heard that several times today. I have an idea, I know, they are with me, that hired men are necessary. It all depends on your getting the right man. But to come back; my father said to me, "My boy, I want you to go ahead and do anything you want to. You go ahead and do what you are a mind to, and let me help you. Let me be the boy." I could not help but think of that this morning when the president of Trinity College was talking, when he told about his father turning the grindstone while he ground the scythe. That was about my situation. It took me a long time to adjust myself to those new conditions, especially after what I had been used to in the far west. I never did become entirely adjusted to it, but when I heard him tell that story this morning it seemed as though I just fitted into the story.

Well, I went out and looked over the farm, and began to calculate what had to be done. I saw a field which I thought might serve some of my purposes. It was a wet, damp, poor kind of soil, a wet, sticky, miserable soil, and I looked at that land, and I could not help but think of some I had seen in the far west. There was no help for it, however, so I said to my father, "Father, I am going to drain this plot." I got right down to digging ditches, and dug ditches most all that winter.

I am telling you all of this because it has its application in what I am to say to you a little later in regard to what I did on that place. I put in tile, and succeeded in making that old field dry. I did not care what it cost. I had made up my mind that I would make there something that would pay. I had made up my mind that in that wet, cold ground, as the result of work, I would make it dry, and make it yield something worth while. I made up my mind that I would make it rich, so that clover could grow on it; so that somebody, even if I did not do it myself, would be able to keep more stock. I intended, of course, to avail myself of it, and I was determined some day to make that thing pay. I used to talk with my father about it, but he had been used to a different order of things. He had faith, however, in my push, and he said to me, "You will never believe what can be done here until you try it. Go ahead and do whatever you are a mind to. If you do it, then you will believe it." Well, I went to work on that farm. I had always thought of raising lambs, more or less, but the only trouble was I had not thought of it enough. The idea at that time did not come to me what possibilities there were in that business. But all this work that I was doing, as it turned out afterwards, was simply preparatory, and was work which needed to be done. The farm was poor. The first problem that I had to face was to build up the fertility of that farm. I well remember the first summer. I had to face the same kind of a problem that many of you here undoubtedly have had to face. I said to my father, "I want bigger fields. I want more room. I want to keep more stock." I had made rich a little spot on that farm, but the most of it was poor. I was anxious to make it do the best it could. I said, "Father, I am used to more cattle and more stock. We haven't any sheep. We have only a few cattle. I am used to more cattle than we have here. I am not satisfied to take care of six or eight head of cattle. I have been used to taking care of large numbers. We must arrange things here so we can take care of a good many more than we have." I thought at that time that we could. I told my father that I thought I knew how it could be done, and that I was going to try it. He said, "Go ahead and try it if you want to." I went to work with a will at that farm. I tore out some of the wood and brush and scrubby portions of some of the fields on that farm. I tore out some of the fences and made another

field. I laid out a new land and made an entire new arrangement out of that old farm. I remember how that first summer I went back and forth between the fields and the barn and the house, and I could not help but think, as I looked over that place, how far it fell behind what it ought to have been, and how far short it was of the land on the prairies of Illinois, Kansas, and Nebraska, that I knew so well. That thought ran in my mind all the time. That was one trouble with me. I could not be content to carry on farming as we were compelled to do on that small place in Ohio. I could not see to my entire satisfaction, at that time, how it could be made to pay. I said to my father, "This land is poor. It does not pay to carry on farming here and raise crops to compete with those raised on the prairies of the great west." I said, "I think we make a great mistake. This soil has got to be made rich before we can raise crops with which we can compete with the west in farming," and so I constantly took counsel with myself and studied how to make improvements; how I could bring that land up to a high state of fertility, where it would raise good crops that would pay some money. I knew that it had run down. I knew that something must be done. I did not know then of the fertilizing power of clover and other legumes. I knew about stable manure, and about the advantage of keeping live stock on a place, but I did not see how I was going to bring that farm up to a high state.

And right here I want to tell you a funny thing. It has nothing to do with sheep in the world, but it does explain how I solved that problem, in part. A mile and a half away was the village, where they wasted a good deal of their manure. It was a village of a couple of thousand inhabitants, and I could buy the manure for twenty-five cents a load. I thought that was going to solve my problem. I made a great wagon box, wide and deep, a regular hay rack, and I had a big pair of Percheron horses, so that I could draw a big load. Then sometimes, when some man sent me word, I would go up to the village and buy it and draw it out to the farm. I felt mighty glad when I got those big loads of manure, and I would just think to myself, as I was going home, "Why, in this stuff I have got something which I can spread out there, which will bring my farm up, and where it will be forever." And so I pushed the horses along as fast as they could walk. I felt

that I had a solution of my problem. And do you know that on those loads of manure I felt mighty proud sitting or standing there on that load hauling it home, although it is not always a fine thing, in any sense, to sit or stand on a load of manure. But I felt in drawing that down there that I was soon going to make that country rich and more like the lands in the far west that I had known; into a land that should be rich and black as the land of Illinois. But I said I was going to tell you a funny thing. I was riding out on one of those loads one day when I saw a carriage coming. I thought I must pull to one side so as to let the carriage pass. I recognized who was in the carriage. Out in that country there was living there then, and there is living there yet, a real nice man, a very cultured and refined man, who had some beautiful daughters. I knew them. They seemed to like me well enough when I had my good clothes on. And sometimes I used to meet them when I did not, but that did not seem to make any difference. However, on that occasion I perceived one of those young ladies, and I thought, "There comes Miss ——, and I will have to get out of the way with the wagon and give her a chance to get by, and when she gets up even with me I will give her the nicest bow I know how." As she approached me she did not look at me. I thought, "Why, that is funny," but presently when she got right up within a few rods of me I saw something happen which surprised me; that poor girl had been stricken with blindness and couldn't see me at all; never looked at me in going by. At first it was with a feeling almost of rage, and then I thought, "You can go by me in that high and mighty way if you are a mind to; with all your chances in life," I thought, "and with all you enjoy, and with all your value, and your farm to boot, I would not have that spirit to go by an acquaintance because he happened to be on a load of manure. Is it nothing to you, young woman, that I can draw this load into a field where the field is dry and barren, where nothing grows; that I can drive in there with a load of manure, and by the use of that cover it deep with clover or corn; that I can make grain grow and raise good crops? Is it nothing to you, young woman, that because of this I can make that farm fertile and in time make a home for that sweetheart of mine and those children I hope to have some day?" So, full of these thoughts, I drove into the field and began to throw down big

forkfuls, and as I took it out I said, as I threw it onto the ground, "There is one and there is another. Now you be good, and you be good, and you do the best you can for me."

But I found after a while that I did not have to haul out manure from the town. I did not build up the farm with it as I expected, and then I began to think what I could do. I saw that I could not build up the farm fast enough in that way. Of course, it was valuable enough in itself, but it cost too much to draw it out. Then I turned my thoughts to other things. My father had never kept much stock on the place, and what he had kept had perhaps been of the wrong kind. I wondered what I could do. Then I thought of sheep again, and I thought of lambs. I said, "Here is a little lamb. Is there any money in him?" We feed him while he is a baby. I grasped at the idea. I thought possibly there was a solution of my problem. And all my life I had been taught how much easier and how much less food it took to make a baby grow than an old animal. I said to myself, "I am going to try lambs and see what can be done." So I went out and bought a couple of hundred lambs. They were lambs that had been born in the spring. I took them home and put them in the barn. I bought the littlest ones I could find, because I hadn't the money to buy larger and more expensive ones. I had to borrow even as it was. I was living alone on that farm, without any money to go on with, and I had to do the best I could. So I bought the littlest ones I could. I built a place for them and commenced to try my experiment. There I fed them, there I took the best of care of them, and began to study how I could do the best with them. And I want to say this, for the encouragement of the business, that I never have yet fed a bunch of lambs that did so well as that first one. It was a great experience for me. And I was just as careful as I could be with them. If I had been feeding a typhoid fever patient I could not have been more patient and careful with them. They grew to like me, and I grew to like them. They would keep all around me and nibble at my coat tails, and put their noses up into my hand, though if I would try to touch them they might run away. I would stand and look at them. I tended them with the utmost care and in the best manner I knew how. They weighed fifty-six pounds on the average when they went into that barn, and as the result of my care and attention, I believe, they weighed a

hundred and eight pounds and a half when they went out late that spring. Was not that a triumph? I did not lose one. Not one in all that whole winter. I have never done that well since, but as a result of that experiment I made that one winter a profit of one hundred and fifteen dollars on those lambs. That was enough for me. I said, "I am going into the lamb business." I made one hundred and fifteen dollars, and that was after I had figured all the work and all the feed, together with the cost of the flock. A clear profit of one hundred and fifteen dollars. Then I said, "Now I begin to see daylight. Now, it is only a question of having enough lambs, and I will make this thing pay." In my prosperity I kept it all to myself. I did not even tell my wife. I said, "Some day I will feed a thousand lambs on that farm." I did not tell anybody of it. They would have thought I was foolish. Today there are on that farm a thousand lambs, and a hundred breeding ewes helping me to raise that flock. They are all being fed on that farm. I had to borrow money to do it. I would not advise everybody to borrow money, but I did it in my case and got out of it all right. I was a little astonished to hear this good friend of mine, who addressed you this morning, advise you to do the work yourselves. We tried that, my brother and I. I called them home, just as my father did me, and my two brothers are there feeding sheep today. We tried to do all the work first, and then we began to hire some helpers, but we did not do so until we thought we were in a position to hire some additional help. We tried to keep it all for ourselves and turn the results of our labor into money. We were quite successful. Of course, with the increase of the business we had to increase our facilities for handling the flocks. We had to make money then on the farm. We had to build barns. We had to pay out a good deal of money for our sheep, and we did not always pay our own money. Sometimes we had to borrow. We borrowed a good deal. I do not advise any one to borrow money, but I am just telling what we did. We had to borrow money until the debt got pretty heavy. We had faith to believe, however, that it would be all right. We had faith in the enterprise, for this reason: that while the debt was going up all the time the prospect of final success kept growing brighter. The prospect of success was beyond anything we had expected. I saw that the farm was producing better. We had our fences

in good shape. We used to take care of our fences and do some work on the farm in between. Just living half the time between the flocks and the fields, and during that time we made over some of the poor spots, improved the whole farm, until we finally got it so that we could take care of a thousand lambs. We kept hard at work, and finally, four years ago, there came a good year, when we had a thousand lambs on the farm, all as fat and sleek as they could be; all in the best of condition possible to send to market and realize good prices. I sold them out, and, of course, when the checks came back, one at a time, we were in a position to get out of debt. I never did anything in my life with greater satisfaction. I took those checks and laid them on the banker's counter and asked him to take out what I owed him and let me know what balance I had left. I knew him well. He used to come out to the farm and look at things, now and then. I suppose he wanted to see just how things were. I told him I wanted to pay every cent that I owed him in cash; everything that I owed anybody I wanted to pay in cash. We owed this banker a lot. I had not figured it up to know just how much we did owe him, but I said to him, "Now I have got money enough to pay that debt, to cancel all the notes which you have against me, and I want to pay that, and then I want you to tell me if I have anything left." He figured up for a minute and handed me back a bank sheet showing the state of my account, and showing me that I was on the right side of the books. I had almost six hundred dollars in clear money. I was surprised and delighted. The farm was all paid for, and we were out of debt. We were all right then, because we were out of debt. That was a happy day. I went home and told my wife about it. When she saw me coming she stood in the doorway waiting for me to come, and when she saw my face she knew the story, and we were both of us so happy we could not say a word. Then we figured that night what we had made in profit on the farm, and we found that we had made more than twenty-five hundred dollars on that same farm, which had only given us a gross return when we began of seven hundred dollars. And there has not been a year since that we have not done as well. Cleared away all the debts, cleared away all the poor spots on the farm, so there are not any any more. We have moved the line fences back, and have built two new homes on the farm, one for my

brother and one for myself. That is what the sheep have done, or the lambs, and that is why I have the courage to stand here and talk to you about them.

There have been two branches of the sheep industry which we have followed. The first is, where we buy the lambs and fat them; but, of course, there is more profit in having the lambs born on your own farm, and feeding them to fatten them, than there is to buy them outside. It is much better to do that on the farm than it is to go to the trouble and expense of finding and purchasing the lambs. I am going to talk to you about that in the first place. Of course, one of the most important things is to make sure that the flock is well taken care of, but it is hardly necessary for me to say much about that now. Mr. Harris has discussed that question. I am glad that Mr. Harris has given you the good instruction he has about the care and breeding of the flock. That is a very important point. That is what we believe in, and what we try to do; that the ewes especially shall be strong and well nourished when they go into winter quarters. If the ewes are strong and in good condition, you will have strong lambs when they are born. Of course, in that connection the question of feeding is an important one. I feed some rape, and approve of it, the same as does Mr. Harris. I do not feed it quite so long as he does, because I do not have quite so much feed. Besides rape I have to have some dry clover hay. We want the ewes to be strong and well nourished, and not fat like this quarter which Mr. Harris exhibited to you. Ewes for breeding purposes should not breed too fat. You want them to be well nourished and strong, but not too fat, and then when the lambs are born they will be strong. I believe what he says is all right about their taking a walk out doors every day and having plenty of exercise. Sheep, of course, as he says, need plenty of air, but I would like to tell you that our barns are so built that they are almost like out of doors. We have them so arranged that clear along on one side is a raised door, or a door which is attached by hinges at the top, and which we can raise or lower at will. Then if the wind blows from that side we can close down that side and protect the flock, and give them plenty of ventilation from the other side. Or if there is a regular blizzard we can close down both sides and ventilate from overhead, and so protect the flock from chilling winds. Our sheep are

always put in the barn at night. We do not want to run the risk of having little lambs born out in the snow bank. It is a good deal better if the lambs can be born early, and if the flock is well taken care of there is no reason why they will not do as well. We do not find any more loss among them by being born in cold weather, but it is because we look after them carefully. Many and many a time I have gone with my wife to look in the pens among the sheep to see if the little ones were strong and all right, and if the ewes were all right. So bear those two points in mind if you are going to raise lambs for money. First, not to let your ewes get too fat, and, second, to take the very best care of your flock, so that the little lambs will always be born strong and well.

Now, another point. When the lambs are born we just simply make a little pen in the barn, that is made up of two pieces hinged together, two panels like, like the two sides of a gate; we take that and put it up in some corner in the barn. It is made just so that it opens and fits into the corner, the outside corner being hinged together at the ends. We take that and put it up in some corner of the barn, and it makes a little pen something like four feet square. Sometimes we use that and put the ewe in it, particularly when it is necessary for her to have careful attention. Then when the little lambs are born we put them with the mother. We believe that that is an important thing, and it is certainly a saving of expense. In that way it makes it very easy. We do that for several reasons. In the first place, an old ewe does not know her lamb except by the odor, and the lamb only knows its mother by the call. They have a good deal of individuality, and we think it is a good policy to always shut them up a little while. Of course, after the lamb is born the udder of the ewe will be full of milk, or should be if the ewe is in good breeding condition. An old ewe will always own her lamb if her udder is full of milk, and that is one of the points that we are careful to look out for. If she has not got plenty of milk she will not own her lamb. We try to raise the lambs, or to give them a good start, on their mother's milk. After a ewe has been parted from her lamb we can still use them, and we try to encourage the ewes to adopt other lambs, and so we keep them at work in that way. We place them in a pen and put the lamb in with them and try to make them own them, and as a usual thing they will

do so as long as there is a good supply of milk in their udders. After the lamb is born then our method is like this: There should be two or three pens for lambs of different ages. We put them by themselves and then begin to give them, gradually at first, a little more variety of food. We also do the same thing with the old ewes. We begin to give them a little richer feed, so as to increase the ewe's milk, not only to increase the quantity, but so she will give it up more readily. Then, too, we always pay careful attention to this fact: For a week, after the little lamb is born, we milk her out every day, clean. That should be done particularly in cases where the lamb is unable to take it all. If we do not want to do that, if we have got a big lamb that can take it, we catch the old ewe and put this lamb on, and he will usually clean her out good. Generally we will have half a dozen that we are able to use for that purpose. You see if a ewe gives more milk than the lamb can take, of course, the milk is not all taken out, and that interferes with the length of time that the ewe stays in milk. It is an easy matter, in such cases, to arrange so as to have lambs that will run up and clean out the ewe. Of course, there are good reasons why the lamb should take what it can after being born. It is the natural method, and a lamb needs that for medicinal reasons. It does not do to take them away too quick, certainly not for three or four days, as it is very apt to kill them. Our ewes are such large milkers that the little lambs almost never can take it all, and so we have a surplus to use for others. We find that fact a strong element in our success. We try to increase the milk-giving habit of the ewes, because we want to hurry that little lamb along into quick, fat mutton. The lambs, too, must have a chance to be by themselves. We cannot hurry them along as fast as it is desirable, we cannot go to that extreme just on the mother's milk alone. So in some corner of the barn we pen off a little pen — not too little — in some place where it is easier for the lamb to get into it than anywhere else, making it where it is natural for them to get to it, and placing it where the ewes are all around it. The pen should be made with panels wide apart, or pickets spread from one another, so that the lambs can run through easily. I find that our ewes cannot follow the lambs into these little pens if we have the pickets about seven inches apart. These little pens should be placed so that the lambs can run back to their mothers and placed so

that the old ewes cannot follow. That, of course, gives us a chance to separate the little fellows from the ewes, and to feed them separately. In these little pens we put a flat-bottom trough with a board over it, so that the lambs cannot get in, you know. In that trough we put ground feed at first. I do not care very much what you put in, wheat bran with a little linseed meal with it, or a little cracked corn, or even some wheat middlings. I do not like that so well because it is too floury. Wheat bran and a little cracked corn, with parts of linseed meal, is what I use most. They will not eat it for ten days or two weeks unless you educate them a little. If you are careful to train the little fellows to eat, and if you accustom them to being handled, there is no trouble to hold them up, and pretty soon they will like it; they will not object to that, and then you can take a little of this stuff in your hand and put it in the little fellow's mouth. Put your hand up to his mouth and may be all at once he will find out it is good and commence to eat. Then give him some more, and some to some of the others to eat, and pretty soon they will all follow that example. It is surprising to see how quickly they will do it sometimes. I have often used a little coarse brown sugar in order to encourage them to eat a little quicker than they otherwise would. After they get to going then give them all you can possibly get them to eat. That doesn't mean that you can put it in in great quantities and leave it there all the time. That is not the way to get them to eat, because if they go there and find the feed always there they simply nose it over and somehow or other it becomes distasteful to them, and they do not take so much of it. They will not eat so much. I do not know whether these boys here before me know how to keep in a girl's good graces. There is a little lesson in this, so let me tell it. When you go to see a girl, if you leave just five minutes before she wants to have you go, the next time you go to see her she will say when she sees you coming, "There is that fellow coming again. I am glad to see him, because he never stays too long." If you stay just five minutes longer than she wants to have you, then what does she say? Why, she sees you coming, and she says, "There is that fellow coming again that bored me so the last time he was here." That applies to lambs also. If they have a little bit less than what they want to eat they will come back with a big relish the next time. For

that reason we try to feed them so they will eat up all that we give them, and get good and hungry by milk time. If there is a little bit that is not eaten up we take it and give it to the ewes.

I want to emphasize this point. I do not know whether I have brought out this idea with sufficient force to make it as clear to you as I would like to. There is a great deal in handling the flock in a perfectly natural way. Handle the ewes and lambs so naturally that it will seem perfectly natural for them to run in and out among each other, and by having these pens placed as I have described that goes a great ways towards keeping the flock contented, as it allows the lambs to mix with their mothers, and they do better in consequence. Lambs do not want a hothouse. I think I have already told you that they want plenty of good fresh air. I do not mean by that that they can stand it*to be kept in a cold or damp place. They cannot. They do not want a cold place, where the wind blows through. They want to be protected from strong winds if possible. It is better to have a place that is open to the south, if open at all, with the wind all shut off on the other side. The place should be arranged in such a way that the wind can be shut off in the direction from which it comes.

Now, when the lambs will dress from thirty to forty pounds they are ready to go to market ; to ship to New York, to New Haven, or any other place where there is a good sale for them. I do not know much about your local markets. I know what the markets are in our large western cities, and after figuring up the cost of raising you will find that they have cost you less per pound to produce, by reason of shipping them off in the way I have been describing to you, than they will if you carry them on for a year. They will bring you from six or eight to ten dollars apiece, and sometimes even more, and it is almost like finding money.

When you take them away from the ewes then you can put others on. Perhaps there are twins, and one of them needs more help and nourishment than the other. Just take an old ewe that has parted from her lamb and put her in her pen, and try her to see whether or not she is milking in good shape, and if she is, and she objects, just put her neck in the stanchion. All that is necessary is to keep her quiet, and to prevent her from running around. I just drive two stakes down and tie

them together and then put the twin lamb in with the ewe, and with the twin there, if she does not kick too much, he will help himself. After he has taken nourishment from this foster mother for a few days she likes it just as well as though it was her own, and she will raise him. If you do not want to do that you can simply catch her once or twice, or three times a day, and let the little fellow clear the ewe out while you hold her. Perhaps it may be necessary, if the lambs are quite young, to milk her out afterwards, but that is not usually so. After she has served your purpose, and when it is necessary to dry her up, if you will stop the grain feed and give her some timothy hay, that will do it every time.

The little lambs are fed. It is better sometimes to feed them so as to shove them along as fast as possible. Of course, you want to get them into market as soon as you can. I will give you my ration that I give them first. It is corn meal and wheat bran, equal parts of wheat and meal. I put in about ten per cent. of coarse ground linseed meal or oil cake, as the Englishmen say. I find that that agrees with them first rate, and they do very well. I give them a low trough and let them eat all they want. What they do not eat I give to the ewes. The soy bean, such as you grow here, makes the best thing I know of to furnish the protein for lambs. I believe that is grown here, as well as with us, for that purpose. We do not have any trouble in growing it, and I do not think you will have here. At least that is the way I understand it.

The principal thing to be aimed at in selecting the food and fattening the lambs, is to get them into condition to be sent to market as soon as possible. This method of grain feeding, mixed with the mother's milk, makes the cheapest lamb food I know of, and they seem to do the best on it. They will always bring a good price.

I cannot quite agree with my brother here when he advises you to carry them over whether your prices are good or not. I do not believe in that. I believe in letting them go and not being obliged to incur the expense of keeping them. Let them go while they are young. The babies are the things that pay in this world, especially in the lamb business.

Now, if you have any questions to ask I shall be very glad to answer them.

Mr. HINMAN. What kind of fences do you use?

Mr. WING. Nowadays we are using almost altogether wire fences. We find that wire fences serve our purpose, and we are able to make them dogproof without much trouble. Perhaps if our country was situated the same as some of yours we could use some other fence to advantage, but I do not think you can make any fence dogproof so well as you can a wire fence. We place a barbed wire on the top.

Mr. HINMAN. Do you have much trouble with dogs?

Mr. WING. We had that trouble. I think it makes a difference what breed you raise as to whether you have trouble in that line or not.

I am so far away from home that I probably shall not get into trouble if I say this to you: I think that Dorset ewes are not nearly so subject to attacks of dogs as some other breeds, or in any case they stand their ground when dogs come around, and do not run off. Some breeds of sheep run almost on sight of a dog, and dogs from instinct take after them.

Mr. HOYT. Do you have any Angora goats? It is said around here that they will not run for dogs.

Mr. WING. We introduced Angora goats for that very purpose. Of course, I think a real sheep-killing dog will kill a Dorset sheep, but under ordinary circumstances if the dogs have not been in the habit of killing sheep they will not worry Dorset sheep, and I do not think they will Angora goats. The Angora goat, I do not think, however, is quite so brave.

Mr. HINMAN. Do you confine yourself to Dorsets entirely?

Mr. WING. In breeding ewes I confine myself to them entirely. I want to say that there are objections to the pure bred for the business I have. A sheep that is descended from a merino ewe and a Dorset ram makes the best sheep in the world for this lamb business. They are a lamb that fattens quicker than the better breeds, they are more sure to lamb early, and that is a point of great advantage.

A MEMBER. What do you think of the Shropshire?

Mr. WING. The Shropshire is a grand good sheep, but they do not lamb quite so early as the other breed.

Mr. HINMAN. Are they not a larger sheep?

Mr. HOYT. Will they not weigh more when you send them to market?

Mr. WING. Well, I do not know. Of course, they all vary some, but taking a lot on the average I think the others are better.

Mr. HOYT. Do you think that they are better than the Southdown?

Mr. WING. Well, between the Shropshire and the Southdown I do. Of course, we know that the most perfect mutton form in the world is the Shropshire.

Mr. RICHMOND. Can you get any more for it in the market here?

Mr. WING. It sells for about the same price as the Southdown. The Dorset sells also for about the same price per pound. All classes are on about the same level in the market, except as to the wool.

Let me tell you just a thing or two here. Of course, I do not know whether there are any sheep breeders here or not. If there are I do not know it. But if you are going into the sheep business do not buy extraordinarily high-priced sheep. Get good sheep, of good average kinds. I have not the time now to tell you all the reasons why, but let me tell you this: They are more subject to parasites than most sheep I know of, and also for the reason that they are slower to mature. You cannot do so well with them where you keep them year after year.

Secretary BROWN. Do you not change your stock?

Mr. WING. We do. We get new rams occasionally. The suggestion that brother Harris made is a splendid one, that when you get a new ram, to get just as good a one as you can. If he is not a good one you are not apt to get good, strong breed of stock, so that it is quite important to get a strong, vigorous ram.

We have a great deal of trouble in Ohio, and in fact I think more than you do here, because we have a worse climate than you for resisting parasitic infection. Many of the diseases of the sheep come from the stomach worm. When the lambs in the summer time begin to scour, and the wool gets loose and the eyes look weak and blurred, and they go around in a half lifeless condition many times, the trouble is nothing but stomach worm. They die and you bury them. Over in England they have more trouble than we do. I have been over there and I have noticed some of their methods. I noticed that they changed the sheep from one field to another frequently. I asked one shepherd about that, and he said, "Why, sir, we do not dare to let our lambs sleep two nights on the same ground." One time I saw a flock and they had a fence around some oak trees in the pasture, so that the sheep could not get under it. I asked the shepherd, "Why don't you let the sheep get under those trees?" and I found out the reason. I didn't blame the shepherd, but it was not that at all. There was apparently no objection to letting them lie underneath that tree where there was thick green grass, but the fact was that there they got a little throat worm, which works on the sheep, and they had learned by experience that they must not let the sheep lie underneath that tree.

We change our flock from one field to another and not let them run all summer in one place. By doing that we have had apparently no trouble with parasites.

Mr. BROWN. How often do you change these flocks from one lot to another?

Mr. WING. I should say they ought to be changed as often as once in ten days.

I would like to tell you a little about our fodder. Of course, we have to grow fodder for the sheep in the winter. One of our strongholds is alfalfa. That grows high up, and it has this advantage in connection with this matter, that we have just been talking about, that they do not get the germ of the stomach

worm among it so much. That only breeds down close to the ground. We have never had any parasitic sheep come from alfalfa fed. Red clover will do the same thing. To my mind that is a strong recommendation for both of those feeds.

Mr. WILSON. Do you have any idea that you can raise alfalfa in Connecticut?

Mr. WING. I think you can. If you take pains to procure alfalfa that has these little nodules on the roots, so that the ground can become thoroughly inoculated, you will not have any trouble about raising alfalfa.

Mr. HOYT. Did you ever raise any alfalfa for your sheep?

Mr. WING. I cut about 350 tons of alfalfa hay for the sheep this year.

Mr. HOYT. Do you think it is better than the common clover?

Mr. WING. Oh, yes. I think it does better with us.

Mr. HOYT. Do you mean it grows better with you?

Mr. WING. Yes.

Mr. HOYT. Do you think it does better there than here in Connecticut?

Mr. WING. Well, I don't know about Connecticut. I think red clover is as easily grown as alfalfa. Alfalfa, however, produces a larger crop, and more of it. When once it is introduced you are sure to get a good crop from it without much reference to drought. When once the soil is thoroughly inoculated you would have no difficulty in getting three crops year after year.

Mr. HOYT. Is there anything in this idea of buying the soil that is inoculated where that grows?

Mr. WING. Yes, there is. There is a good deal in that.

Mr. HOYT. Then, in your opinion, it is necessary to have the inoculated soil before you can do anything with it?

Mr. WING. It is necessary, as I understand it, before you can obtain the best results, to have your soil thoroughly inoculated.

Mr. HINMAN. How many years do you grow your alfalfa before you plough again?

Mr. WING. Well, we plough it about every four or five years.

Mr. HOYT. How do you manage to plough it? I should not think you could plough it, as the root is so strong and runs down so deep. I should not think you could plough it without cutting it.

Mr. WING. We do not find any difficulty in ploughing the alfalfa. It is not often that our men say it is difficult to plough it. The way we do is this: If you take an old plow and an old worn-out harness, a poor team, and a hired man without any conscience, I will admit it would be a pretty hard matter to plough it, but if you take a new plough, or one just as good as new, with a good, stiff harness, and a good team, and a man with a conscience, and a file to follow the plough, so as to sharpen it up every little while, you can plough it just as well as you can anything. If the roots are tough and big it is sometimes necessary to sharpen the share every twenty minutes.

Mr. HOYT. The hired men in Connecticut, I am afraid, wouldn't stand that. They would leave us in no time.

Mr. WING. You might have to do more of that here than we do. Our soil does not have so much stone in it as yours. Here your ploughshare would not stay sharp very long. It is not necessary to do that with us so much. Furthermore, our fields are mostly 160 rods long, and we go down the field and then come back to the upper end before the plough comes out of the ground, and the man files the share, or sharpens it up, before we start out again.

Mr. HOYT. Have you had any experience in raising soy beans?

Mr. WING. Yes. They do well in the south of Ohio, but I do not think they will do well so far north as this. In some years they may be useful to you, but the further north you get, of course, the less liability there is of getting a good crop.

There is one little point that I intended to speak of. That is, in speaking about running sheep together, it will not do to run weak sheep with strong sheep. If you have any weak sheep in your flock you should cut them out. That escaped my notice, and I failed to say anything about that before. That applies particularly if you are running large flocks. It is better to put the weak ones by themselves.

The PRESIDENT. Mr. Wing has been on the floor for some time, and if there are no further questions we will take a recess until 7.30 P. M.

(Convention adjourned to 7.30 P. M.)

EVENING SESSION.

WEDNESDAY, December 14, 1904.

Convention called to order at 7.30 P. M., Vice-President Seeley in the Chair.

The PRESIDENT. If you will come to order now we will have some music. There is nothing that a farmer likes to hear any better than good music, and I am pleased that we have some young people here who can entertain us in right good style.

Music.

The PRESIDENT. The subject of the address this evening is "Some Observations in the Orient," illustrated with the stereopticon, by Congressman E. J. Hill of Norwalk. He certainly needs no introduction to this audience. I take pleasure in calling upon him.

NOTES ON "A TRIP AROUND THE WORLD."

(From an Informal Talk)

BY HON. E. J. HILL of Norwalk.

Illustrated by Stereoscopic Views.

On Saturday March 23, 1901, I started with a friend upon a trip around the world. We left Jersey City for Chicago on

a bright, pleasant day, and next morning found ourselves speeding across Central Ohio and through the gas belt of Indiana, and so on to Chicago. The next morning found us in Omaha, where we were temporarily delayed by a severe snow storm, but the delay was short, and the morning of the third day found us crossing the splendid grazing country of western Nebraska. The morning of the 27th of March witnessed our arrival in Salt Lake City, where we made a short stop. We visited Fort Douglass, which is situated on a plateau at the base of the Uintah Mountains at the outlet of the gulch through which Brigham Young and his people marched into the modern Zion. The view from the fort is beautiful, the mountain-rimmed valley showing up in all its glory. It is little wonder that Young concluded that he had found the promised land. On the day that we were there the whole circle of mountains was glistening white in the clear sunlight, and with the lake in the distance, the farms to the south, and the city in the foreground, it made a fine picture. The mountain streams have been tapped and the alkali plains turned into a garden. We visited the Mormon Tabernacle, Zion's Coöperative Mercantile Institution, the Lion House and the Beehive, where we had an audience with President Snow.

After a very agreeable day we started west the next morning, and with a varied and uneventful trip arrived in San Francisco on April 1st. The next day we boarded the Steamer Buford and started on our ocean voyage to the Orient. We reached Honolulu, in the Sandwich Islands, on April 9th, and as we were sailing along over a smooth sea we could see Molo-kai. It looks like an extinct volcano in the distance. In the center of the island there is a broad yellow band, which indicated where the sand hills lie. After we arrived at Honolulu, and after inspection by a quarantine officer we were told that cabin passengers were free to go and come at will. We landed, and meeting friends were taken to the heights back of the city, called the "Punch Bowl," where a magnificent view of the city and harbor and ocean is given. Honolulu lies upon a flat at the foot of the mountains. The streets are wide and straight, and the general impression which one receives of it is very favorable. The growth and progress of the city since the islands were annexed to the United States have been great. The wonderful profusion of flowers in all the yards makes the residence sections look very attractive.



No 1 PARLIAMENT BUILDING, HONOLULU



No 2 HONOLULU HARBOR

Many new buildings are being erected, including hotels and fine residences, and the outlook for the prosperity of the islands is good.

We paid a visit to Governor Dole, also visited the House and Senate, and were much amused at the procedure in two languages.

(Photograph No. 1.)

Both houses have many members who speak only Hawaiian, and everything must be done twice through an interpreter in order that each side may know what the speakers upon the other side are saying. The session of sixty days is thus practically changed into one of thirty days. At the time we were there, only eighteen days remained, and but four bills had been passed.

The city is wealthy, and is clearly a delightful place in which to live. The harbor is small, but the crowd of shipping from all parts of the world was highly indicative of the prosperity of the place.

(Photograph No. 2.)

We made a visit to a new hotel, called The Moana House, at Waikiki Beach. It is a fine structure and worthy of any watering place. The beach is superb, and altogether it is a delightful place to enjoy a vacation. The next day we drove to the Pali. The word means precipice, but this is The Pali or the greatest of all. The government has built a splendid road up the cañon. The valley gradually narrows, being shut in by the precipitous sides of the mountains until at a point about five miles from the city, and about two thousand feet above it, we came to a sheer drop of 1,200 feet, and before us was spread out the whole windward side of the island and a vast expanse of ocean. The opening between the mountains is not more than two or three hundred feet, and on the quietest day the wind sweeps through this funnel at a terrific rate. The view is superb.

The next day we took cars and visited a large sugar plantation on the north side of the island, 55 miles away. The ride around Pearl Harbor and along the ocean beach was very interesting. We found cane cutting going on and the sugar mill in full operation. The daily produce from that one plantation is about 100 tons of sugar. The plantation consists of about 25,000 acres, 11,000 of which are tillable, the balance

mountainous and used to control the water supply for irrigation purposes. About 5,000 acres are now under cultivation, and more being prepared. The plantation reaches for 15 miles along the coast, and constitutes a little community by itself, with a population of about 2,000 persons, having their own stores, shops, scientists, chemists, surveyors, and engineers.

Leaving Honolulu on April 12th, after an uneventful voyage, we arrived off Guam on April 20th. A launch from the naval collier "Justine" came and took us ashore. We found that Governor Schroeder had gone to Agaña, but Mrs. Schroeder and her children and governess were camping on the beach in a board house and tents.

(Photograph No. 3.)

She sent us in a carriage to the Presidio, where we visited the Filipino prisoners. We saw and talked with Mabini, Pio del Pilar, Ricarti, and others. We found them well taken care of, and they said they had no complaint to make of their food, accommodations, or treatment. We told Mabini that Aguinaldo was captured. He said, "I am glad. Now we shall have peace." As the news was whispered around it seemed to me that the faces of the prisoners indicated satisfaction rather than regret.

Here, for the first time on our trip, we saw water buffalo, carts with solid wooden wheels, houses with thatch of palm leaves, and nipa, and all the peculiar characteristics of the tropical life among the natives.

(Photographs Nos. 4 and 5.)

The island is about 29 miles long, and from 6 to 10 wide. The population is about 9,000. It can be made useful to us as a coaling station and cable relay, but aside from that is of comparatively little value.

On Wednesday, May 1st, we found ourselves in Bernadino Straits, with the island of Luzon due north, and the splendid ash cone of the Mayon volcano smoking away in plain sight. Flying fish and porpoises abounded upon all sides, and the sail through the inland waters was very interesting and attractive after the monotony of our sea voyage. Early next morning, upon going out upon the deck of the Buford, I saw the flash lights of Corregidor right abreast of us as our ship was entering Manila Bay. All large ships in Manila harbor anchor about two miles from shore, and are loaded and discharged from cascoes or large canal boats.



No 3 AMERICAN SUMMER HEADQUARTERS, GUAM



No 4 A HOUSE IN GUAM



No 5 THE GUAM EXPRESS



No 6 PASIG RIVER, MANILA



No 7 STREET SCENE, MANILA



No 8 STREET SCENE, MANILA

(Photograph No. 6.)

These boats are poled by the natives, who live with their whole families in a little cubby-hole on the stern. The boats are covered with bamboo matting along the sides and half way down to the water a bamboo platform is built, about 18 inches wide, on which the men walk from bow to stern and push the boat with poles. There were hundreds of these boats to be seen, and thousands of people were living upon them. The government hires them at \$3.00, Mexican, per day, for the boat with the crew, men, women, and children thrown in.

Passing up by the Lunetta and the walled city, we entered the Passig River. It would be difficult to find a busier place. The commerce of the place is enormous. I counted two ocean steamers at the wharves in one little contracted spot, and hundreds of tugs, barges, cascoes, and small boats. Manila lies at the southern end of an enormous bay, and a few miles east of it is the Laguna, a large fresh-water lake, connected with it by the Passig River. The land for miles around is almost perfectly flat, having a great depth of soil, very rich, densely populated, and producing enormously of rice and sugar.

Manila is a city of about 250,000 people. In fact it is really two cities, one city within and the other city without the walls. The Spaniards long ago built regular walls, moats, drawbridges, and forts, and must have spent millions in this work. Within the walls are the government buildings and official residences, and some business as well as residence buildings, but the high walls towering up for about 25 feet shut off the sea breezes, and make it a very hot place. Outside is an area of open ground, used for gun ranges, and then comes the modern city, stretching along the bay and up both sides of the Passig River, and around to the bay shore to the south and west of the walled city. This latter section is called the Lunetta, and here the bands play at night and all Manila turns out for a drive and relief in the sea breezes from the scalding heat of the day.

(Photograph No. 7.)

We put up at the Hotel Orienta. It was said to be the best, but if so I do not know what the others can be. The beds, like all here, are made of splendidly carved native mahogany, with woven bamboo, like the cane seat of a chair, in place of a mattress. On this is a piece of grass cloth, and a sheet over all. They are as hard as a board, and it would seem as though the

people must develop ossified hips from their use. Possibly there is some connection between these bamboo hard beds and the prevailing custom of carrying the babies here astride of either hip, instead of in the arms or on the back as most mothers do elsewhere. Mosquito nets are necessary. The insect is small, does not sing, but is present everywhere, and a voracious biter. The streets are fairly wide and clean. There are about 55,000 Chinamen there, and they constitute the workers, servants, and shop keepers of the city. They are industrious, active, and shrewd, and constitute a very important element of the population. It is amazing to see the great loads which some of them carry hung from bamboo sticks, balanced across the shoulders.

(Photograph No. 8.)

One street, for several blocks, is lined on each side with little shops about the width of an ordinary window. Chinese women sell drygoods. The goods are piled up on each side of them, and they sit in the middle for business. At midday a canvas is suspended from awnings at the curb to shut off the heat of the sun, and the whole thing looks like a toy shop.

Of course, everybody there rides when they can, as it is too hot to walk. The cab and street service of the city is miserable.

(Photograph No. 9.)

Most of the buildings are of stucco or hard wood, with the floors in mahogany or tile. Ants eat up everything else, and the cockroaches take what they leave.

Outside of the city, in the outskirts, and in the poorer quarters, the houses are nothing but huts, made of bamboo, and thatched with nipa. They are built from six to ten feet above the ground, and have good ventilation if lacking in other things. Everything is subordinated to coolness, and life is hardly worth living then. A shirt worn with the tail out and a pair of pants is the prevailing costume. Sometimes the shirt is of lace, but it is worn the same way.

The people, as a whole, are small, with splendid coal black hair, dark brown skin, small features, and little hands and feet. They appear to have few wants and apparently no ambitions. As a rule they are clean, but know little of sanitary regulations. They are, of course, ignorant. An officer told me of one town of 5,000 people where an attempt was made to establish local



No 9 THE CARABAO EXPRESS, MANILA



No 10 ON CARS TO DAGUPAN



No 11 CALUMPIT ON DAGUPAN R. R.



No 12 DAGUPAN MARKET



No 13 DAGUPAN MARKET



No 14 DAGUPAN MARKET

government. The right of suffrage was given to all who had held office under Spain, together with those who could read and write and had five hundred dollars' worth of property, and even under those conditions they could only find 28 voters.

We made a visit to Dagupan, and on the way passed up through the region where Lawton and McArthur carried on their campaign against the Filipinos.

(Photograph No. 10.)

We found a splendid farming country, furrowed with the little dykes and low terraces of the rice fields. The houses are almost all bamboo and covered with nipa thatch, perched on poles and raised from six to twelve feet from the ground, presenting a curious sight.

(Photograph No. 11.)

Most of the towns along the route had been burned to prevent their giving shelter to the Americans. Rice and sugar are the prevailing crops in this section. Timber is very scarce, and fuel dear. The city of Dagupan and the outlying barrios include about 30,000 people. It was a curious sight to visit the market. They have two market days each week, and I presume there were fully 2,000 people who had come in from 20 miles around to swap their wares and the products of their labor. Bolos, hats, sugar, fish, meats, vegetables, and every conceivable thing were bartered, exchanged, or sold.

(Photographs Nos. 12, 13, and 14.)

On our return to Manila our attention was called to the ant hills. They are a curious feature of the landscape. In places, as far as one could see, the fields looked as if filled with haystacks standing higher than a man. Ants are masters of the situation here, eating up everything, timber and even lead pipe, and, of course, food of all kinds. Bananas, mangoes, and cocoanuts are the staple fruits in that region, together with a kind of pear called a chico.

(Photograph No. 15.)

Before leaving for Japan we paid a visit to Cavite, where we saw the wrecks of the Spanish ships which were sunk by Dewey's fleet.

Our next stopping place was Nagasaki. It was a genuine relief to board the steamer and enjoy once more good beds and the comforts and luxuries which we missed while in Manila. As we sailed into Nagasaki harbor the steamer was almost

instantly surrounded by hundreds of sampans. They are small boats, that are quite wide, and have a little cabin on them. The Japanese handle them very skillfully.

We went ashore, called on the American Consul, and then took a jinricksha and rode about the city. A jinricksha is a large-sized, two-wheeled baby carriage, drawn by a man. It is wonderful how strong these men are, and how handily they get about with these vehicles. One amusing thing to me was the serious, sedate countenances which the children seemed to have. I say "seemed," for on every conceivable occasion they break into laughter, and old and young all appeared to be a polite, agreeable people. The women are strong and vigorous, better looking than the Filipinos. The people are clean, and the women have splendid jet black hair, which they do up most elaborately and curiously. Men and women work alike, as boatmen, coal passers, and in the fields, as well as everywhere else. It was a wonderful sight to see them coaling the ships. There must have been three or four hundred, of all ages and both sexes, at work on the "Sumner." Six lighters were ranged alongside, and forming in rows they passed the coal up in little baskets, holding about twenty pounds each, and there was a constant string of them coming up all the time. It was a human elevator.

(Photographs Nos. 16 and 17.)

I saw a pile-driver operated by hand. About fifty women sat in a circle, each with a rope run over a roller overhead. At a signal all pull together, and up came the big iron hammer and then dropped on the pile. Pretty much everything is done by hand there. The shops all open on the front, and the work can be seen going on in plain sight. We saw needles being made by hand, and many other curious operations. It was very interesting to watch their processes, all the reverse of ours. Even a carpenter's plane is drawn towards one, instead of being pushed away as ours is.

Upon another occasion we went ashore and calling on Mr. Harris, the American Consul, he went with us to visit the Shinto Temple. This temple was built 600 years ago, and contains the famous bronze horse brought from India. From the location of the temple a magnificent view of the city and harbor was had. That same day we started with 'rickshas and extra push men over the mountains for Moge, a little fishing



No 15 CARABAOS BATHING



No 16 COALING SHIP, NAGASAKI



No 17 COALING SHIP, NAGASAKI



No 18 JAPANESE HILLSIDE



No 19 ON PEKIN R. R. CHINESE BOYS SELLING FRUIT



No 20 PEKIN R. R. WAYSIDE HOTEL

village three miles away. It was particularly interesting to notice how the people have terraced and utilized every inch of ground. The steep side hills are built up with stone walls and made into little spots where rice, wheat, and barley, potatoes, beans, and all kinds of vegetables are grown. The industry of the Japanese is remarkable. They work hard, live on very little, and sleep on a mat on the floor.

(Photograph No. 18.)

On the way to Moge we stopped at the Japanese school, and although the school had just been let out we found a lot of children playing and the teachers weighing and measuring the new scholars who had come in that day. Each one is weighed and measured in every way for identification, and then given a brass tag so that they will know themselves and be known by others.

From Nagasaki we journeyed to Taku, up along the coast of Korea and across the Yellow Sea. When we reached the place we found it to be a city of mud huts. Row upon row of mud huts with a single two-story wooden hotel, constituting our first view of that Chinese town. It is simply awful how human beings can exist in the way they apparently do in that place. Passing up the river between crowds of junks, steamers and sailing vessels, we came to Tangku. There was no hotel, no food, and no place to get either. We were advised to apply on board the United States ship "Monocacy," which was lying in the stream. We made a descent on her and were cordially received by Lieutenant Ryan and Captain Wise, who gave us staterooms and beds for the night. We were heartily glad to sleep again under the American flag. The next morning we took the train for Peking.

(Photograph No. 19.)

The whole country between Tangku and Peking is as flat as a board, except for the millions of graves and tombs. They look much like the ant hills in Luzon. As far as the eye can see the country adjacent to the large towns is dotted with these tumuli. Each year the living enlarge the mounds of those gone before. China is an immense graveyard. The mounds are to be seen in most inopportune places. I saw several in the busiest streets of Peking. On our journey up we saw many signs of the destruction wrought during the Boxer uprising. We passed through Tientsin, which seemed to be quite a pre-

sentable city of a million people. The country through which we passed was splendidly tilled, everything agricultural looking finely.

(Photograph No. 20.)

The whole country is a garden, and most of it made so as the result of hard labor. There were plenty of mules, and yet many ploughs were drawn by men.

At 3 P. M. that day our train ran through a breach in the wall of Peking, stopped in an open space between the Temple of Heaven and the Temple of Agriculture. A howling mob of 'ricksha men captured our party and took us to the "Hotel du Nord," which we found fully occupied, but at the American Legation we met the Rev. Gilbert Reid, who kindly provided for us at a Chinese residence, which he was temporarily occupying.

(Photograph No. 21.)

Our beds were curious. They were of stone, built up about eighteen inches and reaching entirely across the end of the room. Midway a door opened under the stone mattress, and there was a long oven where a fire was built to warm the bed. In winter one side of the sleeper is roasted, while the other freezes. This couch is called a kang. On it is spread a mat, and here a whole Chinese family is accustomed to sleep. For four days we did Peking. Bumped about its horrible streets and choked in its blinding, ill-smelling dust. We visited the Temple of Heaven and the Llama Temple where the worship of Buddha is maintained. The Temple of Heaven is a large walled area, with walls within walls, and in the central area is the Holy of Holies. None of the outer buildings are remarkable, and all showed signs of decay. The Temple of Heaven, where once a year the Emperor goes to pray, is a splendid pagoda, three or more stories high, round and tapering to a large ball or globe at the top. The brilliant blue tile and the bright-colored intricate wood work of the cornices, and the harmonious proportions of the whole structure, make it very grand. It stands on a series of marble terraces, built in circles and raised to the level of the colonnade. This is fully half a mile long, and I should say three or four hundred feet wide. Chinese architecture, as a rule, is cheap and tawdry.

(Photograph No. 22.)

The Llama Temple is a repetition of a Chinese house on a



No 21 SHINTO TEMPLE AT TOKIO



No 21 DR. REID'S RESIDENCE



No 22 TEMPLE OF HEAVEN, PEKIN



No 23 SUMMER PALACE



No 24 MARBLE BOAT SUMMER PALACE



No 25 FORBIDDEN CITY
In Emperor's Palace



No 26 CHINESE R. R. AND CITY WALL



No 27 CHINESE LOCOMOTIVE

large scale. It is filled with all kinds of gods. There were 400 of them in one receptacle, and the chief glory is a wooden image, at least sixty feet high and ten or twelve feet in diameter, and about as hideous as it could be made.

We saw a Buddhist Bible there. It consists of 180 volumes and there is at least a ton of the book. There were 400 priests at this temple.

We made a visit to the summer palaces in the country, 12 miles out of Peking. A stone road runs the whole distance, being about 20 feet wide and perfectly level, and built of heavy flat stone like our flagging, and heavily curbed on each side. A large artificial lake has been constructed at the foot of a precipitous mountain, and part way around this lake and up the face of the mountain are the buildings and enclosures of the summer palace. A fine covered walk runs along the edge of the lake. Flowers and plants, odd rock work, and bronze ornaments meet the eye. Every rafter of this long covered way is hand-painted on both sides, showing scenes in the history of the empire and views of palaces and charming natural scenery in the various provinces.

(Photograph No. 23.)

All of the tile roofs here are of gold color, and the balustrades and staircases to each building up the mountain side are of green and gold. The effect is very fine. The view from the top, out over the lake, gardens, and the vast expanse of a perfectly flat country, is very novel and interesting. Just beyond the palace is what is called the marble boat. This is a full-sized river steamboat, built wholly of marble.

(Photograph No. 24.)

We made a visit to the Forbidden City. The Forbidden City is walled within the Tartar city, and, like the others, is a series of courts beyond courts, temples behind temples, big reception halls and little ones, according to the degree of importance attached to the ceremony. The Acme or highest throne is here. It is an ordinary gilt framed sofa, with seats for two. I sat upon the throne. We visited the private apartments of the Emperor and Empress Dowager, and the gardens of the palace, and found them very interesting.

(Photographs Nos. 25, 26, and 27.)

From Peking we went back to Nagasaki in Japan, and from there went to Takeo, famous for its hot baths, and tried them.

From there we went to Moji, a great coal depot, with a fine harbor, and from there to Kobe and Osaka. In Osaka we visited the Satsuma ware painting shop and bronze factory warehouse. All of the so-called factories which we saw in Japan are very small, having perhaps five or six men at work in an upper room. At a foundry and machine shop there we found more of a factory than we had seen anywhere before. Cast iron pipes, screw jacks, blacksmiths' supplies, and iron work generally was being made. We also visited the mint.

From Osaka we went to Kyoto and visited the Temple of Buddha. The place is full of temples. We visited many shops and were surprised to find most of the fine embroidery was made by men.

From there we went to Narra, the site of one of the principal Buddhist and Shinto temples in Japan. The approaches to the shrine are by stone steps, and the path, leading through splendid woods, is lined on each side by hundreds of square stone ornamented pillars with stone lanterns on top. When lighted the scene must be magnificent. We saw the sacred white horse, and fed the sacred fish at the pond.

That evening we started for Yokohama. There we called upon the American Consul, purchased some photographs, and made acquaintances with the American colony.

From Yokohama we went to Tokio, obtained our mail at the American Embassy, lunched at the Metropole Hotel, and then journeyed to Nikko. The country, like all Japan which we saw, was filled to the last inch.

(Photograph No. 28.)

Wherever irrigation is practicable rice is raised, but where the country is dry or water scarce, wheat, barley, and other vegetables are grown. The Kegan waterfall is an exceedingly beautiful sight. It is formed by the outflow of Lake Chusenji into a deep gorge, and the main waterfall is reinforced half way down by little falls made by seepage of the lake through the rocks. We made the journey in jinrickshas. The scenery was delightful all the way, and the lake is a gem in the mountain tops.

We went back to Tokio (Photographs Nos. 31 and 32), visited and lunched at the American Embassy, went through the House of Representatives and House of Peers, visited an iris garden (Photographs Nos. 29 and 30), some of the tem-



No 28 RICE FIELDS, JAPAN



No 29 IRIS GARDEN, TOKIO



No 30 SEA HOUSE IN IRIS GARDEN, TOKIO



No 32 OSAXA DISTRICT, TOKIO
Theatre in temple grounds

ples, and after having our passports viséd by the Russian Minister and obtaining letters from him to the governors of various Russian provinces, started on our journey to Siberia.

We left Kobe on the Japanese steamer "Rosetta Maru" for a trip down the inland sea to Nagasaki. The sea seemed to be as densely populated as the land. Lobster boats, junks, schooners, and fishing craft were on every side. After having spent about three weeks in Japan, traveling by rail most of the time, I had found my anticipations of seeing much beautiful scenery wholly unrealized, but it all came back to me on that delightful trip through the inland sea. Alaska and Norway cannot compare with this part of the trip, for in addition to the countless islands, of all shapes and sizes, the channels are filled with steamers, schooners, junks, fishing boats, and the terraces and slopes on the mountains, and the numerous villages and cities, give an odd feature here, which neither of the other countries have. A blue sky and a bright sun made the trip a charming one, and I went to bed that night feeling that another gem from the world's scenic treasures had been added to my collection. We left Kobe that night, and after a rough trip found our steamer, the "Borea," in Nagasaki harbor. The steamer, however, was not very satisfactory, and we concluded to wait a week for a larger and better boat. While waiting we paid a visit to the United States man of war "Kentucky," and lunched with the admiral. The following Sunday we went to the English church, which, after a long hot climb, we found on the hill back of the American Legation. The missionary question in Japan is a much discussed and never settled one. The American Consul's servants were nominally Christians. They dedicated their boy to Shintoism. His interpreter when educated declared himself to be a Buddhist. The English Consul's interpreter was a Methodist, Dutch Reform, and Catholic all at once.

After waiting several days we left Japan for new experiences in Korea and Russia. Our first destination was the harbor of Fusan. All of the Korean town which was visible consisted apparently of mud huts, like the Chinese houses of Taku. Owing to the lack of transportation facilities we were not able to see much of the city. We left Fusan in the most cosmopolitan company with which I ever sailed. It consisted of Japanese, Chinese, Koreans, Danes, English, Americans,

Turks, Scotch, French, Russians, and some whose nationality was unknown. We sailed up the Japan Sea in plain sight of the coast of Korea. Many whales were spouting around the ship. After a delightful day's sail we reached Gensan, but too late to go ashore. Gensan has a fine harbor, well protected, and with good anchorage.

(Photograph No. 32½.)

The Japanese were in possession, and have evidently gone there to stay. The next morning we took a sampan and went ashore, walked through the Japanese concession, and crossing a primitive bridge went through the Korean town.

(Photograph No. 33.)

It consists of one long street, lined on both sides by miserable little one-story mud huts, without floors, and horribly dirty and ill-smelling. Why a people living amid this filth should clothe themselves in white, I do not understand. The women wear sleeves and neck pieces, leaving their bosoms exposed, and then a white skirt below.

(Photograph No. 34.)

The men wear long white coats and full pants, and wooden or grass-cloth shoes, with white cloth bound about the ankles, in place of stockings. This, with a little black stiff hat, set on a head frame, makes a queer costume. The men are large and generally good looking, while the women are small and homely.

(Photograph No. 35.)

The country about Gensan seemed to be well cultivated.

From Gensan we went to Vladivostok. The entrance to the harbor of Vladivostok somewhat resembles the Golden Gate at San Francisco. The city is fortified from every hilltop. The harbor is a splendid one, with abundant room and deep water. The city appeared to be perfectly new, brick buildings abounding, and the change from mud huts and one-story thatched roofs which we had been seeing for two months, was very agreeable. Upon landing we found that our impression of the city when viewed from a distance was entirely correct. The buildings are all new, constructed of brick and stone, ranging from three to four stories in height, and are well designed and substantial. The city has good wharves, parks, wide streets, a new railroad station, fine steamship lines, and is evidently well prepared to exercise a large influence in the future of the Orient.



No 32½ COREAN GROUP ON JAPANESE CONCESSION, GEUSAN



No 33 COREAN EXPRESS, GEUSAN, COREA



No 34 COREAN WOMEN, GEUSAN, COREA



No 35 COREANS ON SHIP

We called upon the governor. In the evening we went to the opera and enjoyed a very creditable entertainment. When we went to bed our sheets and blankets came into play, for all travelers carry their own bedding in Siberia. Candles, water, and everything were charged extra, and our bill for one day came to \$4.25 each.

At noon, July 4th, we started on our journey across the continent. Very soon after leaving the borders of Amur Bay the railroad enters the valley of a river, and judging by the soil, grass, flowers, and general appearance, we seemed to be transported into a rich river valley of our own west. We occasionally passed thriving villages, and prosperous looking farms were noticed frequently. As we journeyed north the country improved, disclosing magnificent stretches of well-watered prairies, wheat farms, large herds of cattle, and fine grass. The towns, as a rule, are located some considerable distances from the stations. The depots are well-built pretty wooden cottages, and in each town on the highest point the domes of the Russian churches were seen. As we continued to journey north the country changed. Much heavy timber was to be seen. A train of cars loaded with 3 by 10 white pine timber indicated pine trees somewhere, and a profusion of gnats, mosquitoes, and flies told of near-by forests.

When we reached Khabarosk, on the Amur River, we wondered whether we could get a boat. We found, however, that the governor at Vladivostok had telegraphed the chief of police to arrange for us. We were taken to the best hotel and informed that a cabin for two had been reserved on the mail steamer sailing the next day.

We called on General Grodekoff, and he offered to telegraph ahead for the boat at Blagovestchenk.

The city of Khabarosk has wide straight streets, spread over the high bluffs, and the principal part of it looks down on the River Amur, which at that point is about a mile and a half wide.

We sailed on the mail steamer the next day, and during the following night one of the iron barges, which were being towed astern, swerved and ran into the bank. The second one ran into it and rammed it so hard that its back was evidently broken. We were obliged to tie up to the bank while the barge was being unloaded. We were able, however, to make

better speed without it. The Amur is a wonderful river. More than a mile wide, it is like a great lake. It flows through prairie country, a splendid tillable land, which some day will raise a large part of the world's wheat supply. The Amur River is the boundary between Russia in Asia and China. China on the south and Russia on the north. It is a splendid country. Mountains are occasionally seen in the distance, but for the most part it is prairie, and the river banks show at least ten feet of soil.

(Photograph No. 36.)

At a small village we passed we found a crowd of women at the gangplank selling strawberries.

(Photograph No. 37.)

I bought two quarts for 40 kopecks, or 20 cents of our money. We had to take on wood frequently, and as it was all carried on board by hand from woodpiles high up on the river bank, our progress was very slow.

(Photograph No. 38.)

As we passed through the Kingan Mountain section the scenery on the river became very fine. At one of our stopping places we took on board a correspondent of a Paris journal, who was racing around the world with a representative of another Paris journal, one going east and the other west.

During the trip to Blagovestchenk we frequently ran aground and were delayed by having to tie up at the bank and take on wood. Upon our arrival at the city we found it to be constructed of good buildings, and to possess wide streets and good stores. After leaving Blagovestchenk we had the same sort of experiences as before, our boat frequently running aground, but we had the consolation of finding other vessels and steamers on the river in the same predicament. Traveling on the Amur in low water is not pleasant. The insects infesting that country were very annoying. We were especially tormented by enormous horse flies, fully an inch long. One of the most interesting things in natural scenery that we found upon the trip was the so-called White Mountains, or Tsaigon Mountains I think they are called. They are uneven hills of sand rock, several hundred feet high, which bordered the river, and which are continually breaking off and wearing away. The strata and layers visible seemed to be on fire. The smoke is visible in points in the day, and it is said the fire is seen in



No 36 WAITING FOR WATER TO RISE ON THE AMUR



No 37 MILK AND BREAD SELLERS ON AMUR RIVER



No 38 WOOD YARD, AMUR RIVER



No 39 POVROSK, AMUR, AND SHILKU RIVER JUNCTION



No 40 A BUSINESS CORNER IN STRETENSK



No 41 MUSEUM, IRKUTSK

the night. I think it is a discoloration from hot springs, which exude vapor, and that instead of coal it is a brown earth like the mud springs of the Yellowstone.

At Povrosk, which is at the junction of the Chilka and Aigoun Rivers, we took the Chilka.

(Photograph No. 39.)

The character of the country through which we had passed can be somewhat judged by the fact that we had sailed for nearly 1,200 miles on the Amur River without having seen a single waterfall on either bank. The Chilka proved to be more picturesque than the Amur, the mountains being higher and the banks bolder. The river runs in a single course between high banks, and the views are far reaching, and the mountains, though not high, are beautiful.

We finally arrived at Stretensk, where we were to resume our railroad journey westward.

(Photograph No. 40.)

The route is through the Valley of the Chilka and the Ingoda Rivers. The views are very pretty, and the country superb. Fine farms, excellent cattle, and good grazing. We had been told all day of a railroad accident ahead of us, and at half past two in the morning we were compelled to get up and dress and transfer around the débris. The wreck was on a high bank with steep rocks on one side and the river on the other, and with twelve carloads of people attempting to pass each other, all carrying beds and bundles, and all in a hurry, the scene in the moonlight can be imagined only. It was finally done, however, and we went to bed and slept till morning.

Much of the country that we passed through appeared to be well adapted for farming purposes. The country was quite populous, villages being frequent, and the farms looked well and prosperous. We passed through one city (Tchita) of 22,000 people, and that same evening we entered the Ablonai Mountains. At that point in Siberia the railroad runs along by a little river, which flows westward to Lake Baikal. The soil is light and sandy, and the prevailing trees are pine. This is the country of the Beuriats, a pastoral people, formerly Mongols, with the Chinese features, queue, and dress, except that they wear round hats with turned-up brims. The country is fine.

When we reached Lake Baikal, after passing our baggage through the custom house, we went on board the steamer to cross the lake. The ice-breaker, used in winter for keeping the channel open, went out ahead of us with the baggage cars, while the passengers went on a smaller boat. Lake Baikal is a fine body of water, and is said to be about 50 miles wide and 400 miles long. After crossing the lake we continued our journey to Irkutsk.

(Photograph No. 41.)

That is a city of about 35,000 people, situated on both sides of the Ungara River, and apparently in a flat country. The next day we went shopping and bought cigars, four English novels and some candy for use on the steppes. We visited the cathedral and museum in the morning, and in the evening continued the journey.

(Photograph No. 42.)

The country after leaving Irkutsk is especially fine. All day long we rode through a splendid prairie country with just enough grade for good drainage. White birch abounded on both sides of the track, and dense pine forests could be seen a little further removed. Here and there was a small farm, and now and then a river. The country appeared like a paradise for farmers and cattle raisers. The forests are clean, no underbrush, but grass and ferns carpeting the ground under the trees.

After leaving Irkutsk the country continued fine. Many undulating prairies could be seen, stretching as far as the eye could reach, with plenty of timber scattered about. I was surprised at the extent of cultivation there, and at the frequency and size of the towns.

(Photograph No. 43.)

The soil seemed to be very fertile, and the crops and grass excellent. As we continued our journey westward the country steadily improved in appearance, changing from a prairie country to fine rolling slopes.

After leaving Omsk we came into a flat prairie country, where the soil looked rich and the grass thrifty and good. It is magnificent farming land. Every little while we saw herds of horses, cattle, and sheep grazing on the open prairie, and Tartar boys sitting on horseback watching them. In that section of Siberia the towns are larger than those we had seen



No 42 OPERA HOUSE, IRKUTSK



No 43 A SIBERIAN VILLAGE



No 44 EUROPEAN RUSSIAN PEASANT VILLAGE



No 45 KREMLIN, MOSCOW



No 46 BIG BELL IN KREMLIN, MOSCOW.



No 47 A BREWER'S RESIDENCE, MOSCOW

before, but less frequent. Still further west we passed into the country of the Khirgese. They are cattle raisers. The country in that section of Siberia is splendid, as fine as I ever saw. Lakes and large ponds abound, and in the absence of rivers they receive the drainage of the country.

Continuing our journey westward an occasional pretty view could be seen from the car windows as we climbed up the eastern slope of the Ural Mountains. We passed the boundary post marking the line between Europe and Asia, in the night, and in the morning ran down into the valleys of the western slope. In that section of the Ural Mountains there is nothing especially attractive about the scenery, but as we journeyed still further west we came into a splendid farming country, with the peasant villages and large estates, splendid farms and wretched huts, indicating wealth for the land owners and misery and poverty for the land workers.

(Photograph No. 44.)

Upon reaching Moscow we went to see the Kremlin and the churches there, also the "Napoleon" church, or Church of our Saviour. The latter is a new one, built to commemorate the French campaign. It is a beautiful building, and is said to be the finest church in Russia, but it is not to be compared with the cathedrals of Milan, Florence, Cologne, or even those in England.

(Photographs Nos. 45 and 46.)

We visited the Royal Palace (Photograph No. 50), where all of the emperors of Russia go to be crowned. It is a beautiful building. Since Peter the Great, St. Petersburg has been the capital, but the coronation ceremonies are held in Moscow. We visited many churches and museums, and among other sights drove out to Sparrow Hill, where Napoleon had his first view of Moscow. The view of the city from there is a very fine one.

(Photograph No. 47.)

From Moscow we went to St. Petersburg (Photograph No. 48), visited the American Embassy, the Royal Art Gallery, the Monastery of Alexander, where we heard the monks singing the service, also the curious cemetery connected with the monastery. We also drove through Alexander Park and the islands in the Neva, as well as visited the cathedral built by Peter the Great in the Peter and Paul Fortress, together with

the three-room cottage in which he lived. We visited the Gallery of Russian Art, went to the lace stores, the monuments of Catherine and Peter the Great, and finally to the palaces.

(Photograph No. 49.)

From St. Petersburg we passed by rail through Russia over the German frontier to Berlin, visiting many of the points of interest in Berlin. From there we went to Brussels, to London, where we spent a week in visiting the scenes of former experiences, including the National Gallery, St. Paul's, Westminster, Blackwall Tunnel, Regent's Park, the Zoölogical Gardens, the theaters, and many other points of interest.

On Saturday, August 31st, we boarded the good ship "Philadelphia," and as we passed down the Solent the United States cruiser "Dixie" mustered her whole crew, and as our ship passed the bands played the "Star Spangled Banner" and "Home, Sweet Home," and with three hearty cheers sent after her the "Philadelphia" began her first voyage under her new name.

After an uneventful trip we sailed into New York harbor, only to receive the awful news that McKinley had been shot, and the expressions of pleasure on reaching home were at once changed to those of sorrow and sadness. However, we reached home in safety, having circumnavigated the world in five months and fifteen days from the time of departure, visiting many strange countries, having been among many queer people, and seen many beautiful sights; but of them all none were so dear or so pleasant as New England and our own home in Norwalk, Conn.

Music.

Convention adjourned to Thursday, December 15th, at 10.00 A. M.

SECOND DAY — MORNING SESSION.

December 15, 1904.

The PRESIDENT. The meeting will come to order. The first on our programme this morning is music.

Music.

The PRESIDENT. I am sure we are all very much interested in housekeeping. I suppose we could not help it very well.



No 48 BUSINESS CORNER, ST. PETERSBURG



No 49 PETER THE GREAT MONUMENT, ST. PETERSBURG



No 50 EMPEROR'S PALACE, ST. PETERSBURG

If you will look on the programme you will see that the first thing this morning is "The Reserve Power in Housekeeping." We have a lady here who, I think, will be able to interest us all in this subject. I have the pleasure of introducing Miss Martha Van Rensselaer of Cornell University.

RESERVE POWER IN HOUSEKEEPING.

BY MISS MARTHA VAN RENSSELAER,

Of Cornell University.

Ladies and Gentlemen: I am really glad to see so many gentlemen in the audience, although it is not generally supposed that they are interested in housekeeping — though they certainly are three times a day, and the women certainly are interested in having them take up the subject as a study, because they have an idea that if men built the kitchens, if the men worked in the kitchens, if the men stood at kitchen sinks, if the men stood over the stove, if the men threw out the dish water, and the men traveled up and down the cellar stairs, that the cellar stairs would be easier, that kitchen stoves would be higher, that the kitchen sinks would be suited to the height of the individual, that gas jets would be hung within reach of the people who have to light them, that steps would be taken out from between kitchen and dining-room, that refrigerators would be within easy reach, that ice would be upon the farm, that the water would be brought into the house as well as into the barn, and, in short, that the same economy of labor would be studied in the household that is now studied in other lines of work in which men are engaged. For that reason we do not regret that the men are here this morning to hear a simple talk upon "Reserve Power in Housekeeping," for the men do build the houses, the men do plan the kitchens to some extent, and it is a very fortunate thing when a man says to his wife, "I want to know where to put this kitchen sink." It is a very fortunate thing that he consults his wife in regard to the plans of the house, because she is the one who does the work, and because she seems to have an intuitive knowledge of how these things ought to be. I was not saying — I would not have you misunderstand me — I was not saying that I thought the men ought to work at the kitchen sink; I was not saying that I

thought they ought to do the cooking, although I think it would be well done if they did it, and I think perhaps the dishes would be well washed if they washed them. When men do things they generally do them pretty well. When they do learn how to cook beefsteak it is very appetizing, and if men planned the meals I am sure they would study rations for the family as they now study rations for cattle. I think it is a very fortunate thing, when an emergency occurs, that the men know how to do these things, and when it comes to training boys, I think I should have boys trained to do housework the same as girls are trained to do housework. Boys go away from home, boys are thrown upon their own resources; they go into the cities and into colleges, and very often board themselves. They very often have to darn their own stockings, and it is a very unfortunate thing when a boy is not trained in some of the arts of home-making, so that they can be a helpmeet as well as to have the wife a helpmeet.

I have not come to you, I assure you, with any new ideas in regard to housework. I wish I had some new ideas, because I think we have certain problems in connection with house economy which it would be well to solve. I cannot tell you how to lead the girl to like housework so well that she will want to stay upon the farm instead of going to the city — I cannot solve that problem entirely. I cannot tell you how to secure domestic service and have it well trained. I cannot tell you how to make girls like to do housework better than anything else, but I can suggest, perhaps, some of the old, old things; I can remind you of some things our mothers did — some things we know so well and yet which we do not practice and for that reason need to be reminded of over and over again.

In the first place our houses are not always as convenient as they should be. I shall refer several times, perhaps, to our work in the University Extension in New York State, and for that reason I am going to take the liberty of giving you a little sketch of it in order that you may know something of the source of help and the information that I want to give you. We were having in New York State a reading course for the farmers, and nature studies for the children, and they said: Why not have something for the farmers' wives? While the men are studying rations for cattle why should not the women study rations for men? While they are studying the conditions of the soil,

and the culture of fruit, why not give the women a study which shall make them better homekeepers? Then they said: You cannot, in a university, tell women how to do housework; they are doing it every day, over and over again. They can make better doughnuts than you can, they can make better pies than you can. Nevertheless, we sent a letter to the women of the State, assuming that every farmer who was enrolled in the farmers' reading course had a wife. We sent in that lesson to the farmer a letter to the farmer's wife and said, "Would you like a parallel course with that of your husband, in domestic economy?" About two thousand replies came saying, "Yes, we want to study along those lines," and there came at once a large number of letters, because we had asked in that lesson. "Are there any ways by which you can save steps in the home?" We found we had touched upon the vital question; that women were not asking for less work to do, but to be able to do more work, to conserve their strength in such a way that they might be able to accomplish more work. They needed not a recipe for making doughnuts, they wanted to be in sympathetic touch with other people. The healthy woman upon the farm is not complaining of the drudgery, neither is she complaining because she has so much work to do, but the thing that wears upon her, and the reason, perhaps, why so many girls do not want to remain on the farm is on account of the monotony of the life. When you give them something to think about, when you lead them to look beyond the kitchen sink to the sunset, or, if necessary, to the sunrise; when you lead them to look beyond the kitchen work to the time which they have for reading; when you lead them to become interested again in the music they had forgotten, to the book they had put upon the shelf, you bring them into touch with life and give them something to lift them out of the drudgery — the work doesn't seem so much like drudgery.

We began by asking about steps, steps that they were taking in the home. Several women wrote that they had been reading the lesson we had sent them upon saving steps to their husbands. In some cases the husbands objected and said, "Don't tell me about that; I am so driven I can't talk about extra steps." On one occasion a man said, "You are making some expense on my farm, but it is a good thing. I had to put ice in the house and bring water into the kitchen." We found in

the ten or twelve lessons or bulletins we have sent out that the lesson upon saving steps was perhaps the most vital and touched them in a way that other lessons have not. In many cases the houses are not convenient. A farmer doesn't always consult an architect — perhaps fortunately, perhaps unfortunately — when he builds his house. He is very apt to make a house according to the custom which prevails, whereas an architect, or a person who is spending a good deal of time along that line, will study how to build a house with the most convenience; he will study how to build a house in order to bring the furniture into the right place, and the doors into the right place.

It is a very good problem for a woman to consider whether she is taking five steps to get to her cupboard when she might just as well move the cupboard and take only three. She begins to consider how many miles of travel she is taking in the course of a year. We asked them to make a mathematical calculation to determine how many miles of travel a woman would take in getting their meals — in determining how long it would take them to go around the world, traveling the distance required to get around the world in doing their housework. You will see that it was a good thing; it induced them to study wherein they might change conditions and bring their household furniture into lines so that they would not travel very far. One woman writes this: she said, "Ever since I have lived in this house I have made my bread in the kitchen; I have traveled across the dining room, across the pantry, to get to my flour bin." She said: "My mother did it before me, and I have done it, and it never occurred to me, until we studied the lesson upon saving steps, to change the flour room, or bring the flour barrel into some place within easy reach of the kitchen." A man wrote that he had found it very convenient to have water in the barn but it hadn't occurred to him before that he might bring it into the kitchen, and save his wife's time and strength by bringing that water where she could merely turn a faucet and have plenty of water for her kitchen work without having her travel across the veranda, down the steps, part way across the door yard, to the pump.

They have also studied ways by which they can use their muscles to better advantage. It isn't possible to change the height of the kitchen sink for every passing maid, but a man can at least change the height of it for his wife, for he doesn't

change often enough so that there will be very great inconvenience in that respect. I have seen women working at kitchen sinks so low that they had to bend the back. No wonder that the spirit droops and she has very little courage, for three hours spent at a low kitchen sink is backaching work.

Why is it that the hooks are put into the closet or about the room just a little higher than it is easy for a person to reach? Why is it that the gas jet is very often just beyond a woman's reach?

There are simple changes which may be made about a house which will make it possible for a woman to keep her courage, keep her strength, and make her feel that housework is not real drudgery.

Another bulletin which we sent out is on the subject of saving strength. We have physical culture for women in the household. A woman very often says that she has no time to study physical culture, that that belongs to the women who are not busy, and to the women who haven't very much exercise; but the woman who has to do her household work from day to day is not using certain muscles that she ought to use. She is bringing the strain of her work upon the wrong muscles. I don't know that very many women will care to go to school, but there are a few vital principles which she may study which will keep her in good health. She is not asking for less work to do, she is asking how to do the work she has better, so that she may be able to accomplish more without loss of strength and health. In the first place she does not stand always upon the balls of her feet in doing her work. If, as she stands at her table, she will study to see whether the weight is upon the heels or balls of the feet, it will be a wise conservation of strength. She can determine that by rising upon the balls of her feet occasionally. As she stands at her table doing her work, if she stands back upon her heels, abdomen forward, chest down, she will feel a constant sagging of her hips, a constant depression which comes to every organ of her body, then a depression to her mind which affects her whole being. Let her rise upon the balls of her feet, abdomen back, chest up. Let her say, "Life is worth living." She sees the bright side of life, courage comes, strength comes. An athlete works hard to keep his muscles strong. A woman should practice the same principles as an athlete, use her muscles, and she will become

stronger if she uses them in the right way, as does the athlete or the student of physical training, keeping her weight upon the balls of her feet, keeping her chest high and head high. If she is obliged to bend at her work, let her not get over it in this position (illustrating), which she has gotten in the habit of doing, but bend at the hips; that keeps the chest up. And if she is obliged to work at a table too low for her, or at a stove (and a stove is nearly always too low), or a sink too low, let her bend at the hips and keep her chest up. Working in this way there is no strain whatever upon the abdomen. Let the limbs perform the burden of the work; they contain no vital organs, therefore they cannot be injured. See that the weight is kept over the center of gravity, which will be over the balls of the feet. They become the base. In this way she will accomplish more, and she will find that she is gaining strength rather than losing it.

She wants to reach, she finds she is obliged to. The shelves are high. Some women reach in this way, bringing the body away from the reach instead of with it. It is possible to keep the weight upon the balls of the feet, let the body go with it; that motion does not injure the person, does not bring a strain where this does. This brings a strain upon the back, upon the organs of the body which are not well suited for the strain, but bring the arm this way, let the body sway toward the place where one has to reach, and there are no bad effects. We often watch men at work and cannot help but notice that they use their bodies to rather better advantage than do women. If a man is sawing wood — we don't see them sawing wood so very often nowadays, I don't know but it has become a lost art — I have been looking for a man sawing wood for a long time to see how he did it, but I suspect he uses his arms. If a woman washes clothes she uses her back. She gets over her tub, her chest gets a little depressed, and she uses her back upon her work, bringing the strain upon the back, and says work is drudgery. It is hard work, indeed it is, but it is possible with the weight forward upon the balls of the feet — I don't mean she shall rise upon her toes in doing it, but keep the weight there, keep the chest up, use the arms as a man does when he saws wood, as a man does very often when he rows a boat. The great difficulty in a woman's work is that she uses her back while a man uses his limbs. Is it not a fact that a

man is very apt to do things in the easiest way and a woman in the hardest way? When a man lifts he uses his limbs for it. When he lifts a bag of meal he uses his arms. If a woman has to lift a chair or to lift any burden, she is very apt to use her back. No wonder it is hard work. It isn't difficult if one has strong arms — and the more we use them the stronger they become — to lift a chair with the arms. Let a woman try to lift a bag of meal, she doesn't manage it perhaps very gracefully, but she can certainly gain strength and come to the point of lifting heavy loads if she will study how to lift. She ought never to try to lift with the weight upon the back of the heels. That is a very vital point, she should keep the weight forward and lift with the arms.

I suppose that one of the things which women will always have to do is to pick up after the men and after the children. There are various ways of doing that. I suspect that the ordinary way, the one which we usually practice, is this (illustrates). No wonder we women when we do it think it is pretty hard to always keep picking up after folks. When I picked up that handkerchief I bent my back, brought the strain upon the back, but it is possible to keep the back from doing any work. (Illustrates again.) All the strain in that case is brought about the knees, and it wasn't a difficult thing to do; I didn't think to groan when I did it that time, for it was so easy. I think when a woman picks up that way she should be thankful that she has a man to pick up for. A great degree of courage goes with our work when the work doesn't seem very hard.

Washing clothes isn't a very easy thing to do, scrubbing isn't easy, but houses have to be scrubbed and clothes have to be washed, and a great many women nowadays are doing it in order to get it done and done the way they want it done. It isn't easy to get hired help; that is, it isn't always a possible thing to get someone who will come and do the work as you want it done. A great many women do their own housework, not because they cannot get help at all, but because they can't get it done the way they want it done. We have to study simplicity, study how to do things in the easiest possible way; then we can learn to scrub and sweep in a way that will give a great deal of personal comfort to the woman who is doing her own work.

I don't see a broom around here; it may not be necessary

to have a broom here, but I will use my arms so that you may see what I am doing. I can sweep in a way to bring a great deal of strain upon the back, and the woman who does that gets exceedingly tired. When a man sweeps he sweeps toward him, doesn't he? Or I may be able to sweep so as to use my arms in doing it — I don't suppose you would know what I am doing now. There is no strain upon the back. It is possible to sweep for quite a long time, using the arms, and it is possible to get over and use our backs and become weary in a very short time; so in mopping, so in scrubbing. I suppose the very easiest way to scrub is to get down on our hands and knees. A foreign woman prefers to scrub by getting down on her hands and knees, and I can see the advantage of it to a great extent. She lets the weight of her body do part of the work. In getting over upon her hands and knees to scrub the weight of her body comes on the brush to some extent. If she takes the mop, she uses her back in such a way as to weary her in a very short time. You say it looks like hard work to clean a kitchen floor by getting down on one's hands and knees. After all a great many do it in preference to using a mop, simply because it is a conservation of strength to do it in that way, and she finds she doesn't get so weary and perhaps she has better results.

There are various things along that line that I might speak of in ordinary housework, but I think I have mentioned the general principles.

Then there is the habit which we have of resting when we have hard work to do. Did you ever see a woman when she thinks there is no one around drop into an easy chair, pick up a paper and begin to read, but she hears some one coming and she gets up quickly and goes to work again. She feels as so many have felt — but I think they are giving up the notion — that it is something to be ashamed of if she stops in the middle of the day to rest. One of the very best times to rest is just before dinner, when things are rushing; you expect the men in the house very soon and they want things about right when they come, and they ought to have them about right, we don't deny that; but that woman is very apt to get the screws screwed a little tighter, to get a little more tension in her body, to work a little harder, and the lines in her face become a little deeper and she gets a little more anxious. She is afraid dinner won't be ready on time, that something is going wrong, and she thinks house-

work is very anxious work. That woman at dinner time must have her warm meal ready to serve. She must be ready to receive the complaints of the children, if they have any, when they come home from school; she must be the sweet spirit of the household. She must preside at the dinner table and be just as serene as though the cake hadn't burned, as though everything had gone well about the dinner. She must be the one to be sweet and amiable, no matter how things have gone, and to be the one who is the lever of the whole household. Really, she has had cares enough since early morning to break down one individual unless she learns to look at life in a philosophical way, as she very often does. Now, if she has added tension to her body as the work increased, become more and more anxious, when dinner-time comes and that strain comes upon her from the necessity of being the one who is always bright and cheerful, if she is able to go beyond the dinner hour to her resting hour, if she has one, she gets along very well, but sometimes there is a last straw which breaks the camel's back. She may want to go behind the kitchen door and cry; she can't do it, though. She may want to give up and say: "I can't keep this household running; it is too hard work. Here I have spent the whole day trying to keep things in shape and have the cooking good, and I haven't heard anything but grumbling since dinner began." The daughter says, "I don't want to settle down to this kind of a life." It isn't to be wondered at, but I suppose if when she found she was getting tired she would simply drop everything and say, "I have done the best I can, I will do the very best I can, and it will come out all right, I don't need to worry"; if she would have an easy chair brought down to the kitchen, one of those good old-fashioned easy chairs, and drop into it perhaps at eleven o'clock in the forenoon, drop into it and simply relax, close the eyes, relax the jaws — it is a good thing for even a woman to relax the jaws sometimes — give up, take the tension out of the body, shake it out. She finds her hands clinched, she finds the lines getting very deep in her face, she finds her teeth shut tight together, and she is working harder and getting more anxious, and sometimes I have heard of her getting so anxious that she got cross. But if she will drop everything and say, "I am going to rest for an hour or so," it is surprising how cares will fly away, how refreshed she will feel, and she will go about her

work feeling that the dinner hour is much easier than she anticipated, and she meets her family with a cheerful countenance. She has a right to that rest. Perhaps she may pick up a book at that time, perhaps that is relaxation to her; it may be a book of poems, it need not be a recipe book necessarily, it may be something that will refresh her soul. Let her go to the piano any time during the day. You know when a woman leaves school and goes onto a farm she is still just as much interested in books, she is still just as much interested in music as that woman who went into the village or the city and settled in life, who hired her help, went around the corner when she wanted a loaf of bread instead of having to make it, who calls in a milliner when she wants a hat or goes to the dressmaker for her dress, and finds life a great deal easier in these respects. The same two women possibly went to the same school, stood as high in their classes, had the same ambitions in life, had equal ability, and yet, when a woman goes onto a farm there is work for her from morning until night. Shall we say that woman is not as well educated, has not just as high ambitions in life; shall we say that she is not just as intelligent as the other woman who married a lawyer or a doctor or a teacher? What do we expect of the farm woman? We expect that she will be an all-around, well educated woman. What does she do? She is her own cook, she must know all about cooking; she is her own milliner, possibly her own dressmaker; she takes care of the animals about the place, or at least part of them; she attends to the flower garden; she is the nurse of the household, and very often nurse for the neighborhood. She is the woman who takes some interest in public affairs in the neighborhood; she is a pillar of the church. I might enumerate a good many things that she is. Do you say that the farmer's wife, then, isn't an intelligent, all-round woman? She is a woman with a broad education, with a practical education, the woman upon whom we are all depending. She is the woman whose sons and daughters we are relying upon. She is the woman whose sons have gone to college, whose sons are occupying important places in this world. She is the mother of the household; she is the woman who is staying at home and doing that housework, taking up the cares of the household to let the son and the daughter go away to school. In the city or village it is the man a great many times who is furnishing money to

send the son to college. The burden doesn't come upon the woman in the city as it does upon the woman on the farm. Many a boy or girl who goes to the agricultural college says that it is possible from the efforts of his father or mother, for they are staying at home and attending to the work so that they can be away, and that is the woman who has the care, who is taking the responsibility, making it possible for the farmer's boys to be the great men of the country; and are they not? It is an oft-discussed proposition and nothing new to you, that it is the boys who have come from the farms who are making their way in the world, becoming our statesmen, becoming our lawmakers, becoming our clergymen and substantial men in the community. Let the time come when we shall go back to the farm and make farming one of the greatest professions in the world. Now, if that woman has that care in company with her husband, she is the woman who needs to learn to relax. There is a large responsibility resting upon her. Is it not a difficult thing when a woman's health gives out, when a woman has lost her strength, is it not a difficult thing to find any one to come in and take her place? Then she needs to conserve her strength, needs to add to it, for it is a pretty difficult thing for a man to run his farm without his wife. It is almost impossible for her to give up, therefore she needs relaxation more than most anyone else. She needs to rest part of the day. We can relax without going farther than our easy chair, without lying down to do it. What do you do when you go to the dentist's? Do you relax? We Americans have a peculiar habit. Do you know what a German physician said when he came to this country? He said, "Americans have a terrible disease. It is written on every face," and he called it "Americanitis." You may call it ambition. Perhaps it is ambition, it grows out of ambition; but has it not become to a great extent, as the German physician said, "Americanitis"? It is written in our faces. When you go to the dentist you grasp the arm of the chair, you push your feet against the bottom of the chair, and you shut your teeth together until the dentist pries them open, and you suffer more in the anticipation than you do in the participation. What do you do when you think the train is late, when one is waiting for the train? You get anxious. What do we do when we get on a street car going to make an appointment? Watch the people upon a street car

and you will see anxiety written upon their faces. Watch it in a city where there is rushing and turmoil. Relaxation is a thing we are leaving out of our lives. That man who has written that wonderful book called "The Simple Life," is teaching relaxation all the time, relaxation of the spirit. Now relaxation of spirit may come to be relaxation of the body, and the woman in the home needs to learn it; needs to simply relax and take away the tension out of her body and learn to do things in an easy comfortable way. When life seems to be full of care she needs to relax and say, "Things will take care of themselves, we will get along all right." We need it in the busy time when we screw things up still tighter, so we can stand the work. I would suggest, then, relaxation of the nerves, of the muscles of the body. When a woman feels that she has difficult work before her, I would suggest that she go and rest; have a chair in the kitchen, an easy chair where she may sit down when she is paring the potatoes. After a woman has worked a good many years she learns to do that, and it is to the daughters perhaps that this should be said. After a woman has lost her strength it is very easy for her to learn to do those things, but sometimes it is too late. We need to learn those things while we have our strength. No one need to be ashamed of a chair in the kitchen, no one need to be ashamed to have conditions so nearly right in a kitchen that it is easy to do the work. We have large missions to do upon earth, and we need to have a great deal of ability and competency, and we need to study all the time to be at our best, and we are not at our best when we are tired. We are not at our best when we are working under unfavorable conditions.

These are merely comments, merely suggestions, which, while as I said before they are not new, we may still well keep in mind. We get into bad habits, we can get into the good habits just as easily. We can get into the habit of keeping cheerful and pleasant, and letting our worries go, saying, "We will do the best we can," and when we do the best we can we have nothing to worry about.

I want to congratulate you upon the fine opportunities which you have in this organization for meeting shoulder to shoulder and having heart to heart talks once a year, of having an organization where the men and women work together. I don't object to women's organizations, I don't object to men's

organizations, but one thing I like about the farmers' organizations is that the men and women work together. I do know that the women when they attend these meetings listen with a great deal of interest to the discussions in regard to the raising of cattle and the rearing of sheep, and the planting and tilling of the soil, and I have often wondered if when they went home they did not advise their husbands in regard to it. But at any rate I admire their interest in the subjects; I like the fact that they are working together and that they are partners. In no profession of life that I can name are men and women so nearly partners as they are as farmers. For that reason it is a delightful occupation, and for that reason these meetings which we have throughout the country are delightful, and I carry with me a very great admiration for the work which you are doing.

MR. GOLD. As no one appears to be ready to ask questions, I rise to ask a question and to say a few words myself confirmatory of what the lady has told us.

I learned a good while ago that a boy could be kept in trim so that work and errands were a pleasure to him, or he could be driven with work so that he would shirk it every time he had a chance, and that was a provision of nature to restore that boy's activity again. When you sent him in a hurry on an errand, he came back again and tumbled down under a tree. That was an exercise of nature to lie there. You could call upon him in a few moments again and he would start up as lively a boy as ever. But if you didn't let him have, once in a while, a chance to rest, if you were all the time nagging him, you wouldn't get much satisfaction out of that boy or girl that you wanted to stimulate to exercise.

Now if we have a horse we find we have to get a certain amount of work out of him, and we feed him, and one man, with the same amount of feed and the same amount of work, keeps that horse in good plight, and he holds him in with the rein all the time while the horse is doing his work. The other man so manages that horse that he has to have the whip up to strike him to do his work, and he will do no more work, and keep that horse poor all the time on the same feed.

There is a principle in our animals that we understand and practice as farmers, and now we need to apply it to humanity a little more than we have been in the habit of doing in the past. The lady has given us illustrations with regard to the use of the back or the limbs for doing some kinds of work. Mr. Hoyt here might tell us something about pulling trees. He knows how to have men pull trees without breaking their backs and tiring them very much, and we can pull docks with our knees instead of our backs, and other weeds and bushes. We have learned that, and now we are learning that a woman may spare herself some of her labor by using her limbs instead of her back.

I am very much pleased with these illustrations of family matters, and some of them come home personally to the house that I occupy. The kitchen is a good way from the dining hall, but that seems to be the nature of things and difficult to remedy. The flour barrel is conveniently near the kitchen, and we have water in the kitchen as well as at the barn. We are all up in that line, but the matter of disposing of the refuse from the kitchen is one that we haven't solved to a general family satisfaction. It comes up in a variety of forms, and is one worthy of a great deal more study and consideration than it has yet received among our rural population.

I am very much pleased with the sort of home character of this address we have had this morning, and I am surprised there are no more ladies here in the audience; there ought to have been, but there are a goodly number here, and I hope that we shall carry these instructions to our rural homes.

Mr. ROBERTSON. I would like to ask what the lady would suggest in this matter. There are mothers who feel that their children should take life easier than they themselves have done, they are relieving the children of burdens and carrying them all themselves. They want to relieve their sons and daughters of work which they had to do, for the reason that they went through things not very pleasant and they want to have their daughters have an easier time.

MISS VAN RENSSELAER. I have rather old-fashioned ideas in regard to that subject. I think that the fathers and mothers are relieving their children too much, that the burden is coming upon the father and the mother when the child ought to be taught to do for his father and his mother. It never hurts a boy to relieve his father. It never hurts a boy to relieve his mother in any kind of work, and that is the greatest blessing which you can confer upon a boy when you teach him, if he needs to be taught, to do things for his father and mother. Give a boy or girl his strength, which we will assume the boy and girl of whom we are speaking has, and I would say that you train him to do those things. They are not going to hurt him, and if you do these things for him and thrust him about upon the world, he is helpless, and the world has got to teach him a great many lessons that the father and mother should teach him. Therefore, I cannot sympathize with that condition. I cannot sympathize at all with the boy or girl growing up in a home not knowing how to build a fire. A boy in my class the other day said, "My mother never let me build a fire, she thought I couldn't." There he was, a boy in the twenties, who owned up before those young women that he didn't know how to build a fire. Do you suppose anybody would choose him? No. I feel that one of the things in this world that we need nowadays is to teach boys and girls to wait upon their elders; it won't hurt them. I cannot comprehend how men who have made themselves and become the great men that they are, through self exertion, through self-sacrifice, can shut their sons off from that same privilege. Paying their bills, letting them not work their way through but satisfying every possible want, is a great misfortune to the children.

This question has been asked: "Do you believe coöperation in domestic affairs to be possible in farming communities to help the housewife?"

It hasn't, it seems to me, been tried very much, but it seems to me possible, and this question comes at once: "Can we have

a laundry?" We had an article a short time ago in "Country Life in America," written by Professor Bailey, in which he advocated a laundry in a farming community. Nearly every farming community has some water power or machinery by which this same power could be applied to laundry work. This woman spends half a day or more in her home washing out the clothes; that woman over there is doing it, and that woman over there is doing it, all through the community, and she is getting pretty tired of it. The woman in the larger village or city sends her clothes to the laundry. It seems to me it would be possible to have a laundry in connection with a cheese factory, if necessary, although I am not certain that the two things would work well together, but in some way utilize power for doing that washing. I am not saying that it can be done. I am still in doubt about it. I have asked some men who handle laundry machinery if such a thing were possible. They say, "We have written to a number of manufacturers in the country asking that question in regard to a laundry. They say they cannot make the machinery cheap enough so that farmers will want to buy it. It would hardly be possible to do it less than \$300." Now, if twenty families in a community can use one laundry machine at a cost of \$300 will it pay? I have asked the question instead of answering it.

This woman makes cake today, and pies, and that woman does the same thing, and that woman does the same thing. In a larger community these women send to the bakery — and I am sorry she has to, for home-made pies are better than any other. There is a duplication in a farming community of all lines of work, so that if you had some woman in a community who would learn how to make the best kind of pies, and let this woman send to her for her pies, and that woman send to her for her pies, and that woman, I don't see why you are not saving the time of these women to do something else. Here is a woman who keeps chickens, and that woman keeps chickens, and that woman. There is a duplication of time and work and

energy. It seems to me if that woman would make a success of her chickens, and that woman make a success of making honey, and that woman make a success of bakery stuff (if she knows how to make it homelike), and that woman raise celery, perhaps it would be better for each woman. I haven't tried any of these things, but I have been thinking along that line and wondering why farmers cannot have united interests. I hope some of you will disagree with me and take up the other side, for I am very anxious to know if these things are at all possible. I would like to see the things tried. To be sure it would be better for the women to eat fewer pies and to get along with less cake, and have a simple table; perhaps that would be a better solution of her household problems.

The PRESIDENT. I would like to ask the speaker if she doesn't think the women are largely responsible for this routine work into which they are so likely to fall? They get a certain round of duties and they follow the thing up day after day and never think that they themselves can make an improvement.

Miss VAN RENSSELAER. I think that is true. It takes thoughtfulness. We are doing things at a great disadvantage simply because we have got into the habit of it, but I do want to say that the men can help a great deal in that respect. Women do get very tired in their work and some people need encouragement a good many times; they need to have the man drive around with the carriage as bright as before he married her and say, "Let's go for a ride; let's go to see our neighbor; let's go to church today; let's go and hear a concert." Then she will begin to see other people and see how other people are doing. But when the conditions are such that she gets up at five o'clock in the morning and works until nine, and goes to bed and just lies down to sleep exhausted, without any of those things like music or books to rest her, it is very natural to fall into that rut, and that rut, expressed in a common way, is the thing that is wearing her out, not the hard work.

Mr. KIRKHAM. I got up with about the same motive that

Mr. Gold did, to tell how glad I am to hear this lecture. I wish Mrs. Kirkham had been here to hear it, but I couldn't prevail upon her to leave. A great many things, it seemed, needed attention and I couldn't induce her to come. That is the way with a great many of the ladies, I presume. The gentleman who spoke last night confided in me a certain fact which has been illustrated here by the speaker. He has been through a very active campaign, we all know, and is one of our Congressmen from this State. Being well acquainted with him, I asked him about his health. "Well," he says, "I have had a hard time since the campaign closed. I thought I should just sit down and get rested, but there was something the matter with my heel, and I went to see a doctor. He told me what I had done exactly. 'You have used that heel more than any other part of your body.' I used to speak every day and every night, and I had a habit when I was speaking of stepping back on my heel and putting the whole weight on that heel, and now I have been laid up and ought not to be here tonight." That is the way he spoke. "But," he said, "I'm getting better of it now, and I'm going to take a rest."

I am old enough to know better, but I got onto my heel a month ago, and I took off my stocking and saw a black streak clear around from the instep to the other side — the blood had settled there. I knew what caused it, and I let up. Well, I remember when I was a young man hearing a farmer talk one Sunday noon — the time the farmers get together in the horse-sheds. He said the Swedes were their help. He said: "You never hear of a Swede complaining of chronic disorders; they know how to handle themselves in hard work. They stand straight up when pitching oats, rye, or hay; they stand right up with the whole strength of the body over the center of gravity." He had studied the matter himself, but farmers don't have time to do it as a rule — I don't.

Then when the lady was talking about the planning of the house, I suppose every one here thought about the back part

of his own house. It carried me right home, but I am happy to say when I called to see my wife and told her I was going to get a man to plan the house, she said, "I wish you would let me do it." I said, "I want to have you." And so we just put our heads together and planned that house, and the only problem I have never been able to solve is where to put the cellar stairs. We couldn't find a place in the house to get them in, so we made a crooked pair of stairs to get down cellar, to save room. I have wanted to tear those stairs down for over a year, but my wife says, "Would you change those after twenty years of occupancy? Not a thing in it have I wanted to change in all those years." Just as soon as I could get a man to do it I brought water into the house, and it has been a wonderful blessing. I don't know how any one ever lives without it. My neighbors don't have it, and a great many of them go to the well.

I am thankful I have heard Miss Van Rensselaer, and shall report her when I get home.

MR. PLATT. A year or two ago, before the Connecticut State Grange in Hartford, Dr. Smith of Higganum, a good physician, presented an essay on the model kitchen. One prominent way in which he made it was to have a revolving cupboard in the kitchen to contain the pots and kettles and pans, and perhaps the flour. That was to have it convenient and save steps; and he did away with the cupboard under the sink, and made the kitchen more sanitary. I would like to ask the lecturer if such a revolving cupboard has been put in use and found a desirable thing. I never saw one, and I don't know where you could find one. The doctor himself said he didn't put one in his own house because his wife objected to it for some reason or other. I would like to ask the lecturer if she ever heard of one.

MISS VAN RENSSELAER. I did hear of one, but I have never seen one; but I don't see why it wouldn't be a good thing. One great difficulty in all of these things is very often the

expense and that the help will not use them. This is oftener true of the help than the housewife. Not having any practical knowledge of that, I couldn't say, but it would seem to me that it might be a saving of steps and time — you let the cupboard do the traveling instead of the woman.

Pres. STIMSON. My question, which I arise to ask, is right in line with the previous question. We see advertised on the market kitchen cabinets. I wondered if they had been brought into use very extensively. My question was prompted by the feeling that most men feel that if we adapt our houses so as to save steps, our wives will be stronger in most cases. I know that in my grandfather's house the china closet was at the far end of the house, in the parlor, and over the fireplace in the parlor was another cupboard devoted to some pewter ware brought out on state occasions. The big oven was near the center of the house, a room at least away from the kitchen. Now, very fortunately, that house burned down, but there are still houses which have not burned down, and I have wondered whether kitchen cabinets would serve a beneficial purpose in this matter.

Miss VAN RENSSELAER. My experience with kitchen cabinets is this: I would not want to keep house without one. The shelf is a good place for mixing things. You pull out a drawer here at the right, and you have cooking utensils; in another drawer you have spices, and possibly another place here for the flour, which is a great deal better than traveling off somewhere for it. It is better than going to the cupboard to get the necessary knives and spoons. Then it keeps things away from the dust, that is one thing.

We have made quite a study of home sanitation in our Farmers' Wives' Reading Course — trying to get things under cover, trying to do away with the danger of disease, in connection with the utensils and the food. I just take this occasion to say that I brought along a few of our Farmers' Wives' leaflets, which perhaps you will be interested in. There is one on "The Saving of Steps," "Decoration in the Farm Home,"

"Sanitation." These we have for free distribution in New York State. I don't know as they suggest anything very new, but a few things to remind the women.

(Question.) Have you anything there to remind the gentlemen?

Why, yes — the first question in this "Home Decoration." I would say that we sent with the bulletin a quiz, a fourth page, containing perhaps ten or twelve questions which the women answered and sent back to us; then if they required any correspondence further we sent them letters. The first question is "Comment on the Attitude of the Men." One woman said, "I made a perfectly lovely silk pillow, and a gentleman had gone and laid his head on it." We have received answers from a great many on that subject, and I want to tell you that almost every lady is in sympathy with that gentleman who laid his head on that pillow, although they say they would make them out of gingham instead of silk. Then, too, out in New York State we are driving our hints straight home to the farmers when in this lesson on "Saving Steps" we talk about an ice house, about bringing water into the house, etc. We get very pathetic letters, letters which show to us what is needed perhaps more than anything else. When a woman says that she is becoming tired of the four walls of her kitchen, and she is thankful for a letter which is coming to her regarding her home life, and says, "Remember me in your prayers," when she wants sympathy from some one; when a woman says that she is very glad to get these lessons because her husband considers that it isn't necessary to build a vegetable cellar, that it isn't necessary to build a place for her to keep her provisions, and that it is trot, trot, trot into the kitchen all the time, we can feel that it would be a good thing to put in a few hints for the farmers, so our letters to the farmers' wives are lessons to the farmer and his wife at the same time.

Mr. GOLD. I am reminded just at this point that the last story that I have read in a magazine happens to come in just at

this point. In Scribner's last issue is the "Corner Cupboard," which is made the basis for a pleasant little story that reminds me somewhat of the kitchen cabinet. Have you seen "The Corner Cupboard"?

MISS VAN RENSSELAER. No.

MR. GOLD. Look it up in Scribner's, last issue, I believe.

MR. HOYT. I have been hesitating for some time whether I ought to say anything about this important and vital, and I might say tender, subject. If there is anything that a wife hates to hear talked about it is for her husband to tell how his mother used to do things. Of course there is nothing that stimulates work as well as love for that work, and there is nothing that makes work such a drudgery as to have no love or heart in that work, and I am sorry to say the tendency at the present time is for both boys and girls to look upon work as a drudgery, therefore they do not like to do it. I know of instances where young ladies will not do a particle of housework because they haven't the strength. It makes their backs ache to sweep, and yet they will take a stick and go into a forty-acre field and knock a ball all day long, and chase it about with perfect ease and contentment because their hearts are in it. It is no harder work to sweep than it is to knock a ball over a ten-acre field, neither should I think from the position that it would make the back ache any worse.

My mind goes back to my boyhood days, and I see my mother doing her work, and her heart was in it. I have seen her, day after day, skim thirty pans of milk and carry it to the swill barrel perhaps forty feet away to empty it. I have seen her, and I have helped her, pick her forty or fifty geese every six weeks through the summer. I have seen her dip her five hundred candles twice a year into the tallow to make the candles for the family. We had men on the farm to work, and they boarded in the family. I have seen her, for rest, take her knitting needles and all the evening long, knit, knit, knit from the wool, perhaps, that she had carded, and knit for seven children

and herself and husband all the stockings and mittens and comforters they needed. And I have seen the milk on the shelf, and the dozen pies which she made every Saturday afternoon. (My wife says she doesn't believe it, but it is a fact.) Her heart was in the work, and I never heard her complain. And she lived to be ninety-three years old. It isn't work that hurts. When the heart is right work is a pleasure. I believe in making it as easy as you can for your wife in doing the work. We are not living in the days when we required so much of our wives and daughters as we used to, but it is wrong, as the lady has said, to bring up our children so that they will not know how to make a loaf of bread or a good cake, or to sweep the house or mend a stocking. What is a girl for, if she is going to be the wife of some person, if she doesn't know how to do the first thing that is required of a prudent wife? The question of housekeeping today is going to be a serious one, a serious one. We cannot depend upon help as we have done in the past, neither out doors nor in, from the fact that it is more amusement and more pleasure that the young are looking for rather than for anything else.

The PRESIDENT. The next number on our programme will be a lecture by Dr. G. P. Clinton of New Haven on "Diseases of the Potato in Connecticut."

DISEASES OF THE POTATO IN CONNECTICUT.

BY DR. G. P. CLINTON, New Haven.

Ladies and Gentlemen: Some of these troubles that I am to speak about are shown by photographs of the Experiment Station, which are in the room below, so that people who are interested especially in that subject can get some general idea from those pictures.

There are many food plants more aristocratic than the plebeian potato, but few that are more useful. The former kind we use occasionally to whet our flagging appetite, but for the people of the temperate zone no plant, save wheat alone, sur-

passes this humble friend in its food value. In the United States it forms one of our most important crops, that of 1899 being valued at about \$98,000,000.

Like most of our agricultural plants, the potato seems to have certain regions or localities where it thrives best. Without doubt the potato belt in this country lies along our northern border, since of the ten states producing crops of greatest value in 1903 five — Maine, New York, Michigan, Wisconsin, and Minnesota — lie in the northernmost tier of States, while the other five — Pennsylvania, Ohio, Illinois, Iowa, and Colorado — lie just south of these. Another group of States in the central and northern Rocky Mountain region stands out as a potato district, but not so much so on account of the total values of the crops as on account of the great yields per acre — a result apparently largely due to irrigation. At present New York and Maine can best lay claim to be our greatest potato States. In the latter, Aroostook county in 1899 had planted about 42,000 acres, or a greater area than any other county in the United States, while the total value of the State's crop in 1903 was over \$9,000,000, and the average yield per acre — 196 bushels — was greater than in any other State. On the other hand, New York led every other State in the total value of the crop, which exceeded \$19,000,000.

There are certain conditions that make these northernmost States valuable for potato culture. This plant thrives best in a rather cool climate; it relishes plenty of moisture well distributed through the season, and the mechanical and chemical condition of the soil must be to its liking. These conditions, apparently, obtain best in the above region. On the other hand, the potato responds as promptly as any other plant to intelligent husbandry, so the proper attention given the crop is a prominent factor in successful potato culture anywhere.

So much for the value of the potato as an agricultural plant and its general condition in the United States. My point in this has been to suggest that here in Connecticut the potato may be classed as one of our most important agricultural plants, that the State itself may be considered a prominent potato State, especially if its size is taken into consideration, and that we may well increase the acreage. The following figures show the present situation: In 1903 the total area of the State planted with potatoes was about 29,000 acres — an increase of about 6,000 acres during the last thirteen years. This acreage

was greater than that devoted to any other crops except hay and corn. The value of this crop was considerably over \$2,000,000, being surpassed only by hay and tobacco. In New England the same year the State stood next to Maine in the value of the crop, and in the United States it was the eighteenth State in the value of its crop and the twenty-third in its acreage. The average yield the past ten years has been 96 bushels per acre. Except two years these average yields have been greater than those for the United States as a whole. While New York is considered a very important potato State, its average yield during this time has been only 83 bushels per acre. All the other New England States, however, surpassed this State in the average yield during the past ten years, though during the past five years our average has been equal to that of Massachusetts, or 99 bushels per acre.

The State lies just on the southern edge of the great potato district, but to offset this it enjoys the best market situation of any State in the Union, and it raises a good quality of tubers. As stated before I believe we are so situated that we should increase our acreage—in fact we are doing it. To do this with profit, however, we should also increase the yield per acre. There are three ways along which we may hope to accomplish this latter result:

First. While the best methods of planting, of cultivation, and fertilization of the soil may be known, the chances are that they are not followed in 25 per cent. of the potato fields of the State. Director Clinton of Storrs gave you a paper along this line last year. We can assume at the outset that the very best methods are none too good for the agriculturist. Every farmer is bound by the nature of his occupation to be somewhat of an experimenter, and his own experience is the experience upon which he must rely in the end, but he should always strive to keep this experience up with or towards the best that his locality and the country affords.

Second comes the factor of seed selection. This may include selection of varieties, but I do not mean this so much as I do the selection of seed free from disease, of good shape and with a pedigree for yields. Neither do I mean such seed as you have bought upon representations that it was of this kind, but rather seed that you have raised yourself and by the rigid application of selection upon approved methods you

know to be of this character. Our agricultural literature now shows the results of selective tests, especially as applied to corn and wheat. Some work has even been done with the potato, and we know that the unit with which to work is the hill raised from a single tuber and not the tuber selected at random after it reaches the potato pile. We now have our seed breeders' associations for discussion and improvement of methods. The work is reaching down to the farmer, who is beginning to apply what has been learned so far.

Third comes prevention of insect injuries and fungous diseases. No one doubts that the potato in this State is severely troubled by these pests and that the financial loss they cause to the growers is far too great. Investigators have learned considerable about the life histories of these parasites and something about methods for preventing their attack. The chief questions now are whether these methods should be more generally adopted by the potato grower and how practical are they. I do not believe that the consistent use of preventive measures against fungi will make any grower wealthy, but, on the other hand, I think most persons are undercautious rather than overcautious in this matter, and that in the long run intelligent preventive measures will pay. It is under this third phase of the question that I wish to indicate very briefly what we know about the fungous pests of the potato in this State and the methods that may be employed to lessen their ravages. They are six in number.

1. The *Early Blight* fungus produces subcircular, brownish spots about a quarter of an inch in diameter or more extended and irregular areas at the margin of the leaf. The trouble occurs from June on and, so far as has been found, only on the leaves. My observations indicate that this is not so serious in this State as some suppose and that it is often confused with paris green burn or with tip burn. It may be prevented by spraying with bordeaux mixture; but it does not usually merit attempts at prevention. Paris green burn may also show as a general searing of the margins of the leaf, which dries up at the injured places. This injury to the foliage often becomes serious and is of too common occurrence in the State. The damage results from sprinkling or dusting the foliage with pure paris green. A small amount of lime should always be used with it, as this keeps it from going into solu-

tion when the caustic action on the foliage results. The tip burn trouble mentioned is purely physiological, due to the foliage at its margin being unable in times of drought to replace and check the transpiration of water, consequently the tissues here turn yellow, roll up, and finally die. This trouble is not so common here as it is in some of the States of the middle west, since moisture is more evenly distributed during our growing season.

2. The *Scab* fungus apparently confines its attack to the tubers, where it produces a superficial, corroded, or "scabby" condition of the skin. The presence of the fungus acts as an irritant, and as a result an unusual development of corky tissue results. This growth of cork cells not only helps to protect the tuber from the scab fungus but it is also helpful in keeping out other fungi and bacteria that would cause subsequent rotting. Scabby potatoes, apparently, are not much more subject to rot than are those free from scab.

Scabby potatoes occur all over the world, and many theories have been advanced as to their cause, but it was not until Professor Thaxter, the first botanist of the New Haven station, studied the trouble that the true cause was shown. The fungus is sometimes seen on the scabby spots as a faint grayish mold that appears most prominent when the tubers are freshly dug. It is very simple in structure and easily breaks up into bacteria-like rods. It can also live in the soil and its development there is favored if this be slightly alkaline, instead of acid, and by the presence of manure. Other root crops, such as beets and turnips, are attacked, so that rotation of these with potatoes is not desirable.

The most efficient preventive measures now known are selection of land as free as possible from the fungus; proper rotation of crops; the use of clean seed; the careful use of animal manure if scab has proved troublesome; avoiding liming land used for potatoes; and seed treatment with formalin or corrosive sublimate. This latter process consists in soaking the tubers for about one and a half hours in corrosive sublimate (one pound to 50 gallons of water), or in formalin (one pound to 30 gallons of water). To get the best results treated seed should be planted on land free from the fungus and but little manure used.

3. The *Rosette* or *Rhizoctonia* disease has lately come into

prominence in the literature dealing with potato diseases in this country, though it has been known and discussed for some time in Europe. It is called the rosette disease because the green vines often show the trouble by a rosette clustering of the leaves. Finally some of the plants may turn a sickly yellowish color and eventually die, but ordinarily the diseased condition does not manifest itself above the ground. The trouble is caused by a rhizoctonia, or sterile fungus that is carried on the tubers. During the past two years this stage has been very evident on the potatoes sold in this State. It shows as blackish growths of threads, usually compacted into sclerotia, or superficial flattish masses, which are a quarter of an inch or less in diameter and which occur more or less distinct or run together over the tuber. Very often these escape notice or are mistaken for dirt, but if the potato is washed and examined while wet they become very evident. These compacted sterile cells carry the fungus over the winter in a dormant condition, but when the tubers are planted in the spring they develop a mycelial growth that crawls up onto the young shoots. On these, beneath the ground, the fungus often inflicts serious injury by attacking the superficial tissues, sometimes completely girdling the stems with a dead area. This attack often results in the death of the parts beneath, in which case new tuberous shoots must be formed above the dead area. The final result, then, is a crop of small potatoes or a greatly diminished yield. By the latter half of June and in July the fungus appears just above the ground, surrounding the stems with a grayish, mealy, rather inconspicuous growth for a distance of an inch or two. This is the fruiting stage of the fungus, and while not at all like the toadstools in appearance the manner of its spore production places it with this group of fungi. Both the fruiting stage on the stems and the rhizoctonia stage on the tubers have been known in Europe, but their relationship was not suspected. Only recently Mr. Rolfs of Colorado, while studying the cause of the potato failure of that State, has proved their connection. During the past season the writer has observed the development of the fungus in this State and has no doubt of the relationship of these forms. In some fields from fifteen to twenty per cent. of the hills were observed with the fruiting stage on the stalks. However, we were not able to trace so serious injury to the infected plants as has been reported in some other States.

As this trouble is carried on the seed tubers and as it becomes established in the soil, the preventive measures must be the same as those used against scab. Two experimenters have tried formalin and found this more or less efficient. The chief objection to it is that sometimes the germination of the tubers is retarded or injured enough to decrease the yield.

4. *Bacterial Blight and Rot.* There is a bacterial disease, usually to be found in our potato fields in June and July, that attacks a plant here and there. This trouble generally infects less than two per cent. of the vines. The plants assume a sickly yellowish color, remain stunted, and finally wither and die. These plants are easily pulled from the soil, when it is seen that the stem below is more or less rotted. Even in the early stage; while the plants are still green, if cross sections are made of the stems the bundles will often show a brownish diseased condition while the rest of the tissue is healthy. This diseased condition of the bundles interferes seriously with the proper conduction of water and plant food. The disease becomes most prominent in the underground stem; the tissues of the pith collapse, leaving a hollowed center, in which stage the plants look as if attacked by the stalk borer, and eventually the whole stem rots off. Practically no potatoes are obtained from these plants.

Later in the season, especially after the true blight has killed the vines, one often finds that the tubers are rotting from a slimy, sticky, ill-smelling rot. This is also caused by bacteria though sometimes attributed to the blight fungus. A year ago this was a very common trouble in our potato fields. It is quite possible that the bacterial blight of the stems and the rot of the tubers are caused by the same organism. The fact that the tubers usually begin to decay at the stem end points to this relationship.

In the way of preventive measures we have little to suggest beyond care in the selection of seed and the removal of diseased tubers from the field when dug.

5. *Fusarium Wilt or Dry Rot* is a fungous trouble in its effects somewhat like the bacterial disease just described. The fungus invades the stem underground and reaching the bundles chokes these with a growth of its threads so that eventually the water supply of the plant is cut off or greatly reduced, when the parts above ground wither and die. We have had

some obscure wilt troubles in our potato fields, though as yet the writer has not recognized this as the cause. In the tubers, however, it has been found as a very common agent of decay, with the bacterial rot being largely responsible for the trouble a year ago. The disease usually begins at the stem end, forming a slow dry rot. Not unfrequently bacteria occur with it and help the rot along. When the infected tubers are placed in a moist atmosphere the fungus breaks out on the surface in small white fruiting tufts. The decay continues in the cellar, though probably not so vigorously as in the fields, especially after the tubers become dried out. Often tubers show the presence of the fungus only in cross section by a slight discoloration of the bundles. These tubers, when planted, no doubt help to perpetuate the disease.

Because the fungus develops inside the tissues of the tuber, seed treatment is of little value against this trouble. Our preventive measures so far are limited chiefly to the selection of seed tubers free from the fungus.

6. *True Blight* or *Downy Mildew* is the last and most important of these parasites of the potato. It is an old trouble, has proved very injurious in Europe and here in years past, and has been much studied both to gain facts in its life history and to prevent its ravages. Blight first appears on the potato leaves in this State anywhere from the first of July to the latter part of August. Its time of appearance and the severity of attack depend on weather conditions. If after its appearance there occurs a moist or muggy period of several days' duration, it develops with surprising swiftness and carries off the vines in a short time. The fungus produces blackish areas, usually beginning at the tip or margin of the leaves, and these increase more or less rapidly according to the weather. Examining the underside of an infected leaf the fruiting stage is seen as a faint whitish growth at the juncture of the diseased and healthy tissues. In dry weather these moist blackened tissues dry up. Under favorable conditions the disease progresses so rapidly that there soon remain only the green stems and these then die as a result of the death of the leaves. In a week the blackened dead stems will wither up. Inconspicuous leaves may take the place of the former luxuriant green field.

Occasionally one sees diseased spots on the stems, but so far as I have been able to observe we have no reason to believe,

as do some, that the fungus passes down the stems to the tubers. So I see no reason for pulling up the vines to prevent the tubers rotting from this trouble. The tubers, however, do become infected with the fungus, apparently by the spores falling from the leaves to the ground and washing down on them. After gaining entrance to the tuber the fungus causes a slow, dry, reddish-brown rot. Bacteria and the *Fusarium* fungus, however, often gain entrance as the result; the blight infection and these agents make the trouble much more serious. A tuber containing the blight fungus often shows a pitted surface, has a reddish tinge, and the skin may often be easily separated from it, while in cross section the reddish-brown diseased tissue usually shows most prominently in a band at the surface. So far as we now know the blight fungus is perpetuated only by the mycelium carried over the winter by these infected tubers. Just how the disease is transferred from these to the leaves is not definitely known, though it is believed by some that the mycelium passes from the tubers up into the stems and leaves. Personally I do not believe this occurs. Theoretically the fungus should possess thick walled resting spores to carry it over the winter. Such spores have been found in decaying tubers and leaves and associated with the blight fungus, but their real relationship has never been definitely proved, and botanists are disinclined to believe that such a stage exists. The writer has recently been striving to settle this point, but so far has found little that is new to add to our knowledge of the fungus. Artificial cultures of the fungus have been grown on sterile media in test tubes. Slices of potato taken from the interior of the tubers under conditions to exclude bacteria and spores of fungi and inserted into a sterilized test tube containing a plug of cotton saturated with water have afforded the best substance for the growth of the fungus. These slices of potato are not decayed by the fungus, thus showing that the decay in nature is due to the bacteria and other fungi which closely follow the blight fungus. So far only the summer spore stage of the leaves has developed in these cultures.

The blight fungus decreases the yield of potatoes in two ways. First, by the premature killing of the vines a month or six weeks before they should die, the possible yield is diminished sometimes by half, as it is during the last weeks of the plant's natural life that the tubers rapidly make their growth.

Second, the full or partial yield of the plants may be obtained and then cut down more or less by the subsequent rotting of the tubers. If I can judge accurately from an experience extending over only three seasons, the blight, when it comes on early and suddenly, as it did in 1902, may cause a small crop with but few rotten tubers; but when it develops late and lags along slowly to the end of the season, as it did somewhat in 1903, but more especially this past season, we may grow a larger crop that suffers severely from rot. This rotting no doubt develops worse in a season like the past because more spores through a longer period are washed down onto the tubers than are when the vines are blighted and dead inside of a week.

Finally let me give briefly the preventive measures that may be used against this fungus. We may grow the early varieties with their smaller yield and higher prices. These are often nearly matured by the time the blight appears and so suffer much less than late varieties. However, they are not without their diseases, and on the whole are not so popular with growers as are the late varieties. Knowing that the blight is carried in the tubers, all potatoes showing any signs of the disease, especially a reddish discoloration of the tissues when cut open, should be rejected. While evidence so far goes to show that it makes no difference if rotten tubers are left in the field, yet we may be mistaken about the ability of the fungus to develop winter spores in these, in which case it would be an error not to gather them up. Cultivation that tends to cover the tubers deeply in the soil and at the same time keep the ground from becoming wet — such as ridge culture — seems to be best adapted to prevent the tubers from rotting. This system also tends to hold up the vines and allow freer circulation of the air for drying out the soil and evaporating moisture from the leaves. Too close planting and too luxuriant growth of foliage, for the opposite reason, favor a more rapid development of the blight. Some work has been done on the selection and breeding of blight-proof varieties. The government is said to be at work along this line. One rarely sees any indication of blight-proof individuals in our fields, so we should not be disappointed if we get no relief from this direction. Spraying with bordeaux mixture has given more or less excellent results. The writer's experiments along this line have given some encouraging and some discouraging figures as to yields.

If he was a potato grower, however, he would not hesitate to use this method of combating the fungus, believing that it would pay in the long run. Spraying with the bordeaux mixture should begin about the middle of July and at least three applications of two to three barrels per acre should be given. The second application might be given about the first of August and the third after the middle of that month. One, however, must use his judgment as to the exact time and the number of applications, as these depend upon the weather. The proper thing is to have the foliage well covered with the mixture when the blight weather comes on. When needed, paris green — one-half pound to the barrel — may be added to the mixture to fight the potato bug, and there is no danger of burning the foliage. There is considerable work about spraying large fields and it necessitates a convenient and good water supply. The geared sprayers that pump out the mixture as the horse carries the apparatus along are rather unsatisfactory for use with bordeaux mixture, since they do not sufficiently drench all parts of the foliage even when driven over the same rows a second time from the opposite direction. A barrel pump carried on a one-horse cart — one that can straddle two rows of potatoes — with one man to pump and drive and two to follow on foot, each with a sixteen to twenty-foot hose provided with a single nozzle and spraying two or three rows as he goes, is the most efficient way of spraying a field, but it takes time and labor and lots of the mixture.

DISCUSSION.

The SECRETARY. You will notice Dr. Clinton is the only speaker on our programme who has ever spoken before at a midwinter meeting. I happened to be at Dr. Clinton's laboratory in October and found he was at work upon a scientific investigation of the diseases of the potato in Connecticut. I thought it was too important a subject to be neglected, therefore he was asked to speak on this subject before you today. There are two questions I would like to ask him. The first is in regard to the selection of seed. If I understood him correctly he recommends selecting seeds from the plants before

the potatoes are dug. The second is, whether we shall continue to plant our own seed, seed which we grow, or whether we shall get new seed every year. I know in large potato growing sections in many parts of the country they will not plant their own raised seed, but they will go to Maine or New York for seed every year. I'd like to get an answer from Dr. Clinton on these points.

Dr. CLINTON. Our method of seed selection is this: First I call attention to the fact that you can breed up good strains of plants just as you can breed up good strains of animals, but it has got to be by selection. It has got to be rigid and carried through some years. Our plan of selection is like this: We go through the field and mark out the most vigorous vines — those freest from disease. At the end of the season we dig those vines and you select only from those that have got not necessarily the largest potatoes or those that have the largest number, but those that have the best shape, freest from disease, and that indicate the largest total yield, also selecting for the size or type of potato that you want. You select very carefully in this way, and the very best that you find. Then take the potatoes next spring and plant a little plot of those whole tubers so that you know that the vine comes from a single cutting. Then you go through the crop at the end of that season, and from them select the very best individuals, the same as the preceding year, and plant those the third season. The fourth season you can make your selection a little larger and plant enough so that from that crop you will have enough to plant your whole acreage the succeeding year. You have had four seasons' selection. The fifth season you may plant your crop from those selected plants. Each year keep up the selective process. At the end of the tenth you have been selecting the best tubers from certain points. If there is anything in evolution or breeding up one individual from another, you have perhaps accomplished that result. I know it can be done in other things — in corn and wheat — and they are doing it with

the potato. The ordinary method is to go to the potato pile to pick out the best tubers there. That is partially right, but it isn't the whole truth. The best potatoes you pick may have come from a vine that gave a very small yield, but, if you have one potato vine in that yard that has given a large yield of medium sized potatoes, free from disease, you want to get that and try to build it up from year to year.

Now, there is something in bringing in seed from different regions to renew the vitality of plants, but not so much as ordinarily supposed. I do not think that the man that had been bringing in seed from outside that was not selected would have the results that a man would have who selected in this way.

Secretary BROWN. I would like to hear Professor L. A. Clinton, Director of Storrs Experiment Station.

Mr. CLINTON. Mr. Chairman, I was talking with a gentleman in the back part of the room and I don't know what you want me to talk about.

The PRESIDENT. Potatoes.

Mr. CLINTON. This year I sprayed our potatoes seven times, and they nearly all rotted with us. Now, I didn't lose my faith in spraying at all, but I have come to this conclusion: that if we are going to spray we have got to do it more thoroughly than I did it this year, not more times, but it has got to be hand work. I sprayed seven times with one of the automatic spraying carts. That is an easy way of getting it done. You can go over an acre in a morning before breakfast, if you get up early enough, but it doesn't keep the potato from rotting. The only way I have found effective to keep potatoes from rotting is to have one man get on the cart and hold the pump handle, and stay right by them and get them thoroughly covered with the mixture, the under side of the leaves, and the stem as well as the under side. That means strenuous work, but I believe it is better for the farmer to go over the potatoes two or three times and spray them that way rather than seven or eight times with an automatic spraying cart which lets them

rot after all. Even by our spraying, as we sprayed this year, we increased our yield on the sprayed field very perceptibly. Our increased profits per acre were about eighteen dollars, and that paid us well for the spraying that we did. Next year I shall spray, but I shall do the larger part of the work with a hand sprayer and stay right by them until we get them done. I shall spray part of the field with an automatic spraying cart and leave part unsprayed for a test. Another thing that I will do is to plant a variety which will mature in August. I shall grow an early variety even at the expense of yield at first. We can grade up our early varieties so that we can get a larger yield. I want a grade, an early variety, that will mature in August, and I shall grow them and try to get ahead of that late blight. It is a problem how we are going to keep the blight from rotting them after we get them grown. I believe that it means a hand spray or else an early variety. The variety I secure for early planting is called the Early Manisted.

I got less favorable results this year, not that I didn't increase the yield, but I lost it afterwards by the rotting of the potatoes. I don't say that spraying is going to save them; we are going to have failures, but if you don't do it thoroughly you are going to have more failures, but a large part of the increased yield that I got from spraying was afterwards lost from the rotting of the potatoes. The sprayed part gave a greater yield than the unsprayed. The question is how to prevent the rotting — that is the hardest part of the problem.

Professor Bennett of Storrs College carried on some experiments this year. Mr. Bennett sprayed his by hand and did his work very thoroughly. I think it might be interesting for Mr. Bennett to tell the results he secured.

Mr. BENNETT. I have been trying to find out whether spraying would prevent potatoes from rotting. This year I planted a plot of potatoes, six rows, three of which I sprayed and three I left unsprayed. I kept the bugs off of both, and as soon as the potatoes were up I sprinkled them with bordeaux

mixture. I did a good job with the hand sprayer and kept putting this bordeaux onto the potatoes about once a week, covering them all thoroughly. In all I made ten applications. The frost struck them September 23d. The unsprayed plot was dead entirely, no blight there, just turned yellow. The sprayed plot was in as good condition as it was during the summer. If that frost had held off we would have got a better yield than we did. When we dug our potatoes, we got seven bushels from the unsprayed plot, and fourteen bushels from the sprayed plot. When we dug them I think we found one decayed potato in the sprayed plot; since then I have found, I guess, half a dozen potatoes that were decayed quite badly. About three weeks afterwards I looked them over again and picked out from twenty to thirty. The question is whether it paid us. We think it isn't necessary to spray a great number of times. Professor Jones has increased his yield every year — increased from 26 per cent. to 196 per cent., an average of 75 per cent. increase — but he has not controlled the rotting. His potatoes each year have rotted more or less. He has only sprayed two or three times. I should recommend spraying about three or four times, beginning about the time you expect the blight will appear on the potatoes, but it must be done thoroughly. I did not intend to leave practically any space on those plants that were not covered, and I think I didn't leave very much. They had a double spray each time by lifting up the vine and spraying all over. I wanted to see if we could stop the rotting.

The plot, I think, had been manured with barnyard manure to a small extent. The land was pretty rich in the first place, and during the season, after the plants were up, I sprinkled between the rows a coat of nitrate of soda and phosphate of potash, about six hundred pounds of the combined material.

Adjourned until two o'clock.

AFTERNOON SESSION.

December 15, 1904.

Convention called to order at 2 P. M.

Vice-President Seeley in the Chair.

The PRESIDENT. We will open our exercises this afternoon with some music.

Music.

The PRESIDENT. We have this afternoon a very important subject to be brought before us, "Thoroughbred Poultry versus Mongrels, from the Farmers' Standpoint," by Mr. Morris F. Delano, of Millville, N. J.

THOROUGHbred POULTRY VERSUS MONGRELS,
FROM THE FARMERS' STANDPOINT.

BY MORRIS F. DELANO of Millville, N. J.

Mr. President and Ladies and Gentlemen: Before starting my paper I would like to tell you that I fully realize it will be very short from a rhetorical standpoint. It is simply a practical paper from my own personal experience, and I am simply trying to tell it in as interesting a manner as I can.

The number of farmers who consider the mongrel barnyard fowl "just as good" is growing smaller every year. There are several causes that are revolutionizing their point of view, and making them realize the value of the thoroughbred in poultry, as well as in other live stock. Among the principal ones are, first, the press. Every leading agricultural paper now has a department devoted to poultry, with its competent poultry editor. Original articles are now demanded by readers to fill the columns of these departments. The old hit or miss style, where the liberal use of the scissors provided the bulk of the matter for this department of each paper, no longer goes. Farmers are getting more and more particular as to quality of reading given them, as number of periodicals to choose from multiplies.

The growing popularity of poultry topics has been recognized by our leading newspapers. They often print articles in their daily editions, and devote a page in their weekly edition to poultry. As a rule they confine themselves to clippings, but the near future will alter this, and they will follow the lead of the straight agricultural papers, and will add a poultry editor to their staff.

The exclusive poultry press is gaining in numbers, and in circulation every day. They are going more and more to the farmers, and those interested in the bread and butter side of the industry. Several of the leading papers have from twenty-five to forty-five thousand subscribers, and their lists are increasing at a rapid rate.

Next in importance in arousing interest, and reaching a larger number each year, are the State Agricultural Colleges, with their extensive experiments and valuable data collected concerning same and put in tabulated form for circulation. More and more of our bright lads are learning to appreciate the generous living to be earned by following poultry raising as a business, and many of them are taking the courses at our State colleges, and coming out with their diplomas to wake up those of us who have gained our knowledge in the longer course of experience. They gain a good theoretical grounding, and also have some practical experience instilled in them in a much shorter time than they would have gained the same knowledge in any other way.

In the near future, the colleges will demand longer courses, and more practical work from their poultry students before granting them diplomas, and when this time comes they will take an even higher place among the sources of poultry wisdom.

Many States are introducing Institute work, with lectures followed by discussions, at central points. The method of your State Board of Agriculture is really better, I believe, as it brings more interests together, and is more apt to reach men who have never given poultry a serious thought — simply left it to their wives to produce pin money with.

The combination of all these powerful movements, with several others I have not mentioned, is doing the poultry industry a world of good.

It has been demonstrated beyond all shadow of doubt, that thoroughbred poultry is a bigger money-maker than the mon-

grel, considered from every point of view. Carefully and fairly conducted egg contests have proven them to be better egg producers. The fowls sold in the open market, after their days of usefulness as layers are past, have averaged to weigh more and have brought a higher price. The surplus cockerels killed off have been much heavier, and consequently brought more money. Besides these advantages, every farmer raising thoroughbred poultry works up some trade in stock for breeding purposes. This latter source of income will vary greatly with the man. If he will take enough interest in his flock to try and make it uniformly good, and will then hustle a bit in working up trade, he will soon find this feature of his flock bringing in many welcome dollars. Later on I will make a few suggestions that may help somewhat along this line.

As a source of beauty and adornment on the place, the thoroughbred easily wins the blue. A man has a large variety of colors to make his choice among, and, when he has chosen his favorite, each one of you will grant that he will enjoy and appreciate a uniform flock having color of his choosing much more than he will the motley conglomeration of all the rainbow hues possessed by the old time mongrels.

Grade poultry well deserves consideration, and is a big improvement over mongrel stock. Vigorous thoroughbred male birds, crossed on mongrel females will, as a rule, produce cockerels that make better market poultry and pullets that are better layers than were the old flock. It will take a long time to build up a flock in this way, but it is far better than the old method of inbreeding, or swapping for a likely cockerel with one's neighbors.

A better class of grade poultry is produced by making first crosses of thoroughbreds with an especial purpose in view. For instance, a White Leghorn male bird crossed with Light Brahma females will produce pullets that are better layers than straight Brahmas, and cockerels that mature earlier than do the Brahmas, and weigh much more than do the Leghorns. A Plymouth Rock-Brahma or a Wyandotte-Brahma cross will make better market poultry, but not quite as good a layer as does the Leghorn crosses on Plymouth Rocks, and Wyandottes produce quicker growing broilers and good, plump roasting chickens, as well as making a good laying cross.

All the crosses I have mentioned are good, and are largely

grown. My own experience has been that these cross-bred chickens are not enough better than the thoroughbred, in the particular point you are after, to counterbalance their many weak points.

In choosing cockerels for crossing purposes, breeds to cross, or a breed to be kept pure, you should consider thoroughly what you wish it for, and then select the breed that will do you the most good. There is some one breed that will exactly fill your requirements, and it is then simply a matter of your own personal color preference that will determine the variety.

Most breeds have several varieties distinguished by color alone. The shape of all varieties of the same breed should be the same, but varieties of color are nearly legion. For instance, we have ten varieties of the Wyandotte, seven of Leghorns, five of Plymouth Rocks, and so on. Before suggesting breeds, I will first take up the branches of the industry and outline these.

This is the day of the specialist. The poultry industry is beginning to feel the trend in this direction, and the most successful poultrymen today are those devoting themselves to one, or at most two, of the important branches of the business. The chicken is marketable at several stages of its development, but to produce the best quality at any given age it is necessary to vary the feed right from the shell.

Market poultry can be graded in five classes; squab broilers, broilers, small roasters, large roasters, and stewing fowls. The first class requires a 10 to 16 oz. chick. This weight, in good order, is reached in five or six weeks. The broiler weighs three to four pounds to the pair, and is finished in 8 to 14 weeks according to parent stock, and size demanded. In roasting chicks, the weights most desirable are from 10 to 12 pounds to the pair. As a rule, they command top prices at this weight. There is a growing demand, however, for extra good soft roasters, weighing 8 to 12 pounds each. These choice big fellows are even better eating than are turkeys, and when they become more generally appreciated, they will need to be grown in large numbers. This top weight has been reached in six months. It takes good vigorous parent stock, and an experienced feeder to drive them quite as quickly as this, however. Stewing fowls are desired plump, with yellow skins, and as

young as your conscience will force you to put them on the market.

Prices for market poultry are governed, first by time of year, and second by condition. I put the season first simply because best prices are determined by fashionable trade to a certain extent, and because it is much easier to condition poultry at some parts of the year than at others.

Good squab broilers rarely ever fall below 60 cents per pair in New York, or Philadelphia, while Boston market seldom goes as low as this for top quality stock. The highest price I ever received was \$1.40 per pair for selected chicks in private trade. A full season's record averaged 81 cents per pair for the output. Our average cost to produce was about 50 cents per pair. This could have been reduced somewhat if we had been able to procure more hatchable eggs. Squab broilers are used at luncheons, both in private families and at hotels and clubs. They make a much better appearance than does a regular broiler, served split.

Broilers should weigh 3 to 4 pounds to the pair, and range in price from 20 to 60 cents per pound. Have known price to remain constant at 35 cents for six weeks at a time. From February to September the average price in a good season will be about 32 cents for first quality chicks. The best broiler is one we can plump up at eight weeks, and have it reach one and one-half pounds weight. This size, in perfect condition, and with good yellow legs and skin, will bring top market price.

It will cost about 30 cents to produce a first class 2-pound broiler, and a little less for a 1½-pound chick. You will see that this leaves a good margin of profit in this branch of the industry, and market is never over-stocked with AI products.

Before going on with roasters, will say a word about feeding broiler chicks for best results. I have made very careful experiments covering several years' time, and, having tried almost every method, have chosen this as the most successful:

We do not remove chicks from the incubator until they are 24 to 36 hours old. Simply remove trays, open ventilators, and allow machine to run down to a temperature of 95 degrees or less. This will allow chicks to finish thoroughly the assimilation of the yolk of the egg which has been their nourishment during the formative period, and will bring them from the machine chipper, and ready for trouble. The first feed they

get is fine chick grit, and a clean fountain of pure water. We then feed a cake composed of bran, rolled oats, enough middlings to stick it, fine grit, fine shell, and well mixed with milk. No rising timber of any kind is used. This mixture we put in large flat pans, and bake in a slow oven for four or five hours. When cool, we crumble up, and feed twice a day. The other three feeds we give a mixture of cracked grains, seeds, and grit, very similar to the leading commercial brands of chick feed. The fine grain is thrown in cut clover litter for the first few days, but we soon graduate them to planer shavings. We try and feed exactly enough to keep their appetites on edge, and have them watching eagerly for attendant as he comes along with next meal two hours later. The working chick is a healthy animal, and conversely, the healthy chick is a worker.

When we are forcing chicks for broilers we put a box of beef scrap in their pen when they are two weeks old, and let them eat what they wish. They will soon become accustomed to it, and will not gorge. It is a big factor in producing quick growth. Perfect cleanliness is absolutely necessary to successfully raise broiler chickens.

The production of roasters is getting to be more and more a profitable and prominent branch of the poultry industry. My personal experience with this branch has been very limited. We market each fall several hundred off-colored specimens from our thoroughbred flocks, but have never forced growth from shell to roaster age. If I were to do so, would start in the same as with broiler chicks, but not feed the beef scrap until about 3 weeks old. Beginning with the fourth or fifth week, would make one feed a day of a good concentrated mash food, and gradually increase number of mash feeds until we were feeding it three times a day with mixed grains in between. This method would help grow larger frames, and not force plumpness too quickly.

The cockerels in a flock of chickens you are raising to the roaster age should be caponized for best results. It not only increases their eating qualities, and consequently their market value, but it makes them docile, and does away with scraping proclivities. This will enable them to convert all food into growth and not waste any energy in recovering from battles with others in the flock.

The modern cramming machine promises to revolutionize

the fattening of fowls. When marketed they should be plump, yellow as gold, and not over-fat. Experiment with the machine has produced this result in a shorter time, and with no more labor than other methods.

A poultryman can combine all branches of the market industry just described, or, better yet, can combine some one branch with the production of ducks for market. The raising of broilers will conflict less with the ducks than will the production of roasters, as they are turned over more rapidly, and easier to drop when work on ducks becomes burdensome.

A great number of small, as well as large poultrymen, specialize on producing market ducks. In some sections, and on some farms, the industry has reached enormous proportions. Two mammoth plants have an annual capacity of 100,000 ducklings. Many others, perhaps better money makers, produce 25,000 to 50,000 per annum. Besides these many large plants, the number of farmers, or farmers' wives, taking up this branch as a side issue is rapidly increasing. They are making money in every instance where they go about it right. Perhaps a few hints as to the way we raise ducks on our farm will help some of you.

Our location, on sandy land, gently sloping to the shore of a beautiful lake, is almost an ideal one for ducks. Our breeding ducks have runways into the water, and we find our eggs more strongly fertile than are those laid by birds without swimming pools. To encourage those of you without available water, and who wish to give ducks a trial, will say that two of the most successful growers of ducks in New England do not have any water for their breeding birds to swim in, and think they do exactly as well without it.

We begin setting duck eggs about January 1st, and continue until they begin dropping off badly in fertility, or cease laying early in July. We hatched a few late in August this year, but eggs ran so poorly in fertility at that time of year it hardly paid us to bother with them.

When our ducks finish hatching, we remove trays, and let them dry off in the incubator, as we do the chicks. Removing them to the brooder house at 36 or even 48 hours of age. Our first feed is a crumbly mixture of rolled oats, kiln dried bread crumbs, thoroughly mixed with raw egg beaten up, and milk. To this we add plenty of fine grit, and give pure water

in clean fountains, giving depth enough for them to wash their nostrils, but not room enough to get in all over. We drop the egg, and work in a little middlings, meal, and beef after the first week. After the third week, drop the oats, and cut down the crumbs, and feed bran, middlings, and meal with about 5 per cent. beef scraps. The amount of meal and scrap we increase gradually, until at 6 or 7 weeks they are getting nearly half meal, and 15 per cent. scrap. At 10 weeks old our ducks will weigh 10 to 12 pounds to the pair when fed on this diet.

Prices for green ducks range from 15 to 35 cents per pound. The average price for best quality is about 18 cents for the season. It costs 50 to 60 cents to grow a duck to 10 weeks age, leaving about 40 cents profit on each duckling computed on average prices for season.

We use artificial means altogether in producing our market poultry, and, whether you raise 100 or 1,000 or more youngsters a year, it will pay you to give the incubator and brooder a thorough trial. They work when you want them to, and produce early youngsters to catch the high prices. Poultry raising on a large scale is absolutely impossible without their use.

Geese are profitable to raise where one has pasture to turn them out on. They will require almost no grain food, and are nearly clear profit when marketed at Thanksgiving or Christmas time.

Turkeys are rather hard to rear, but a sure market awaits the successful grower, and prices average higher every year.

In marketing all kinds of poultry they should be dry picked to command top prices. Most sections of the country have a more or less competent man who does this work by the piece. We pay $3\frac{1}{2}$ cents each for chicks, and 7 cents each for ducks.

In producing broilers, I have used eggs from mongrels picked up within a radius of ten miles of our farm, at a price 3 cents per dozen above the market price — eggs from Leghorn crosses on Plymouth Rocks, and on Wyandottes, and eggs from thoroughbred Plymouth Rocks, Wyandottes, and a few other breeds.

We have had some fair hatches and produced some AI broilers from the mongrel eggs. The average quality was not good however. Our grade eggs have done better, and have made good chicks to weigh one pound each at six weeks age.

Our thoroughbreds have averaged nearly as well at six weeks age, and after that time have run right away from both mongrels and grades. For two years, now, we have raised nothing but thoroughbreds, and the rapidly increasing number of broiler raisers who are willing to pay \$60 per 1,000 for eggs from good thoroughbred Plymouth Rocks, and Wyandottes proves that my experience is not unique in this respect. Last year we sold nearly 30,000 eggs for hatching, and this year our trade promises to exceed this amount. Am citing this merely to give you an idea of what the demand is for thoroughbred products at prices well in advance of market rates for eggs.

During the fifteen years since 1889, I have tried nearly every popular variety. Will give you a brief synopsis of my experience, and reasons for choosing and retaining the varieties I now breed.

My first thoroughbreds were Brown Leghorns, and Light Brahmas. At the same time I had a flock of cross-bred buff fowls, very similar to the present-day Buff Plymouth Rock, but several years before the latter were introduced as a distinct variety. The Leghorns were good layers of medium-sized eggs. They were nervous, impossible to confine without mutilation with ordinary wire, and color of egg shell was against them on Cape Cod, where I had my early experience with poultry.

The Brahmas were quite good winter layers of brown-shelled eggs of splendid size, and found them very profitable from that point of view. They were slow in growing to marketable condition, and in maturing, and made poor market poultry below the roasting weight of eight pounds. The hens are also heavy awkward mothers.

My buffs were good layers of fair-sized eggs. Made splendid mothers, and were comparatively easy to break up from sitting. The chicks made rapid growth, and were ready to market in July and August, when my summer resort trade demanded them. They filled every requirement for me, excepting at that time I did not consider them thoroughbred. Can trace my present fondness for the Buff Plymouth Rock right back to this flock of single-combed buff fowls that gave me such excellent results when I was a boy.

The Langshan boom now came on in full blast, and I discarded Brahmas to make room for their lordly Chinese breth-

ren. Added both blacks and whites, and the next year the Barred Plymouth Rock.

The Langshans are splendid winter layers, excellent mothers, and AI flavor as table fowls. They have but one serious fault. The black, feathered shanks and white skin on the black variety, and blue shanks and white skin on the white variety absolutely spoil them as high-class market poultry, and make them second quality. These defects are all that prevent the Langshan from becoming one of our leading general-purpose fowls.

The white shanks and white skin of the new English Orpingtons will prevent them, too, from becoming popular in this country, as, to be widely bred, a breed must conform with the general requirements of the public taste. So far they demand yellow legs and skin on dressed poultry, and I have seen no signs of their becoming educated to anything different.

The Barred Rock filled a niche in my regard from which no other variety has succeeded in ousting them. They are today, and probably will always be, one of our leading general purpose fowls. Their only drawback being dark pinfeathers when dressed for market. The buff and white varieties combine the good qualities of the barred, without this single defect. Their light-colored pinfeathers make theirs a most attractive carcass when picked by the expert. The Plymouth Rocks, barred, buff, or white, are good winter layers, first quality table poultry at any age, ideal mothers, and they are fine docile birds, standing confinement well, or able to hustle for themselves where they are given the opportunity.

The White Wyandottes were added to my yards in '98, and have qualities that are unexcelled. Their rose combs, fitting closely to the head, are practically frost proof with ordinary protection. Their earlier maturity makes them lay a month ahead of the Rock in the fall, and this about counterbalances their being one pound smaller. Their laying qualities and well-rounded carcass when dressed make them the only serious rival the Plymouth Rock has as a general purpose fowl.

In 1900 when moving from New England to southern New Jersey to start our present farm, I took with me a flock of 600 Barred, Buff, and White Plymouth Rocks, and White Wyandottes. That year added Buff Wyandottes to our flocks, and sold the White Rocks.

On account of warmer climate, my thoughts now turned to the Mediterranean varieties, and bought a flock of nearly 300 Buff Leghorns, and some Minorcas. One winter's experience with these varieties was enough. They did not lay as well, with same attention, as did our other varieties, and the Leghorns were too wild and nervous to run in our yards containing oak trees. When time came for winter quarters we found it necessary to run them down daytimes, as a number of them preferred the *tops of the trees* as sleeping quarters to the comfortable coops provided for them. The Minorcas we discarded without quite as thorough trial, as they did not suit me personally, and wished to cut down breeds.

That spring we bought over 1,000 Rhode Island Red eggs from the leading breeders and had quite a flock of them when fall came. They ran from light red through all shades of buff and yellow to pure white, and from dark red through the smoky shades to pure black. Selected the best birds and found them to be excellent winter layers and good hardy fowls. Did not find them ahead of our buff varieties in any way, and knew it would hurt our trade in fancy buffs to have a fowl on the place that was liable to breed specimens of a buff color, hence closed them all out the next year.

During the past five years the Red breeders have made a wonderful amount of improvement in the uniformity of color in their flocks, as well as in excellence of individual specimens. They are a valuable general purpose fowl, and, while pins are a little darker than those of the buff and white varieties, they rival either in attractive appearance of the dressed product.

During the past five years have made experiments with pens of Golden and Silver Wyandottes, White Leghorns, again with Brahmas and Langshans, and added the White Plymouth Rock once more. In turn they have been discarded, excepting the whites, and I now give my unqualified endorsement to the Barred, Buff, and White Plymouth Rock, and the Buff and White Wyandotte, as being the best all-round general-purpose fowl in existence, with Rhode Island Reds their nearest competitor. This is the result of my own personal experience, and not influenced in the least by the opinions of others.

In choosing which variety of the above to give a trial, I will simply advise that you take the one best suited to your personal taste in color or form. They vary so little in egg production,

and in other desirable qualities, that hardly any two experiments or series of tests would bring the same variety out in the lead. We are all human, and, in a neck and neck race, most of us would be inclined to give a friendly push to our favorite. For this reason we are apt to do best with what we personally prefer. You will make no mistake in choosing any one of the five varieties named.

In choosing a variety of ducks, we are not confronted by such a bewildering array as with chickens. We do not need to even consider the mongrel, or common puddle ducks, as at maturity they are no larger than the Pekins are at eight weeks of age.

Everyone knowing even the rudiments of duck culture will know that the Imperial Pekin Duck is raised by the thousand in America, while all other varieties combined are raised by the score. This is caused principally by the fact that, from the growers' standpoint, they are an ideal duck. They are good eating, with plump, well-filled-out breasts; are quiet in their habits, with neither ability nor inclination to fly; while they are splendid layers of hatchable eggs, hearty eaters, and put on meat and flesh more rapidly than does any other duck. A two-foot fence will retain them, so expensive yards are unnecessary. These many good points make them profitable to raise.

The Rouen is colored very similarly to the Wild Mallard, and is more delicate in flavor of its meat than is the Pekin. They should weigh one pound more than the Pekin, but will hardly average as large. They will not grow as rapidly, but put on flesh very fast, it being quite hard to keep them in good breeding order. Several farms are making a specialty of growing them for private trade, and there is plenty of market for a larger number every year.

The Muscovy, white or black and white in color, has many characteristics in common with chickens. They can fly as well, though probably not as far, as can the wild ducks. Our lake is about three-quarters of a mile wide opposite our farm, and our young Muscovies thought nothing of flying across and back for the exercise. Returning they would light in trees, on roofs of buildings, or on the ground, as their fancy dictated. Muscovies have been known to nest in hollow trees, up in the manger in the barn, and in other places where they are not apt

to be molested, just as hens will. I have never had a Muscovy egg fail to hatch, when set on by a Muscovy duck. Have also never lost a duckling when the mother duck was left with her brood. They are the most fearless variety of ducks I know of, and quite easy to tame and make pets of if one has patience. Other varieties are too nervous and excitable, the Pekin being notably so. Another pleasant feature, where one has near neighbors, is the inability to quack. The Muscovy talks in a hoarse whisper, and never makes enough noise to annoy any one. The loud quacking of ordinary ducks makes them objectionable to any one within hearing not having a monetary interest.

As a market duck the Muscovy is excellent. Plump, full-meated breast, and the minimum amount of fat, even on AI market specimens. The defects in the Muscovy as an ideal market duck and that prevent its more general growth are three in number. First is the difficulty in yarding them. They will require quite high fences, and without crippling them when they are half grown no fence will retain them. This requires covered pens and excessive cost. Second, the difference in weight of males and females. A flock at ten weeks old will not average as large as a flock of Pekins of same age. The Muscovy males will run overweight, but the females will be considerably smaller. Third, but not least, is the pugnacity of the male bird during the breeding season. He will tackle anything living, and with anywhere near an even chance will come out ahead. With his powerful wings striking with hard butts and sharp claws, he makes a formidable antagonist.

Will never forget the first Muscovy drake I attempted to catch. I caught him by the neck, as I would have any other duck. Mr. Muscovy objected, however, brought both feet up quickly, and catching me at the wrist with his toenails, scratched clear to the ends of my fingers. It was several weeks before I lost the traces of my reminder, and you can rest assured I knew how to capture a Muscovy after that.

The Cayuga should weigh as much as the Pekin, and so, of course is larger than our Wild Cayuga duck. They do not average anywhere near the standard weight and make a very acceptable substitute for the wild duck in the market. It is a beautiful bird in the sun, with its iridescent, greenish-black plumage, and will beautify any place.

The Aylesbury is the most popular market duck in England, and is grown there very much as the Pekin is here. It is a pound heavier than the Pekin, and pearly white in color, with flesh-colored legs and bill. The Pekin plumage is creamy white, and so differs from Aylesbury in shade of color as well as in shape. The Aylesbury carriage is more horizontal, and body should be rounded without keel. As with chickens, the American market demands the yellow legs and bill of the Pekin. The Aylesbury is a good layer, and fattening quickly, is a very desirable duck.

The new Swedish duck seems to be at a standstill, and not gaining in popularity. Indian Runners, too, have not taken hold well here. They may lay more eggs than the larger varieties, but their small size is against them.

All other ducks are more or less ornamental. Any farmer whose land borders on a lake, or who has a brook or pool on his farm, can add an extremely attractive feature, as well as a money-maker, by building a pen and stocking it with Wood, Mandarin, or Call ducks, or some of the species of Teal.

Any duck classed as practical, will prove profitable as a market bird, and will pay back a good income from a comparatively small investment.

Geese, turkeys, and Guineas are all sources of profit to the farm, and, more are raised in small flocks by farmers' wives throughout the country, than are grown in any other way. There are few farms where unusually large flocks of either are kept, but a large number that make a good profit from their flocks.

If one has a low, marshy meadow bordering on a stream he cannot find a way to make it more profitable than by turning a flock of good geese loose to graze on same.

The Toulouse is most popular, with the Embden a close second. The former are gray, laced with white on back and breast, solid gray heads and necks, and white underneath. They are a big, low, firm-set goose, and an invaluable variety.

My choice is the Embden. Their pure white plumage, orange bill and legs, and clear, bright blue eyes make a very attractive combination of colors. Their carriage is a trifle more graceful than that of the Toulouse, and they are exactly as large and equally productive.

The African is a good goose, and it is claimed will lay more eggs than do the Toulouse and Embden.

The China varieties, white and brown, are somewhat smaller, but of a good size for market, and extremely productive. They are a profitable goose to keep.

I had the pleasure of judging the geese at the World's Fair, St. Louis, poultry show. Have never before seen so many good geese in the showroom at one time, and the quality of the winners was grand. It was very interesting to me to note which section of the country produced the best geese, and was surprised to find how little this big collection taught me along this line. Will simply cite the Toulouse class to show you how well the prizes were distributed. The winning old gander was from Minnesota, the old goose from Pennsylvania, the young gander from Illinois, and the young goose from Canada.

We did not make a success with geese because we have no pasture for them, and it cost us too much to buy all their feed from shell to marketable age. Our soil is light and sandy, and will not grow a grass with a heavy enough sod. It pulls up too easily. Below us, on the salt marshes, they are raised in large numbers.

Have never raised turkeys or Guineas, but know there is a good profit in growing both of them, and, as I said before, the large farms do not monopolize the trade.

After we have started a flock of any thoroughbred variety we want to know how good they are, and ask ourselves if we have better birds than our neighbors, who breed the same varieties. Naturally, we think we have, and, just as naturally, he prefers his own. There is a good opportunity given to have an unprejudiced third party decide this question at every fall fair in the country, and at winter poultry shows held in most every city in your State. There is no place where one can learn as much in a day about his favorite variety as he can at a poultry show, where he puts his birds alongside the other fellows and then studies out the strong and weak points in each bird. A little of this experience will soon teach him where to strengthen his flock, and the next year he will come back determined to do better, and will be able to show better birds.

Even a local reputation of owning a winning flock will enable a man to easily sell some cockerels for breeding, and also a few surplus pullets each year at prices well above the market

value. An advertisement in a neighboring agricultural or poultry paper will help find new customers and, if the man or woman possesses the true fancier's spirit, it may be the starting point of a good-sized and growing fancy poultry plant.

It will take considerable correspondence and office work to sell fancy poultry for the show or breeding pen, but, if the best birds you can spare each year are sold at good prices, it will help to increase your profits and be worth the labor.

The ideal plant from a money-making point of view, whether a side issue on a farm or run as an exclusive poultry plant, is a combination of market and fancy poultry. One should not carry on all branches of the market industry, but should specialize on one or two, and combine with this the thoroughbred branch. On our own farm we raise several thousand ducks for market each year, and several thousand thoroughbred chickens. At broiler weight we market all the chickens we know will not make good breeders or show birds, and in the fall we market all that do not develop as well as they promised to earlier in the season. This leaves us about 2,000 selected birds to sell each year, and we find no difficulty in disposing of them.

The most important thing in starting any branch of the poultry industry is to approach it seriously. Treat it as a business proposition and consider carefully each step you take. If you have means and not sufficient knowledge hire the knowledge. We would not close our eyes and jump blindly into any ordinary business, yet that is exactly what many have done in the poultry business. Let us all remember that we must creep before we can walk, and start in a small way. If we will thoroughly learn each step and then work the business up to the point where our bump of precaution bids us stop, we are sure to be successful.

If every beginner will use these precautions, the poultry industry would show no larger percentage of failures than does any other business, and the people will more fully realize the exact truth, that the raising of thoroughbred poultry for eggs, market, and breeding purposes is a sound and respectable business, and one that annually produces more dollars than any other product of our farms.

DISCUSSION.

QUESTION. What is the value of Guinea hens?

MR. DELANO. Since the interstate laws, the game laws, have gone into effect, Guineas have had a ready market. They are used by hotel proprietors in place of partridge and other game. They have a decidedly gamey flavor. It is against the law to send Guineas from one State to another all over the country.

QUESTION. What kind of grain rations do you give poultry to make them lay eggs the year around?

MR. DELANO. We never mix grains of any kind. We use wheat, barley, oats, buckwheat, and corn. Our birds get a corn ration twice a week. They do get corn in a mash food, in a cake which we bake, composed of corn, oats, middlings, and bran, then we mix that with beef scrap.

QUESTION. Which would you feed in the morning, grain or the soft feed?

MR. DELANO. Hard grain in the morning and soft feed at night. I presume more farmers feed the other way around. There are a number of good reasons for following either course. The only reason I can see for not feeding the hard grain at night is that it will stay in their crop longer and not work through as quickly as the mash. On the contrary, after a hen is gorged with mashed feed it is very apt to go on the roost and sit down and wait for it to digest. It is the birds that work the hardest that lay the most eggs.

THE PRESIDENT. Do you always thrash it for them?

MR. DELANO. We do not raise grain, simply buy it already thrashed.

QUESTION. How many birds do you think it wise to have in a flock together?

MR. DELANO. It all depends on the condition of the coop. If they have a large-sized yard, perhaps twelve or fifteen. You will get more eggs from fifteen than from twenty-five. If they have free range you can keep almost any number — forty, fifty, or a hundred.

QUESTION. Why do you prefer to feed corn and barley without mixing?

Mr. DELANO. For the same reason that I do not want beef, mutton, and chicken all in one meal; I want variety. I have no other reason for it.

The PRESIDENT. Do you give them all they want to eat?

Mr. DELANO. I like to keep them a wee bit hungry. If they get all they want to eat they get lazy and get fat.

QUESTION. If there is a market value for Guinea eggs, what are they for layers?

Mr. DELANO. I have had no experience with Guineas at all. I have never raised one, but there is a market for Guineas. They are never less than 75 cents a pair, and quite often bring a dollar a pair when half grown.

The PRESIDENT. Do you think that it is in consequence of the game laws?

Mr. DELANO. Yes.

QUESTION. Is dry bone all right?

Mr. DELANO. All right, yes, but I think most of the feeding properties are taken out of it. Oyster shells answer the same purpose.

QUESTION. Hasn't there been some discussion the past year over feeding mash without wetting? Do your fowls eat it in that manner?

Mr. DELANO. I never experimented with a dry mash. I can't tell you whether it has any advantages or not.

QUESTION. I sometimes think that if you had a good deal of hired help there might be a possibility of their wetting it too much.

Mr. DELANO. Not if you are anywhere around to watch the help. Our chickens get dry food altogether. They get two meals a day of this cake which we bake that has milk baked in it.

QUESTION. If you had plenty of skimmed milk would you advise a dry feed?

MR. DELANO. I would give them milk in fountains. There is nothing better than milk.

QUESTION. But you don't mix it in their feed?

MR. DELANO. We mix it in this cake which we bake, we mix that with milk instead of water.

QUESTION. Do you consider it necessary to study the different feeds—the use of protein or anything of that nature, as we do in cattle?

MR. DELANO. Yes; it is a very good point. I think probably protein will be used more than clover as a basis to work mashed food on. In making a mash food we always use some clover hay because it contains a high percentage of protein, and I think makes a better food.

QUESTION. How about wheat screenings?

MR. DELANO. We never use them at all. We buy the best wheat we can get.

QUESTION. Do you prefer wheat to barley?

MR. DELANO. I feed them both. I like to give the hens all the variety I can. We use five or six kinds of hard grain all the while, only we feed them one at a time.

QUESTION. Won't a hen as a rule prefer barley to wheat?

MR. DELANO. I think my hens like wheat better than any other grain, better than corn, but I think flocks of hens differ in that respect. I think they care as little for oats as anything, but if they are fed oats alone they have got to eat them.

THE PRESIDENT. When we came to our oat harvest and carried our oats into the barn, the chickens came and picked them up, and we noticed that when hens hadn't been laying at all they would begin to lay and keep it up as long as the oats lasted which had been dropped around.

MR. DELANO. Probably the main feed before that time had been corn and the oats acted as a tonic.

QUESTION. How about wheat screenings?

MR. DELANO. Wheat screenings are always full of elevator dust, and elevator dust will get into the throats of the chickens and irritate them and cause canker and various other things.

QUESTION. I would like to ask why a hen doesn't lay that is fed on wheat, bran, corn, oats, wheat, and oyster shells?

Mr. DELANO. I think you have asked me a poser. If you will go on and describe their quarters, how they are kept, what kind of hens, how old they are, how many lice they have, perhaps I can tell better.

QUESTION. When they have a good airy house, and warm.

Mr. DELANO. It is a very hard thing to get eggs in the off season from any flock of hens.

QUESTION. There is one mongrel that lays, a Rhode Island Red; she lays an egg every day, but none of the rest of them ever think of it.

Mr. DELANO. Is that flock overfed?

QUESTION. I don't know as to that; they are very well fed.

Mr. DELANO. Do you feed any animal food of any kind?

QUESTION. Some.

Mr. DELANO. How much?

QUESTION. Once in a while.

Mr. DELANO. Increase the ratio. The hens can't get many worms now.

QUESTION. You spoke of hens being too fat. How much do you feed them?

Mr. DELANO. I want them to turn away from the food a little hungry; I don't mean half fed.

QUESTION. In the old country they often feed rye. What is the objection to rye?

Mr. DELANO. I have been told ever since I was a young man that rye was injurious to poultry. I have never fed it, never experimented with it; simply took it on hearsay evidence.

QUESTION. I would say in regard to rye that I have fussed with poultry for several years. I was on a place once where a good deal of rye was raised. I had been feeding wheat, but I had the rye on hand and it was slow of sale, and I thought perhaps I could make the rye take the place of the wheat, but it seemed to be almost impossible for me to get the hens to eat the rye, it was something they didn't seem to like.

Mr. DELANO. I have heard it is the last grain they will eat if they are given ten or a dozen kinds, but personally I have never tried it.

QUESTION. What about apples, potatoes, and fruit for poultry?

Mr. DELANO. You can't do better than feed them, although there is very little value in potato except when used in a mash.

QUESTION. I think raw potatoes would answer the same purpose. I fed them in the fall and they answered very well. Last winter I had plenty of turnips, and we boiled them and mixed them with coarse wheat bran, and the result from that or some other cause was that I sold quite a large number of dozen of eggs at fifty cents a dozen.

Mr. DELANO. If you had gone a little further and added a little corn, oats, and middlings to your mash, and a little beef scrap you would probably have sold more eggs at fifty cents a dozen.

QUESTION. Right here I would like to ask you is it possible to feed barred Plymouth Rocks so that they will lay eggs the last of November and December, when they are worth fifty cents a dozen?

Mr. DELANO. Yes, because I have had them do it.

QUESTION. I have tried it two or three years. I have taken the best possible care of them. Three or four years ago I had about thirty young pullets hatched about the 20th of March, the nicest ones I ever raised. I took the best possible care of them, and about the first of November I put them in a pen where they had plenty of room for exercise, fed them fresh meat, gave them a mash with pepper in it, but up to the first of January I couldn't get but three or four eggs a day. About the first of January they began to lay and up to within three weeks or so they have been laying an egg a day. I have spoken with others that had Barred Plymouth Rocks and they told me it was pretty hard work to get eggs early. They had a large run in the orchard and yard, had plenty of fallen fruit

to pick up, had plenty of skimmed milk; I have a good warm henhouse and everything to keep them comfortable. Neighbors of mine that have Barred Plymouth Rocks say they can't get pullets to lay in November and December. I would like to know how to do it.

Mr. DELANO. Perhaps they are too large. I have found that the medium-sized birds are always the best layers. A big bird is not usually as good a layer as perhaps an undersized bird of the same breed. The barred Plymouth Rock will put on fat very easily and the egg production is always spoiled by fat. They are a very easy bird to fatten.

QUESTION. Is there any large bird like the Plymouth Rocks that you can get to lay in November and December?

Mr. DELANO. Yes, there are. I don't consider the Barred Plymouth Rocks impossible, although perhaps not quite as good a layer as other varieties. Personally I have found some of the other birds a little better layers. The White Wyandotte will lay in November, the Buff Wyandotte, and also the White Plymouth Rock.

QUESTION. Would the difference in climate make a difference?

Mr. DELANO. Yes, it would make a difference, but birds all over the country didn't do well last year.

QUESTION. What do you think of artificial heat?

Mr. DELANO. Better not let the birds out doors at all if you give them artificial heat. I don't believe in artificial heat for laying stock.

QUESTION. One man told me today that they kick the hens out in the snow and let them run, and they lay 100 per cent. better than hens confined in houses. It is contrary to what I have been taught.

Mr. DELANO. You know whether you consider the man truthful or not.

QUESTION. There is an old farmer lives next door to us that has a flock of perhaps 30 or 40 mongrel hens, and he has

nothing but an old shed which has been built 100 years; cracks in it $1\frac{1}{2}$ inches wide all around the sides, the roof isn't tight and the snow drifted in there during this last storm. Out in the yard he has corn lying there before them all the time, which is all the food they get, and those hens have been laying all winter, and they are still laying; he gets 20 eggs from 30 hens.

Mr. DELANO. I think that is the exception that proves the rule.

QUESTION. He does it every winter; always has done it.

Mr. DELANO. The fact of having $1\frac{1}{2}$ inch cracks all around the house probably explains it.

QUESTION. I would like to say in regard to large Plymouth Rocks that I have a flock of 18 large Plymouth Rocks and a dozen Black Minorca pullets, and they are all fed on wheat screenings and beef scraps in hoppers. The Black Minorca pullets are laying, almost 100 per cent., but from the Barred Plymouth Rocks the most I get is two out of the 18. That is different perhaps from most theories, but I notice that poultry fanciers are taking up the hopper dry-feeding plan and find that it works very well indeed.

The PRESIDENT. I see Mr. Stoneburn of the Connecticut Agricultural College, here, and I hope he will favor us with some remarks on this subject.

Mr. STONEBURN. I always have a plenty of poultry talk on tap, but I don't know what line you want me to take up. The subject has been admirably covered, but there are one or two things which came to me during this talk, and possibly a word or two along that line might be acceptable.

In the first place the speaker asked the question, "How good are they?" in reference to the stock a man should have. There are several standpoints by which we shall answer that question. In the first place, how good are they from show points, or as performers in the next box? I am inclined to believe that the average fancier — I am open to conviction here

— I believe that the average fancier in breeding for show purposes, who notices only the head, the marking of the feathers, etc., and disregards the egg production and everything else, is making a mistake if he is doing it for thoroughbred stock on the farm. If he wants to put eggs on the market at fifty cents a dozen I think he is making a mistake.

As an illustration: I was over near Syracuse the other day visiting a breeder of White Wyandottes, and he had most beautiful birds from a fancier's standpoint. That man is working to build up a heavy egg producing strain and has birds with records of 240 eggs in 365 days. But it isn't the show birds that are doing the laying. And so I say the man who is going to take up thoroughbred poultry must bear in mind in selecting his birds — must take into consideration what he is going to breed for. There is no doubt in my mind that the thoroughbred egg producer is the bird that makes the record, and when we decide the value of a bird by the number of points in his comb we are getting away from the farmer — the average farmer — I believe.

Now, there is another thing. The average farmer, I am convinced from what observations I have been able to make, makes a mistake in the handling of these birds. I think there is a lack of knowledge regarding the proper way of handling poultry to get good results. The man who will not *keep* his birds high grade had better keep his old mongrels. If you have a lot of undersized birds that have been accustomed to roost in that old shed you will probably get better results from them than if you took high-bred birds and put them in the old shed and let their combs freeze.

The speaker said that he had no use for the Leghorns. We keep nothing but the Leghorns. Why? Because we have a trade that demands a white-shelled egg. Further, we have a short summer season and the Leghorn will come on to egg laying maturity sooner than any other bird that I know of.

The question of variety will have to come down, as the

speaker said, to handling the bird that you like, but you evidently like the bird that will meet your requirements.

The speaker also spoke of the "cramming" process for the high-grade market poultry. We have a fattening house there and we have room for 750 birds. We put in perhaps 250 birds each week and the birds gain from two to six pounds. We ship to some of the high-grade clubs in the Adirondacks, also have a very nice college trade at Columbia University. We are buying at this time poultry that costs us ten cents a pound alive. We put it in the crate for three weeks and it gains about 50 per cent. in live weight, and we sell it dressed at 20 to 22 cents a pound. The demand is far in excess of the supply. I fully concur with what the gentleman said in this: that that is the method by which our high-grade market poultry is all to be finished in the future. It takes four men a little over an hour to feed that stock with our two cramming machines. Possibly some of you don't know what these machines are. There is a receptacle in which the food is placed after being finely ground and mixed with milk — a cylinder in which there is a plunger, a long tube which is inserted in the bird's throat, and by the movement of a lever the food is forced into the crop. That cramming process is used twice a day, in the morning and at night. Two men, one to hand the birds from the crate, the other to operate the machine, will cram from 300 to 400 birds in an hour. There is not a doubt that this is the highest grade of market poultry, and I believe that we of New England and the Middle States have got to come to it, as the west is now producing such high-grade market poultry at approximately the same prices received for eastern stuff.

Now, just a word regarding turkeys. The time was, within the memory of many of the gentlemen of this audience, when every New England farm had its flock of turkeys, but you can't raise them today very successfully. Why? Because of that fearful disease that we term "blackhead." It swept New England and decimated the flocks, and it is almost impossible

to raise turkeys in New England. Keep your eye on the Rhode Island Agricultural Experiment Station. They are at this station devoting a large part of their available funds to working out the problem of overcoming that disease and restoring the bird to its old place, king of table poultry, in New England.

I know that all our experiment stations and colleges, sooner or later, are going to come to this investigation of poultry subjects and to the teaching of poultry culture, and the sooner that time comes the better for all concerned.

Mr. PRESIDENT. I would like to ask a little more about this cramming business, this cramming machine. Whether a person of average intelligence, fairly bright hired man, would be able to use the machine fairly successfully.

Mr. STONEBURN. I can answer that from my own experience. We are running a correspondence school for poultry culture, and we have a great number of students. We have what we call a "residence course." We have students on our farm at all times and these men are doing our cramming. It is a very simple process; no trouble whatever.

QUESTION. I would like to inquire the price of these machines.

Mr. STONEBURN. They vary. There are several machines made. There is one made up in Massachusetts, I don't know the address. It is called the King machine.

Secretary BROWN. I wish to say, gentlemen, before you leave, that there is an exhibit in the lower hall that is well worth your inspection, the exhibit of fruit, and the exhibit which Dr. Clinton has made in regard to the investigation of the potato diseases at the Connecticut Experiment Station and also by the Agricultural College at Storrs, all of which are not only interesting, but very instructive.

Convention adjourned to 7.30 P. M.

EVENING SESSION.

THURSDAY, December 15, 1904.

Convention called to order at 7.30 P. M., Vice-President Seeley in the Chair.

The PRESIDENT. First we will have a song, "Way Down on the Suwanee River."

Song.

The PRESIDENT. The subject of the address this evening is "The Geology of Connecticut as Related to Its Water Supply." A year ago we had something of this kind and it created a great deal of interest. There is a good deal of interest taken in this question, especially in this State of Connecticut, and not only here but it extends to the State of New York, particularly in regard to her future water supply. We have with us this evening a gentleman who is going to instruct us still further upon this interesting question, Professor H. E. Gregory of Yale University, New Haven, whom I am pleased to introduce to the audience.

Owing to the protracted illness of Professor Gregory, his article will not appear in this Report.

MORNING SESSION — THIRD DAY.

DECEMBER 16, 1904.

Convention called to order at 10 A. M.

Vice-President Seeley in the chair.

The PRESIDENT. I would ask the audience to rise and sing "Praise God, from Whom All Blessings Flow."

Hymn.

The PRESIDENT. The program this morning calls for an address upon the "Care and Cultivation of Tobacco in the Connecticut Valley." We are to listen to an address on that subject by Mr. W. F. Andross of East Hartford, Conn., whom I will now introduce to you.

THE CARE AND CULTIVATION OF TOBACCO IN
THE CONNECTICUT VALLEY.

BY MR. W. F. ANDROSS, East Hartford, Conn.

Many years ago, almost with the advent of agriculture in the Connecticut valley, whose fertile soils early attracted the attention of the settlers, the farmers of those days began, in a very modest way, to cultivate a plant adopted from Virginian soils. The settlers of Virginia received it from the island of Cuba, where it was discovered by the Spaniards under Columbus. It having been used for centuries by the native Indians, according to their statement, by whom it was called "Uppowoc," and, receiving its first introduction to the civilized world through Sir Walter Raleigh, it soon spread and became a source of much revenue to the planters of Virginia, who in 1620, the time of the pilgrim fathers, were shipping to England large quantities of the leaf, where it was already a government monopoly. At just what time this plant was first cultivated in the Connecticut valley is unknown, but at first it was only for individual purposes, or as a curiosity. It was a long time afterward before it became a commodity of trade. At first the methods of growing it were extremely crude and unsatisfactory; but from this small beginning the plant grew and thrived on the virgin soils of the valley until in agricultural importance it overshadows all others, and in its insidious way it crept all over the world. Its influence is felt in every country, whether civilized or savage. Many strange things may be said of this remarkable plant. From this green plant, growing with mushroom rapidity, not very imposing to the eye, there emanates an influence felt the world over. There has been more literature produced on this subject than on any other appertaining to the virtues of one plant, there being, in the library of nicotines in New York, over 300 volumes devoted to this plant alone. It will grow wider in extremes of climate, more legislation has been passed upon it, and more stringent laws prohibitive of its cultivation and use than any plant known. It is more universally known and used than any plant in nature's category. Many governments have made its cultivation or use a crime, and ended by making it a government monopoly. At one period at least it has been legal tender in the state of Virginia. An eminent savant has said that America

has furnished to the world two of the greatest curses known to mankind: tobacco and potatoes. Whether he would be in the minority or not, were a vote to be taken on this subject today, it is impossible to say, but strange it is that both the plants named belong to the same order. It is also said that the devil sowed the seed. Without vouching for the authenticity of this statement we would say that if he did he conferred a great favor on this valley with its small farms, many of which are unsuitable for general farming, and on the growers of 1904 in particular. As I remarked, it is uncertain at just what period tobacco first obtained a foothold in the Connecticut valley, from which it spread to adjacent parts also, but it was somewhere about the time of the Stewarts' reign in England.

At first it was only used for smoking, but its cultivation continued, mainly in Virginia, but in a small way in Connecticut, until 1835. Then it received a great impetus in this state, particularly in the vicinity of Hartford. It was then that it became popular as a field crop, or money crop. The civil war also marked a large increase; and since that time its progress has been steadily increasing, and it is now conceded that Connecticut leaf is the standard of the world for the purpose of wrapping cigars, or for blending with the king of all tobaccos, the finer grades of Cuba.

From the time of its introduction to our soil many and varied methods have been applied to its cultivation, only the latest and most popular of which I shall speak. Particularly are there many and widely different varieties of the weed, as it is called, many of them the result of hybridization, and of purely local repute. But there are in reality but two distinctive varieties under cultivation, under general conditions in this state, of which the mechanical processes employed in producing a crop differ but little. These are designated as broad leaf and Havana seed. Of the former there are many sub-varieties. The Havana probably comes nearer to a standard of purity, as regards original stock, than any other. Soils that will successfully grow one will grow the other. Methods that are applied to one can be applied to the other also. Many whims, fancies, and notions that had their day have now passed into oblivion as exploded theories or non-essentials.

The first thing necessary to consider in starting to grow a crop is the seed bed. Some warm, sheltered spot is selected

and properly enriched. Many methods are here applied, differing according to individual opinion; also as to whether glass or cloth are to be used, or whether the bed is to remain open, whether dry or sprouted seed is to be used. All these things are merely matters of opinion; but, observing results and experiments closely, I am led to the conclusion that it makes but little difference in the final result how they are obtained, so long as they are obtained. I know that artificially forced plants are a few days earlier — an important consideration in some cases — but that they are more liable to contract disease, are more costly, and are obtained with the expenditure of much more labor and attention. Also that plants grown in an open bed, planted at the same time, with dry seed, will on the first of August be as far advanced and just as early as those that were forced, and less liable to develop calico and rust, though, as a rule, not so desirable for machine setting, where longer and more spindling plants are a necessity.

This open bed system, the old fashioned way as it were, though almost obsolete for a few years, is fast coming back again into popularity among some of the oldest and most successful growers. Where extremely early setting is necessary, in order to prolong the season of that laborious part of the work, of course some method of forcing must be employed. With only a few acres to set it is different. The plants that are to be used for very early setting must of necessity be artificially forced, regardless of extra labor and care. A good way to obtain middling plants is to remove the cloth or glass after the first weeding, when the cold winds are somewhat abated and the frosty nights are over, and leave them off. This will retard the plants somewhat, but it will give stronger and better plants, as plants breathe and need plenty of air, something they are not always sure of getting. Air is as necessary to them as it is to an individual. The only reason for having extra early plants is when an extra large field is to be set and the grower wishes to extend the time of setting. Plants set from the 15th to the 20th of June as a rule give the best results. Nature has its season for producing tobacco, even in Connecticut, and her plans must not be interfered with very much.

It has been demonstrated that we can grow tobacco here under shade conditions. Tobacco has been known to grow

under an apple tree, but it does not compare with the open air plant, whose natural requirements are not interfered with. An apple can be picked very green and house-ripened, but it would be better to leave it on the tree until the sunshine had a chance. There will be something wanting in it after all. Nature can be swayed out of her course sometimes, but where she grants one thing she withdraws another equally desirable. But let each grower decide this plant bed point for himself, if he can obtain good, green stocky plants, no matter how he gets them. He can easily find some one that will disagree with him and his theory; but if he can get plants sufficiently early for his purpose, and apparently free from disease, he won't mind the other fellow.

As to the advisability of preparing the seed bed in the fall or in the early spring, observation leads me to conclude that it makes but little difference either way. One can get good results both ways, though perhaps it is best that nitrogenous fertilizers, if applied in excess, such as dry fish or castor pomace, be applied in the fall, as late as possible before winter sets in. These fertilizers should be used more sparingly if applied in the spring. The advantage sprouted seed has over seed sowed dry is a few days gained in earliness, and usually plants better adapted to machine setting, that's all. Most constant and unremitting care and attention must be guaranteed the bed after sowing, especially if under glass or cloth. Frequent waterings and airings are necessary, as during warm days there is danger of suffocation, and people wonder what makes their plants rot. Plants grow very rapidly when nearly large enough to set. The old rule used to be: when the plants are as large as a mouse's ear begin fitting your land. There are different ways and opinions regarding this portion of the work, but, first, it is best to consider the fertilizing problem. Coarse material, like stable manure or tobacco stems, it is sometimes considered best to plow under in the late fall and stimulate with commercial fertilizers in the spring, just before the plants are set. The only thing gained by fall ploughing is the time, and sometimes cheapness of material; but it should be borne in mind that there is a continual loss of the essential elements of the manure from the time the ploughing is done till the time the plants take it up. This is especially true of stable manure. Some consider stable manure at \$7.00 per cord the first of May

as cheap as \$6.00 the first of October. Sometimes the mechanical effect is of advantage, sometimes the opposite in spring ploughing. There are some pieces of land that have been in continual use for tobacco for a period of seventy-five years or over. The soil does not seem to deteriorate under the treatment, showing conclusively that land is merely a machine. These lands have been highly manured all this time, mainly with stable manure, and it is only within a few years that commercial fertilizer has been generally used by the farmer in connection with this material. Formerly ten or twelve cords of manure per acre were used alone. Now eight to ten are used with a quantity of fertilizer, mostly of a nitrogenous nature, as a top dressing. Castor pomace and cotton seed meal are favorably received, some growers deeming them indispensable, as insuring the growth at the latter end of the season. Potash is an element very necessary to the proper development of the plant. This is too often lost sight of by the growers. Still, our tobacco lands are as productive as ever. It may be that the weights are not as heavy as formerly, but this is partly due to methods of cultivation, a finer leaf being the result.

The rule seems to be to plough the land in the fall as soon as the crop is off, whether the manure is applied then or not. Plough again in the spring when the manure is applied (if not in the fall), and sometimes again just before setting. A good way is to apply the manure — if any is to be used — as early in the spring as it can be obtained, keeping the land as free from weeds as possible, with some kind of a harrow. Then apply the fertilizer at the next ploughing, or at setting. The broadcast way is best, and is absolutely necessary with machine setting. Starters can be applied in the drill or broadcast, as most convenient, according as to whether it is to be hand or machine set. The land should be made as smooth as possible with a smoothing harrow. This is especially necessary if the machine is to be used. The plants of suitable size having been removed from the seed bed in the early morning and kept in a cool place until wanted, the setting may begin at any time that is convenient, though afternoon hours are preferable. Here individual custom and convenience, with weather conditions, govern. Of course, the mechanical condition of the soil must be taken into consideration also. The machine, which can only be used to advantage when the ground

is comparatively dry, does its own watering, but it is sometimes necessary in hand setting to water the plants by hand, a slow and tedious process. This should be immediately after the plant is set and again the morning following, care being taken not to wash any dirt into the bud so as to injure the chit. Two or sometimes one watering is sufficient. Immediately after a shower plants can be set without any water. The rows, whether hand or machine set, are marked out the same distance apart. Formerly this was three feet six or eight inches apart, now three feet four inches is deemed sufficient; but twenty inches in the row is adopted as best. The old way calls for about 6,000 plants per acre, but growers now prefer to set about 7,000. The larger number does not seem to increase the weight, but the quality is finer.

In taking the plants from the seed bed care should be taken that no diseased or calico plants are saved, if any are manifest, as they never grow out of it at this stage. Calico usually manifests itself a few days after setting, when such plants should be removed and sound ones set in their places. It may be said here that the disease called "calico" is the most dangerous one that the plant has to contend with, yet no one knows what causes it, and no one knows of any remedy for it. Plants thus affected are sure to rust, and may as well be removed at once. This disease, developing at the later stage of the growth, does not always spoil the plant, as only the top leaves are affected. It may occur at any time during the period of growth, or it gets in the seed bed. It is less liable to be found among plants taken from an open bed, and is supposed to be more likely to show on land that is deficient in potash. It is not known whether it is transmissible or not, through the seed or the soil. Indeed many things indicate that it is not. In support of this theory I would mention known cases where plants have been taken, decidedly calicoed plants, ripened and saved for seed, for experimental purposes, setting a few rows of the plants in an isolated place, but not a plant, either in seed or elsewhere, was affected by calico. I have taken plants from another man's bed, whose field was half ruined by this disease, moved them only across the street, and not had a sign of it. I have stopped setting at night, and commenced the next day with plants from the same bed. The latter setting was half calico, while there was not one of those

set the day before. Any theory that has been advanced as to the cause has been exploded. Usually it comes in an early stage of growth, when it is possible to reset. High ridging has become obsolete, unless it be on certain lands, where there is a surplus of moisture. Level culture is now considered the best, especially for seed leaf. High ridging is mostly used in the cultivation of Havana. Of course, level culture is a necessity with machine setting, but among small growers the machine is not considered profitable, and the result is that one-third of the acreage is set by hand. The old prejudice that once existed, that machine set tobacco was more subject to disease, has been refuted by a demonstration. After the setting, usually about eight or ten days elapse before the hoeing begins. This is rather a delicate operation, it being necessary to use the first time some fine pulverizing tool, running very near the plants, smoothing the ground as much as possible with the hoe, and setting the missing plants. Plants are sometimes killed by worms, or they die from other causes. This work is generally done immediately after the first hoeing, or after a shower of rain. Sometimes this is a work of very little importance, but it has been necessary to plough up the whole field and set over. The second hoeing is more rapidly done than the first, as the plants are much larger.

A slight hill can now be made around the plant, as it helps to sustain them in case of a heavy blow, though any radical departure from a general level is not popular. The second hoeing immediately follows the first, with usually an interval of about a week. The plants are then five or six inches high. From this point the growth is very rapid, unless cold nights or dry weather intervene. Indeed, the superficial growth of the plant is made in good seasons in about six weeks. Still another hoeing is necessary, with cultivation also, to remove the last standing weeds before the crop covers the ground. About this time the anxiety of the grower is very great. This anxiety will continue without abatement until the crops are harvested. The paramount danger is from hail, which is the most feared, heavy winds, too much or too little rain, rust, insects, etc.

When the plant shows a little color in the bud it is time to top it. It should be topped at a point as low as the leaves seem to be of proper size to save, or as low as one thinks

the leaves left will mature. Generally a field has to be topped over several times before all the plants can be topped at the same height. Some, at first, only pinch out the bud, waiting a few days before topping to a standard or general level. Top suckers appear in a few days, and must be removed before getting very strong. The general suckering of the plant clean to the bottom should be done a few days before cutting, though sometimes it is necessary to cut a row before suckering the next, on account of the large growth, — when a person can not do this work without considerable breakage. The period during which tobacco ought to stand between topping and cutting is dependent somewhat on the stage of growth it was in when it was topped. Also it is largely a matter of opinion. The old rule used to be ten days. This was twenty-five or thirty years ago. Now it is considered best to let it stand three weeks. Havana a longer time. The fact should be determined by a slight change of color in the general aspect of the field, showing the plants have reached a degree of ripeness that will warrant cutting. As long as the field remains of a healthy dark green color, and no rust appears, it is considered best to let it stand a little longer, as at this stage it is increasing in weight. Warm nights are now necessary. Cool nights retard growth, though they have a tendency to force the ripening of the plant.

The green worm, which in former years caused much destruction in the tobacco fields, has become almost a curiosity, so scarce have they become. The cutting or harvesting season seriously begins the 10th of August. Cutting should not begin until the dew is off in the morning. This is done to the best advantage about two o'clock in the afternoon, if the weather is fair and hot. Wilting before stringing depends entirely on the weather. Wilting tobacco thoroughly is not only a convenience in the handling, but a saving method as well, as there is much less breakage, and less liability of pole sweat if carefully wilted before stringing.

Lath has generally superseded twine in hanging tobacco, as a quicker, more convenient, and less costly method. Tobacco cures quicker on lath, the split stalks evaporating the moisture much more rapidly. The hanging capacity of a building is the same whether lath or twine is used. Tobacco will keep better when piled down on the stalk if it is hung on lath. The

plants should be thoroughly shook out when the hanging is done. This prevents pole sweat to an extent. Twine and the fittings necessary are more expensive than lath, besides the process is more awkward, both in hanging and taking down. Thorough ventilation, when the tobacco is hung in the shed, is of the utmost importance. The doors must be kept open days and closed nights if the weather is dry, or the reverse if too dry. At first it is better to keep them closed during a rainy spell. Care must be taken that high winds do not whip the leaves after the tobacco is hung up. Doors must be shut on the windward at such times. The sun shining directly onto tobacco after it is hung is also a detriment. It is said to be productive of white veins. It should be dry, or free from rain or dew, when carted into the shed, so the leaves will not stick together and sweat. But a moderately damp cure is preferable to a dry one.

The number of plants strung on each lath depends on their size and growth. Ordinarily six is the usual number, but sometimes five is enough. Their distance apart when hanging is eight inches, unless the tobacco is very large, when five is enough. Sometimes, in case of a light growth, seven may be used. The period that tobacco should hang before it is sufficiently cured to take off the lath depends entirely on the weather and cure. In a good curing season early cut tobacco should be ready to take down in six weeks, but late cut tobacco requires a longer time. Be sure the stems are thoroughly cured.

Water should never be used on tobacco to dampen it. If it does not show at the time when used it will in the bale or case months afterwards, unless very carefully used. Much of the fineness and quality of the leaf seems to depend on the season, not only on the growing but the curing season also. The market at the present time demands light shades in tobacco. These colors are the most desirable as people now smoke, fashion governing the trade. The first requisite in a tobacco leaf is its color. Everything else is seemingly of secondary consideration. This is liable to change at any time among the class of smokers who smoke with their eyes, and, strange to say, this class predominates today. The eye must be suited first, regardless of all other considerations. Real flavor and quality is relegated to the background.

There is no doubt that tobacco has improved in all essentials in the last few years, in spite of the constant reiteration that "We don't raise as good tobacco as we used to years ago." The fact is the market did not at that time make the demands on us that it does now. Forty or fifty years ago, when farmers were delivering their crop in a one-horse wagon load, and the stripper made but two kinds, holding the principal leaves in their hand as wrappers and dropping a few bottom leaves as fillers, taking the longest leaf in the bunch to tie the band, making only two kinds, does any one suppose that the leaf of those days would go now? What would the growers of 1860 think of making 15 or 20 kinds and sizes? At this time there was a great cry made that it would not last, that the farmers would soon overdo the business of tobacco growing. Now it has increased a hundred fold, and still there is room. It is a mistake to think that all the land suitable for tobacco has been taken up. There are still many lands, sections, and parcels of land, still covered with a forest growth, that are yet to become good tobacco soils.

To properly describe the various ways of sorting and curing a crop of tobacco, as manipulated today, would take a volume of itself. Suffice to say a good crop will always sell without being assorted. Growers make no money sorting. This is only done from necessity. Many farmers are not aware that the bundle prices have averaged the best.

Keep tobacco as clean of rubbish as you can when stripping, and it will shrink ten per cent. in sorting before it is delivered.

The bright outlook for the cultivation of tobacco in Connecticut applies not only to the next succeeding crop but many more to come also.

The PRESIDENT. The secretary informs me that he has been able to secure the attendance of Mr. A. D. Shamel, of the bureau of plant industry at Washington, who will address us now, after which we will have some music, and then a general discussion on this matter of tobacco culture will follow.

IMPROVEMENT OF TOBACCO BY SEED
SELECTION.

BY A. D. SHAMEL,

Of the United States Department of Agriculture.

Mr. President and Ladies and Gentlemen: Mr. Andross has made some suggestions as to the length of time it takes for a man to become familiar with the various processes of growing tobacco. I am afraid that you will think that my experience in this matter is rather limited, which it is; but the thing I wish to present this morning is the question of seed selection and breeding, which I believe to be new, and I think that the result of the experience of the Department of Agriculture obtained in this valley during the past year will perhaps furnish some suggestions to you for the improvement of this crop.

In all varieties of tobacco there are certain strains of seed which are looked upon by growers and buyers as possessing some particular merit and special value. Many of these strains have been produced by growers observing some peculiar or striking plant during the cultivation of the crop, and saving the seed from it for future planting. In fact, most of the varieties now under cultivation are the result of such accidental selection of seed plants. The improvements in yield and quality of the crop, made by such selections of valuable seed plants, indicates that much greater and more important results can be secured by applying the principles of plant breeding in a careful and systematic manner to the improvement of the tobacco crop. There is no general farm crop grown under such an intensive and costly method of culture as certain classes of tobacco, and by reason of the importance of soil, climate, and other influences on the character of the crop, the importance of seed selection and breeding has been neglected and not given much consideration. While in some districts one hundred dollars worth of fertilizer is used per acre, and other methods of culture are similarly developed, the methods of saving seed are the same as those introduced by the pioneer tobacco growers. The writer's experience with the breeding of the several varieties of wrappers grown in the Connecticut Valley has shown that the improvement in yield and quality of

tobacco by seed selection, and probably by hybridization, is one of the most important means of increasing the value of the crop, and without additional cost of production. The general results of the experiments conducted by the Department of Agriculture with the breeding of different varieties of tobacco in the Connecticut Valley last season will be presented here, in order to offer some practical suggestions to growers for the improvement of their crop by breeding and seed selection.

CHANGE OF SEED.

There is a general impression that a change of seed from one region to another is necessary to prevent the "running out" of the variety. In other words, many growers believe that a variety of tobacco will deteriorate in quality if grown on the same farm or in the same locality for several years. A similar belief exists among the growers of other crops, such as corn and cotton, and many of those farmers follow the practice of obtaining fresh seed from some distant locality year after year. In corn and cotton it has been found by careful tests that when a variety has become adapted to certain soil and climatic conditions the yield may be increased by seed selection and breeding, and, instead of deteriorating by reason of continued growing in the same locality, the value of the crop can be increased. In order to illustrate the effect of a change of soil and climatic conditions upon tobacco the experience of the growers of imported Sumatra and Cuban plants in this region will be reviewed. In the seasons of 1902 and 1903 tobacco seed from Cuba and Sumatra was extensively used on the plantations growing tobacco under shade. The crops produced from this seed lacked uniformity to such an extent that several distinct types of plants could be found in every field, many of these types bearing no resemblance whatever to the Cuban or Sumatra varieties. The Cuban seed produced a large proportion of small, narrow leaved plants, the so-called "freaks," in some cases constituting about one-third of the entire crop. The Sumatra seed produced many long and pointed leaved types, which were practically worthless for any purpose, and were probably reversions to some early unimproved type of tobacco. This breaking up of type and lack of uniformity has been observed to follow the use of imported seed in other tobacco-growing sections of the United States, particularly when seed

from the tropics has been grown in the north. The change of seed from one state or locality to another has produced similar though less striking results, and has led to the general conclusion that the tobacco crop should be grown from seed which is thoroughly adapted to soil and climatic conditions. In the case of the Cuban and Sumatra crops grown in this valley in 1903 typical plants were selected for seed, and the seed protected from cross fertilization by means of a paper bag enclosing the flowers. This seed produced uniform plants similar to the mother plants, and showed that by such a method of seed saving uniform crops can be secured one year after the variety is introduced into a locality. If it is desirable to make a change of seed the farmer should grow a few plants the first season for the purpose of producing the general seed crop for the following year.

THE VALUE OF UNIFORM PLANTS.

The value of the tobacco crop depends largely upon the uniformity in type of the plants, particularly the shape, size, quality, and number of leaves. The lack of uniformity increases the cost of sorting and growing the crop, and results in the production of a certain proportion of inferior tobacco. It costs about the same to grow the irregular and undesirable plants as typical plants of the desired type, so that it is highly important to grow uniform crops. An examination of the crops grown in this region showed that there was great variety in the size of plants, number of leaves per plant, the shape and size of leaves on the individual plants, the number of suckers, the earliness of maturity, the quality of the leaves, and other characteristics which go to make up the types of the varieties of tobacco. The difference in size of plants and rate of growth was most clearly seen during the fore part of the growing season, at which time the plants were found to vary in height from one to four feet. This variation in size is not shown clearly at the time of harvest except by careful examination of the tobacco stalks, by reason of the topping of the plants to about the same height. The number of leaves varied to a marked degree, some plants producing a large number while others bear only a few desirable leaves. The increase in number of leaves is not accompanied by a corresponding increase in the height of the plant, but the plants bear-

ing a large number of leaves are so arranged that the leaves are set closely together on the stalk, while the plants producing but few leaves have long internodes of spaces between the leaves. The increase in the number of desirable leaves borne by the individual plants means an increase in yield of the crop without increase in the cost of production. As a rule the plants producing the largest number of leaves are the most desirable type and quality for wrapper purposes. The shape of leaves is the most variable of all the characters of the tobacco plant, and is one of the most important factors in the value of the leaf for cigar wrapper purposes. The long, pointed leaves do not cut as many wrappers as the rounded leaves, and the pointed tip is usually accompanied by a long, narrow base, which is of very little value. In every crop observed some plants were found having leaves with round tips and base, so arranged as to cut out wrappers very economically. The size of leaves also varies with the different plants in the field, so that in a given variety plants bearing leaves of almost any desired size can be found by careful observation. The time of ripening of the plants is not uniform in many cases, some individuals maturing their leaves several days earlier than the other plants in the field. In the same way many plants are late in ripening, and do not produce desirable tobacco. The number of suckers, the quality of the leaves, and other characteristics vary to such an extent that the production of improved strains by the selection of improved types of plants is made possible, and the wide variation in tobacco is a desirable basis for such selection. This variability is not confined to any variety, but has been found to exist in all the varieties grown in this country.

THE SELECTION OF SEED PLANTS.

The selection of seed plants must be made before the plants are topped, and the most successful selections can only be made after a study of the crop from the seed bed to harvest. It is necessary to study the plants in all stages of growth, in order to judge of their fitness for the parentage of the future crop. In order to fully determine the value of the plants it is advisable to follow the leaves from the separate plants through the curing shed and compare the cured leaves from the selected plants. This plan of examination of the product

of the seed plants is extremely important, because the character and the comparative value of the tobacco cannot be wholly determined by the study of the plants in the field. From the fact that it requires some care and continuous attention, in order to keep the individual samples in order and good condition, this test of the seed plants is usually neglected. The leaves from the seed plants are not ordinarily of as good quality as the leaves from the plants that have been topped, and this fact must be kept in mind during the comparison in the warehouse.

In making selections of seed plants it is desirable to run over the entire field and mark the best plants for a second examination. This preliminary selection can be made just before topping, but it should not be done before the plants are pretty well developed, so that the type can be determined. A second, more careful selection should be made, and each one of the selected plants examined with regard to the character and features which are important in the variety of tobacco. The best plan for making such studies is to follow some regular outline of points, such as are used in the plant breeding records of the Department of Agriculture. In this way the definite data secured as to the actual condition of the plants can be kept for use when the leaves are compared in the warehouse. The number of desirable leaves should be noted, and in counting them only the leaves useful for manufacture should be counted. The size of leaf can be pretty accurately determined by measuring the middle leaf of each seed plant. The length should be measured from the tip to the point of attachment of the leaf to the stalk, and the width measured at the widest point of the leaf. The shape of the leaf is somewhat difficult to record, and the most effective means of making this note is to describe the shape as briefly as possible. The number of suckers is easily recorded, and the time of ripening of the leaves should be kept in order to throw some light on the time of maturity and the comparative earliness of the plants. In addition to these notes a record should be made of the quality of the cured tobacco when the cured tobacco can be examined.

The number of seed plants to be saved depends upon the size of the tobacco fields for which they are expected to supply plants. Each seed pod contains from five to seven thousand seed, and, as there is from fifty to one hundred and fifty

pods to every plant, the average seed plants produce from three to seven hundred thousand seed. It can be seen that in view of the large number of seed produced by the seed plants it is necessary to save but few plants in order to secure enough seed to produce plants to set out a large field. For a field of ten acres a dozen plants is all that it is necessary to save in the field, and after the examination of the cured tobacco it is necessary to save only the best two or three of these plants for seeding the following season. The fact that a minute tobacco seed, so small that it takes nearly half a million to weigh an ounce, produces a large, thrifty, and rapidly growing plant, and a progeny of five hundred thousand children in a season, is one of the wonders of plant life. Where only two or three seed plants are saved it is desirable to save the seed in separate samples, and divide the seed bed into two or three sections, sowing each section with the seed from one seed plant. The seedlings from each section should be set out in separate portions of the field, so that the field can be made a test of the transmitting power of the seed plants. The selection of seed plants for the next year should be made from the selection of the field in which the plants are most uniform and of the most desirable type. In this way improvement in the uniformity of the type can rapidly be secured by the grower.

SAVING SEED UNDER BAG.

The tobacco plant is naturally self-fertile, that is, the seed is the product of a single parent. However, in the field bees and other insects carry the dust-like pollen from flower to flower and effect cross fertilization, as in the case of the clover plant. The tobacco flowers contain a sweet, syrup-like nectar, that bees, humming birds, and many kinds of insects feed upon. In passing in and out of the flowers they naturally brush pollen from the flowers over their bodies, and in this way carry the pollen from flower to flower, plant to plant, and field to field. This cross fertilization in the same variety is detrimental to the yield, the quality, and the uniformity of the tobacco grown from such cured seed. In this way tobacco is a marked exception to most plants, many of which show increased vigor of growth as a result of cross fertilization in the variety. Darwin has explained this condition by comparing the tobacco plant to peas and a few other exotic plants which have

been inbred for so long that they have become accustomed to this kind of fertilization.

In order to prevent this crossing in the variety the flowers should be covered by a light, strong paper bag. All of the sucker branches should be removed before the bag is applied, together with the small, useless upper leaves. The bag must be placed over the flowers before any of them open, or the entire benefit of bagging will be lost. Any light bag will answer the purpose, but the twelve-pound manilla bag with roof-shaped bottom, sold by most grocery stores, is the best kind of a bag under ordinary conditions. If the plant will not support the bag a stake should be arranged to hold it up. The bag should be moved up the stalk occasionally, in order to accommodate the extremely rapid growth of the plant at this stage of development.

Seed saved in this way is larger, heavier, and lighter in color than the seed saved in the ordinary manner. The plants grown from the seed saved under the bag grows vigorously, and produces the best plants. The most striking effect of this method of saving seed, however, is the wonderful uniformity of the plants in the field, a condition which is not found in any other crop so far as is known. The number of leaves, their shape and size, the number of suckers, the height of plants, the size and nature of the venation of the leaves, the earliness, — in fact all of the important characteristics are transmitted from the parents to the progeny of the tobacco plants with almost absolute certainty.

THE USE OF SPROUTED SEED.

It is a common custom in the Connecticut Valley to sprout a part of the seed before sowing in the seed beds. This sprouting is usually done in rotted apple tree wood, or coconut fibre. When the sprouts have been well started they are thoroughly separated, and sowed with an equal measure of dry seed. There is no doubt but that this method produces the earliest plants, and the sprouted seed in the present arrangement of seed beds means a gain of several days in earliness for a part of the plants. However, it was observed this last season that where plants from sprouted seed grew side by side with plants from dry seed, other differences could often be observed. In many cases the diseased and freak plants

could be traced directly to the sprouted seed. In other words, it seems probable, particularly where the sprouts are allowed to grow one-quarter inch more before sowing in the seed bed, that many of the young plants are injured during the process of sowing in the bed. This injury frequently results in abnormal plants, which develop unusual and undesirable types of plants. If the seed is sprouted before sowing, it should be sowed before the sprouts reach a quarter of an inch in length. In fact, it is desirable to sow as soon as the young sprouts appear, and any injured plants which are found at the time of transplanting should be discarded.

THE INFLUENCE OF LARGE, HEAVY SEED.

The small amount of seed necessary to sow a large seed bed, and the minute size of the seed, have resulted in a neglect of differences of weight of seed in the growth and development of the plants. It has been fully demonstrated by foreign experimenters that the heavy seed produces the most vigorous and best type of plants and the largest yield of the best quality of tobacco. In the writer's experience in the Connecticut valley it was found that by separating the seed and sowing the heavy and light grades in different sections of the seed bed the heavy seed produced the most uniform and vigorous seedlings. The light seed produced a large proportion of small, freakish, and undesirable plants, which were not ready to be set out for several days after the plants from the heavy seed. Every grower should carefully separate the tobacco seed, no matter how carefully the parents were selected, and use only the heaviest seed for planting. Owing to the small size of the seed it is very difficult to separate the light and heavy grades. A practical method is by the use of an air current, or air blast machine designed by the writer. In this machine the seed is lifted in a glass tube by means of a current of air, and the light seed blown out of the tube while the heaviest seed remain at the bottom. Some authorities recommend throwing the seed into water, allowing the heavy seed to sink and skimming off the light seed. This method is faulty in that small bubbles of air prevent the uniform settling of the heavy seed, and after the separation it is necessary to either sow the seed immediately or dry it thoroughly for preservation.

THE EFFECT OF AGE ON THE VITALITY OF THE SEED.

The vitality of tobacco seed is preserved for several years, and is apparently as good for producing vigorous plants as when harvested. However, it has been demonstrated that very old seed has very weak vitality and produces weak and wholly undesirable plants. The effect of age on the seed depends on the condition of the seed when harvested, the manner of storing and keeping, and the character of the seed itself. In Cuba the vitality of the seed is soon lost, especially when stored in the ordinary manner by the Cuban farmers. In fact two or three year old seed is of very doubtful value, in many cases having entirely lost its vitality. This loss of power of germination in Cuban seed may be due to several reasons, and particularly to two main causes: first, the practice of sowing sucker seed, and second, the moist atmosphere. The poor quality of the seed, combined with the unfavorable climatic conditions, tend to destroy the life of the seed very rapidly. In any case it is the best plan to use fresh seed every year when possible, and if necessary to use old seed a test of its vitality should be made by sprouting several samples before the seed is used for general sowing.

SELECTION OF PLANTS IN THE SEED BED.

One of the practical means of securing uniform crops in the field is by the selection of plants in the seed bed at the time of transplanting. At this early stage of growth the shape of leaf, the comparative vigor of growth, and the general type of the plants can be observed. If this matter is taken into consideration, and the plants pulled by some one who is capable of discarding the individuals of poor type, the benefit from this kind of selection will be very marked and noticeable in the crop in the field. It is supplementary to the selection of seed plants, and, by combining both methods of selection, the rate of improvement can be increased and improved types more rapidly developed.

STRAINS RESISTANT TO DISEASE.

In a field of tobacco grown in the Connecticut valley in 1903 most of the plants were attacked and destroyed by a root disease. A few of the plants in different sections of this field

developed normally, and produced a desirable type of tobacco. The seed from some of these plants was sowed, as well as the seed from a few of the diseased plants which were not wholly destroyed. The seed from the resistant plants produced healthy and vigorous plants in 1904, which were set out in the field that grew the diseased plants the previous season. This crop was fully resistant to the disease, and produced a uniform type of tobacco. The seed saved from the diseased plants produced weak seedlings, which, when set out in the field, grew slowly, and finally the leaves began to turn yellow and the entire plants died before they had reached one-half of their full development. This clear and decisive case of resistance in tobacco is a good foundation for the belief that resistant types may be developed which will be immune to the attack of many of the fungous diseases common to tobacco.

NEW AND IMPROVED HYBRID TYPES.

One of the most promising fields for the production of improved strains of tobacco is the crossing of the native acclimated varieties with the most valuable imported kinds of tobacco. In the Havana seed and broad leaf varieties there is a considerable portion of the leaves not adapted to wrapper purposes, but the large yield is such as to produce profitable crops in favorable seasons. In 1903 the writer made crosses of the Havana seed and broad leaf varieties with Cuban and Sumatra tobaccos. The Havana seed and Sumatra cross produced a type somewhat shorter than the Havana seed leaf, but with very round and broad leaves and very fine veins. The texture of the leaf was even from tip to base, so that practically all portions could be used for wrappers. The broad leaf and Cuban cross produced leaves which were very round, with fine veins, of desirable texture from tip to base, and on the whole a great improvement over the broad leaf tobacco. As in the case of the Havana and Sumatra cross, this hybrid developed thin elastic leaves, in which the greater portion could be used for wrapper purposes.

The object of these crosses was to secure types of tobacco adapted to the purposes and market for which the Havana seed and broad leaf varieties were produced, of improved quality, so that a greater portion of the leaves could be used for wrappers. From the character of the hybrids thus far secured, it

seems very probable that such improvements can be secured. In other words, by crossing the native varieties with the valuable imported tobacco types can be secured combining the yield and hardiness of the native with the improved quality of the imported varieties. The hybrids were much more vigorous and productive than either the native or imported parent varieties, and gave every indication of increased yield and improved quality.

The PRESIDENT. We will proceed to the discussion of this question immediately after the song which we are now to have.
Song.

The PRESIDENT. We will proceed now to the discussion of this question. These gentlemen have given us these excellent papers, and I presume are now ready to answer any questions which you put to them.

To start the ball rolling, I would like to ask Mr. Shamel in regard to the matter of experiments with corn on these different varieties. What was the result of a cross in these leading varieties as you found it out?

Mr. SHAMEL. In regard to that I will say that our best results have come, not from crossing leading varieties of corn, but from strengthening new varieties. Corn itself is naturally a cross-fertilized plant — wind-fertilized. The wind carries the pollen from one plant and deposits it upon the silk or ear of another. So in any case we get naturally cross fertilization, which gives, in the plants produced from these seed, much proof of striking variations and differences in the crop. In fact we have obtained too much variation. We have got big ears and small ears, poor ears and good ears. We have, in other words, a sufficient quantity of variation to make a selection from as the matter now stands, so that by crossing two individual varieties it simply intensifies and increases this variation to an undesirable extent; but with the selection of choice varieties in corn, and the planting of seed from these in individual rows in the breeding plot, and then saving the

seed from the best rows, we have been able to improve not only the yield of the crop but to increase the per cent. of the protein, the per cent. of oil and the per cent. of solid, and increase both the feeding and commercial value of the corn.

The PRESIDENT. That rather refutes the old idea that was held when I was a boy, of picking out the best specimens and saving those for seed, and using that year after year. That wasn't correct.

Mr. SHAMEL. No, sir ; I do not believe it will give as good results as the selection of some strain and continually and systematically breeding up that single variety.

Mr. HALE. While I am not a tobacco grower, I live in the midst of tobacco growers. I have been interested this morning in listening to these two papers, one from brother Andross, who is a practical grower, and who has given us an excellent paper on the practical side of it, and then we have had the scientific matter from the last gentleman. It has been an exceedingly interesting analysis of tobacco growing, both from the practical and scientific standpoint. What I want to ask brother Andross is this: With a meeting of this kind, in the very center of the tobacco growing district, where there are thousands of tobacco farmers, situated on lines of trolley cars leading into this city, why we cannot get more people here? Why don't the tobacco growers, as a whole, take more interest in just such discussions as we have had this morning? They are not here. I remember when Dr. Jenkins gave this board an excellent paper on the subject of the scientific curing and care of tobacco some years ago, and I believe there were only two or three tobacco growers in the hall, and so far as I know there are not more than that here this morning. I don't know, but I doubt if there are twenty-five in the hall this morning who are practical tobacco growers. It seems to me that there is something wrong when we have under consideration the improvement of such a valuable crop as this, a crop which amounts to millions every year, and a crop which re-

sponds so readily to better culture and to a better understanding of the plant from a scientific standpoint. Why are the growers so little interested in that higher side of it, which really means dollars and cents to them? It is a matter I cannot understand. Mr. Andross probably knows. It has been so when the attempt has been made to hold other meetings for the discussion of these higher methods for the improvement of tobacco culture. We have had just the same results before, and I cannot understand it. What is the answer to it, Brother Andross?

Mr. ANDROSS. Mr. Hale has made a point that I have often noticed. There seems to be a great deal of jealousy among tobacco growers, and I have sometimes thought they were more blind to their own interests than most any other class of farmers. This is not only noticeable with these special meetings, but it is so in the meetings of the New England Tobacco Growers' Association, and also the National. Very few get up to the point of taking a really active, intelligent interest in the proceedings. They do not care anything about our legislation, although it was of vital importance to them. Meetings like this are important, and would be helpful to them, but they seem to lose sight of that fact and do not come out. At this time of the year very few of them have anything to do important enough to keep them at home, but somehow or other they would rather stay home by the fire. I think it is largely due to a certain amount of jealousy, that does not seem to exist among any other class of farmers. They are highly pleased if they can get a cent more a pound for their tobacco, but they do not seem to be ready, as a class, to study the means by which they could get considerably more than a cent. If they can get a cent or two a pound more than the other fellow they are happy; but as a rule they do not seem to be interested, and the only way I can explain it is that there is a certain amount of jealousy, as I have said. They will keep a buyer away from another farmer if they can. I have heard that complained of

many times. I attribute it to a sort of jealousy which seems to exist in this branch of business.

Mr. HALE. Another phase of the question I would like to inquire about, because it is something that has been asked me. Those of us who hope to succeed on the poor, worn out soils of New England find that we have to grow a good many green crops to maintain the fertility of our land and increase the fertility at certain seasons of the year, particularly in the winter. Now, I have observed all along the Connecticut valley, from Hartford down to Glastonbury, that the majority of the tobacco lands are barren. I have also observed that the tobacco growers plough their land in the fall, so that it shall be more bare. I have asked myself why it was over and over again, and I should like to be informed why they take that course. Why do the tobacco growers put so much money into fertilizers in order to keep the fertility of their tobacco lands up, and then in the winter allow those lands to be bare, and allow the very elements that they want to save and use in their crop to escape? Why don't they set a trap and hold it? In other words, why don't they grow some green crop on those lands in the fall and winter? Is there some reason that is peculiar to the tobacco plant, that makes that necessary? Is that the reason, or is it because they don't think enough about it, or don't care enough about it, or is it because the tobacco business is so profitable that they can let at least a hundred thousand dollars worth of plant food go to waste?

Mr. ANDROSS. It is a lack of knowledge. They believe that anything growing on the lands, after the crop is removed, even weeds, affects the tobacco. They believe in that kind of a doctrine, and most of them live up to it without any kind of a demonstration that it is true. I know that many plough the land immediately after the crop is taken off. No one can give you a very good answer to that question, as to why it is done, except that it keeps out the weeds. That is about all

that can be said, but at the same time some say manure is cheaper at \$7.00 the first of May. They seem to acknowledge it in one sense and refuse to believe it in the other. Few act from information gained by actual tests on the land.

Mr. HALE. Have there been any actual experiments, brother Andross, which really established whether a cover crop wouldn't be of advantage after the crop of tobacco was out, or some other crop that might die down in the winter? Have there been any experiments to show that that would be injurious to the quality of the tobacco? Is it injurious to the quality of the tobacco?

Mr. ANDROSS. So far as I know it never has been known to be. I think there exists a prejudice against trespassing on tobacco land, so to speak. There may be a feeling that another crop would tend to weaken the land, although, of course, as most of us know, no such crop as brother Hale speaks of would take anything very essential out of the land. The most of it would be left there.

Mr. FOOTE. Perhaps you do not all understand just the way this is handled. I do not profess to be a scientific man, or to know very much in regard to this matter. I live among tobacco people. Now, we want to look first at what we are raising tobacco for. We are all after profit. We do not care to work for nothing, and one great point in the business of profitable tobacco culture is to have a clean, perfect leaf, without flaws or damage from insects of any kind. Now, whether it is so or not, it is thought by the tobacco growers that the late ploughing of tobacco land tends to destroy all the insects which are detrimental to the tobacco leaf, not only cut worms, which are understood to be destroyed by late ploughing, but other insects which attack the leaf at the same time. Also the green worm, which at certain seasons does a great deal of damage. All these insects are supposed to be destroyed, to a greater or less extent, by the late fall ploughing. If you can destroy the flies which produce these insects, or the

eggs in the ground, a little matter of a few dollars worth of fertility, which may be lost by that, does not amount to very much. It is, of course, desirable to save all the fertility we can; but it is more desirable to get a perfect leaf, and thereby get a dollar where otherwise we would lose ten. This is something we should consider. I, myself, practice covering the soil with some green substance. I usually sow right on my tobacco land. Not particularly as I know of to save the fertility, yet I believe it does, but because it helps me in other directions. I keep a large herd of cows, and I find it very convenient to have that for fall feeding. I really believe that it would pay very well to sow some sort of feed upon the land, and thus protect the land; yet it is a question whether it pays to do this rather than to do what we can to destroy the insects, which are such a great damage and detriment to the tobacco crop.

Mr. HALE. Mr. Foote, do you have more trouble from insects than your neighbors, or are you troubled more with the insects than they are?

Mr. FOOTE. I will tell you. This last spring I aimed to get our plants in as early as possible, yet, of course, the manure must be gotten out and hauled onto the field. If we use stable manure that must be gotten out first, because I think the growth is better. I think it is altogether better to put it on first and then plough; so we must get the manure on first. This spring, before we could get the manure on, some of the rye that I had on that lot got too large to turn under, and we had to mow that rye. The spring work was pressing, and various other crops wanted our attention, and that lot lay there, about an acre of it, lay there without any ploughing, after the application of the manure, until the last ploughing, which was along the last of May. Now, on that acre of ground I had more cut worms, and I had more trouble to get rid of the cut worms than I did on the eight or ten acres which I had besides. I think if a man properly attends to his crop that is

no detriment, but with a new crop on the land, unless it is attended to properly, I believe it is a great detriment.

Mr. ANDROSS. I think I can give a little practical instance about the way this works. A few years ago I took an acre in a field and ploughed it just as the crop was off and planted it. The next spring the crop was up about that high. I never ploughed only that first time, but my next neighbor said he should be all eaten up with cut worms. He had kept his land entirely free. He ploughs his land so as to kill the weeds. I never saw those worms on my acre.

Another time I took an acre, a little like that, but it was meadow land, where we usually raise two or three acres of corn. When the time for cultivation came that was covered with water. A freshet came up and stayed on it several weeks, so that it was the 7th of June before I got through putting in the plow. That land was just as smooth as could be. I planted that piece to sweet corn, a piece, mind you, which had been kept perfectly neat and clean. I planted that with sweet corn, replanted it, and finally gave it up on account of the cut worms.

Prof. BRITTON. Mr. President, I would like to inquire why the tobacco grower doesn't poison the cut worms.

Mr. ANDROSS. Very few of them know of that process, although it is used by some.

Prof. BRITTON. Another thing: as I understand, they never use any poison upon their tobacco plants.

A MEMBER. I never, or at least very seldom, have seen that done.

Prof. BRITTON. In Kentucky poison is used upon the tobacco plants. It is a good way of protecting the young plants. If you do not wish to use Paris green you can use lead, which would stay on a much longer time. If you will make a strong bran mash, with a little poison in it, we can get rid of a large proportion of the cut worms. This should be put on the field a few days before the plants are set, perhaps a week before.

That I think is a most practical way of getting rid of the cut worms, not only in tobacco, but in other fields that we have. You can use other poisons in the same way, with the bran mash, and it seems to be eaten very readily.

A MEMBER. How do you fix it?

Prof. BRITTON. Just mix up some bran mash, just the same as you would for hens. Of course, if it is left near the house the hens may eat it and be poisoned, so it would be best to be careful and keep it away from the house.

Mr. POTTER. What proportion of Paris green to bran do you use?

Prof. BRITTON. I should think about a hundred pounds of bran, or something like that, mixed up with one of Paris green.

Mr. NOBLE. This mixture has been used by a number of tobacco growers in my vicinity, but they have added some molasses with it. They mix up about a bushel of the mixture and sow it on broadcast, about a bushel to the acre, I think. It has been tried up there on some of our farms after the tobacco was set, and they found there was more work there, but the cut worms got the tobacco in preference to the mixture. In other words, if it is sowed on after the plants are set the worms naturally prefer the tobacco to the mixture. If it is sowed on a few days before they like the molasses and the bran, and, of course, eat the Paris green with it, and that is the end of them. The sensible people in our vicinity have kept their tobacco lands clean, and that restrains the worms very much. Those same tobacco fields have had to be reset, and sometimes set again. Lately we have not been troubled with worms very much, and I think it is due in large part to the method which is now quite generally practiced, of throwing on that mixture before the setting.

Mr. FOOTE. Some gentlemen inquire as to the quantity of the mixture. This mixture is being used to a more or less extent all through the tobacco section. Those who are finding trouble of this kind are pretty sure to use it.

The proportion of this in East Hartford is one pound of Paris green to two quarts of molasses and one hundred pounds of coarse middlings; not bran, but coarse middlings. They do not wet the middlings enough to be sticky, but so that they will mix easily, and mix a little loose, so it will lie up a little and be loose; not too thick. One hundred pounds of middlings to one pound of Paris green, and about two quarts of molasses.

Prof. BRITTON. Mr. Chairman, we have all been very much interested in the paper given by Mr. Shamel, and we all know that the Department of Agriculture has been doing some wonderful work in plant breeding. It seems to me while we have him here we ought to ask him a lot of questions. This is a very interesting subject, and it seems to me that the farmers might do a good deal of selection in their own field crops and improve the yield of crops in this way.

Now, I would like to ask Mr. Shamel what the prospects are for improving our general crops in this way, our farm crops.

Mr. SHAMEL. Mr. President, I am not entirely familiar with the crops that are grown in Connecticut outside of the tobacco crop and the corn crop, that is, to any considerable extent. I feel, however, from the results of the investigations and experiments which have been carried on by the Department of Agriculture that there is no question but that the yield and quality can be improved by the selection of desirable seed. In the case of the department we are conducting some practical lines in breeding improvements that ought to have a strong influence in promoting the quality of many crops and horticulture in general.

Some very interesting experiments have been carried on. For instance, the sweet orange is being crossed with undesirable types of the old wild orange. Some of the trees, which are grown from the seed, produced in that way, have produced a desirable crop of oranges, and a type of orange tree which

can be grown two or three hundred miles north of the orange belt in Florida, which can be grown as far north, for instance, as Memphis, Tenn. These oranges, some of them, make particularly good lemonade, and there is a great demand all over the South by the farmers for these oranges in their door yards, for family purposes, to take the place largely of lemons.

Other lines of work have been inaugurated in the South in the way of improvement of cotton. We have a number of breeding farms for this purpose in South Carolina and in Georgia, in Mississippi, and in Texas. In Texas the work is particularly interesting, or has been, especially in the last two or three years, on account of the attacks of the boll weevil upon the cotton. This insect seemed likely at one time to largely injure the cotton crop in Texas. It has been found by the selection of early varieties, and by the selection of plants which are resistant of the boll weevil, a strain can be developed which is in a large part immune to the attacks of the boll weevil. In fact, this is one of the most interesting things we have developed in recent years, and this work is very suggestive of what may be accomplished in the line of growing strains of different crops which are immune to insect attacks. In the case of the cotton it has been found, so far as the boll weevil is concerned, that certain plants are not attacked by the boll weevil in the general manner in which the majority of plants are destroyed. By saving the seed from these plants which appear to be partly immune, and sowing it the following season, an immune strain is being secured, a strain which can be planted earlier, and which apparently resists the attack of the insect. So that in the case of cotton, and also to a less extent with some other general farm crops, strains are being developed which are comparatively immune to these attacks from destructive insects, or partly so at least.

Take it in the case of tobacco; in North Carolina and South Carolina, where thousands of acres have been destroyed this last season, we found, on examination, certain individual

plants in those fields which were resistant to the disease, and were able to produce a desirable type of plant which was resistant, while the majority of the crop was wholly destroyed. Now by the selection of these individual plants in a field we are developing resistant strains of a type, or a seemingly resistant strain, to the root diseases which attack the tobacco crop. That is a matter that we have been working on a great deal.

Along the line of corn, as I said before, our most extensive improvements have been carried on in the West, and have shown that substantial improvement could be made in the yield by the selection of ears which produce a vigorous strain of corn, and by the selection of seed containing a larger percentage in protein and other valuable qualities. Some corn that is grown in the West contains too high a proportion of starch in order to make it a well-balanced ration for feeding purposes, and we found there was a great variation in the per cent. of protein and in the per cent. of yield, and by the selection of ears, which were high, we have been able, in the course of four or five years' selection, to produce a strain carrying a percentage of protein nearly double that of the crop when we started. In other words, we have been able to increase it from a little over seven per cent. to a little over fifteen per cent. in the varieties which were treated in this way. In the same way by the selection of the seed ear a change in the proportion of starch was also brought about.

The development of nitrogenous bacteria, which are more active in the securing of nitrogen from the air and putting it into condition where it is usable by the farm crop, has been an interesting feature of the work in plant breeding during the last two years. It was found that by crossing the bacteria, or the organism which forms the nodules on the roots of clover and other leguminous plants, and putting them into a condition where they could not secure any nitrogen from the air that it was possible to produce strains of these organisms or bacteria which were more active in the development or in

the securing of nitrogen from the air than the strains of these organisms are that now exist in the fields. In other words, these organisms, grown in rich soil, get lazy, and instead of taking their supply from the air will take it directly from the soil, but if they are put where there is no nitrogen for them to feed upon except in the air all those so lazy that they will not work perish, and only the ones that will work by active effort will live. Improved strains have been developed which have given very marked results in the increase which they secure in the general crop.

In speaking of the crops which are to be grown in the fall in this section I will say that I believe that vetch, which is a crop that has been introduced into this country more extensively of late than before, will give satisfactory results as a cover crop, or a crop for that purpose. I have seen some of this vetch in the Connecticut Valley in two or three places this fall, and where it is sown early enough it has produced a large plant of fairly good size and developed a large tubercle on the root of these nitrifying organisms. I believe this crop will make a satisfactory addition to the number of green crops and to the kinds of green crops which may be grown in this latitude under these climatic conditions. It needs to be tested further, however, before any statement can be made in regard to its value. This, however, can be said, that it is not detrimental to the quality of the tobacco when used upon tobacco fields, and it is one of the best fertilizing crops that we have. It can be sown after the tobacco is harvested, will make a vigorous growth in the fall, and comes up green and good in the spring, so I think it can possibly be used quite beneficially by tobacco growers, either alone, or with rye.

I think these are along the lines of the most important practical work, the most important lines of practical work, we are taking up in the department.

I wish to add that the work we have been doing in tobacco bids fair to give us more practical results than the work on

any crop that we have carried on. The results are more quickly secured. In other words, by using seed of tobacco grown under bags and protecting them from cross-fertilization, in this way we are able to secure a uniform plant, and by crossing the types which we now have, and maintaining the purity of the seed of the best types thus secured, we are able to improve the crop very materially. The fact of the matter is that the improvement of the crop along these lines, by breeding and seed selection, seems to bid fair to give us very good results, and seems to be very practical, and in fact the most practical of any of our work which we have yet carried out.

A GENTLEMAN. You spoke of getting good, large, fully-developed seed. Is there any difference in the seed that grows on the edge, or on the extreme top of the plant, over that grown lower down?

Mr. SHAMEL. I think possibly that grown in the central cluster of the flower produces larger seed than the buds, which are grown in other locations, and I believe that seed should be saved from those buds, rather than from others, if a preference is to be given.

Mr. FOOTE. I would like to ask about the covering of the seed with the bag. Is there any particular kind of bag which would be particularly advantageous for this purpose?

Mr. SHAMEL. No, sir; I don't think that it is necessary to use a bag which is impervious to water altogether. The ordinary manilla paper bag will shut the water out, or it will not admit the water freely into the bud, and will dry out rapidly after a shower is over, after the sun comes out. In fact, so rapidly that we have had no difficulty with the mildewing of the seed under the bag. As a matter of fact the seed that stays under the bag is freer from bacteria than the seed on the outside, such as I have here on the table. This last year I had some Japanese bags which were absolutely impervious to water. The way they were prepared, they were very light and very strong, but they did not seem to give us any more satisfactory results than the ordinary bag.

Mr. FOOTE. I didn't know, but if, for any reason, by dampness or by accident, the bag should be broken it should be repaired.

Mr. SHAMEL. It is necessary, of course, to cover the seed in order to prevent cross-fertilization.

Mr. HALE. In speaking of corn breeding, I would like to ask Mr. Shamel if he knows anything of the method pursued by Col. Wood.

Mr. SHAMEL. No, sir; I do not.

Mr. HALE. I was telling a party of his method of selection. Mr. Collingwood in the *Rural New Yorker* has had considerable to say about it. His method of selection is this: To select the strongest stalk in the field, and the stalk having the greatest number of ears, and to always get the small ear. He has shown that by pursuing this method he gets a very strong, vigorous stalk, and by breeding it up he is able to get a variety having quite a large number of ears. Ordinarily I think we usually have varieties that bear only two or three ears to a stalk, but in this variety he gets from five to eight ears from the stalk.

Mr. SHAMEL. I have no reply to make. I should think that the greater number of ears that can be grown on the stalk the more it would vary. I have no doubt of that, and in fact I have seen varieties which naturally have grown from five to eight ears of corn, but for feeding purposes I think that one ear to the stalk, perhaps, gives the best results in the quality of the corn. As indicated by Mr. Hale here, it would be more beneficial if we could secure a greater number that were up to the standard, but so far we have not been able to secure more than one good ear to the stalk.

Secretary BROWN. I should like to ask Dr. Britton to say a few words along the lines of his work during the past year. What he will say may have an important bearing upon the insect pests of tobacco, and incidentally throw light upon the subject of the discussion here.

Prof. BRITTON. Mr. President, ladies and gentlemen: Of course you know that a scientific man cannot do anything but talk shop, and when the secretary asked me to say a few words I thought it might be interesting to say a few things about the occurrence, or absence of insect pests during the past season. Many of you have made observations along those lines, but before starting in I thought I would like to say that I consider this question of plant breeding one of the most promising lines of work for us all to take up, that we can engage in, not only as regards the yield of crops, but also in the larger information which will come to us in regard to plants which will resist the attacks of insects, and of various diseases caused by bacteria and fungi. Perhaps the insects cannot be kept off quite as well as the other thing, but I believe there is a great chance in work along this line for us to increase our ability to keep off certain diseases to plants caused by bacteria and fungi. In fact, at one time I was engaged in some breeding experiments. I worked along lines somewhat different from what a good many do, but along the same lines that Mr. Shamel has indicated. Mr. Shamel has told you about the selection of heavy and light seed of tobacco. We went to a great deal of trouble to select out heavy seed. We began with seed purchased from seedsmen, and the first generation of the plants gave us some very striking results. We got earliness in the crop from light seed, with a heavier yield and a larger growth of leaf and stem from the heavy seed. But after a few generations this difference seemed to disappear somewhat, and there was not so much difference except that the plants from the light seed seemed to mature earlier and gave us a larger weight. Finally we got in diseases. After several generations our results were entirely destroyed from one of those diseases, which we could not combat. Now I fully believe that if we had gone on with it and selected seed from plants which resisted that disease we might finally have reached some very valuable results. As it was we have all

the notes, but they have not yet been published, and probably never will be.

Now, as you know, last winter was one of the most severe for many years in Connecticut. It is, therefore, interesting to notice the effect of that cold weather on insect life. One of the most important things is the fact that the San José scale insect was killed out to a large extent. Not entirely, but in many parts of the state a large proportion was killed outright. In examining specimens where we were carrying on spraying experiments we found that the cold weather had killed as high as fifty per cent. of them at the end of the winter. In some places seventy-five to eighty per cent. were killed. We can attribute this to nothing except the severe winter, because there was no evidence of other causes for their death. A great many trees, as you know, were killed outright by the winter, and, of course, when the tree dies the scale is also killed.

Other insects suffered in the same way. Butterflies were not abundant during the season, and certain earwigs and other insects, which were common the year before, were very hard to find this season, and that is to be accounted for by the large number which were probably destroyed from that cause. Prof. Verrill of Yale has asserted that certain species of earwigs, which were quite abundant heretofore, have been very difficult to find. He hunted over some lands where they had been common for specimens, and could not find one.

I tried to study tobacco insects, or those insects which attacked the growing crop. Of course, the worms were abundant both seasons, and especially the last season, but the insect which attacks the plant later, the green worm and the flying beetles, and the sucking bugs, were so scarce that I had hard work to find any who were in the tobacco fields, so that I really did not get along very fast in studying the tobacco industry from that standpoint.

On the other hand, aphid has been extremely rare. A year ago this was very common, — exceedingly abundant.

Last winter we tried to find eggs upon twigs and found almost none. At the meeting of the Pomological Society it was thought that the aphid would not probably be abundant, but this winter I found some of the eggs on a tree, and we will probably have some aphid next season.

A year ago last summer the potato beetle was not abundant. A great many growers were not obliged to use poison. This season, of course, they started in with the hope that it would be scarce, and many of them did not poison their plants. Early in the season this insect was not abundant, but late in the season it seemed to increase, and the potato beetle could be seen crawling everywhere, all over the garden and on potatoes and other things. We can expect, therefore, that there will be a great many of them next year, so potato growers should be prepared to fight them.

One characteristic thing which was very noticeable on apples the past season was the great injury from the plum curculio. The plum curculio makes a puncture in the skin of the apple and probably lays eggs in it. As a rule, people do not pay much attention to it. The apple does not fall to the ground like the infested plum, but after an attack from this insect it simply makes it a little irregular in shape. If an apple has only one or two of these punctures it doesn't hurt it much, but when the curculio attacks it so frequently, so that each one of the fruit has ten or a dozen of these holes in it, it does injure the shape and growth of the fruit. And that is one reason, I think, why so many poor apples were obtained along the southern part of the state, near the coast, owing to excessive attacks of the plum curculio. This, of course, can be prevented to some extent by spraying our apples early with poison, or soon after the blossoms fall.

Among some of the insects which have been abundant the past season are the onion maggot and the cabbage maggot. These have done more harm than usual, especially in the onion-growing districts of Connecticut. In many places from

one-third to nearly one-half of the crop was ruined by this insect. It does its work early in the season, and does not keep it up as late as the cabbage maggot. The dryer portions of the field seem to suffer worse than the moist part. It seems to stop work along in June or early in July, and not much injury results after that. Some growers say that they can combat it, some with kerosene, and some with various other remedies of that kind. Our experiments show that those things are almost useless in fighting the maggot.

The pear scylla has also been abundant on many trees. I think, however, I can say it was much less abundant on trees sprayed with the mixture which kills the San José scale. At least my observation leads me to make this statement. This may not be generally true, and yet it is quite probable that spraying, especially late in the season, would kill this insect, because the eggs left on the twigs through the winter hatch very early. They hatch usually before the leaves come out, and so spraying with the lime and sulphur mixture just before the leaves appear would undoubtedly kill many of these insects. Of course we did considerable spraying work to kill the San José scale. Over four thousand trees were subjected to treatment in our experiments in different localities in the state. The lime and sulphur mixtures were used chiefly, that being prepared for fifteen different farmers. The boiled lime and sulphur mixture, containing from fourteen to twenty pounds of lime, fourteen of sulphur, and forty gallons of water, has given as good results as anything we have tried, although some of the experiments, which were made up without boiling, were almost as good. A mixture which has been made, containing lime, sulphur, and caustic soda, gave fair results. A mixture which we made up ourselves, containing lime and sulphide of sulphur or soda, also gave excellent results. These were both prepared without boiling, simply weighing the material to see that the proportions were correct. After the material is put in it should be stirred vigorously and kept warm.

The heat from the lime helps to dissolve the sulphur and the alkali present, also aids in its dissolution. After the lime has ceased slaking the whole mixture should stand, with a very little water added to it, so it will not dry up. We allowed it to stand fifteen or twenty minutes, or perhaps half an hour. It is not well to add too much water, because it is desirable to keep it just as hot as possible. That dissolves more of the sulphur. Then we added to that water and applied it to the trees.

We also used caustic soda and water, which did not give very good results.

Aside from this work I have been engaged to some extent in making a study of the mosquitoes of Connecticut and their breeding places. As some of you know, this is a great deal more important than we used to think, because it has been proven that mosquitoes are the only agent that we know of in the transmission of certain diseases, such as malarial and typhoid fever. Malaria is a common disease in Connecticut, and the reports of the State Board of Health show that during the past ten years over a thousand deaths have occurred in the state from malarial diseases. We have generally looked upon malaria as a disease that makes a person feel uncomfortable, but which is not dangerous. There are a great many more cases where persons do not die than there are where death occurs, but if there were one thousand deaths there were probably a hundred thousand cases in the state.

The malarial mosquito breeds in about the same places that the others do, in stagnant water and in holes and places where stagnant water accumulates. It is known that it does not breed anywhere else. Along the coast we have what is known as the salt marshes, where mosquitoes are very abundant. The most abundant kinds do not carry malaria. They are simply pests and nuisances. The malarial mosquito breeds around these salt marshes in about the same kind of places as the salt marsh mosquito lives in, but these are very much rarer. We began along the coast in Connecticut an examination of these

places, and there are quite a number of them. Connecticut has got quite a large area of salt marshes, over 34 square miles, or more than 22,000 acres. We found, however, only a very small proportion of these marshes is breeding mosquitoes. Most of them are fairly well drained, either naturally or artificially. The large Quinnipiack marsh of 3,600 acres is quite fairly well drained for the purpose of getting the salt marsh hay which grows there, and affords almost no breeding place in the whole tract. Furthermore, many of the pools of water are stocked with fishes and insects, which prevent the breeding of mosquitoes. Wherever we have finished an examination of the salt marsh a report has been made to the health officer of the town, and also a map has been given to him with the breeding places located on it, and a report regarding the conditions found, and also recommendations as to what shall be done to get rid of the pest.

Then we have been more or less engaged in the general collection of Connecticut insects. A list of insects in New Jersey was published four years ago, which contained something over eight thousand species. In Connecticut, probably, there are as many insects as in New Jersey, although Connecticut is not quite the same as to mosquitoes. We probably have just as many species, but our collection at present is only beginning, and comprises about two thousand species.

Before closing I wish to call your attention to the fact that we may at any time get the Gypsy moth and the brown tailed moth in Connecticut. These two insects have caused great destruction in the eastern part of Massachusetts, and after a million of dollars was spent in the effort to exterminate them the work was dropped in 1900. There has been some talk about the government lending a hand in fighting these insects, but they will probably never exterminate them, and they will be like the San José scale, always with us. The important point in fighting all these insects, like the San José scale and the Gypsy moth, is not extermination, but to hold them in check

in such a manner that we may save our crops, our trees, our health, and so on. If we can hold them in check to this extent there is little use in trying to wipe them out entirely. Now the Gypsy moth has already become established near Providence, R. I., and it seems wonderful that it has not been brought into the State of Connecticut before this. Perhaps it has been, but wherever it has been reported, and the matter has been followed up, it has proven to be some other common insect, which the people did not know, and which they thought was the Gypsy moth. It is always well when we find these things to submit them to some one who does know, and it is always well to do that before it is published in the newspapers that the Gypsy moth has been found. The Gypsy moth feeds on the foliage of most all kinds of shade and fruit trees, and many garden plants.

These insects have been quite common in eastern Massachusetts, and we have been highly fortunate that they have not worked into Connecticut before this. They seem to have been working northward along the coast of Massachusetts, through southeastern New Hampshire and Maine, and so on into New Brunswick and Nova Scotia. I think it would be well for us to be on the lookout for these insects, because they may be found here at any time, and the sooner we know it the better.

Secretary BROWN. I thought, Dr. Britton, you could give us some general description of the difference between the malarial mosquito and the common kinds. If you could I am sure it would be very useful information.

Prof. BRITTON. Those of you who observe mosquitoes can tell the difference on a very little study. The malarial mosquito has wings which are spotted, and its proboscis is usually more nearly in one line, one straight line, than the common mosquito. When it has lived quite a while the axis of the proboscis becomes more nearly perpendicular than in the common mosquito. The common mosquito has its proboscis nearly at an angle of 45 degrees with its body, and the body is

nearly parallel to the surface. In the larval stage the malarial mosquito lies horizontally, and has a very short breathing tube, while the common mosquito holds its head down when it comes to the surface, and has a very long breathing tube. It would be easy enough for an observant person to tell them apart after very little study.

The PRESIDENT. The hour is getting late, and we must now adjourn these proceedings until afternoon.

The convention will stand adjourned until two P. M.

THIRD DAY — AFTERNOON SESSION.

Convention called to order at 2 P. M.

Vice-President Seeley in the Chair.

The PRESIDENT. The audience will please come to order. Music is the first thing on the program.

Music by the North Haven quartette.

Mr. GOLD. Before proceeding with the regular exercises of the afternoon I will request the privilege granted me to present some resolutions with regard to the recent death of a former member of this board, and one who was well known throughout this community. I refer to L. Sedgwick Wells. "Be ye also ready, for ye know not the day nor the hour." The sudden death of our friend and former associate Mr. Wells of New Britain, on the 12th instant, reminds us of our mortality, and some notice of his death from this assembly would seem to be highly proper.

Resolved, That we desire to put on record our testimony that from long association with Mr. Wells we can speak of him as an honest man, a patriotic citizen, ready to aid in every good word and work, and one to whom the agriculture of Connecticut is especially indebted for his wise counsels and efforts in its behalf, and one who by precept and example endeavored to extend the blessings of improved husbandry to all classes of the community.

If any one was ready, within our knowledge, to meet the last call that man was Mr. Wells.

Resolved, That these resolutions be placed on our records and furnished to the press, and that they also be presented to the family of the deceased.

The PRESIDENT. You hear the resolution; is it seconded?

Mr. KIRKHAM. Mr. President, I consider it a privilege to rise here and second this resolution. I claimed Mr. Wells as a friend; do now. He was my companion when I first took the responsibilities of business in times past. He lived not a great ways from me. I was within easy communication with him. I knew him by a great many deeds of kindness. We, unfortunately, became connected in a mistake. We both of us knew it, and it was the only mistake of judgment that I ever knew Mr. Wells to make. We both signed a fraudulent note nearly thirty years ago. It was not for such a great deal. Mr. Wells was thrifty, well off, but he was so put out, and so ashamed of his own failure to recognize the fraud before he signed the papers, that he took it to heart, and he says: "Let's face it; we will fight it. It is a fraud that has been going over this state fooling the farmers for a great many years. Let's stop it." Well, he was a quiet, but a determined man. We went to work and we found just as many as we could of those who had been swindled, or who were to be swindled, and in that organization with Mr. Wells I was connected with him for about seven years before the last note was outlawed. During that time we were much together, and I think I knew him personally better than any other man outside of his own relatives and family. Many a deed of kindness did he do. Just to show what kind of a man he was I will cite that the law concerning commercial paper was defective at that time, as most lawyers know. I asked him if he could not help us. We changed that law in regard to the evidence in such cases. It was a very ticklish thing to do, but we had the sympathy of the whole community, because very many had been swindled.

A member of the legislature that year from Litchfield, a bright man and a lawyer, a member of the Judiciary Committee, took it up. He had lost his case every time when called to defend those men. He saw the mistake in the law. When he drew his bill he submitted it to then Governor Richard D. Hubbard, and Governor Hubbard finally told him that if it passed he would sign it. Well, it did pass, and great benefit was conferred upon the state.

Now, as showing the disinterested unconsciousness of the man whose death all deplore I want to just cite one instance and then I will sit down. He was nominated for the legislature one spring. He saw his opportunity. He wanted to be elected on account of serving, but there was an adverse measure against him. He lived just over the line from me, and I was nominated at the same time. He said he thought I should be elected. Well, said I, "It is doubtful." There was always a doubt about it. We were both elected, Mr. Wells on the sheer popularity of his personality. He had been the first selectman of the town of New Britain for ten years, and the best, I was told by several at his funeral, that they ever had. What Mr. Wells said went in everything. I found out afterwards that that man used to slip over the border into my town and request votes for me, leaving his own town to take care of itself. I never heard of such an instance before. We were opposite in politics, but Mr. Wells did not think about that. He had but one thing in mind, and that was the good of the state. I did not know anything about Mr. Wells' efforts in my favor until long afterwards. He did not consult me about it, and it was highly indicative of the unselfish character of the man.

In this Board of Agriculture he did not make any show of himself at all. He never rose to speak but he gave us all advice and counsel which was of the soundest kind and which was always for the best interests of the board. His advice and counsel was always followed.

The PRESIDENT. You have heard the resolution and the comments which have been made by Mr. Kirkham. The motion has been made and seconded. What is your pleasure in regard to it?

Mr. STERNBURG. I move you, Mr. Chairman, that the vote be taken by rising.

The PRESIDENT. It will be so understood if there is no objection.

(Resolution passed by a unanimous vote.)

Mr. J. B. NOBLE. Mr. President, before we commence with the regular exercises of the program can we not have one more selection from that quartette?

The PRESIDENT. I am not sure that we can. I will tell them that it is very earnestly desired by everybody in the hall. I have just seen them and they did not say a word, but they looked good-natured, and I think they will be here in a few minutes.

Music.

The PRESIDENT. We will now proceed with the work of the afternoon in connection with the program. The first matter upon the program for this afternoon will be an address on "Agriculture in the Public Schools" by Mr. Fred Mutchler of the Connecticut Agriculture College. I am happy to introduce that gentleman to you.

AGRICULTURE IN THE PUBLIC SCHOOLS.

BY MR. FRED MUTCHLER,

Of the Connecticut Agricultural College.

Mr. Chairman, and Ladies and Gentlemen: It certainly is a delight to me this afternoon to come after some years again before this representative body of agricultural people. For the greatest part of my life I have been more or less intimately associated with agricultural and farming interests, but I am sure it will do me good as a teacher to be back here today and confer with you, not so much to give you ideas of

my own, but rather to get ideas of yours. I got a few of them this morning that are quite good, and they will help me in my work. It is a tendency among school teachers more than any other class of people to become exceedingly dogmatic in their manner of thinking, or in their ways of thinking. We are not accustomed to have people come and say to us, You ought to do this, You ought to do that, because ordinarily people do not come up to us and question the facts in the case when we are speaking about them. Therefore, I say there is a strong tendency for us to come to believe that the things that we say are just a little better than those of anybody else, or better than the opinion that anybody else holds. I want you then, as farmers, as people interested in agricultural interests, and also as people who must have and who surely do have an interest in the public schools, to keep in mind the fact that you ought to help us as a class, as school teachers, to keep away from dogmatism, and to help us to learn to be open-minded. To this end let us call ourselves into council this afternoon for a little while, by way of an address and discussion. Let us find out about these things, whether they really be things that we ought to pay serious attention to, and whether they really are true. Now it will be impossible for me to inaugurate or even to attempt to outline in detail a course of study to be followed out in the public schools if I wanted to do it, but that is not my business here. It is for me to speak concerning the things that are being done in the public schools, by way of agricultural study, nature study, or to speak of it under any name which you choose. It has been suggested that, if possible, I speak upon some things that seem to me to be important and that ought to be done, and which our interest in this great subject-matter should prompt us as needing to be done.

Now suppose it were perfectly certain that the life and fortunes of every one of us were some day or another to depend upon his winning or losing a game of chess. Don't you think that we should all start rather promptly to learn at least the names and moves of the pieces, and then to think of the means of giving and getting out of check? If that were so do you not think we should look with aversion, amounting to scorn, upon a father who allowed his son to grow up without knowing a pawn from a knight? Yet it is a very plain and elementary fact that the life and fortunes and happiness of

every one of us, and more or less of those who are connected with us, do depend upon our knowing something of the rules of the game in order that we may play our part with credit in that far more difficult and complicated game than chess, which has been played for untold ages — the great game of life — every man and woman of us being one of the two players in a game of his own. The chess board is the world. The pieces are the facts of the universe, and the rules of the game are what we call the laws of nature. The Player on the other side is hidden from us, but he is one that is playing his game in a manner that is always fair and just, but we also know to our cost that he never overlooks a mistake, or makes the smallest allowance for ignorance. To the man who plays well the highest stakes are paid with that sort of generosity with which the strong deal out to the strong, and the one who plays ill is checkmated; without haste, but without remorse. The principle found here stands out to the open-minded person in large, immensely large, bold type. Life is no joke. It is a constant fight. We go up to victory or down to defeat, depending on the moves we make. The moves we make depend upon our knowledge of the game. It, therefore, becomes a question of equipment. The law of the survival of the fittest hangs over your head and mine. This is the theory of the public school, to equip for life, that is, to make the people know how to play the game, and not to teach them how to shun the game. Their purpose is not to put the mantle of protection around a man so that nothing can get to him. That is not the principle. Animals that do that go to the wall quicker than any other. The great object and the purpose of education is to make a man able to stand in the firing line.

Back in the middle ages the black death spread over the continent of Europe, decimating the ranks of the people to the extent of twenty-five millions in a single year. Imagination fails to picture the dread, darkness, and despair which such a pestilence creates. Such a thing could not happen today, because the people are prepared to meet such great emergencies. Now there are two phases of this equipment about which I wish to speak, and with these two phases we are concerned in the public schools, as well as with many others, of course. The first one is this: To form the habit of working; to fall in love and be irretrievably lost in love with your work. I

think that other things being equal individual success will be most nearly taken care of by a man learning to do some work which he is willing to do, and likes to do, and which he does in the best manner possible. I met an individual some few weeks ago who was very much disappointed. He says: "I can't get anything to do." I said: "What would you like to do?" He said: "Show me something by which I can make some money quickly." I pointed out to him various kinds of work that he could do, and he says: "I can't do any of those things; I don't like to work. I want money." Now that is far from being the proper spirit. The farmer's boy comes up under auspicious circumstances so far as this matter of work is concerned. All things with which he is surrounded make him a good worker. He gets up in the morning. He goes out to the barn and feeds the horses and pigs and various other kinds of live stock. Gets his pair of horses ready to work. Goes back into the house and eats a hasty breakfast, and then says: "Father, which field today?" He finds out what is wanting to be done, and he goes to his work as a matter of course. The next day he does the same thing. The habit of work becomes established with him. The habits of work are instilled in him that are far different from those which are instilled in any other type of individual. Think of the boy who grows up in the city. Can you think of him getting up in the morning to do those things? He would be likely to get up at seven or eight o'clock, perhaps nine o'clock, and wonder what he was going to do to pass the time during the day until night comes. Nothing but play largely; not altogether, but in the main that conveys a fair idea of the way he passes his time. How is it possible for a boy trained up under such circumstances to become accustomed to a habit of industry, without which success is almost impossible? An instance came to my knowledge a year or so ago which well illustrated this. Two boys came from college who had grown up in the city and who had been on the nine and in the football team. They were healthy, strong, able-bodied men. Their father had suffered losses in business, and they were forced to give up their home. One of these boys came to my room, where he was often fond of being, and he says: "I don't know what I will do now. We have lost everything. I wouldn't care, but I don't know how to care for father and mother. They are old." Imagine

a farmer's boy coming up to manhood on a farm, where there are so many ways in which work can be done, and not knowing how to get up enough energy to take care of his father and mother. So I say that the circumstances and surroundings of the farmers' boys are those that are conducive to good work. "Blessed is the man," says Carlyle, "who has found his work. Let him ask no other blessedness."

The second phase of this subject, and one which I wish to discuss more closely than any other, is that of putting ourselves into proper relation with the things that are about us, so as to utilize those that are helpful, and rid ourselves, if possible, from harmful influences. We are tempted with many influences in our complex, organized society, and it is perhaps well that we are, for if we view those things rightly they all have a usefulness in developing character. These influences may be moral, social, and spiritual. It is about the first named, the moral influences, that I wish to direct my remarks. The other two depend, to a large extent, upon this one. It concerns influences that make the views of life higher and better. In the public schools the study of the vast array of facts and phenomena in the universe, and the force which they exert, have a great power for weal or for woe. The world of nature is fraught with influences, the effect of which upon life is bound to be very great upon all who come in contact with them. It is the province of the public school to put people into the right attitude towards the things he is living with, and to teach him who are his friends or enemies, as the case may be. Is agriculture a subject that will do this? If rightly taught I think it is. I think it is safe to say it will lend itself to this end in equipping for life. It all depends upon the kind of agriculture that is taught. I would like to comment a little at this point upon what I mean by the kind of agriculture that I think would be the most helpful. It is not technical agriculture. I should say that that ought to be kept out. While I agree that there are certain features of agriculture which should be taught in the public schools, and which can be taught with advantage, it is not technical agriculture. It is not the province of the public schools to make farmers any more than it is to make preachers or lawyers or doctors, or teach any other profession. It is the province of the public school to equip for life, no matter what business or what profession we

may go into. There is a seasonable kind of work, I think, that can be done in the public schools that will help measurably in this matter of equipment for life. There are a great many things, there are a great many phenomena, there are a great many facts and things about the farm that everybody ought to know. There are a great many of the insects that were spoken of here this morning that everybody ought to be familiar with. It is along that line. There are thousands of things in farm affairs, in nature, that act upon the life of the individual, and that phase of it, I think, is what we want to bring out; what we want to take up in this work. I would not call it elementary agriculture. Call it nature study if you will. That is what they call it in some places when they don't know what else to call it, and under which there is almost everything under the sun done. Now a great many times the things that are taught are not at all to the point. Later on I will designate some of the things that I think should be brought out more clearly in such a course, and if you will bear with me I should like to relate a few of the things that I have seen taught in the school under a course of so-called nature study, or elementary agriculture. It has been pointed out by many authors, and by many people, by lecturers everywhere, and by public school teachers, that bird studies were exceedingly fine; that the value of birds to the farm is something of very great importance. I agree thoroughly with them. But on account of this some people take advantage of it and they say we must teach birds therefore. Just tell whatever we can find out about them. Therefore, instead of going to the birds and finding out something about them, they content themselves with relating stories that are written about them. Could anything be more erroneous? One day I met a little girl coming home from school. It was about three o'clock, and I met this little girl, whom I knew, hurrying home from her school, and she says: "Oh, we just had a fine talk in the nature study class! We had such a delightful lesson. It was about the red-headed woodpecker." And she says: "Now, let me tell you about the lesson." And then she went on to tell how the red-headed woodpecker got his red head, and proceeded to relate the story of the old woman that lived out in the woods and had a great many evil characteristics, and with that peculiar disposition she went on to do more and more mean

things, and every time she did a mean thing she got smaller and smaller. She kept on doing mean things, and the little girl told me of the mean things that that woman did. And she says: "Just see, she was turned into a bird, and the little red hood that she had still stays as the red head of the woodpecker." (Laughter.) I said to her: "Did you find out anything about the bird, anything about its feathers or tongue?" "Oh, no, no. The teacher didn't say anything about that." "Did you find out what the woodpecker eats?" "Oh, no, we didn't learn anything about the woodpecker at all, not in that way. We didn't learn anything about it, only how it got its red head." So it is. It is unnecessary for me to comment upon that method of teaching.

I agree that we ought to teach the children the things of nature. We ought to carry them close home to nature, in a way that would make it worth something to him in after life. It is all right to tell stories, but put them where they belong. I don't know where that is, but I am quite sure they do not belong in this phase of the work.

Over in the State of Illinois there was a little bulletin put out by a teacher there concerning trees. The whole thing is a waste. Among other things the book went on in this way: It spoke of how the trees must feel when they are taken out of their native woods and planted along the public streets in the city. "Oh," she says, "how the trees must feel when they are taken out of their beautiful surroundings, in their native woods, and taken into the town where everything is hurry, this way and that. How the trees must feel when that occurs." And she says: "I can imagine the great big wail which the trees pour forth into the ears of the wind." It is against such work as that that I would like to have public opinion turn its attention, for many good citizens are paying taxes to support the school teachers, who will waste their time and the taxpayers' money in serving out such twaddle as that. I would like to get such work as that out of the way.

I have before me a little book which I wish all people could examine who are interested in this subject. It is a little bulletin that has been put into the hands of teachers, expecting that they shall follow out these lessons. I want to call your attention to this: If the codling moth lays fifty eggs on fifty apples in a single day, and then lays fifty more eggs, how many apples

will be destroyed by one codling moth in a year? And then to this: If the downy woodpecker eats one codling moth every day during the six months from October to April — 180 days — what will be the value of one such bird to an orchard?

Well, I will guarantee if the children will work out problems like that they will have more respect for the woodpecker. When you come to substitute a problem like that for some of the stuff, it gives a boy or girl the germ of an idea that is valuable. That is not the way to teach it, however. We want to give them in every school something that will come close home to them, which shall not only interest, but which shall convey instruction which will be of practical value.

Then there is a good lesson which follows. Some of this is important. Some of it is good material. Some of it should be left out. Take Lesson 13, in reference to domestic animals; that is a good lesson. Then there are twenty-two pages in this book on how to tie knots. Finally there is a lesson on feeding calves.

That is a sample of some of the nature study that is prescribed. It is done all over the country. Public school teachers, who have no idea what to do, do those things that in most cases they ought not to do. There is not an exercise in there that is not worth something if it is properly handled. I wonder sometimes whether the individual who wrote the book ever saw a farm or a farmer boy, or, if he did, what his idea must have been; whether he had any real practical knowledge of farming operations, or whether he thought that the farmers of today were living back thirteen or fourteen centuries.

Think, if you please, of the people who are going into the colleges of this country. What proportion of the children of the public schools ever get to the college? Only a very few of them, comparatively speaking, get into the high school, and a very much smaller number ever get into a college, and of those who do get into college how many of them ever get into the study of the natural sciences, or physical sciences, where these things are brought up? There are some things that are so important that everybody ought to know them, and that is the purpose of the public schools. There are those things that make so much for weal or woe in the life of every individual that it is a public obligation to see that they find them out, and that they find them out properly. Very much good can be done

in this kind of work if it is conducted in the right way. I was always very much interested in a case that occurred in the State of Massachusetts, some ten miles north of Worcester, in connection with a peach orchard there. The man's entire income was from his peach orchard. His children were sent to school from the money derived from that. Their home was dependent upon it. An individual, who was interested in peach growing, and who understood peach trees, walked in there and told the farmer one day that his trees were infested with the peach borers. The man says to the farmer, "Why don't you get rid of those borers? They will kill your trees." The farmer said, "I can't do anything with them. I can't get them out of the way. It is impossible for me to do anything with them," and the visitor said, "You can punch them all to death if you want to. If you will take care of those trees you can save them, but if you do not this orchard will die." "Well," the farmer says, "I can't do it." His little girl happened to be not far away, and she came over, and she said, "What was that you said about getting rid of the borers that are going to kill our peach trees?" And then the man turned around and told her. She went to work; interested the family, and they all went to work on that peach orchard, and they practically got rid of the borers that they had. They saved the peach orchard, and by saving the peach orchard they saved their home. They saved that girl's high school work. They saved that girl's education in music. They saved that girl's usefulness, to a great extent, in the community, and benefited everybody else that was dependent on them. That is the kind of work that ought to be brought close home to the children in school every day. We ought to teach the value of birds to the farm. And that is one of the most important phases that can be brought out; the value of bird life. Only a few years ago it was found out that during the craze for birds as ornaments there was taken from Russia a certain variety of bird, which was highly prized for that purpose. I cannot say how many of them were taken out in a very short time, but in less than two years the other countries had to send food in there for the people, so that they could live. Their crops were being destroyed by noxious insects, which had become established in a very few years. By the annihilation of the birds there had come almost a famine. Of course, this estimate of bird life is a thing of great importance,

and should be brought out in all the public schools. Now so much for the sake of the birds. They are interesting for their beauty, but they are exceedingly interesting and important from the standpoint of what they do and of their value to agriculture and to man. What is a robin good for? What is the chipping sparrow good for? How many plant lice does a chickadee eat during the winter and spring? What is a quail good for, other than to be served up on toast? Of course, I can't go into a discussion of these things. My time is too limited. But I speak of this simply to suggest that there is a line of work, which, if carefully worked out in detail, would give the teacher a whole year's work, and which will be important as having an effect, and a beneficial effect, upon the life of the people.

Then as to the growing trees; that would be an important phase of work to take up — how to grow trees. I would teach a child how to grow plants in the schools, especially in the city schools, where they have never grown plants at all and know nothing of the enjoyment and instruction which comes from their cultivation. You will find many children that have never grown a plant in their lives, and it does seem to me that a child will derive great benefit by such instruction; by watching them grow they will procure not only enjoyment, but will always experience a thrill of pleasure from seeing a thing grow that really belongs to them. They take an interest in a thing like that to a greater degree than in many other pleasures. I was at a flower show last season, a year ago, in which I was asked to judge some flowers, and afterwards I was to make the speeches of presentation of prizes in a school. In the first grade I simply asked how many children ever grew a plant before. They came from some of the homes that were not the best in the city, and only two or three little hands went up in that room of about forty children. They never had grown a plant. When I got into the second grade I asked how many of them had ever grown a plant, and quite a number of little hands went up. You see some of them had had instruction upon that line from some source. If you can get a child to plant a tree, or to grow a plant, which they own themselves, it will develop in them the instinct of ownership, such as was referred to by the speaker. My time will not permit me to speak at length upon this point. There can be no question,

however, but what it is a subject of large usefulness to the children in our public schools, and will be of great benefit to them in after life if it is properly handled.

Then, too, take the subject of the taming and domestication of animals. That is something of vast importance — how to treat an animal; how to look after it; to know what kind of teeth they have, and many other essential points which might be enumerated if time permitted. The taming and domestication of animals should not be overlooked, because it is something which a child ought to learn in order to know how to live with them. They have to live with these things in their lives, and they ought to know how to do it in such a way as to make the best of it.

Furthermore, an understanding and acquaintance with a great many of our insect eating animals that we have about the farm is a matter of importance — toads and frogs and that class of animals. I was thinking this morning in connection with this subject, of a story that is told, in which two men in Worcester went down town and bought some strawberry plants. Each man got a dozen, took them to their homes and put them out. A few days afterwards one of them came over to the house of the other and asked how his strawberry plants were getting along. He said, "They are all eaten up with the cut worms. All gone." The other one said to him, "Why, how did it happen? Mine are all right." "Haven't you lost any of yours?" "Why, no." Then he wanted to know the reason, and his friend said to him, "Go out there and look." So he went out to the garden and there he found several huge fat toads sitting around on the plants, and, of course, every time a cut worm showed up it was promptly put out of the way. The man who had lost his plants promptly took the hint. He says, "I will just fix that." He went back home and replanted his strawberry bed, and took pains to see that there were some toads around the patch, and after that he had no trouble. In that way he saved his strawberries. If we had toads enough to put on the tobacco fields you would not be worrying about keeping the cut worms away from the plants. It will take some time to get them, but we and our children ought to know these facts, about the force in nature that controls this, that, and the other thing, or ought to know that there is a balance somewhere, and when that balance has been destroyed it is

because the equilibrium has been destroyed. The world of nature is so designed that one destructive thing is kept in check by the operation of another thing, and our children ought to know the necessity of keeping this balance maintained.

I was thinking of another very important fact that was suggested this morning, and that was the question of malaria and the relation of insects to the health and comfort of animals and of man. Every child ought to learn in school, in this day and age of the world, that the mosquito is responsible for malaria. He ought to learn how he can best protect himself from it, how he can keep away from the ill health that is caused by it. The schools are doing this in various places. There have been crusades organized at many schools at different places where they go out and examine the mosquito, and trace its life history from the larva to the mature development of the insect; teach the children all about it. Our Department of Entomology in this state will not have very much work to do when the public school teachers generally call attention to the fact of what can be done in this line. Furthermore, that is something that every child ought to know. When they do know it, it will help us immensely to get rid of this nuisance. You will not have to pay for it as you do now.

The problem of the preservation of the public health is an exceedingly important one, and for that reason some of the essential points of public hygiene ought to be taught to the pupils in our schools. A few days ago one of my friends was buried as the result of an attack of typhoid fever which he contracted from eating raw oysters. Not very many people would care to forego the pleasure of eating raw oysters. A great many of us would not forego them, unless, of course, we knew they were tainted, or knew that they carried typhoid fever. The important fact, of course, is to teach a child that such things may carry disease. Then, if the child knows it and then turns around and deliberately eats raw oysters and gets typhoid fever, a child or any one else that will do that is to be pitied.

There is another important phase of this subject, which, in this age, we cannot well afford to ignore. It is a matter which I cannot now, for lack of time, take up in detail, but it is the matter of the taxes that are laid upon the people of this country by noxious insects. A child in the public school ought to learn

what the San José scale is, and why it is that people have to fight it. He ought to learn what the peach yellows is, and why it is that he must be careful that it is not distributed. He wants to learn a great many of these useful things. He wants to learn as many of them as can be put before him. I think that our public schools are at fault in not giving more instruction on many of these things. It is a duty which they have to perform to the State. It concerns not only the individual welfare of the pupil or the child in after life, but instruction along some of these lines concerns the welfare of the whole public. Our public schools have a very important work to do in bringing about, and in bringing to the proper place, instruction upon these matters, which are of such vital interest to the masses of the people. That instruction should be put where everybody who needs it can obtain it. It is absolutely necessary in order to correctly solve many of the problems of life and of living that we have before us, and it is a fact, if I may be allowed to state it, that the Board of Agriculture and rural people everywhere in connection with this organization should demand of the public schools of the State education of this kind. Not technical agriculture. You can demand that if you like, but I would not suggest that; but sentiment ought to be worked up by which throughout the schools of the State more attention may be given to these things that affect to such a great degree the life, health, welfare, the wellbeing and the well-doing of so many people who live in the different communities. It is not very difficult if the matter is properly handled. I would put before a child in the public schools those means by which he can make his own livelihood, by which he can live easier and more comfortably, and by which he can do it easier than he can any other way. I would put before him everything that is possible to put before him that is worth something in making his life conditions and his home conditions easier and more attractive. I would put before him, first of all, those things most important in making those conditions easy and profitable for him. (Applause.)

The PRESIDENT. I happened to listen to some poetry a little while ago that this quartette has composed, and I proposed to them that they give it to us after we were through with this

paper. I don't know what it is, or how original it is, but I will ask them to repeat it for your pleasure.

Music by the quartette.

The PRESIDENT. This discussion is now open, and is to be led by Mr. Henry C. Burr of the Normal School at Willimantic.

Secretary BROWN. Mr. Burr has not arrived.

The PRESIDENT. Well, if he has not arrived probably he will be here later. Very likely you have questions to ask and more sentiments to offer on this important question. I presume that our last speaker will be ready to answer any questions you may put to him.

Mr. Burr was unable to be present but sent the paper he had prepared for the occasion, which is here inserted :

We may admit that it is proper to make use of the elementary school in any way which will best serve the interests of society. We no longer feel bound, in theory at any rate, to devote the school time wholly to the traditional studies. We stand ready to welcome the introduction of any subject that will make our work more effective.

There is no doubt in my mind that the present demand for the study of agriculture is based upon a real social need. Much of our efficiency in this country has been due to the fact that children have combined a home training in handling real things, in meeting real problems in the daily work of life, with a school training in the essentials such as reading and writing. Children in the city no longer get this home training. They are no longer brought face to face with real problems. They are no longer forced in their daily experience to recognize and deal with the laws of cause and effect in nature. The child is not only deprived of a very valuable portion of his education but is led into distorted views of the values of things. He is no longer properly impressed with the dignity and importance of the labor of production.

Partly for this reason we have broadened our curriculum. We try to develop manual dexterity and inventive skill through hand work of various sorts in the lower grades and systematic manual training in the upper grades. We treat of natural laws

in elementary science and nature study, not so much by talking of them as by observation and experiment, and we try to show the application of these in our daily lives. Of late we have begun to develop the idea of the school garden as a central feature of our nature work. We find that it pays. We believe that the school garden will become the parent of many home gardens. We know that it leads to a more intelligent interest in growing things and appreciation of their value, and that it lets a ray of light in on the working of natural laws that illuminates all our science work.

The problem in the country school is equally pressing but quite different. The ideals of this part of the country have been turned away from the country and agriculture toward the city and business. Very many of the more ambitious young men feel that farm work is unprofitable and monotonous.

I believe it is the opinion of those who have studied the matter that very many of our farms may be made, by modern methods, to yield a much larger return than they do at present. If this is so it ought to be made known to the young people of the country and definitely illustrated by experiments and investigations with growing plants, soils, fertilizers, etc. The thoughts of older people become crystallized and their habits of work fixed. It is not easy for them to adopt new methods. We may work most rapidly through the children. If the young man can be made to see that there is a profit to be made from working the home farm this will go a long way toward inducing him to stay there and develop it.

Farm work is often done by rule of thumb methods. Tradition has settled the main problems. For this reason farm work often seems mere drudgery. Its monotony is at once relieved by a realization that the problems are alive — that it requires a considerably higher intelligence and a broader knowledge to run a farm to the best advantage than to fill most office or factory positions. The boy who is led to see that there are problems worthy of his highest effort waiting to be worked out on the farm will be given the strongest incentive to remain and meet them.

It is hardly intended, I suppose, that I should attempt to outline a course of study here. The State Board of Education has published an excellent pamphlet by Mr. H. N. Loomis entitled "Lessons on Plants." The teacher who will follow

the work outlined in this pamphlet will go a long way toward developing a course of study in agriculture. The State board sends out to those who request it a box of materials for performing the experiments suggested. The pamphlet contains also a list of the books which will best serve as aids in this work. To this list should be added "Agriculture for Beginners," published by Ginn & Co.

It is well to recognize that certain difficulties will attend the introduction of the subject into the schools. In most places it will not be successfully developed unless the sentiment of the community or at least of the school committee is actively favorable. The subject will be a difficult one for the young women who teach the country schools. It lies outside their interests and experiences. Burdened as they are with much other work it should not be expected that they should develop a radically new subject unaided. The committee should, in consultation with the teacher, definitely outline the work to be accomplished and should see to it that the teacher is furnished with the materials to work with. I feel confident that valuable work may be done, and effectively done, wherever the community desires it and will support it.

HENRY T. BURR.

Mr. HOLMAN. Mr. President, I was hoping to say a few words after Mr. Burr had spoken. I remember writing to the Agricultural College, and at the same time to the principal of the Normal School at Willimantic, in regard to this subject. I had come to feel the great importance of the subject. I hoped very strongly that Mr. Burr would put in an appearance, and that we should hear from a practical teacher in the public schools how he proposes to train public school teachers to do this kind of work. At the time I wrote these letters I remember I suggested that the Normal School at Willimantic and the Agricultural College at Storrs take counsel together, and should work together in solving this question, so that it would be of value to the state. The importance of this subject has come to me from my life in the country and from my interest in the responsibility for the schools of the community.

First, I think we may ask what are we going to do about it? I was out at St. Louis this summer and spent a little time in looking over the educational exhibit. I found two or three things there which were new to me. I spent a little time in looking at the Missouri exhibit in that department, and in connection with that I had submitted to me a little pamphlet showing how the children of Missouri at the State Agricultural College are taught about the grasses which grow in that state. I also noticed an exhibit made by one of the normal schools of Massachusetts, where the children in the training class were encouraged to keep poultry. Photographs were shown of poultry coops, and considerable information given in regard to the value of such a course. One thing in particular was that this spirit or pride of ownership, which has been referred to this morning, was secured and developed in that way.

Now, what are we going to do about it? I say our Agricultural College and our normal schools, especially the Normal School at Willimantic, can combine and get out a course of study which could be issued by the State Board of Education and thus bring the matter to the attention of our schools. I think we could not do a better thing to advance this line of study than this.

In that visit that I paid to the educational exhibit at St. Louis I was greatly interested in what was stated to me and in what I saw there of the schools of Indiana. In that state they are bringing the boys and girls from the sparsely settled surrounding farming districts into one center and teaching them in one central school building, with perhaps fifteen rooms. In that way they provide a good graded school. In such a building as that special facilities can be provided for first-class instruction, whereas in many of our little country schools, where there are but six or eight scholars, you cannot get teachers for the money that is paid in those districts who know these things. In this central school building high school work was done, and they could have scientific teachers, and were

able to give instruction in a great many things which are of immense advantage to the children, but which, of course, it is utterly out of the question to teach in our little country district schools. For instance, such subjects as cooking and sewing and many other practical subjects which might be mentioned. But what I want to suggest is not so much that, but thought something on that line might be done in Connecticut with great advantage. Some of our small towns cannot give their children proper educational advantages unless they have a larger grant of money. In many of these towns they have to close the district schools earlier than they ought, whereas if they had one school in the center of the town, employing competent teachers, where boys and girls of school age could congregate, not only many of the studies which it is now impracticable to take up in the small schools could be given, but instruction in plant life and many of the other things which have been suggested here today could be added. One difficulty, I suppose, is in the right kind of teachers. I don't know but what the graduating classes at our State Agricultural College could be drawn on for this purpose. If we could make an arrangement by which these boys and girls could then go down to Willimantic to the Normal School and take a term or two there it seems to me that then they might go out pretty well equipped to do splendid work. There is no use whatever in putting out a course of study devised to carry these ideas into effect and put it into the hands of many of the teachers like some that we have in Connecticut. The teachers in the country schools of Connecticut, as we all know, are not what we would like to have. I should say that they are decreasing in the State of Connecticut, because I think the movement is upward toward insisting upon a better grade of teachers, but in many places they are still not what they ought to be, and it is not because of the responsibilities of their positions so much as it is because of the conditions under which they work. We need better school privileges, and that is one of the most im-

portant problems which we must solve if we are to keep up our country life in the State of Connecticut. For ten years in my own community every year a few people have moved away because the school was not up to what they desired, and they were just the people whom we could least spare.

I think we can do no better thing this afternoon than to pass a resolution asking our State Board of Education for the enlargement of the course of nature study in our public schools along the lines suggested here.

Mr. McLEAN. Mr. President, I speak as one who came in here this afternoon interested in the work of teaching and to find out a little as to what was coming in the future. I had a curiosity to know what was being proposed in this line. After listening to the lecture I felt as though I had been reading one of Browning's poems. I don't know exactly where I am. If I understood the speaker he did not advise at first doing what he advised us to do near the close of his lecture. If we were to do many of the things that he advised we should certainly come pretty nearly into the line of technical agriculture, and that is something which I did not understand him to recommend.

But the poor teachers; I wonder if any of us really think what a wonderful being a teacher must be at the present time, and even more so in the future. The time has been when we had our colleges, our art schools, our conservatories of music, our agricultural and technical schools, but now, if I understand him aright, many of the things which it has been their particular province to teach have got to be combined in one little tired head of a country school teacher. The school teachers all dread it. They don't know today how they can possibly do what they are being asked to do. Every circle of people having certain things that they are particularly interested in think they should be taught in the public schools. Some people are sure that drawing must be taught in the common schools. Others are very sure that music should

be taught. Others that it is especially important that civil government and political economy should be taught. Even in the district schools many of them are very sure that hygiene and physiology and anatomy, to a certain extent, should be taught. Nearly every one now agrees that botany should be taught. Others still claim that the elements of chemistry, entomology, and physics, together with a great number of other ologies, should also be taught by this teacher of the village school or of the public school. Now we are to add to all that agriculture and nature study. We are to teach the pupils the best means of feeding calves, of punching borers out of peach trees, and how to attend to the teeth of domestic animals; how to estimate the size of strawberry boxes, and how to fill them; in catching toads and placing them under cabbage plants, and a great many other useful industries are to be promoted in this manner. It is all to be added to the work of the teacher, in addition to the usual routine work of the school, which, of course, nobody thinks of laying aside. It makes me think of the poor little girl who was crying over her long example in multiplication. Her mother came along and asked her what was the matter. "Oh, my," she says, "I do wish that I was an Australian rabbit." "Well, why do you want to be an Australian rabbit?" "Why, I read in the geography this morning that they can multiply rapidly." Almost every teacher would begin to feel if this greatly increased burden was placed upon them that he or she had got to multiply into innumerable persons, or into a person with innumerable heads upon them, in order to master all these things.

Now, I think they will try to do it if you ask them. I do not agree with the gentleman who last spoke that our teachers are a disgrace to our state. I think they are a great honor to our state. The teachers that are teaching in Podunk Hollow, in Stony Lonesome, and Rattleium, and everywhere else over these hills, what they have to do they are trying to do well.

They are trying to do it under conditions that are sometimes very difficult. Today they are doing the most important work that is being done, and more rests upon the sense of responsibility, conscientiousness, and ability of the country school teachers of today than rests upon any other body of people in our commonwealth. More of the future rests upon them. I speak of this not because at the present time I have fifty of them under my special care, but as one who, as a coworker with them in this work, knows something of their feelings and of their willingness to do their best in the great work laid out for them to do. I think they will try it. They are a brave set. They are not afraid of labor. They will try to do most anything that you ask them to do, but don't ask too much. If you want these things done, if you really think that they are necessary and should be engrafted into the work of common school instruction, then put it in some way where it can be done well. With all respect to our great and wise legislators, they do sometimes ride a good many hobbies. For instance, our wise legislators say that the eyes of every child in all our schools must be tested, and instead of letting the towns pay for having this work done by somebody that is qualified to do it, every little school teacher has got to try to understand the structure of the eye sufficiently to do this. It is not reasonable to expect our teachers to do such a work as that and do it properly. It will not amount to anything. Of course it cannot amount to anything. Now, if you want to do this do it intelligently. You know very well that you cannot expect every teacher, aside from all the other things which he or she is expected to know — you cannot reasonably expect that they shall master the science of breaking steers, raising calves, studying out trees, and all the intricate and interesting secrets connected with entomology, fungus, and fungicides, and all those things. If you must have this done send somebody into the towns that is qualified to do it. Let them give lectures weekly or monthly, that shall be born of knowledge and ex-

perience, so that our teachers may be able to take up this work. These lectures may be designed for the teachers, as well as for the pupils, and designed in such a way that the teachers can take up the topics and carry them out without adding too much to the great work which many of them are carrying at present. If that is done, then something may be accomplished which shall be practical and beneficial. (Applause.)

Mr. STERNBERG. The subject, Mr. Speaker, under discussion appears to me as a very important one, and it also appears to me that we should get right straight at the facts. We do not come here today to devise or advocate means of burdening our teachers with additional duties. We do not come here to express our sympathies for overworked teachers, but the subject of the discussion is simply this: Can we induce in our children an interest that pertains, or that should pertain, to agriculture? Now, it seems to me it can be done with very small labor. In fact it is being done. It may not be well known, but in this city is a school which is adapted entirely to the teaching of horticulture. The school is largely supported by some wealthy gentlemen of this city. The children are put through a regular course. They are taught how to grow plants. They are taught how, after a plant has come up, to cultivate it, to develop it, and make it grow to the best advantage. In fact they are taught how to raise flowers. Now this same system is being carried on in quite a number of our prominent towns of the state. The town I have the honor to represent, and in which I live, the town of West Hartford, has carried on this system for a number of years, and has done so with good results, which you see around every schoolhouse as you travel through our town. You will see the little beds of flowers well taken care of by little fingers. They have been taught to raise flowers, and to raise vegetables to a small extent, and we believe it will be noticed that as a result of that instruction our children are today entirely in love with horticulture and agriculture. And there is the solution of the

whole question. If a child is in love with any one thing you do not need a teacher, it will teach itself. If the interest of the children has been aroused in these things they soon develop an enthusiasm for the work and carry it on themselves.

For fifty years I have been engaged in raising fruit of all kinds. I try to keep myself informed in regard to fruit raising, but for information I do not burden the teacher; I consult the papers and the magazines devoted to that business. I well know where to get my information. I attend meetings of this sort, where I can derive a great deal of information, and I buy and read the farm and fruit papers. So it is with the children; let their attention once be directed to these things, and their enthusiasm aroused, and the means are at hand whereby they can carry on and develop their knowledge.

The State of Connecticut has already done something in this line. In our exhibit at the Louisiana Exposition the State, under the direction of a committee, of which Connecticut may well be proud, has spent several hundred dollars in that kind of work. Not only that, but something in this line is being carried out in other towns, as well as my own. It is all going to bring forth good results. I see evidences of work of this kind being done throughout our State, and it will be of great benefit in inculcating into the young minds of our children a love of agriculture. I think, on the other hand, Mr. Chairman, that instead of overburdening our teachers we might well eliminate some of the studies that are taught today. With the advance in the literature which we are able to obtain in these days, and with the publication of many encyclopedias at a very moderate price, there are many things which we can read up about in a very short time, and over which our children in the public schools pore a good deal with very little value. There are matters in geography and history, over which our young minds pore for years, which, in my judgment, result in very little benefit, and the time spent is of very little value. The time is largely spent for naught, because later on, if information is

required about those particular subjects, we naturally go to sources from which we can obtain complete information. Our papers and our magazines provide us with the very best of information about a good many things which in times gone by we all of us here have spent considerable time upon. That time was largely lost. I have no need to discuss that part of this matter in detail. I think that some of the time, which, as I say, is now devoted to subjects which might, with profit, be eliminated, could be devoted to the study of some practical pursuit, like agriculture, or at least to the study of enough of it to arouse in our children a love of agriculture. The prosperity of the State of Connecticut depends upon agriculture. It depends upon disseminating knowledge among our young people in our country towns, in order that they may make a respectable and successful living in agriculture, and in order to retain them upon the farms. In my judgment a portion of our educational work should be directed in that line.

I was glad when the cities of the State introduced instruction in manual labor in their schools. They needed it. It was badly wanted. You do not need that in our country schools, because our boys are engaged in manual labor. From the time they first exercise their muscles on farm labor, as long as they stay upon the farm, they are getting all of the manual exercise which they need. In the summer they get it in the routine of farm work. In the winter they get it on the wood pile which is to be worked up, and about the farm. But that was something which was needed in the cities, and I was glad to see it adopted.

Let us devote a part of our work of education to agricultural instruction. I think it will be an important element to the future prosperity of the State. Let us eliminate a part of the instruction now given in our schools and devote a certain time to the study of agriculture.

I was pleased to hear from the gentleman upon my left in speaking of what has been done in Indiana. That very thing

has been done in the State of Connecticut. In our town we have three large 'buses conveying the children to a school where we teach all branches. Our board of education has tried year after year to get the country towns to adopt this system, believing that it was the salvation of the country towns, and so to have better schools, but some towns have not seen fit to adopt it. We have worked hard in our town to improve our educational facilities, and in every town, so far as I know, where this system has been adopted, the schools have improved.

It seems to me that the real question here this afternoon is, what can we do in a practical way to create a sentiment and create sympathy on the part of our young people to study agriculture?

Secretary BROWN. I wish to say, right here, that Mr. Hine was engaged to lead the discussion upon this subject, but later he found that an engagement previously made would take him out of the city this afternoon, and he called up, at my request, Mr. Burr, principal of the State Normal School at Willimantic, who agreed to act as his substitute. Later, I received a letter from Mr. Burr confirming our conversation over the 'phone. I cannot explain Mr. Burr's absence this afternoon. Mr. Hine, however, wished me to say, and to say with emphasis, that he was in favor of the teaching of agriculture in our public schools.

I think the greatest obstacle that we would encounter in teaching agriculture in the public schools would be the one which President Hadley intimated that they encountered in the teaching of English. He said that the great difficulty in teaching English was that they could not find teachers to teach it. The great difficulty we would have in teaching agriculture in the public schools would be in finding teachers that could adapt themselves to the conservative position which I think our first speaker, in the opening of this discussion, very properly took. It seems to me that instruction in the fundamental principles of animal and plant life is one of the best things that could be taught our children, and there is no better place in which to begin to teach them than our public schools.

Mr. T. S. GOLD. Mr. Chairman, I want to improve this opportunity, as there is no one else here to speak perhaps upon this subject, to say a few words, if you please. I have had a good deal of experience in little efforts in that direction. Probably more than any of those around me. I began our Cream Hill Agricultural School in 1845, and taught for 24 years. I had boys in my house and boys all around me; boys with me, indoors and out. My course with regard to instruction in agriculture was not so much to teach those boys scientific agriculture as it was to teach them what city boys are often very anxious to learn about — common things; to teach them to use their eyes and their ears; everywhere they want to use their hands and their feet, and to notice things to some purpose. We had a plot of ground in the garden which each boy was taught to prepare, to plant the seed, and cultivate the plants, and so learn the history and mystery of the germination of seed. The boys thus found that some plants came up just as the minister did, wrong end up; that they would not stay in the ground; that they had a habit of their own. Those were curiosities to them, and we found that some boys who did not care about books were very often extremely eager students of nature. When you get a boy's mind and his eyes open to seeing natural things he sees things more readily in the books. He learns more in books, notwithstanding the time he spends in learning the practical part of nature. The time devoted in the schoolroom to this agriculture, and to general natural history instruction, was the last half hour in the afternoon. Usually it was one of the most unprofitable and trying half hours in the teacher's duty in the schoolroom to keep them on their books, keep them in order, and all that sort of thing.

In agricultural instruction I had a little catechism — Johnson's "Agricultural Catechism," which was a little text-book which I used, and aside from its use as a text-book I used it a good deal to draw out, and as something to excite talk upon the subjects it treated of among the boys. We also taught

botany, mineralogy, entomology, whatever they were able to learn of those subjects, in a small way, and if they showed a disposition to go on further with those subjects they were furnished with books suitable to them. In that way we laid the foundation for a great many impressions, which they remembered through life, and which they needed to have.

We used to try some experiments, such as showing the boys how they could blow through a stick of wood endwise. A good smart boy can blow through a long stick of oak timber. If any of you have ever tried the experiment you know what it is, and that is enough to wake up the most dull boy. We used to do considerable of that at times, because it afforded the boys amusement, as well as useful instruction. So on with all these little matters that came up on the farm from day to day and from week to week. They took readily to it. They learned a great many of these things. I didn't try to teach them everything, but I did try to open their eyes, and to impress upon their minds facts and information which would be of use to them in after life. There are plenty of things to show them and to teach them, to engage their eyes and to use their hands. We always tried to teach them something about practical agriculture. The foundation principles of agriculture were taught. All of those things were taught to the best of my ability. And we succeeded, as we thought, in demonstrating that we could teach as much arithmetic, as much geography, as much history, and all those common studies besides, but most of all we believed we succeeded in calling their attention and awaking their interest in common things. We believed that we succeeded in impressing as much knowledge of those practical studies taught in our common schools as we could have done if we had had a teacher the whole time to teach arithmetic, geography, and history. And we carried it on for 24 years to our satisfaction, and we believe to the satisfaction of our patrons, and we believe it can be done today in the common schools on very much the same plan. By showing a boy today

something that attracts his attention, by the shape of a stone, or the history of a stone, or about a plant, you can open his eyes in three minutes to more than he ever thought to see. I believe if any teacher can do that they will open their eyes and see and study what is in nature. That is the kind of teaching that you want at present, and you want the kind of teachers who will work upon that plan.

In this matter of the opportunities for agricultural instruction we want, first of all, sound instruction, and we want that of a primary character, and that depends upon the habit of seeing a little. A teacher that sees things in nature and understands their import and importance, if that teacher has the faculty of imparting that information to her pupils, she can accomplish much. Some people go through this world blind as bats. Others find amusement everywhere, and instruction, as they go about the fields and woods. Some cannot settle down anywhere, but they see something to enjoy, and such people are filled with the enjoyment of living and the profitableness of life. I commend to everyone the cultivation of the habit of learning to see and learning about common things.

Mr. McLEAN. Ex-Secretary Gold has outlined what he thinks should be the instruction in this line in the common schools, and I want to add to that, that I think if we could only have Secretary Gold in every one of our schools the problem would be solved. If we could have Mr. Gold we would have no need of legislation or agitation.

Mr. KIRKHAM. Mr. President, I was glad that Mr. McLean voiced what I had in mind, but I am sorry that he said that it should not be technical education in this case, for it seemed to me to cut the ground all out from under the feet of those who would have the study of agriculture made more prominent in our public schools. It has been suggested and urged here that some action ought to be taken by this board. Well, it is all right for us to express our opinion. As my friend from West Hartford said, "We should do something," but I

don't think that any positive action by this body would do any good. I have had a little experience in these matters. Fifteen years ago I introduced a resolution instructing the secretary of the board of that year to request the State Board of Education to introduce an amendment into the education laws to the effect that botany should be taught in our public schools. There were three or four that spoke in favor of it, and it passed unanimously, but that was the last that was ever heard of it. The trouble is not that botany is not a good thing to teach, but it is in getting teachers who understand botany. We must have teachers who not only understand botany, but in order to make others get the full benefit of the study the teachers have got to love nature too, and must be able to adapt their teachings to the child's mind.

Over in our town last summer there was a competition among five schools as to how many wild flowers should be brought to each teacher. There was a prize for the school that got the most, and the number ran up somewhere from eighty to a hundred, I think. They had to know the names, and as many as possible the botanical names. I was much handicapped in that respect, for I did not know anything about it. After I got married I found that I had married a nature-lover, one who loved plants and the trees, and whenever we went out they attracted her attention. I knew comparatively little about such things, and I had to ask her what this and that was; even as to the grasses that grew in my meadow. I did not know the names of them, nor their quality, nor whether they were annuals, biennials, or perennials. Well, I was proud. I did not like to ask my wife every time. I wanted to know the thing myself. I felt my smallness. It led me to introduce that resolution years ago. I did not want others to be in the same situation that I had been in. I wished that I had been instructed, when I went to school, in those things. You must instruct the children, if you are ever going to, when they are young, and particularly as to the botanical part of it. I felt when Mr.

McLean spoke as if, possibly, we were loading another burden onto the teachers, but after thinking the matter over I think that most of them are capable of teaching a good deal that we want now, especially in simple studies of plant and animal life.

As my wife was a nature-lover, my boys and girls have been taught the name of every tree in the fields and woods, I suppose. My youngest child can teach me the names and the natures of, I presume, twenty trees that I do not know anything about.

I am heartily in favor of doing what we can to extend the study of nature in our public schools, but I doubt whether we will accomplish anything by taking action as a board, anything further than its being the mere expression of our opinion.

Mr. STIMSON. Mr. President, perhaps I ought not to have anything to say at such a long meeting as we have had this afternoon, but I have been exceedingly interested in this discussion, and as I have listened to it for the last fifteen or twenty minutes I have felt that I ought to explain, perhaps, what we are doing at the college on this subject.

Now, this whole thing of teaching agriculture in the public schools has come down, as I look at it, to a question of feasibility and of ways and means; namely, have we in Connecticut any influence or means from which we can expect some new life, enthusiasm, and interest on this subject to go out into our public schools, something which will direct the work of the public schools in this direction, and something which will put life into the instruction, into the teaching, and rouse enthusiasm and interest in the work? I believe we have. I will tell you what we have done. Three years ago we raised the question with ourselves at the college as to what we could do in the rural communities to get the boys and girls from the rural communities into our college in order to profit from the educational courses which we offer. How could we raise an interest in this very matter that we have been talking about? Should we attempt to teach the children that came to us to love agriculture

and then go out and teach these things? That seemed too slow. Lots of us would be dead before the children would be old enough to teach anything. So would some of our teachers, who we believed were thoroughly equipped for just this sort of work. Should we attempt it in our older classes? Under the best view that could be taken of it, it would be at least two or three years before teachers that we trained could get into the schools and begin to do something. So we said to ourselves, why not test this matter? Why not ask the public school teachers themselves if they will be interested to learn something about feasible methods of teaching practical agriculture? Not technical agriculture, but the simple, every-day practical facts that all ought to know. Not how to hoe or plow, or how to plant and raise crops, but instruction as to the facts of practical agriculture, very much upon the lines that have been indicated here. We determined to try an experiment. We sent out our papers to the teachers of the State, announcing that we had established a summer school devoted to nature study; and it was to be a summer school made up of teachers actively engaged in the profession. Dr. Mutchler, who gave us the first address this afternoon, had the honor one year ago last summer of teaching over sixty public school teachers who came to our institution to learn what practical agriculture might be taught in the schools, the kind of instruction that could be used successfully now, of individual benefit to the pupils, not ten years hence, or twenty years off, but immediately. Dr. Mutchler may not be able to be with us as he has been, because he is a man that is in much demand. The Boston Normal School has been after him, and other schools are after him, but he will be with us in our summer school, ready to infuse into our teachers these principles of practical agriculture.

I want to say another thing: that the question has been raised as to what we are going to ask these teachers to learn in order to know how to teach these topics. Let me say in explanation that we do not ask anybody to come to our summer

school who is not interested in nature. That is what we start with. That is the first question we ask, are you interested in nature? If you are not interested in nature and in nature studies, you will receive practically no benefit from coming to our school. We do not teach music; we do not teach mathematics; we do not teach drawing; but we teach nature studies. We teach practical agriculture. Are you interested in this subject? Then we go further than that. We ask what class of nature study are you interested in? Insects? Very well, we will teach you about insects. Birds? Very well, we will teach you birds. Plant life and botany? Very well, then we will teach you botany. Are you interested in farm animals and domestic animals of the various sorts? Very well, then we will teach you in regard to domestic animals. And it is a significant thing about our policy, or the thing that we have observed, that these nature teachers do not stay very long in any one school. Now suppose in a location you have a teacher that is an adept at any one of these topics. You may have one that is interested in one particular topic and learns how to teach that well, and you may have the next year a teacher that is interested in botany, or the next one that is interested in animals, and so on in the course of a few years you will get all of these subjects touched upon by people who have the interest in the general subject very closely and warmly at heart.

Now it seems to me that that is pedagogically solid, and the results we are going to get are going to be pedagogically practical and good. I do not use this term "pedagogue" in quite the sense that it was understood in the old days when they called a man a pedagogue who, in the course of time, could not do anything else but teach. Generally our first teachers were busy fitting young men for college, and they were pedagogues if they still continued to be teachers at forty or fifty years of age. I use the term "pedagogue" in a different classification. When I say that a thing is pedagogically solid I mean from the standpoint of sound principles of educa-

tion as applied to the practice and province of teaching. So I think this part of our policy is shown to be pedagogically sound.

Next summer we shall offer another summer school of four weeks. This policy has been definitely established by the management of the college, and the results already indicated are so good that we shall continue these summer schools.

Mr. PLATT. Mr. President, I want to say a word or two in approval of the plan of President Stimson, of holding this summer school at the college for teachers, in which they teach them something about nature. I do not know anything about it myself further than this: That one of the teachers in the New Haven schools, and a bright and successful one, too, went up there and spent a few weeks at this school. On her return she said her eyes had been opened to a great many things which she had not known about before, and which had been taught her there. Ideas were given her there that would be of use to the scholars in her school. So that I say that that one teacher that I happened to fall in with feels as though she wanted to approve of this plan of holding these summer sessions for the training of school teachers at Storrs.

Mr. HOLDEN. Mr. President, I have just one word which I want to say in explanation, perhaps, of what I said before in regard to our school teachers. I think that Brother McLean looks at it from one standpoint, while I have been looking at it from another. The conditions in Simsbury, where Brother McLean is located, are very different to what they are in many other parts of the state. I know personally that that is so. I know of teachers teaching in the public schools of Connecticut, within a very short time, who do not understand the common ordinary principles of school teaching. That is a fact. I say this not because I want to discourage them or to unduly criticise, but only because I want to wake up the people to the opportunities that exist for improvement. I am not saying that there are not good teachers. Any such statement as that

would, of course, be incorrect, but I do say that in some of our schools, in the back towns, the condition is very bad. We have something to learn from the progressive school systems of the West.

In Indiana they not only have better schools, especially in some places, but their schools do not cost them so much.

Now in order that we may take some definite action I want to offer this:

Resolved, That the State Board of Education be asked to endeavor to secure such courses of study in our country schools, including agriculture, as are adapted to the needs of the state, and that they be asked to secure, so far as practicable, the coöperation of the State Agricultural College in this movement.

I offer that as a motion.

Mr. KELSEY. Mr. Chairman, is this open to debate?

The PRESIDENT. It has not been seconded. If it is seconded it will be.

(Resolution seconded.)

Mr. KELSEY. Mr. President, I believe this is a movement in the right direction, but I would like to offer some further amendment. Perhaps it would be best to incorporate it in another resolution, or if deemed advisable, perhaps we can amend this.

I was born in this state on a farm, and I hope to die on a farm. I have also had thirteen years' experience in public school work. As some of you know, I have traveled and lectured a great deal. In my travels I have found that this movement is growing and is gaining great momentum, and, like the momentum of a falling body, will continue to gain and spread until it becomes generally adopted. We have a long session this afternoon, and I do not think we have the time now to go into a discussion of that. If we had I should like to describe to you something of the history of the movement, in order to show what it has accomplished already. But let us take the conditions as they are and make the best of them.

In order to show just a little of the widespread demand that there is for teaching upon this subject let me say this: One week ago yesterday it was my privilege to be lecturing in the State of Maine. I have in the past two years spent several weeks in that state, and repeatedly this question has occurred. Two or three times it has been called for as one of the regular set subjects for discussion. Last year I was in Vermont, and the first lecture I made was on this special topic.

I was also in the State of New Jersey, and every week for several weeks that topic was discussed. Three years ago I was in the State of Ohio, and it was frequently called for there. You know perhaps what has been accomplished in such states as California, Missouri, Wisconsin, and other states which have been mentioned, and it behooves us to keep pace with the procession, and to do all we can to help inaugurate the principles of this system of public instruction into our public schools. We have everything to gain as farmers by assisting in the inauguration of this movement.

In the State of Maine some years ago there was considerable agitation on this subject. It came up before the legislature, and some twelve years ago they passed, in a hasty, blind way, a law upon this subject, making it compulsory. I think it was a law that agriculture should be taught in the public schools, but without any text-books, without any normal instruction previously, without any special teachers having been trained to teach in the schools, the law, of course, could not accomplish what it should. The teachers had had no preparation for doing this kind of work, and even if they had it was doubtful if the people at that time were ready to pick up such a movement. I think even in Connecticut we should begin this work by education of the people and discussion of this system before the people whenever we have opportunity.

The amendment I wish to offer is this: That some printed matter, either emanating from the Board of Agriculture or from the Board of Education, or from both, or from the Agri-

cultural College and the normal schools coöperating together, should be prepared and sent out. That printed matter should discuss this question, should contain helpful suggestions and information in regard to this movement. I believe it would be exceedingly profitable to have such printed matter sent out. It will rouse interest in this subject, as perhaps can be done in no other way. It will take two or three years to get ready for this, and then there will be two or three years, necessarily, of work in the normal schools in order that the teachers that are sent out may be properly prepared.

The teachers must not only be properly prepared to handle this subject-matter to the best advantage, they must not only have the instruction where they are willing to receive it, but, to a certain extent at least, popular sentiment in the school districts must favor this movement, and that needs to be developed. We need to stand behind them.

The PRESIDENT. Did I understand you to offer that as an amendment to the resolution? If so, it ought to be written, had it not?

Secretary BROWN. I would like to say to the last speaker that the very literature which he suggests being sent broadcast over the State of Connecticut we are preparing here this afternoon, and the debate in which we are engaged will be printed, five thousand copies of it, and the books sent out to every town in the State of Connecticut. That is one of the educational advantages of this meeting. It is one of the purposes in selecting the subject which we are debating, in order that information concerning it may be sent broadcast over the state. The information which we gather and concentrate here this afternoon will be published together for the use of the public. I do not know of any more feasible way of reaching the people that it is intended to reach than through the course which this board has adopted of reaching the people in this manner. So I do not see the object of having any special literature published and sent to the people outside of what will reach them

through the publication of the proceedings in this debate, in the annual report of the board.

Prof. STIMSON. Mr. President, I think it has been customary in past years for parts of the general proceedings at these meetings, which have been peculiarly interesting, to be printed in separate form and distributed immediately. I would like to ask how many copies of the proceedings of this afternoon could be printed separately and sent out? I think you have all noticed that the volumes of the former proceedings of the Board of Agriculture consist of three or four hundred pages when printed, and it makes a pretty bulky volume. Anything of special interest is quite likely to be lost in it. It is too big, and people sometimes do not like to pick up so large a volume and pick out what is of special interest to them. If the proceedings upon this subject could be printed in a separate pamphlet I think it would appeal very strongly to those who are, perhaps, beginning to take an interest in this subject-matter. I arose to ask the question as to how many copies of such a pamphlet could be printed.

Secretary BROWN. You can have one thousand or ten thousand copies printed in separate form if there is a demand for them. It is not good economy to print a few copies. If there is to be a demand, and this is wanted in the State of Connecticut, we can print whatever is necessary.

The PRESIDENT. The business before the meeting is this motion, and I would like to ask the gentleman to read his resolution again.

Mr. HOLDEN. *Resolved*, That the State Board of Education be asked to endeavor to secure such courses of study in our country schools, including agriculture, as are adapted to the needs of the state, and that they be asked to secure, so far as practicable, the coöperation of the State Agricultural College in this movement.

Mr. CHAPMAN. I would strike out that word "country" and insert the word "state," so that it would read "in our state schools" instead of being limited to the country schools.

Mr. HOLDEN. I have no objection to that amendment.

Mr. MUTCHLER. I am intensely interested in this phase of the work, not so much from the standpoint of agriculture, if you will allow me to make that statement; not so much from the standpoint of increasing interest in farm life in any community; not so much from the standpoint of making more farmers in the State, but I am interested in it intensely because I believe it does everybody good, no matter where he comes from or where he goes in after years. The thing that we want is education in this line, ladies and gentlemen, that is the one great thing. We want education in the common everyday things of life. We need to put before the individual the common everyday things that he has to live with every day, no matter where he is or what he does. For that reason I am intensely interested in that phase of work of this kind, and for that reason I would not teach technical agriculture, but the common, everyday, useful facts about agriculture. No more would I advocate the teaching of technical entomology, or technical medicine, but I would have such a course as is reasonable and sensible. I would have it limited to those things that every boy and girl has got to meet with and should know about in their everyday life. How to grow a plant, for instance, and all those things which have been discussed here over and over again. For that reason I am intensely interested in this, and hope that some action will be taken tending to promote and expand this movement, because I thoroughly believe it is for the public benefit. It is not because Connecticut will be specially benefited, but because it will tend to help uplift the whole country, and because it is going to be useful and helpful everywhere. If I had any urging to do I would ask you to pass a resolution of this kind for the good of the public school system.

The PRESIDENT. You have heard the resolution and the motion made and seconded. Are you ready for the question? All those in favor of passing this resolution will signify by rais-

ing their right hand. Those opposed by the same sign. It is a vote, and the resolution is passed.

Now, in closing this debate I hope you will allow the chairman just one word, because he is a farmer by occupation and interest, and has been for many years, and he has been intensely interested all his life in this very subject. He has been to various schools, and has been engaged in teaching schools. Couldn't teach but little, because he did not know but little.

Now, I want to ask you here this afternoon why it is that you should debate this question? Why you are considering this question here of having this matter of agriculture taught in the public schools in this State, anyway? What is the use of it? What does it amount to? What is the basis on which it rests, the basic principle? Let me tell you. If you will study Mr. Wilson's last report I think he will tell you to your complete satisfaction. When you read that report and find that all the money in the banks, and all of the manufacturing industries in this country, do not begin to equal the agricultural interests of this country, I think you will then have some matter before you which will give you a reason why we should, somehow or other, reach the agricultural interests of this country, and the agricultural people of this country, with the means of education. It is a great industry that is well worthy of development. And do you know that the perpetuity of this government, the perpetuity of this nation, and through it the improvement and development of other nations of the world, depends upon the success and prosperity of these very agricultural principles which you are talking about today, this very thing that we are speaking of, this very thing that we are thinking of today? I do not care in what form you put it, whether the truth has been told about it, or whether the criticisms have been true to a greater or less extent. It is all right. It all tends to give us a broader, general idea of this great and important matter. But do not forget this, as has been said, that man made the town and God made the country. When you

stop to think that in the last analysis of things you have got to get right back to mother earth, and that the real prosperity of this country and of other nations springs, in the first place, from mother earth as the source of most all wealth, then you will understand why we are talking as we are talking here today; why this matter has come up, and for my part I am very thankful to this man for bringing it up in the manner that the subject has been presented before us today.

Our time has fully expired, and if there is nothing further this meeting will stand adjourned until 7.30 P. M.

THIRD DAY — EVENING SESSION.

Convention called to order at 7.30 P. M.

Vice-President Seeley in the Chair.

The PRESIDENT. That banner that hangs on the wall indicates that Connecticut was awarded the grand prize on tobacco, a gold medal on farm products, a gold medal on butter, three silver and seventeen bronze medals on individual exhibits at the Louisiana Purchase Exposition. Now, we have with us tonight the Hon. Charles Phelps of Rockville, who will speak to us relative to this subject.

THE LOUISIANA PURCHASE EXPOSITION.

BY HON. CHARLES PHELPS, of Rockville, Conn.

(Who spoke extempore.)

Mr. President, Ladies and Gentlemen: That epoch of history which marks the transfer of the Louisiana territory was so distinctive for its great activity, both this side of the Atlantic and the other, in the commercial, diplomatic, and scientific world, that it is well worthy of thoughtful study. That period, and the one immediately preceding it, has furnished some of the most interesting chapters of history. It was a period filled with important events. Great things were being accomplished. And such a feature as the acquisition of the Louisiana territory, which was the transfer of the greatest

extent of territory ever accomplished by peaceful means, should not be passed over without proper explanation. In England, George the Third was passing through his long reign of sixty years. He was surrounded by men and events of surpassing ability and importance. Four of the greatest debaters of the world were discussing political economy and social and constitutional questions, Chatham, Burke, Fox, and Sheridan. Many of the progressive ideas of the age had been given voice in poetry, of which Coleridge, Byron, Wadsworth, and Sir Walter Scott were the chief exponents. Their writings were arresting the attention of the literary world. Chemistry and the steam engine were revolutionizing the methods of man. Great reforms had taken a sudden impulse. Among them the most important was the abolishment of capital punishment for minor offenses. Great reforms in the legislative departments of government had been accomplished. In India, Warren Hastings was accomplishing the consolidation of British rule, and the wealth of the Indies was pouring into England, the story of which could hardly be exaggerated in the tales of the Arabian Nights. Hastings, at the same time, was in the midst of those events which led up to those charges which were made against him later, resulting in that famous trial covering a period of nine years. In France, Napoleon had been swept into power on the waves of the French revolution. He had become the dominant power in France, and during those years of which we speak he was practically dictating the policy of Europe. He had become First Consul. In America, Thomas Jefferson, that great author of the Declaration of Independence, occupied the presidential chair. He was surrounded by such men as Livingstone and Monroe, the latter afterwards becoming President. Such were the events, and such were the men in and preceding the period when the Louisiana purchase was accomplished. Like all great events this transfer had its origin in a very small beginning. While the French owned in fee the land in and about New Orleans, the Spanish authorities were still dominant, and they had become so irritating to the navigators of the Mississippi River that it occurred to President Jefferson to see if some negotiations could not be entered into whereby relief might be obtained. He, therefore, projected the idea of the purchase of the city and island of New Orleans, and immediately sent Livingstone to France, through

whom the attempt was made. To the utter amazement of our representatives at the Court of France, Napoleon welcomed their idea, and instead of acceding to their request made, as he is quoted, the famous remark: "They asked me for a province, I gave them an empire." He asked them to purchase the entire Louisiana territory for fifteen millions of dollars. They at once saw what it meant to this country, and they immediately set about the negotiations which accomplished that end. Therefore the entire tract of the Louisiana territory passed under the control of the United States for fifteen millions of dollars, an immense sum then, but comparatively nothing now, for the city of St. Louis alone pays in revenue to the United States government, annually, more than fifteen millions of dollars, and more than the original cost of the entire Louisiana purchase territory. No truer words were ever spoken. "They asked me for a province, I gave them an empire." Roughly speaking, this territory extended from the Dominion of Canada on the north to the Gulf of Mexico on the south, and from the Mississippi River to the crest of the Rocky Mountains. It was greater in extent than the entire original thirteen states of the Union. It covered more than a million square miles in extent, and was larger than the combined areas of England, France, Germany, Scotland, Ireland, Belgium, Italy, and Spain. These figures seem incredible, but I have only to refer, for their substantiation, to the book which was published by Mr. Charles M. Kurtz, Ph.D., who was assistant director of arts at the St. Louis exhibition. Such an event as this, the transfer of such a territory from the old world to the new, by peaceful means, meant everything to the United States. People have discussed, and philosophers and statesmen have attempted to explain what motive moved Napoleon to surrender to the new world such a magnificent piece of territory, which had not its equivalent upon the face of the globe, a territory which, in resources, in richness, in mineral wealth and agricultural development, had no equal, and no equivalent in the same amount of territory anywhere on earth. Three reasons have been given why Napoleon acceded to this request. Some state that he was such a farseeing statesman that he knew that the allied powers would move against this valuable tract, and that he never could successfully defend it in the new world. The days of steam navigation of the Atlantic were far in the future.

He also needed a vast amount of treasure to equip his armies. He is reported to have said that if the young republic secured this territory she would, in the future, "begin a commercial revolution which in the end would hard hit his great rival, England. It is very likely that all three reasons were at work upon his mind. At any rate it was accomplished, and he gave us an empire for fifteen millions of dollars. The managers of the St. Louis Exposition and its projectors, having in mind the magnitude of this enterprise, saw that a proper celebration of that event must be equally great in magnitude. Therefore no enterprise of this kind has ever been projected anywhere in the world on so great a scale as this celebration just closed at St. Louis. You ask if there is no criticism to make. I say, yes. It was too large; larger than it should have been, perhaps, for convenience, and yet correspondingly it had very many great advantages. Those of us who were in Chicago will remember what a beautiful white city that was, how large, and how extensive. We never expected to see anything along those lines of greater magnitude or greater import than that beautiful celebration. Yet Chicago covered 633 acres, St. Louis 1,240. That exhibition was greater than the combined fairs of Paris, Chicago, and Buffalo. I was told by a member of the national board of managers, who had figured it up, that to get the buildings of the St. Louis Exposition upon the Pan-American grounds they would have to be put so closely together that one could hardly pass between them. The fair was projected upon these immense lines because it was to celebrate an event of immense national importance. It is probable that this country never could have saved the Union, or protected itself, and never could have taken its place among the world powers, without this territory, but with it it has become great, and it is steadily increasing, until today, as we all know, America is a world power.

The general scheme of the St. Louis Exposition was very much like that of Chicago, or the Columbian. The buildings were grouped something similar. There were two features in the grand central scheme that called to mind the beautiful Court of Honor at Chicago, although larger and more extensive. Chicago was beautiful in that respect, yet the territory was flat. The Administration Building and the beautiful Peristyle at the further end of the Grand Basin, as all who

saw it will recall, was probably the most beautiful sight of the kind, up to that time, that any one had ever seen, but you will remember that it was all on a flat surface. Not so at St. Louis. The Festival Hall at St. Louis, which corresponded to the Administration Building, and the Colonnade of States, which corresponded with the Peristyle at Chicago, was elevated. The same difference would exist if our beautiful Capitol yonder on the hill, instead of surmounting the crest of the hill it should stand upon a dead level. How much more beautiful it is elevated upon that crest. The Festival Hall at St. Louis was situated very much the same. On either side was the Colonnade of States, representing the states carved out of the Louisiana territory. Twelve states and two territories were formed out of that single tract of land. This colonnade extended a quarter of a mile from the beautiful central piece. Festival Hall, located on this eminence of 52 feet, rose above it for 200 feet more, surmounted by a beautiful dome. The Colonnade of States extended about a quarter of a mile, ending at each end in a beautiful structure surmounted with a circular dome, which corresponded in architecture to the main dome in the center. These colonnades were surmounted with statuary symbolical of the states which they represented. From a point in front of the Festival Hall the Cascades flowed down over the stair work into the Lagoon, which passed on through porches and under bridges and arches clear down through the grounds. So that on a fine evening one could get into a boat, and going up past the Cascade, from which the full beauty of the waterfall could be seen, passing up under the arches and under the bridges, up and down the Lagoon, one could see the white light, and red and green lights alternating. No sooner did one fairy scene burst upon you than in a moment it was changed to something almost equally beautiful. It was indeed a fairy scene. The curved lines of the colonnade suggested the majestic approach of St. Peter's at Rome. As you passed down to the right and to the left there extended the large buildings, which were built for exhibition purposes. There was but little difference between those and the ones at Chicago, except that they were very much larger.

The real genius of the St. Louis Exposition, however, was in its landscape gardens. This country has never seen such

a wealth of ingenuity and skill and taste, and such an expenditure of money, coupled for a given purpose, as was represented by these gardens in the St. Louis Exposition grounds. Not a shrub, not a tree was allowed there without reference to its environment and without some suggestion as to its fitness with regard to the surrounding buildings and architecture. It was the genius of the fair. Whoever have seen the Sunken Gardens, or whoever saw those beautiful beds of flowers, with their grouping on the hillside, clear back toward the center of what was called the forest before that was destroyed in order to erect the building, will say they never have seen anything more beautiful, more unique, and more consistent.

It would, of course, take time to speak of the exhibits. In such a fair they are the world over similar to a large extent, but there were a few that demand special notice. Japan and Germany seemed to vie with each other. Their exhibits were great, lavish, and unique. You could go into one building and see Japan, and then pass into another, and so on through the Manufacturers' Building, or into the Palace of Liberal Arts, and no matter where you went, wherever Japan had an exhibit it became a source of wonder as to how it was that they could send so many goods, with such a variety, and have everything carried out with such detail. The exhibits all through were especially excellent for the reason that there was a system and symmetry all through the fair. It was a serious fair. It seemed as though that was one of the chiefest things that the wit of man had given attention to, the study of the symmetrical and the proportionate.

There were three departments at St. Louis that rendered that exhibition unique in itself. No one of those four departments had ever been exhibited before anywhere on earth. The first was the United States Mint. Of course there have been coin machines and other machines shown of that kind, but this was the first time that there ever was a complete installation of the entire outfit. The United States Mint was shown in detail from the time the metal passes from the crude ore right through the whole process to the finished coin. If you followed what the lecturer said one could not fail to get a very good idea of it. I had a special letter of introduction to a gentleman who introduced me to a man who had coined more money than any man on earth, and under his guidance

we passed from the crude ore through every stage of the process, to the giving us of a coin as a souvenir. It was copper, of course. The machinery was especially interesting. Some of it was so finely made that it could be adjusted to a thousandth part of an inch, so that a bar of copper being put through a roller would be changed a thousandth part of an inch. I cannot stop to dwell upon these processes, but they were as interesting as anything could possibly be. I said to one of the gentlemen connected with that exhibit: "How does it happen that all this part of the building is given over to a representation of the United States Mint? How is it that Uncle Sam can spare all this machinery?" "Why," he said, "there is about to be installed in Colorado an auxiliary mint of the United States government, and it happened that this machinery was perfected just about the time that the exhibition opened. So this machinery was sent to St. Louis and set up, and after the fair closes it will go to Colorado to be installed, and will not again be on exhibition." It was indeed a happy circumstance that the installation happened to come just about the time of the fair.

Passing on a short distance from the mint we came to an exhibit of the wireless telegraph system. There was a lecturer in attendance, who was one of the brightest men I ever met. He gave us in detail the entire history of the wireless telegraph apparatus. I was told at the time the particular difference or distinction between the transmitting medium which they are obliged to use in the wireless system and that used in the X-rays. As you pass through the lecturer on the X-rays explains the various details, and so you go through the entire process, witnessing all of the illustrations, and being subjected yourself to those tests. This gentleman, who was our special attendant, said that when he was illustrating the X-rays he always liked to get hold of a lady's pocketbook. He said he found everything in it but money; that there was always plenty of tickets, books, checks, and samples of cloth, etc., but very seldom money. We tried it on the ladies in my party, but they did not have a pocketbook. He put a rubber band around my hand, and by holding a pin on the inside, like that, was able to locate where it was. So that if a pin was really in your hand the surgeon could locate it exactly, or any other foreign substance. X-rays have been considered as

detrimental to the human flesh, but they have discovered an invention which quite counteracts that evil, as there is a method which they now use and which they claim will protect the patient from any evil effect from the use of X-rays.

So we went on through the entire building. Of course I cannot spend time to take up each interesting subject in detail, but there were these three things shown, which have been developed and have greatly progressed since the last world's fair, and are now up-to-date, and in fact the latest things, and as interesting and more real than the tales of the Arabian Nights.

Some one has said that the particular study of mankind is man. If I were asked what one feature of the St. Louis Exposition was predominant on its educational side I should say it was the study of man. When the St. Louis Exposition was being constructed its managers found, unfortunately, that they were going to have barely enough room for the large buildings and for what they had projected. You will remember that Washington University was just being completed. The buildings included a magnificent great stone building in the parallelogram, covering some 40 to 46 acres. As the fair progressed, the bounds were increased, and finally this was all taken in and rented for use during the fair. In that building was located the administrative department. They fitted those buildings permanently, so far as the museums were concerned, so that there we found all the relics that could be gotten together, representing prehistoric man and his implements and tools. This scientific department was very carefully made up, thoroughly equipped, and systematically and carefully classified in the regular catalogues, so that one could go through there being sure that such men as Prof. Frederick Starr, Dr. Clinton, and all of those men who are pronounced authorities on the subject, had given it careful attention, and could have the benefit of their researches, their books, their data, and their statistics. In there one could find a very complete collection from the mounds in Ohio, collections which had been gathered as the result of long investigation with reference to the mound builders and early prehistoric man. It is said that they found 140 skeletons in two low subterranean terraces. They were first discovered about 1846, and they have been discovered from time to time since. All those were carefully classified,

together with the implements, especially the copper and stone, which have been found with these relics, and also with the fossil remains, sharks' teeth, shells of the ocean, etc. In going through that building one got wonderfully interested, but I haven't the time at present to describe it in detail as I would wish. One could not help, however, in becoming wonderfully interested regarding our own country, and in asking the question: "Are we new or are we old?" One tires, however, with looking at mollusks and fossils and stone, timber, copper, and other metal. One wants to see something that is newer and full of life. So by stepping out of this building, of Washington University, and within a very short distance, we see a group called the Ainu Family. They are representatives of the aborigines of Japan, and were brought from their native island by Prof. Frederick Starr. They are very celebrated for their handsome tattooing, especially on the ladies. They are rather light skinned, and they are celebrated for their remarkable ceremonial habits, "social and religious." It is a subject of intense interest to study and understand from whence spring their life-habits and all these intense ceremonial habits, "social and religious." There they were, living just as they live on the island of Japan. They brought their equipment, their utensils, their songs, their sports, and their serious life, and they ate and slept, and had their recreations and their visits just as they did in their native land.

Just beyond them you passed to the Patagonian Giants from southern Argentina, remarkable for their strength and for their magnificent feats of horsemanship, and for their courage.

You passed then to the tent of the Batwa pygmies. These little people came from the upper Kasai valley of Central Africa. They are representatives of the aborigines of Africa, a race which is being rapidly displaced by men of larger mould. They are the smallest known variety of the human species, and are remarkable for their great subserviency, and for their imperfect development of language. The representatives of these races of people were the only ones that had ever before visited the shores of the United States. They left their native haunts and have all been returned. An interesting scene took place with President Francis of the Louisiana Purchase Exposition Company when the pygmies came to bid him good-by, preparatory to their long journey back to Africa. He gave

them all a little present, but their eyes seemed to become fixed on his coat, where he had some society badge. They wanted that more than anything. He finally gave it to them, and they carried it back to Africa.

This brief and incomplete statement in regard to these peoples serves to illustrate what I wanted to bring out, which is that the St. Louis Fair differed from all the other fairs that we have had, in this principal particular.

Just as you leave these tribes you come to fifteen different villages of Indians, representing every grade among our own inhabitants, both here and in Mexico. There was the wigwam and the squaw, and the Indian chief and the scalping knife, represented just as they are represented to be when at home in their native haunts. There they were, living, eating, smoking, and shouting, just as they do at home.

I had a very interesting experience one day. President Francis of the Exposition Company made up a party, and I, very fortunately, happened to make one of it. The party was to pay a visit to the Philippine village. Upon that occasion it was my fortune to see a chief of one of these painted, beaded Indians going to make a first visit to the Filipinos, and if I ever saw one person look down upon another, it was this Indian chief, as he saw the poor, degraded Filipinos. They were giving their war dance and going through some of their exercises, showing what their national sports were, and as he stood and observed them he wrapped his blanket around him and looked down with the most dignified condescension you ever saw. The Philippine village covers about forty acres of land. There were six villages, and they represented something which was entirely new in this country. They represented different tribes and families of every class and every grade of the Filipinos, from the lowest to the aristocracy. Some of them showed a good deal of intelligence, and, of course, the more intelligent ones will not have anything to do with the others. The lowest were the Igorrotes, called the head-hunters, and they believe in themselves just as firmly as the high-grade ones believe in their habits and institutions. They have one goal, towards which every one of their tribe sets his face. It is their ambition, and you can at once test their standard of civilization by knowing what that one goal is. It is to kill three men under different circumstances and to place their heads upon a pole in

front of their huts. When they have accomplished this then they have reached the highest point of honor in their code. Like the Roman Senator who, having performed a great service for his country, and having been thanked publicly in the Roman Senate, is thereafter entitled to retain his seat, and no one can supplant him. These head-hunters were pure savages, and although rather small in stature, and rather degraded in looks, yet from their earnest eyes and general aspect they showed vigor and power and intelligence if only directed in the right way. I never shall forget one instance that occurred during our stay. We were there in April, about two weeks, at the dedication of the Connecticut building, and again three weeks in October. In April everything was new. The savages were out with the worst kind of instruments, kettle drums, and pans, and dancing the most grotesque dances imaginable around a few embers of a fire burning in the center. Men and women alike. It was a scene which I had heard described, but which I had never seen. I thought then that they represented the worst and the most degraded elements of the Philippine Islands. In October I passed through this same village. I visited their schools. At that time I saw seven of these same degraded children of the Filipinos sitting upon a log, partially clothed, and attempting to sing "America." They were not on the key, I assure you, but you could tell what they were attempting to sing, both in the music and the words. I declare it was a revelation. They had seen for the first time civilization in all of its departments. They had seen something better. They had seen the exact discipline as given out under the government of Uncle Sam, and they were true to the lesson. I never saw such a thirst for knowledge and such intense desire to learn as was pictured upon the faces of some of those children of the Filipinos in their school. I thought what a revelation it was, what an object lesson for America.

From the top of the Ferris wheel, or the tower, one could look over and beyond any one of the large buildings, and could locate the old St. Louis slave market, where only a few years ago, as we know, the institution of slavery was in existence and practiced; yet in sight of that old slave market beings a hundredfold more degraded than were the slaves, beings who had never sat at a table, who had never eaten anything except with their fingers, and whose highest ambition was to slay

human beings and hang their bloody heads on a pole before their huts, were seated, clothed, upon a log singing, or attempted to sing, "My Country, 'Tis of Thee, Sweet Land of Liberty." I thought if Abraham Lincoln could have been where that scene could have passed before him and thought of his martyrdom, he never would have regretted it, for the beginning of the marvelous work which he accomplished was here being plainly carried out, not only among the former slaves of the South, but among people of those sunny islands in the far East.

The Philippine villages would entertain any one for weeks. I was reading that when President Roosevelt visited them it is said that he spent twenty minutes more than the scheduled time allowed in looking at them, and thus threw out of gear his program for the entire day.

They lived there in their villages just as they live at home, with their houses and all their paraphernalia, showing how they slept, ate, and lived, and altogether were one of the most interesting and instructive things shown at the St. Louis exhibition. But I must not delay upon this scene.

I ought to speak a word of Connecticut and of the Connecticut house at the exposition. I do this with some embarrassment, because I see before me so many that know so much more about it than I do; but in order to hedge I will say that no one can successfully dispute me tonight, because I have just received a letter from St. Louis stating that all the books, data, and records are packed up and have been shipped aboard the cars bound for Hartford. I do know, however, for I have been through all the departments, and some of them twice, that the universal expression is that Connecticut made one of the very best showings of any State in the Union. Her exhibits were varied, and they were extensive. They were well classified, and they were presented with a good degree of intelligence and to good advantage. My attention was called today to an entry made in one of the visitors' books by a gentleman who has spent a great many years in California. He went, I think, from Connecticut when he was very young. After he had written his name he said this: "Came from Santa Barbara, Cal. I have seen the Connecticut exhibits, and I desire to say that Connecticut can produce some fruits and vegetables of greater excellence than can be produced in the State of the Golden Gate."

I also read a letter from Mr. L. S. Parker, one of the leading citizens of St. Louis. It was addressed to Governor Chamberlain, and was an acknowledgment of an invitation sent him to meet some members of the St. Louis party at his home last night. He said that it was conceded that Connecticut had made a better and more impressive showing at St. Louis than any single State.

I received word from the secretary that in regard to the award of prizes Connecticut had received a special on farm products, dairy, and tobacco. Most of them received gold prizes, tobacco, as I am informed by a letter, being granted a grand prize. I do not wonder at it, because I happened to be at the department when Mr. Halliday and Mr. Mead were taking out their excellent exhibits of tobacco, and everybody thought they were beautiful, and they were. The exhibits were perfectly fine.

The Ohio building at the fair stood a little distance from the Connecticut State building. Ohio had a very fine commission. One of the members of that commission came over to the Connecticut State building, and it was noticed that he had his hat in his hand. He was received with some joking remark, "Is your head warm today? Were you out late last night?" He said in reply, "I am coming over here with my hat in my hand because I feel like taking it off to you." He said, "We thought we had quite a State building and quite an exhibit here, but I declare, for variety, for variety of industries exhibiting, and for uniform excellence in them all, I do not believe there is a State here represented that equals Connecticut." We thought that was very good testimony, because he was not running for any office in Connecticut, and we thought he was telling the truth. We thought so at the time.

The educational department was complete and in every way a credit. The oyster industry, showing all the different gradations, where the oysters form, and where they catch in clusters on the shells, was shown with great completeness. It was conceded that the showing of the State was universally excellent. Of course, in manufactures and in inventions, Connecticut does stand pretty well to the front, but I must confess that I was surprised to hear good judges speak in the highest terms of Connecticut agriculture in all its departments, and of our dairy interests in particular.

The Connecticut State building, we thought, deserved a prize, and if any had been given I understand it would have received the grand prize, but unfortunately there was no such department. It represented the pure colonial style, both in the building and in the furnishings. The commission turned over to the ladies of the commission, supervised by Mrs. Holcomb of the National Board, the project of furnishing the house, and everything was carried out with perfect symmetry of appointment as to its colonial nature. The gentlemen who represented the National Board coöperated, and, with Senator Wilcox, saw that everything was attended to perfectly. The appointments were carried out to such a degree of nicety that when we had a reception the ladies really did not like it because we put in a few extra hall chairs. They were out of harmony with the colonial idea. Mr. Litchfield, an expert from London, sent over by the British government, and said to be one of the finest experts upon colonial architecture and colonial equipment, visited the Connecticut house over and over again. He could take up any chair, any table, any piece of furniture or picture frame, and tell its history, the class to which it belonged, and the period in which it belonged, whether it was genuine or spurious. He made me happy because he quoted a valuation of \$40.00 on a piece of furniture, higher than I had to pay. The commission was allowed to pick out a few things and get them for just what they cost. Any one else had to pay whatever price was put upon them. He put this at \$40.00 higher than it cost the State. He said that if he had seen nothing else it would have repaid him for his trip across the Atlantic Ocean to see the finest example of pure colonial architectural equipment and furniture that he had seen in a long time, such as was represented in the Connecticut house. He knew nothing about the Connecticut house except that he was told to go there.

Some of the other State buildings are well worthy of an extended description, but, of course, I haven't the time to enter into those details at present. The State of Missouri was represented by a building which was magnificent, a great building, and a splendid dome in the center, but it was erected without any pretension of carrying out any particular idea.

The walls of the Connecticut house were covered with beautiful silk made by the Cheney Brothers of South Manchester. The carpets were made by the carpet company at Thompson-

ville. Although we were offered an entire outfit of beautiful Oriental rugs, we did not care to assume any responsibility regarding them, and the beautiful Oriental rugs were not colonial, and we took the carpets and the colonial andirons, in fact, everything that was purely colonial, and it was indeed a delightful house in which to give receptions. A good deal of the furniture was sold, a great deal of it at advanced prices. Some of the pieces went at very good prices, and some of them could have been sold over and over again. The house itself has been purchased and repurchased. We sold it, and we have lately been informed that someone else beside the original purchaser has paid a bonus to secure it.

Connecticut Day and Connecticut Week at the fair (though perhaps in regard to this I am speaking from a prejudiced standpoint) was really wonderfully successful. In the first place, the weather was ideal. It was perfect Indian summer all the time. The Governor was with us, the State officers, and the Governor's staff; two companies of infantry and one of horse guards, and when we paraded everything was in our favor. We owned the fair for the day. The parade was headed by the Philippine Guard. This is composed of a picked body of men from the Philippines, and are practically like the enlisted men that serve under the United States government. They were a fine looking lot of fellows, alert, quick, and drilled like a machine. In addition to them we had some Missouri regiments, which took part in the parade. You know how beautiful the Foot Guard looks in their continental regimentals, but out there the continental uniforms were a surprise. The western people were not very familiar with them. When they paraded it seemed as though there were more people than I had ever seen together on a similar occasion. It was the talk of the day. The Indiana and Pennsylvania commissions told us afterwards that we were the real thing that day. They had planned for a certain social function at their house, but they reconsidered it, and came over to us and said it was no use; that they could not go on; that there had been no such celebration as that among the entire group of States.

Another thing in which we can take a pardonable pride was the fact that the Connecticut house was dedicated exactly on time, and every function from its dedication to the reception given to President Francis was accomplished exactly on time.

President Francis said to me that if every State had performed its given functions with the same promptness as Connecticut he would have been at the head of a celebration that was simply stupendous. At one time when we invited him to be our guest at the house, even though he was an exceedingly busy man, he said to me, "Mr. Phelps, I am going over there to the Connecticut house, and I am going through that ceremony. I do not care who is in my anteroom, for the least that I can do is to show my appreciation of the spirit of promptness and energy that has been manifested by Connecticut. She has set an example for every other State in the Union, and I am simply giving her her just due by accepting your invitation." That is the way President Francis felt in regard to it.

We entertained the Governor while we were there, and a little incident occurred one evening which I shall never forget. It was a delightful evening. The magnificent Festival Hall never seemed so beautiful. Everything seemed to be just right. All conditions perfect. The music was delightful. President Francis offered the Governor his private launch for a ride through the lagoon. This was accepted, and when we started there were four other launches in the rear, containing other members of the party. President Francis was a little late when we started, but he soon met us and stepped into our launch. The music sounded, and those six launches went on through the lagoon, under the arches and the bridges, with the boatmen singing their songs. It was a never-to-be-forgotten scene. One lady who was impressed by it spoke to President Francis, saying, "Surely, this is heaven. You ought to be the happiest man on earth." He said: "My dear madam, there is no sadder man than I am in the State of Missouri. I have just come from a meeting of the Board of Directors, where we have been arranging to ruin this entire beautiful scene. I am sad indeed." It was a fact. They had been systematically figuring, in the Board of Directors, how much it would cost to destroy that whole beautiful structure. When the time came the last day of November, I have been told President Francis pressed his finger upon the button and the lights went out, and he said, "Farewell, farewell, most beautiful scene," and as he said it the tears came to his eyes. That it was one of the most beautiful, as well as one of the most interesting scenes that the eye of man ever witnessed, there can be no question. The fair

itself was a great success, in a way. There were 142,000 admissions a day during October, or about that, and although there were some 20,000 deadheads a day admitted to the fair, yet the grounds never seemed crowded. Such a number as that, equal to the population of quite a city, would ordinarily make quite a large crowd, yet no particular place upon the fair ground was congested. There was room for all.

The predominant feature of this whole fair seemed to be seriousness. Not that there was no fun, for there was. That was to be found upon the Pike. Let me describe to you, briefly, a few of the scenes to be found upon the Pike. Hagenbach's animal performance, I think, was the best in the world. I have seen one similar in the Hippodrome at Paris, but it was not equal to that one at St. Louis. When you first entered you passed into a vast arena, in the center of which was piled up rocks and earth, and, around the edges, places which formed the caverns and dens of wild animals. Wild animals of every kind were seen coming in and out. When I visited the place I stopped and tried to think what animal I did not see, and I could not. There seemed to be every class of animal known. As you entered the performing arena there was an animal tamer, who at one time had hyenas, jackals, leopards, and other animals under his control, and yet, single-handed and alone, he would make them jump through hoops of fire and obey perfectly his bidding. He seemed to work them as though they were little pet dogs, that would come and go at his will. An interesting incident occurred with reference to the tamer, which I must relate. It was given to me by a member of the National Board. This animal tamer was married, and he had a wife who was anything but a pleasant companion. One Saturday night, when he got through with his performance, he felt immensely tired, and he thought he would not go up stairs to meet his wife and have over with her the same old row. It looked so peaceful in the animals' cage that he laid himself down there, put his head on a lion that was asleep on its side, and fell asleep himself. His wife missed him. She went down and began to look for him, and finally found him asleep in the cage. She got a long stick and thrust it through between the bars of the cage and woke him up. He sprang up, and as he got up he looked out and saw his wife. She was, of course, outside of the cage. He was in there with the other wild beasts.

The significant part of the whole thing was, when he looked her in the face as she was thrusting that stick through between the bars, she said. "Oh, you coward." Think of it, to say that he was a coward! He had shown his courage in taming the wild beasts of the forests, but he couldn't tame her, no matter what he might do. Hagenbach's animal performance was, of course, only one of many interesting and instructive sights to be found on the Pike.

Among other things was a depiction of the destruction of Galveston. Another was the Fire Fighters, which attracted a great deal of attention. Another was called "The Hereafter." There you were shown what the future is. As you passed in you were shown a panorama, and was told what the future is of a good man and the future of a bad man.

There were many other interesting and exceedingly instructive places of amusement upon the Pike, but, of course, I cannot enter upon a detailed description of all of those things here. Suffice to say that after having seen it all it would seem to me that taking the fair as a whole that it must make a marked impression upon this country, and in fact upon the world. There, side by side, among that vast concourse of people, were representatives of every grade of humanity and every stage of civilization; there, side by side, was the lowest exhibition of manhood and the highest; specimens concerning which one could exclaim, "How like a brute!" and beside them illustrations of manhood so exalted that one could exclaim with Shakespeare, "How noble in reason, how infinite in faculty!" And when these all came together, learning each other's ways, singing each other's songs, getting acquainted with each other's religion, with each other's happiness, with each other's social customs and ways, educational systems and industries, it seemed to me that it must make for peace. It seemed to me that this more than any other one thing would turn the faces of men towards those tribunals where great questions are now being settled and decided according to the law of justice and of reason, and influence them to no longer look or dwell upon the horrors of war as a means for the settlement of their differences. It was a scene for the philosopher and the statesman, for it would seem as though, gathered side by side, as they were, representatives from every nation upon the globe, as they looked into each other's faces and saw that they were brothers,

and that they came from the same source, and were speeding on towards the same great future, that it must be a step in advance, and that it must aid in bringing in the dawn of that day when all nations of the earth shall, with sublime accord, join in the practice of the principles of Him who taught "Peace upon earth." (Applause.)

The PRESIDENT. I know you all feel that you wish to give a vote of thanks for this very interesting and instructive lecture, to which we have just listened, relative to the Louisiana Purchase Exposition. All in favor of a vote of thanks for this splendid address will please rise. It is a unanimous vote.

The SECRETARY. Mr. President, I think there is no further business to bring before the convention.

The PRESIDENT. If there is no further business to bring before the convention I will declare this meeting adjourned.

Convention adjourned without day.

EXHIBITS AT MID-WINTER MEETING OF BOARD OF AGRICULTURE.

HARTFORD, December 14, 15, and 16, 1904.

- A case of grasses from farm of Geo. M. Clark of Higganum.
- A large case of bones of animals, showing effects of various diseases, exhibited by Connecticut Agricultural College.
- A cylinder of compressed oxygen with the necessary tubes, the whole comprising an outfit for the cure of milk fever in cows by the new way, from Connecticut Agricultural College.
- A large table covered with photos and printed matter, from Connecticut Agricultural Experiment Station, New Haven.
- Apples — Wm. Taylor, Cheshire, seedling.
 T. S. Gold, West Cornwall, 8 varieties.
 N. G. Williams, Brooklyn, 5 varieties.
 Hubert Potter, North Haven (P. O., Montowese), 1 variety.
 Elbert Manchester, Bristol, 5 varieties.
 Wm. M. Curtis, Bridgewater, 5 varieties.
 Elmer Fairchild, Newtown, 1 variety.
 Connecticut Agricultural College, 70 varieties.
- Squash — Hubert F. Potter, No. Haven (P. O., Montowese), 1 variety.
- Pears — Connecticut Agricultural College, 4 varieties.
- Potatoes — D. W. Patton, North Haven, 2 varieties.
 Wm. M. Curtis, Bridgewater, 2 varieties.
- Nuts — One grafted variety of hickory named the "Eliot" from Whitney Elliott, North Haven.
 Also a case containing 56 varieties of nuts that had been exhibited at St. Louis Exposition by Connecticut Board of Agriculture.
- Corn — Sarah F. Mead, Greenwich, 1 variety.
 J. F. Close, Greenwich, 1 variety.
 Seaman Mead, Greenwich, 1 variety.
 Albert W. Close, Greenwich, 1 variety.
 Paul B. Ferris, Greenwich, 1 variety.
 N. Augustus Knapp, Greenwich, 2 varieties.
 S. E. Mills, Greenwich, 1 variety.
 D. S. Mead, Greenwich, 1 variety. This has been in family since 1750.
 John Voorhees, Greenwich, 1 variety.
 Solomon S. Mead, Greenwich, 1 variety.
- AGR.— 18

John H. Brush, Greenwich, 1 variety.
O. D. Mead, Greenwich, 2 varieties.
Elizabeth Anderson, Greenwich, 1 variety.
J. Brush Husted, Greenwich, 1 variety.
Wm. Brown, Greenwich, 1 variety.
N. Husted, Greenwich, 1 variety.
Saul Pine, Greenwich, 1 variety.
Wm. E. Husted, Greenwich, 1 variety.
Augustus Reynolds, Greenwich, 1 variety.

OFFICIAL LIST OF AGRICULTURAL SOCIETIES HOLDING FAIRS IN 1904.

NAME OF SOCIETY.	PRESIDENT.	SECRETARY.	TREASURER.
New London County,	E. Judson Miner,	Geo. W. Yerrington,	Chas. W. Hill,
Windham County,	Chas. W. Grosvenor,	Joseph B. Stetson,	Preston B. Sibley,
Beacon Valley,	Wm. J. Noble,	Wm. L. Lloyd,	E. A. Hotchkiss,
Berlin,	Frank L. Wilcox,	W. W. Christian,	Francis H. Shaw,
Branford,	Edwin Doolittle,	John F. Callahan,	John P. Callahan,
Chester,	Rej. E. Harwood,	Edgar W. Lewis,	George H. Bolp,
Colchester,	Myron R. Abel,	C. E. Stapler,	Isabel L. Strong,
Danbury,	Sammel H. Rundle,	G. Mortimer Rundle,	John W. Bacon,
Farmington Valley,	Oliver Perry,	E. A. Hough,	Benj. F. Case,
Granby,	Geo. O. Beach,	Theodore G. Case,	Stanley W. Edwards,
Greenfield Hill Country Club,	N. H. Sherwood,	Mrs. D. B. Adams,	A. C. Acker,
Guilford,	John H. Benton,	Robert DeF. Bristol,	Wm. C. White,
Harwinton,	W. J. Barber,	Lewis O. Catlin,	Patrick Hogan, Jr.,
Madison,	Joseph D. Kelsey,	D. Eugene Smith,	Edward N. Willard,
New Haven Co.,	Robert D. Pryde,	Patrick Keane,	David Kydd,
New Millford,	J. LeRoy Buck,	J. Edwin Huncerford,	Edwin J. Emonson,
Newtown,	Robt. C. Mitchell,	P. H. McCarthy,	Henry G. Curtis,
Orange,	Watson S. Woodruff,	Arthur D. Clark,	Edward L. Clark, Jr.,
Putnam,	Eaton D. Bugbee,	Bruce M. Arnold,	John F. Carpenter,
Rockville,	Andrew Kingsbury,	Herbert D. Noble,	Francis A. Kariail,
Stambury,	E. A. Hoskins,	Geo. C. Eno,	Charles E. Curtiss,
Stafford Springs,	W. H. Hall,	G. P. Ereckwith,	Robert H. Fisk,
Suffield,	W. S. Knox,	W. S. Stiles,	J. O. Haskins,
Union (Monroe, etc.),	Warren E. Plumb,	S. T. Palmer,	David S. Clark,
Union (Somers, etc.),	Charles S. Fuller,	Milo Hamilton,	Chas. A. Thompson,
Waterbury,	Thomas Bland,	N. W. Heater,	D. E. Cronin,
Williamantic,	Chas. A. Gates,	Truman K. Sudd,	Fred A. Sanderson,
Woodstock,	Henry H. Davenport,	Leonard H. Healy,	Armin E. Bruun,
Wolcott,	Charles S. Tuttle,	E. M. Upton,	E. M. Upton,
Conn. Dairyman's Association,	E. C. Birge,	J. B. Noble,	Burton C. Patterson,
Conn. Pom. Soc.,	A. G. Guley,	H. C. C. Miles,	R. A. Moore,

RETURNS OF AGRICULTURAL SOCIETIES, 1904.—FINANCES.

SOCIETIES.	Cash on hand.	Single Admission Tickets.	Membership or Season Tickets.	Grand Stand.	Donations and Inclusive Premiums.	Entrance Fees, Trials of Speed.	Other Entrance Fees.	Rent of Grounds.	Other Sources.	State Appropriation, 1904.	Totals.
New London County	\$ 12.08	67.85	\$26.00	\$109.75	.....	\$80.00	\$40.50	\$50.00	\$700.00	\$25.21	\$5,908.39
Windham County	89.63	1,209.60	85.00	903.65	.....	146.50	97.65	310.00	145.48	300.00	2,527.51
Beacon Valley	57.43	742.00	88.00	68.35	.....	130.00	37.50	157.00	.....	169.27	1,144.43
Berlin	559.00	1,821.36	283.00	128.30	\$156.45	.....	.....	280.50	67.53	143.00	3,143.14
Branford	1,787.27	2,750.00	.....	623.00	.....	3,100.00	.....	290.00	350.00	118.21	7,930.37
Chester	78.60	169.25	60.00	.....	.....	.....	.....	21.00	117.55	106.32	492.92
Colchester	.....	83.20	.....	.....	39.95	.....	.....	4.00	105.04	100.48	336.67
Danbury	4,919.48	17,380.21	40.00	3,803.65	.....	2,978.50	13.50	7,957.15	898.17	1,407.13	41,451.60
Farmington Valley	2.77	1,062.00	.....	190.00	.....	340.00	83.35	309.00	92.63	159.91	2,218.66
Granby	70.76	582.20	.....	120.14	.....	233.75	.....	123.00	23.85	.....	1,153.70
Greenfield Country Club	22.46	1,612.85	65.25	218.50	405.05	.....	.....	10.00	1,431.82	.....	3,735.93
Guilford	1,007.08	172.68	105.00	.....	.....	.....	.....	32.00	137.41	153.58	1,603.75
Harwinton	179.86	.....	.....	.....	.....	.....	.....	31.30	89.50	138.65	777.56
Madison	10.15	78.30	54.60	.....	.....	.....	.....	83.00	141.79	141.79	409.84
New Haven Co.	149.18	291.75	88.00	.....	255.50	.....	.....	123.40	193.40	179.75	1,087.58
New Milford	4.86	1,190.10	.....	213.50	.....	440.00	.....	452.11	682.30	157.25	3,900.02
Newtown	192.53	1,137.30	.....	488.00	115.00	1,715.00	10.00	281.25	215.38	153.01	4,347.37
Orange	306.78	3,985.72	237.00	573.35	19.00	465.50	7.00	283.60	265.00	197.03	6,341.98
Punam	215.24	1,792.50	.....	630.05	.....	332.00	87.25	662.00	85.70	201.41	3,906.15
Rockham	1,413.30	2,617.10	142.60	652.25	.....	139.00	.....	1,065.00	269.18	6,329.30	.....
Stimbury	72.68	454.35	.....	.....	.....	208.00	.....	117.00	80.69	114.21	1,046.93
Stafford Springs	4,039.91	3,072.25	207.00	1,117.00	.....	246.30	192.00	1,230.33	2,157.74	302.08	13,780.36
Suffield	17.01	1,391.60	.....	109.80	.....	506.25	.....	317.75	188.80	.....	2,531.21
Union (Monroe, etc.)	.....	387.10	39.00	10.50	.....	34.00	.....	65.00	.....	112.37	756.50
Union (Monroe, etc.)	1,002.61	.....	13.00	.....	35.35	.....	.....	64.50	175.27	130.48	1,420.91
Waterbury	.....	792.25	4.00	29.30	141.00	73.75	58.50	116.75	645.87	.....	1,861.42
Williamantic	59.97	2,738.05	85.00	500.25	.....	292.50	35.60	755.00	52.87	.....	4,518.54
Woodstock	368.21	467.40	81.00	193.45	11.25	130.00	85.65	194.75	200.89	.....	2,669.93
Wolcott	2,949.32	358.00	68.00	.....	.....	.....	7.50	155.50	181.70	178.63	3,629.15
Conn. Dairyman's Ass'n.	.....	.....	.....	.....	.....	.....	.....	.....	302.57	2,000.00	2,356.39
Conn. Pom. Soc.	53.82	.....	413.00	.....	.....	.....	.....	.....	.....	182.77	597.77

RETURNS OF AGRICULTURAL SOCIETIES, 1904. — FINANCES, CONTINUED.

SOCIETIES.	Expenses of Fair.	Premiums for Speed.	Premiums for Amusement.	Other Premiums and Gratuities.	Permanent Improvements.	Other Expenses.	Cash on hand.	Total.	Indebtedness of Society.	Real Estate.	Personal Estate.	No. of Members.	No. of Stock-holders.	Capital Stock.	Admission Tickets.	Season Tickets.	Grand Stand.
New London Co....	\$1,348.55	\$1,270.00	\$655.00	\$1,064.55	\$758.82	\$482.50	\$76.97	\$5,906.39	\$1,400.00	\$10,000.00	\$350.00	195			\$0.35	\$1.00	\$0.25
Windham County.	463.51	370.00	372.00	1,137.05	148.28	90.32	60.35	2,807.11		5,000.00		642			.35	1.00	.20
Beacon Valley....	234.13	325.00	120.00	704.85	389.95	1,437.60	10.30	3,145.43	1,000.00	4,350.00		52			.25	1.00	.25
Berlin.....	679.69	100.00	356.05	801.85	2,000.00		1,571.62	7,930.47				983			.50		.25
Branford.....	900.00	2,500.00	700.00	258.85	36.37		127.42	492.92				105			.25		
Chester.....	227.12	22.30		73.71	35.37		187.42	336.47				77			.25		
Colchester.....	99.05			105.25	129.00		3.17	336.47	1,570.00	2,100.00	225.00	77			.25		
Danbury.....	15,293.82	4,400.00	1,897.30	6,822.90	2,971.16	6,200.00	3,866.42	41,451.60		20,000.00	22,000.00	200		\$12,000	.35	5.00	.35, .50
Farmington Valley	574.01	800.00		422.15	216.10	199.80	36.60	2,248.65	1,900.00	9,203.07	93.00			5,000	.25		.20
Granby.....	156.15	605.00	142.00	196.50	15.50		38.55	1,153.70	1,000.00	3,500.00			93		.25		.25
Greenfield C. Club,	1,647.27		25.00	426.25	1,097.24		603.17	3,795.63	5,735.00	8,250.00	1,000.00	153		3,000	.25	.15	.50, .25
Guilford.....	1,647.27		22.94	411.25	43.89	125.00	817.71	1,693.75				212			.15	.50	
Harrington.....	234.16			260.75			222.65	777.66			200.00	107					
Madison.....	195.75			109.55	30.40	23.10	246.90	369.80	100.00		50.00	40					
New Haven Co....	346.18			434.50			246.90	1,087.58	181.75			88			.25		
New Milford.....	963.31	1,000.00		369.10	650.00	145.00	66.61	3,290.62	2,600.00	7,000.00				5,000	.25		.25
Newtown.....	1,385.10	1,152.00		399.40	180.43		1,124.45	4,247.37	900.00				115		.25		.50
Orange.....	1,019.16	1,080.00	235.25	717.25	1,204.00	300.00	1,786.32	6,341.98				131			.50	1.00	
Putnam.....	1,701.99	750.00	685.00	555.75	108.62		105.39	3,006.15	7,400.00	18,000.00			88	5,000	.35		.35
Rocksville.....	1,220.21	895.00	945.00	1,009.85	1,101.29		1,158.55	6,239.90		7,000.00			120	3,290	.35	1.00	.35
Stamford.....	152.38		650.00			173.30		912.18							.35	1.00	.25
Stamford Springs..	1,712.95	1,345.50	1,790.68	1,189.13	5,614.89	1,012.77	84.41	12,780.36	1,000.00	16,000.00	500.00		56		.35	1.00	.25
Suffield.....	1,163.81	1,050.00	133.50	100.00			2,531.31	4,020.36	1,020.00	7,000.00		100		3,075	.35	1.00	.10
Union (Monr'e, etc.)	401.27	115.00		105.00			135.23	756.50	1,050.00	1,200.00					.25	1.00	.20
Union (Som'rs, etc.)	131.05		40.00	257.35			997.51	1,420.91				250			.25	1.00	.10
Waterbury.....	738.54	140.00		805.55	196.89		2,105.18	4,518.51	500.00			12			.25	1.00	.25
Williamantic.....	902.35	887.50	785.00	816.50		1,064.26	63.03	4,518.51	500.00	4,474.11		19		2,025	.25	1.00	.25
Woodstock.....	374.31	296.00	328.25	989.70			2,567.93	2,901.00	200.00	8,000.00		523			.25	1.00	.15
Wolcott.....	401.01			595.25		95.00	2,130.89	3,029.15			100.00	68			.25	1.00	
Con. Fair 'n A.S'n,				280.00		1,308.34	767.95	2,356.39							.25	1.00	
Conn. Pom. Soc'.,	136.14			398.75			75.43	610.32				650					

ANALYSIS OF PREMIUMS AND GRATUITIES PAID.—CONTINUED. FARM PRODUCTS.

SOCIETIES.	ANALYSIS OF PREMIUMS AND GRATUITIES PAID.—CONTINUED. FARM PRODUCTS.											Total amount for Grain and Root Crops.				
	Indian Corn.	Wheat.	Rye.	Barley.	Oats.	Beans.	Buckwheat.	Grass Seeds.	Potatoes.	Carrots.	Beets.		Parsnips.	Turnips.	Onions.	Other products.
New London County.....	\$4.75	.....	\$2.00	.....	.....	\$5.50	\$1.25	.....	\$6.75	\$2.50	\$1.00	\$0.75	\$2.75	\$3.25	\$32.75	\$66.25
Windham County.....	3.00	.....	.75	.....	\$0.75	1.25	.....	20.75	1.50	.75	.75	.....	.....	2.00	27.00	57.75
Beacon Valley.....	6.35	\$2.75	7.50	.....	4.75	2.50	1.75	3.75	3.75	2.75	2.75	8.75	14.50	8.00	19.50	120.35
Berlin.....	9.00	.....	1.25	.....	1.00	2.00	.50	11.50	2.50	2.75	2.75	1.25	2.75	3.75	15.50	54.35
Brantford.....	2.75	.50	.75	.....	1.50	2.25	.....	15.00	2.00	2.00	2.75	.75	2.25	1.25	1.00	32.35
Chester.....	6.10	.....	.80	.....	1.80	4.35	.20	8.80	1.85	2.80	2.80	.45	1.45	2.05	2.25	31.10
Colchester.....	1.40	.....	.60	.....	.40	.50	.60	1.95	.60	.60	.60	.....	.20	.60	1.25	8.50
Danbury.....	41.25	1.00	2.25	\$0.50	4.75	23.75	1.75	159.75	19.50	54.00	4.25	4.25	19.25	28	.....	360.25
Farmington Valley.....	2.90	.....	.....	.....	.....	2.70	.....	17.70	2.30	2.80	.....	.....	.....	1.60	10.70	40.70
Granby.....	.75	.....	1.00	.....	.....	.....	.....	.75	.25	.25	.....	.....	.....	.25	4.50	7.75
Greenfield Country Club.....	8.15	.60	1.00	.50	.....	2.75	.....	11.75	2.75	4.25	1.50	1.50	1.50	2.25	2.10	39.00
Guilford.....	5.75	2.00	1.00	.50	.....	1.25	.50	13.50	4.00	3.50	1.50	1.50	3.00	1.50	7.55	45.55
Hawinton.....	2.40	.....	.....	.....	.50	2.10	.....	4.30	1.50	1.00	.30	.....	1.10	1.00	3.65	21.05
Madison.....	4.50	.25	.45	.....	.....	2.50	.25	8.65	1.15	1.50	.....	.....	.50	.25	9.35	29.95
New Haven County.....	1.50	.75	.75	.....	.75	1.50	.50	23.75	.75	2.25	.75	.75	.....	.....	4.25	39.75
New Milford.....	3.50	.....	.....	.....	.....	2.00	.....	6.25	1.25	2.75	1.50	1.50	3.00	2.75	43.50	63.00
Newtown.....	12.00	.....	.75	.....	.50	.25	.....	12.00	1.75	1.25	.75	.75	.50	2.75	50.75	82.25
Orange.....	.....	.....	.....	.....	.....	2.50	.....	31.00	3.00	1.25	1.25	.....	1.25	14.00	81.10	134.10
Putnam.....	.....	.....	.....	.....	.....	10.00	1.50	105.50	1.75	1.25	1.25	.50	3.05	3.50	63.75	201.80
Rockville.....	7.25	.....	1.75	.....	2.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Simsbury.....	.....	.....	.....	.....	.....	10.00	1.50	99.25	3.00	2.75	2.75	.75	8.00	5.00	.....	141.25
Stafford Springs.....	8.75	1.00	3.25	1.00	2.00	10.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Suffield.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union (Monroe, etc.).....	1.75	.....	.....	.....	.....	.....	.....	5.00	.....	.....	.....	.....	.....	.....	.....	10.00
Union (Somers, etc.).....	4.00	.....	.....	.....	.....	.....	.....	6.00	.....	.....	.....	.....	.....	.....	19.50	31.50
Waterbury.....	15.50	.....	1.00	.....	.....	.50	.....	44.25	3.50	3.50	.....	.....	.....	.....	.....	49.00
Williamantic.....	3.00	.....	1.00	.....	.....	3.00	1.00	19.00	1.50	5.50	6.50	4.00	4.00	4.30	4.00	113.00
Woodstock.....	.....	.....	.....	.....	.....	1.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	35.05
Wolcott.....	15.50	.....	.75	.....	.....	1.00	.....	22.50	3.00	3.75	1.00	1.00	2.00	5.50	30.75	75.75

NUMBER OF ANIMALS EXHIBITED. — 1904.

SOCIETIES.	Bulls.	Milch Cows.	Heifers.	Calves.	Oxen (pairs).	Steers (pairs).	Fat Cattle.	Horses.	Horses — specd.	Sheep.	Swine.	Poultry (coops).	All other Stock.
New London County.....	25	180	22	23	48	33	16	44	40	92	23	135	
Windham County.....	12	70	58	8	41	44	1	38	32	22	18	62	7
Beacon Valley.....													
Berlin.....	7	30	15	3	5	4	3	33	7			88	20
Brauford.....													
Chester.....	2	7	5	9	11	6		8			2	28	11
Colchester.....	5	23	2	2	9	14		11		12	7	20	
Danbury.....	50	58	113	42	49	33	4	95	85		20	996	402
Farmington Valley.....	30	39	19	9	12	9	4	12					
Granby.....	6	31	23	8	7	17		6	9	8		23	
Greenfield Country Club.....	10	20	25	10	25	18	3	4		12	2	40	
Guilford.....	2	26	2	6	40	12	4	52		19	3	24	
Harwinton.....	6	4	5	10	50	40	3			7	7	100	
Madison.....	5	12	4	3	25	10	3	11		3	1	45	
New Haven County.....													
New Milford.....	14	29	22	11	51	4	5	4				15	
Newtown.....	13	8	18	10	19	32	3	21				28	31
Orange.....	6			22	5	12							
Pittsford.....												37	
Rockville.....	7	82	11	9	17	10	3	21	38	21	8	636	52
Simsbury.....													
Stafford Springs.....	9	26	19	6	12	18	2			2	3		
Suffield.....													
Union (Monroe, etc.).....	2	8	6	3	28	7	2	5	9	11	3	70	
Union (Somers, etc.).....	10	30	20	10	6	14		25		6	3	40	
Waterbury.....	18	25	10	3	20	25				9	5	50	
Willimantic.....	17	29	37	11	51	12	4			15	26	50	
Woodstock.....													
Wolcott.....	16	31	31	19	45	10	8	13		12		174	8

OFFICIAL DIRECTORY

OF THE

CONNECTICUT PATRONS OF HUSBANDRY

FOR 1905.

OFFICERS OF CONNECTICUT STATE GRANGE.

Master, O. S. WOOD, Ellington.
 Overseer, B. A. PECK, Bristol.
 Lecturer, L. H. HEALEY, No. Woodstock.
 Steward, F. P. JOHNSON, Warren.
 Assistant Steward, H. W. ANDREWS, Brookfield Center.
 Chaplain, REV. F. COUNTRYMAN, North Branford.
 Treasurer, N. S. PLATT, New Haven.
 Secretary, H. E. LOOMIS, Glastonbury.
 Gate-Keeper, E. F. HUTCHINSON, Andover.
 Ceres, MRS. NELLIE A. COOKE, Hamden.
 Pomona, MRS. CARRIE A. EATON, North Haven.
 Flora, MRS. HATTIE J. MILTON, Plymouth.
 Lady Steward, MRS. MAY K. TAYLOR, Lebanon.

EXECUTIVE COMMITTEE.

P. B. SIBLEY, Danielson,	Term expires 1908
J. H. HALE, South Glastonbury,	" " 1906
H. F. PORTER, North Haven,	" " 1907
O. S. WOOD, <i>ex officio</i> ,	" " 1906
H. E. LOOMIS, <i>ex officio</i> ,	" " 1906

FINANCE COMMITTEE.

H. C. DUNHAM, Middletown. J. H. BLAKEMAN, Oronoque.
 G. A. HOPSON, East Wallingford.

COMMITTEES FOR 1905.

WOMAN'S WORK.

MRS. MARY W. PHIPPS, Prospect.

DEPUTIES.

Central Pomona, No. 1, HUBERT S. BLAKE, New Britain.
 Quinebaug Pomona, No. 2, C. H. POTTER, North Woodstock.
 East Central Pomona, No. 3, ANDREW KINGSBURY, Rockville.
 Mt. County Pomona, No. 4, J. H. PUTNAM, Litchfield.
 New Haven County Pomona, No. 5, W. S. HINE, Derby.
 New London County Pomona, No. 6, C. E. STAPLES, Colchester.
 Excelsior Pomona, No. 7, F. M. CANDEE, Naugatuck.
 Seaview Pomona, No. 8, E. H. WRIGHT, Clinton.
 Fairfield County Pomona, No. 9, W. J. WOOD, Westport.
 Hou'tic Valley Pomona, No. 10, H. S. MOOREHOUSE, Amenia, N. Y.

BOARD OF ARBITRATION.

The Executive Committee, Overseer, and Lecturer.

THE PATRONS' MUTUAL FIRE INSURANCE COMPANY.

President, GEO. AUSTIN BOWEN, Woodstock.
Vice-President, D. H. CARRIER, Glastonbury.
Treasurer, B. C. PATTERSON, Torrington.
Secretary, CHAS. E. BACON, Middletown.

LEGISLATIVE COMMITTEE.

O. S. WOOD, *Chairman*, Ellington.

J. H. HALE, So. Glastonbury.

I. C. FANTON, Westport.

C. S. HYDE, Brooklyn.

J. C. EDDY, Simsbury.

TELEPHONE COMMITTEE.

N. S. PLATT, New Haven.

W. S. HINE, Derby.

ANDREW KINGSBURY, Coventry.

OFFICERS OF THE GRANGES.

NAME.	No.	MASTER.	LECTURER.	SECRETARY.
POMONA GRANGES.				
Central Pomona,	1,	Henry C. Dunham, Middletown,	Mrs. Lizzie A. Hall, East Hampton,	Chas. E. Bacon, Middletown.
Quincebaug Pomona,	2,	Oscar Robinson, Webster,	Jennie M. Robinson, Webster,	W. F. Day, Danielson.
East Central Pomona,	3,	Andrew Kingsbury, Rockville,	Mrs. Fannie L. Tilden, Ellington,	Mrs. Laura J. Brewer, Hillstown.
Mountain County Pomona,	4,	Fred L. Thory, Litchfield,	J. H. Putnam, Litchfield,	Arthur B. Ferry, Winsted.
New Haven Co. Pomona,	5,	Bennett J. Dickerman, Mt. Carmel,	J. B. C. D. Allen, Wallingford,	Oscar L. Smith, North Haven.
New London Co. Pomona,	6,	F. N. Taylor, Lebanon,	Mrs. B. Bliven, New London,	O. L. Pultz, Lebanon.
Excelsior Pomona,	7,	John L. Rice, Beacon Falls,	Mrs. Della Sanford, Naugatuck,	Mrs. Anna Hall Pierpont, Waterbury.
Seaview Pomona,	8,	Joseph D. Kealey, Madison,	Myron G. Skinner, Higganston,	D. Eugene Smith, Madison.
Fairfield County Pomona,	9,	George B. Beers, Bridgeport,	Mrs. Estella St. John, New Canaan,	Mrs. Nellie E. Blakeman, Oronoque.
Housatonic Valley Pomona,	10,	Gilbert A. Vincent, Kent,	C. S. Phelps, Chapinville,	F. S. Peet, Kent.
SUBORDINATE GRANGES.				
Washington,	No. 11,	Ralph J. Averill, Wash. Depot,	Mrs. Anna Clark, Wash. Depot,	Frederick J. Ford, Wash. Depot.
Tunxis,	13,	F. L. Granger, Jr., Bloomfield,	Harry A. Whiton, Bloomfield,	Herman J. Rowley, Bloomfield.
Hope,	20,	Eugene Wadams, Torrington,	Mrs. Mary French, Torrington,	K. K. Kimberly, Torrington.
Lebanon,	21,	Otto L. Pultz, Lebanon,	Mrs. H. M. K. Taylor, Lebanon,	Norman C. Pultz, Lebanon.
Cheshire,	23,	Alfred S. Bennett, Cheshire,	Mrs. Eva L. Sloper, Cheshire,	E. D. Woodbury, Cheshire.
Berlin,	24,	George G. Griswold, Berlin,	Fannie H. Griswold, Berlin,	W. H. Shumway, Berlin.
Union,	25,	D. H. Bennett, Plaitsville,	Mrs. Jennie H. Prill, Plaitsville,	M. M. Fritsbie, Southington.
Glastonbury,	26,	Stancliff Hale, South Glastonbury,	William Carrier, Glastonbury,	Miss Lucy E. Miller, So. Glastonbury.
Suffield,	27,	Howard D. Sikes, Mapleton,	Arthur Sikes, Mapleton,	Ralph E. Moody, Suffield.
Meriden,	29,	Frank A. Dibrov, Meriden,	Mrs. Mary Ives, South Meriden,	Miss S. F. Grossman, Meriden.
Wapping,	30,	J. Edward Collins, Wapping,	Miss Emily M. Lane, Rockville,	Miss S. Rosa Dewey, Buckland.
Manchester,	31,	Marathon H. Keeney, S. Manchester,	Miss Clara E. Leomis, So. Manchester,	Keeney B. Loomis, South Manchester.
North Cornwall,	32,	Miss Adele T. Peck, West Cornwall,	Miss Elizabeth F. Hart, W. Cornwall,	Mrs. Niles Scoville, West Cornwall.
Wallingford,	33,	F. S. Ward, Yalesville,	Mrs. Hatlie J. Barnes, Yalesville,	Flora E. Hough, Wallingford.
Cawasa,	34,	John Crowley, Canton,	Mrs. Sarah Johnson, Collinsville,	Mrs. Annette Case, Canton.
North Haven,	35,	George N. Blakeslee, Clintonville,	Henry C. Morse, Wallingford,	Myron R. Brackett, North Haven.
Little River,	36,	Austin E. Pearle, Hampton,	Mrs. Mary Lester, Hampton,	Mrs. Angie Burham.
East Hartford,	37,	Charles R. Risley, Silver Lane,	Lawrence V. Lester, Silver Lane,	Miss Charlotte C. Smart, Silver Lane.
New Canaan,	38,	Edwin B. Adams, New Canaan,	J. Howard Hoyt, D. D., New Canaan,	William C. Durlan, New Canaan.
Burrill,	39,	Robert W. Andrews, New Britain,	Mrs. George Sherman, New Britain,	Mrs. F. H. Sharpe, New Britain.
Saxeat,	40,	H. T. Wells, South Woodstock,	Joseph Spalding, Woodstock,	Chauncey S. Child, Woodstock.
Konococ,	41,	J. H. Bliven, New London,	Mrs. J. E. Bliven, New London,	A. E. Bliven, New London.
Matabesett,	42,	Chas. T. Davis, Middletown,	Mrs. Clara Crowell, Middletown,	Mrs. Fannie W. Prior, Middletown.
Brooklyn,	43,	Leroy E. Pearle, Brooklyn,	Joseph B. Stetson, Brooklyn,	Miss Lillian M. Spaulding, Brooklyn.
Newington,	44,	Charles L. Luce, New Britain,	Henry L. Kellogg, Newington,	Mrs. Nellie Luce Eddy, New Britain.

OFFICERS OF THE GRANGES.—CONTINUED.

NAME.	MASTER.	LECTURER.	SECRETARY.
SUBORDINATE GRANGES.— <i>Cont.</i>			
46, Ellington,	Harrison L. Hamilton, Ellington,	Francis M. Charter, Ellington,	James M. Marks, Ellington.
47, Bolton,	C. N. Loomis, Jr., Bolton,	Joseph D. Slocum, Forestville,	Miss Maude E. White, Bolton.
48, Whiteville,	Edward F. Gaylord, Bristol,	F. E. Boardman, Middletown,	Archibald H. Bradley, Bristol.
50, Westfield,	Edward A. Smith, Middletown,	Mrs. S. Elmore Edgerton, Tolland,	Mrs. Mary Addis, Middletown.
51, Tolland,	Clayton C. Reed, Rockville,	Albert W. Post, Vernon Center,	Mrs. Edyth N. Edgerton, Tolland.
52, Vernon,	Everett B. Lathrop, Rockville,	May Hart, Plainville,	Mrs. Jennie F. King, Rockville.
53, Plainville,	H. S. Tyler, Plainville,	Miss Mabel Edison, Stafford,	Mrs. W. H. Plummer, Plainville.
54, Stafford,	J. M. Larned, Stafford Springs,	L. W. Harvey, West Hartford,	S. E. Williams, Colchester.
55, Stafford,	Robert W. Bingham, Little Haddam,	L. W. Harvey, West Hartford,	H. A. Stannard, West Hartford.
56, East Haddam,	A. B. Alderson, West Hartford,	Mrs. Mary S. Clark, Saybrook,	Mrs. Ida H. McAllister, Saybrook.
58, West Hartford,	A. D. W. Chalker, Saybrook,	Miss Alice J. Carpenter, Eastford,	Mrs. L. A. Keith, Eastford.
59, Saybrook,	Ward G. Hohman, Eastford,	Everett E. Brown, Pomfret Center,	Mrs. Anna L. Badger, Abington.
60, Crystal Lake,	A. Newton Vaughn, Abington,	Mrs. Gertrude M. Lane, Bakerville,	Harry G. Doughlass, Collinsville.
61, Wolf Den,	G. C. Beckwith, Nepaug,	Miss Grace E. Miller, Middlefield,	Mrs. Clara E. Goodrich, Middlefield.
62, Enreka,	Almon D. Eimous, Middlefield,	R. W. Stinson, Storrs,	L. A. Clinton, Storrs.
63, Mansfield,	W. A. Stocking, Jr., Storrs,	Harley F. Kendall, Thompson,	Mahlon H. Geissler, Thompson.
64, Mansfield,	E. Everette Rhodes, Thompson,	Mrs. Bertha Waugh, Higgenum,	Mrs. Hattie M. Davis, Clinton.
65, Quinnatisset,	Barton G. Waugh, Higgenum,	Mrs. Belle Sage, Cromwell,	Miss Hattie M. Hubbard, Cromwell.
66, Killingworth,	Ira M. Barrows, Cromwell,	Mrs. Eva Kimball, Hampton,	L. J. Mollit, Hampton.
67, Cromwell,	I. B. Barrows, Scotland,	Mrs. Grace I. Barrows, S. Canterbury,	Levi N. Clark, So. Canterbury.
68, Shetucket,	Lennel N. Carpenter, Canterbury,	Charles Case, Waterbury,	Mrs. Anna Neal Pierpont, Waterbury.
70, Canterbury,	Arthur J. Pierpont, Waterbury,	Elwyn J. Morse, Plymouth,	Miss Edith E. Sutcliffe, Plymouth.
71, Mad River,	Herbert W. Cleveland, Plymouth,	Albert N. Beard, Milford,	George S. Clark, Milford.
72, Plymouth,	Frank N. Platt, Milford,	Mrs. Belle Tibbals, Norfolk,	Edward L. Humphrey, Winsted.
73, Indian River,	Wilbur G. Lee, Winsted,	William B. Hawkins, Coventry,	Miss Fannie J. Kingsbury, Coventry.
74, Winchester,	John E. Kingsbury, Rockville,	Miss Julia A. Perkins, Andover,	William E. Fuller, Andover.
75, Coventry,	John M. Copley, Andover,	Miss Ellen M. B. Peck, Clinton,	William H. Kelsey, 2d, Clinton.
76, Andover,	Edwin H. Wright, Clinton,	Mrs. Mary Bigelow, Colchester,	Mrs. Hattie J. Strong, Colchester.
77, Clinton,	James E. Dutton, Colchester,	Frank E. Blakeman, Oranocque,	George Meachen, Stratford.
78, Colchester,	George A. Porter, Stratford,	Miss Minnie B. Mills, Winsted,	Mrs. S. Ellen Northrop, Colebrook.
79, Colebrook,	J. W. R. Allen, Winsted,	Miss N. D. Woods, East Haven,	F. M. Sherry, East Haven.
80, Foxon,	A. J. Grammis, East Haven,	Miss Ethel Christie, So. Coventry,	Miss Helen M. Potter, Williamantic.
81, Waingumbang,	David A. Turnbull, So. Coventry,	Mrs. F. H. Funnell, Anemia Union, N. Y.,	H. V. D. Reed, Anemia Union, N. Y.
82, Webutown,	J. S. Chadfee, Anemia Union, N. Y.,	Mrs. Hattie Hillis, Hillsdown,	Mrs. Hattie F. Brewer, Hillsdown.
84, Hillsdown,	Chas. G. Strickland, Addison,	Mrs. Mary E. Gallup, EkonoK,	Miss Esther G. Gallup, EkonoK.
86, EkonoK,	E. Byron Gallup, EkonoK,	Alex. Sinclair, Stepney Depot,	Edwin C. Shelton, Stepney Depot.
87, EkonoK,	H. F. Sherman, Stepney Depot,		
89, Harmon,			

SUBORDINATE GRANGES.— *Contd.*

93	Dwight A. Lyman, Willimantic,	Miss Florence A. French, Willimantic.	Mrs. Lillian M. French, Willimantic.
94	Wm W. Thompson, Warehouse Pt.,	F. M. Thompson, Warehouse Pt.	Mrs. K. E. Stoughton, Warehouse Pt.
95	H. A. Edmund, Griswold,	A. T. Palmer, Jewett City.	H. W. Morse, Norwich.
96	William M. Mix, Hamden,	Mrs. Inez Bates, Mt. Carmel.	Thomas Dunn, Mt. Carmel.
99	Edwin M. Trindle, Ellsworth,	Mrs. L. Chapman, Cornwall Bridge,	W. E. Page, Ellsworth.
100	Levi M. Reed, Union,	Nancy E. Howard, North Ashford,	George Towne, Stafford Springs.
101	F. M. Cudde, Nangatuck,	W. A. Hotchkiss, Nangatuck,	R. C. Fowler, Nangatuck.
103	A. L. Adams, Somers,	Mrs. Laura E. Avery, Somers,	F. D. Avery, Somers.
105	Frederick B. Plumb, Litchfield,	J. H. Putnam, Litchfield.	Miss Ida E. Plumb, Litchfield.
107	Paul Chaufield, Seymour,	Charles P. Angus, Westville.	Leroy C. Beacher, Westville.
108	Olis Goff, East Hampton,	Mrs. Harry Strong, East Hampton,	Miss Louise Shaw, East Hampton.
109	Preston B. Marvin, Danielson,	Ray W. Pellet, Danielson.	Miss C. Ella Day, Danielson.
112	Jason J. Martin, So. Killingly,	A. A. Tillinghast, So. Killingly,	Mrs. Frelle A. Sanderson, Moosup.
113	Gideon Wells, Wethersfield,	Mrs. Ida Robbins, Wethersfield,	Dudley Wells, 2d, Wethersfield.
114	Louis W. Button, Rocky Hill,	Mrs. Fannie Warner, Rocky Hill,	Fred L. Belden, Rocky Hill.
115	Wilbur H. Kelsey, Bristol,	Mrs. Edna W. Robbins, Bristol,	Mrs. Mary C. A. Perkins, Bristol.
116	Elsworth A. Lynde, Deep River,	Frederick T. Hommedien, Deep River,	Mrs. Flora M. Dudley, Deep River.
117	Charles S. Hulme, Thomaston,	Mrs. Leila L. Peck, Northfield,	Miss Florence A. Baisden, Northfield.
118	Silas E. Stockman, East Morris,	Mrs. Mary Wright, Thomaston,	Joel W. Skilton, Thomaston.
119	S. S. Lamb, Madison,	D. E. Smith, Madison.	Mrs. Ella M. Kelsey, Madison.
120	Herbert I. Smith, Bethlehem,	Mrs. Bertha Smith, Bethlehem,	Geo. W. Percy, Bethlehem.
121	O. D. Estey, Watertown,	Mrs. S. Grace Smith, Watertown,	Miss Sarah Norton, Watertown.
122	Horace E. Kelsey, Westbrook,	Mrs. Annie E. Hutton, Westbrook,	David C. Dibble, Westbrook.
123	August B. Carlson, Higganum,	Frederic Kelsey, Higganum.	Eugene O. Burr, Higganum.
124	Miles L. Boddgett, Falls Village,	Miss Nettie M. Cull, Falls Village,	Mrs. Louis E. Pendleton, So. Canaan.
125	Arthur N. Skilton, Woodbury,	Michael P. Skelley, Woodbury,	Miss Mattie Barnes, No. Woodbury.
126	Henry P. Smith, Glastonbury,	Harry W. Potter, Glastonbury,	Harold B. Waldo, Naubuc.
127	Arthur D. Clark, Orange,	Mrs. Walter S. Hine, Derby,	Walter S. Hine, Derby.
128	John J. Northrop, Newtown,	Alvin P. Smith, Newtown,	Miss Hattie L. Northrup, Newtown.
129	Chas. H. Jennings, Shelton,	Olin C. Shelton, Shelton.	Miss Eleanor L. Wooster, Shelton.
130	Joseph N. Clark, Columbia,	Alonzo A. Latham, Columbia.	Miss Amelia J. Fuller, Columbia.
131	William Welton, Warren,	Mrs. Sarah Marvin, Cornwall Bridge,	D. Frank Brown, Fairfield.
132	Sherwood Banks, Fairfield,	Glenn H. King, Fairfield.	Charles Perkins, Warren.
133	Burr F. Beach, Trumbull,	Elmore T. Nichols, Bridgeport,	Wm. H. Brinsmade, Bridgeport.
134	Howard Lawrence, East Canaan,	Miss Emma Palmer, Sharon,	Miss Evelyn D. Scott, Sharon Valley.
135	Arthur F. Greene, Woodbury,	Miss Mary E. Stevens, East Canaan,	C. H. Johnson, East Canaan.
136	Turner E. Greene, Plainfield,	Luella Atwood, Waterbury,	Arthur S. Judd, Southbury.
137	Clarence B. Hawley, Hawleyville,	Miss Nettie Bulkeley, Plainfield,	A. H. Mathewson, Plainfield.
140	Ernest S. Clark, Beacon Falls,	Miss L. Williams, Brookfield Center,	Mrs. Jennie Burton, Beacon Falls.
141	Karmi K. Kimbrey, W. Torrington,	Arthur M. Reelft, Beacon Falls,	Miss Flora E. Wright, West Goshen.
142	Elmer W. Griswold, Waterbury,	Miss Lettie Olson, Goshen,	Mrs. Mary W. Phillips, Waterbury.
143	Cyrus Sarles, Springdale,	Mrs. Mabel Griswold, Waterbury,	Mrs. Emma E. Hahn, Stamford.
144	Walter P. Rowland, Westport,	Miss Sadie C. Walker, Stamford,	Mrs. Arthur C. Bradley, Westport.
145		Mrs. Arthur C. Bradley, Westport,	
146			

OFFICERS OF THE GRANGES.—CONCLUDED.

NAME.	MASTER.	LECTURER.	SECRETARY.
Lyme, 147,	Halloek L. Gillette, Lyme,	Mrs. Lizzie Bill, Lyme,	Mrs. Mary S. Fosdick, North Lyme,
Westport, 148,	Mrs. Adelaide N. Sipperly, Westport,	Mrs. Grace B. Fallow, Westport,	Harry B. Fairchild, Westport.
Easton, 149,	A. J. Sherwood, Long Hill,	Mrs. Hattie Candee, Bridgeport,	Willard S. Gillette, Long Hill.
Woodstock, 150,	F. Olin Chaffee, Putnam,	Chas. M. Perrin, North Woodstock,	F. S. Wetherell, Southbridge, Mass.
Enfield, 151,	Harry J. Bridge, Hazardville,	Mrs. Mary Killam, Thompsonville,	Miss Sophia Copley, Hazardville.
Cannon, 152,	Joel Godfrey, Georgetown,	Mrs. Edith J. Clark, Georgetown,	Mary C. Miller, Cannon.
Bridgewater, 153,	A. B. Mallett, Bridgewater,	H. W. Treat, Bridgewater,	Willis E. Frost, Bridgewater.
Kent, 154,	G. A. Vincent, Kent,	Rev. Geo. Henry Smith, Kent,	Miss Carrie L. Stone, Kent.
New Fairfield, 155,	Isaac S. Knapp, Danbury,	Anna E. Satterlee, Danbury,	Mrs. J. U. Mallett, Danbury.
Danbury, 156,	Edward D. Ryder, Danbury,	Mrs. Fannie L. Frundage, Danbury,	Mrs. Jessie D. Ryder, Danbury.
East Lyme, 157,	Jared P. Comstock, East Lyme,	Mrs. Mary H. Weaver, East Lyme,	Chas. R. Wooster, Chester.
Chester, 158,	Theodore Foster, Chester,	Mrs. Hattie B. Smith, Chester,	J. J. Dodds, East Lyme.
Salisbury, 159,	Chas. S. Phelps, Chapinville,	H. Goodwin, Falls Village,	Jas. R. Harrison, Salisbury.
Aspenuck Valley, 160,	George N. Abbott, New Milford,	Mrs. Israel B. Smith, New Preston,	Daniel Marsh, New Milford.
Bozrah, 161,	E. Judson Miuert, Fitchville,	Mrs. W. A. Lathrop, Norwich Town,	Charles A. Johnson, Fitchville.

OFFICIAL LIST OF FARMERS' CLUBS IN CONNECTICUT,
1904.

NAME OF CLUB.	PRESIDENT.	SECRETARY.
New Haven County, ...	Prof. Wm. H. Brewer, ..	Cullen B. Foote.
Green's Farms,.....	W. H. Burr,.....	J. Frank Elwood.
Greenwich,.....	S. R. Close,.....	G. A. Lockwood.
Newington,	H. A. Whittlesey,.....	J. S. Kirkham.
New Britain,.....	L. S. Wells,.....	.....

CONNECTICUT DAIRYMEN'S ASSOCIATION.

E. C. BIRGE, *Pres't*, Southport.
J. B. NOBLE, *Sec'y*, Hartford.
B. C. PATTERSON, *Treas.*, Torrington.

CONNECTICUT POMOLOGICAL SOCIETY.

J. C. EDDY, *Pres't*, Simsbury.
H. C. C. MILES, *Sec'y*, Milford.
ROSWELL A. MOORE, *Treas.*, Kensington.

CONNECTICUT HORTICULTURAL SOCIETY.

A. C. STERNBERG, *Pres't*, West Hartford.
L. H. MEAD, *Sec'y*, Keney Park Nursery, Hartford.
W. W. HUNT, *Treas.*, Hartford.

CONNECTICUT JERSEY CATTLE BREEDERS' ASSOCIATION.

S. C. COLT, *Pres't*, Elmwood.
R. A. POTTER, *Sec'y*, Bristol.
B. W. COLLINS, *Treas.*, Meriden.

CONNECTICUT CREAMERY ASSOCIATION.

JOHN THOMPSON, *Pres't*, Melrose.
FRANK AVERY, *Sec'y* and *Treas.*, Manchester.

CONNECTICUT SHEEP BREEDERS' ASSOCIATION.

F. II. STADTMUELLER, *Pres't*, Hartford.
B. C. PATTERSON, *Sec'y*, Torrington.

CONNECTICUT FORESTRY ASSOCIATION.

E. V. PRESTON, *Pres't*, Hartford.
MISS MARY WINSLOW, *Sec'y* and *Treas.*, Weatogue.

BROWN SWISS CATTLE BREEDERS' ASSOCIATION.

HENRY D. LAUGHLIN, *Pres't*, Chicago, Ill.N. S. FISH, *Sec'y and Treas.*, Groton, Conn.

THE AUDUBON SOCIETY OF CONNECTICUT.

MRS. JAMES OSBORNE WRIGHT, *Pres't*, Fairfield.MRS. HELEN S. GLOVER, *Sec'y and Treas.*, Fairfield.

THE CONNECTICUT BEE-KEEPERS' ASSOCIATION.

CHARLES H. CHITTENDEN, *Pres't*, Killingworth.MISS ELLEN B. PECK, *Sec'y*, Clinton.

CONNECTICUT STATE POULTRY SOCIETY.

GEO. B. FISHER, *Pres't*, Hartford.R. G. BAILEY, *Sec'y*, Hartford.

MERIDEN POULTRY ASSOCIATION.

L. E. COE, *Pres't*.JOSHUA SHUTE, *Sec'y*.W. B. HALL, *Treas.*

NEW HAVEN POULTRY ASSOCIATION.

EDWARD A. TODD, *Pres't*.W. R. KIRKWOOD, *Sec'y*.EDW. L. JONES, *Treas.*

REPORT OF THE TREASURER.

CHAS. A. THOMPSON *in account with*

STATE BOARD OF AGRICULTURE.

1903.		DR.	CR.
July 1.	Balance amount in treasury,	\$3,109.69	
Aug. 11.	E. D. Hammond,		\$10.76
Oct. 16.	T. S. Gold,		200.00
" 19.	Case, Lockwood & Brainard Co.,		141.03
Dec. 12.	For Railroad fares of delegates,		111.89
" 17.	N. S. Platt,		4.79
" "	H. S. Spaulding,		16.00
" 18.	Hotel Chafee,		200.00
" 26.	F. S. Cooley,		29.04
" "	The Penny Press,		11.25
" "	K. L. Butterfield,		28.78
" "	Geo. T. Powell,		56.00
" "	J. M. Hubbard,		35.38
" "	Wm. N. Rice,		25.00
" "	H. B. Cowan,		10.00
" "	Mabel L. Todd,		50.00
" "	Henry E. Alvord,		50.00
1904.		DR.	CR.
Jan. 4.	H. L. Garrigus,		1.60
" "	Wm. Butler Davis,		25.00
" "	L. A. Clinton,		2.00
" "	Chas. C. Tryon,		20.00
" "	E. H. Jenkins,		13.92
" "	By one-half State appropriation,	1,750.00	
" 20.	N. G. Williams,		19.74
" "	Seaman Mead,		21.95
" "	Edward Halladay,		25.80
" "	J. B. Palmer,		22.94
" "	James F. Brown,		687.13
" "	I. C. Fanton,		25.98
" "	Chas. E. Chapman,		29.70
" "	Chas. A. Thompson,		47.82
" "	E. H. Lehnert,		5.80

Jan.	20.	Chas. E. Perkins,	\$26.70
"	"	J. H. Hale,	28.50
"	"	Chas. F. Roberts,	75.00
April	16.	James F. Brown,	176.59
May	12.	Lyman Payne,	6.00
"	18.	H. C. C. Miles,	30.87
"	"	J. R. Clark,	24.15
"	"	The Whitcomb Press,	12.75
"	"	N. S. Platt,	3.00
"	"	J. M. Hubbard,	30.58
"	"	W. E. Britton,	10.17
"	"	E. R. Bennett,	16.83
"	"	J. H. Putnam,	7.40
"	"	F. L. Tibbals,	5.60
"	24.	N. S. Platt, . . . . .	.90
"	"	E. G. Seeley,	20.00
July	1.	By one-half State appropriation,	1,750.00
"	"	N. G. Williams,	17.70
"	"	J. B. Palmer,	25.25
"	"	James F. Brown,	672.39
"	"	Chas. E. Chapman,	29.80
"	"	Chas. A. Thompson,	39.55
"	"	Edward Halladay,	12.56
"	"	E. G. Seeley,	28.84
"	"	Seaman Mead,	25.40
"	"	To balance amount in treasury,	3,293.80
			\$6,609.69 \$6,609.69

CHAS. A. THOMPSON,

Treasurer.

This is to certify that we have examined the accounts of the Treasurer of the State Board of Agriculture for the year ending July 1, 1904, and found them correct.

SEAMAN MEAD,	}	Auditors.
D. W. PATTEN,		
CHAS. E. CHAPMAN,		

July 1, 1904.

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