

# MAINE STATE LEGISLATURE

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OF THE

## STATE OF MAINE

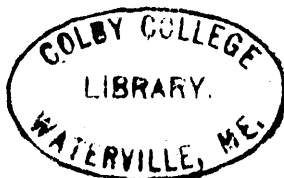
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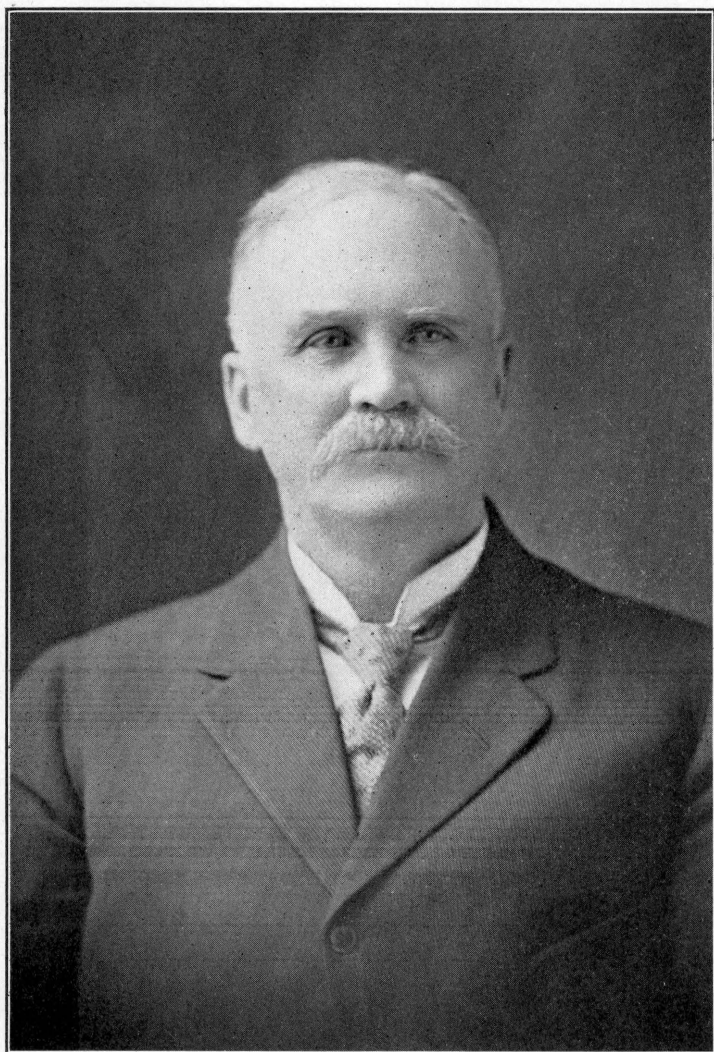
# REPORTS

OF THE VARIOUS

PUBLIC OFFICERS  
DEPARTMENTS AND  
INSTITUTIONS

FOR THE YEAR 1919





JOHN A. ROBERTS  
Commissioner of Agriculture

# AGRICULTURE OF MAINE

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EIGHTEENTH ANNUAL REPORT

OF THE

## Commissioner of Agriculture

OF THE

## STATE OF MAINE

1919

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MERRILL & WEBBER COMPANY, Printers and Bookbinders,  
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DEPARTMENT OF AGRICULTURE.

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*To His Excellency, Carl E. Milliken, Governor of Maine, and  
Council:*

I herewith submit the eighteenth annual report as Commissioner of Agriculture of the State of Maine, for the year 1919, in compliance with Chapter 34, Section 9, Revised Statutes 1916.

JOHN A. ROBERTS, Commissioner.

Augusta, December 31, 1919.



MAINE DEPARTMENT OF AGRICULTURE.

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JOHN A. ROBERTS, Norway .....*Commissioner*  
E. E. PHILBROOK, Portland .....*Deputy Commissioner*

STAFF.

FRANK S. ADAMS, Bowdoinham . . . .*Director Division of Markets*  
CHARLES M. WHITE, Augusta . . .*Field Agent Division of Markets*  
HERBERT M. TUCKER, Yarmouthville

*Director Division Animal Industry*

C. H. CRAWFORD, Dexter .....*Sheep Specialist*  
BROOKS BROWN, Dover .....*Dairy Inspector*  
A. M. G. SOULE, Augusta .....*Director Division of Inspection*  
LEVI S. PENNELL, Portland

*Deputy Sealer Weights and Measures*

M. H. McINTIRE, So. Berwick . . .*Field Agent Gypsy Moth Work*  
FRANK H. DUDLEY, Auburn .....*Horticulturist*  
ERLON L. NEWDICK, † Sanford, *Chief Bureau Seed Improvement*  
GUY C. PORTER, Houlton, *Assistant Bureau Seed Improvement*

CHIEF CLERK.

GRACE G. MERRILL, Skowhegan.

CLERKS AND STENOGRAPHERS.

ANNE B. GOWER, Augusta.  
BERNICE W. WHITE, Augusta.  
LILLIAN D. MASSIE, Wilton, to July 12, 1919.  
LOUISE G. FOLSOM, Augusta, from July 14, 1919.  
MARION D. POPE, East Vassalboro.  
ALICE M. MURPHY, Augusta, to May 7, 1919.  
MILDRED HUMPHREY, from May 12, 1919.  
DOROTHY M. LIPPINCOTT, Augusta.

† In service to April 16, 1919.





## ANNUAL REPORT OF THE COMMISSIONER OF AGRICULTURE.

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The year 1919 has been by far more favorable to the business of farming than the two preceding years. Climatic conditions have been more nearly normal. There has been far less destruction of crops by severe storms.

The winter of 1918-19 was fairly favorable to fruit trees and shrubs. There has been less damage to crops by untimely frosts. Labor has been very scarce and hard to get at any price. Still the situation has not been quite so trying as during the war period. Farmers have planned their business on the basis of using the labor of themselves, their families and such outside help as could be readily obtained. I believe they will continue to do so until labor conditions become more favorable.

Compared with prices received for farm crops and products ten years ago, prices this year, as a rule, have been good. On the other side, taking into consideration the high cost of material and labor, the prices of most crops have afforded no increase in profit. As a rule, farmers feel their situation is a very uncertain one. They entertain much anxiety for the future of their great industry. What course to take, in what direction to move, they are uncertain. There appears little light ahead. Somewhat confused by present unusual conditions, many farmers are merely marking time. However, while the increase in crop planting and numbers of livestock is very small, yet I discern a general movement to produce better crops and to improve their livestock.

### GROUPING THE BUREAUS.

#### *Chapter 64, Public Laws of 1919.*

“An Act to authorize the Commissioner of Agriculture to group the various Bureaus and Lines of Work in the Department of Agriculture into Divisions.

The commissioner of agriculture is hereby authorized to group the various bureaus and lines of work in the department

of agriculture into divisions, to be known as divisions of animal industry, plant industry, markets, inspection, and administration. Appropriations made for the various bureaus and other lines of work in a division and any other funds available for the same purpose, shall be credited to that division. Hereafter, appropriations shall be made for each division, instead of separate appropriations for the several bureaus and lines of work."

Acting under authority of this Chapter, the Bureaus and lines of work in the department have been grouped into five divisions, as follows:

1. *Division of Plant Industry.*
  - (a) Gipsy Moth Work
  - (b) Horticulture
  - (c) Seed Improvement
  - (d) Exhibits
  
2. *Division of Animal Industry.*
  - (a) Livestock
  - (b) Sheep Specialist
  - (c) Dairy Inspector
  
3. *Division of Markets.*
  - (a) Marketing
  - (b) Statistics
  - (c) Grading and Packing
  - (d) Labor
  
4. *Division of Inspection.*
  - (a) Food, Fertilizers, etc.
  - (b) Apple Packing
  - (c) Weights and Measures.
  
5. *Division of Administration.*
  - (a) Institutes
  - (b) Fairs
  - (c) Bulletins
  - (d) Miscellaneous Work
  - (e) General Supervision.

This grouping has resulted in better coordination of work and consequently greater efficiency.

#### MONTHLY MEETINGS.

The members of the Department have held regular monthly meetings throughout the year. These meetings serve to inform individual members of each Division what is being done in other Divisions, with the purpose in view of mutual help.

#### CROP REPORTING.

Attention is called to Chapters 99 and 151, Public Laws of 1919:

Chap. 99. "An Act to Provide for Cooperation between the United States Department of Agriculture and the Maine Department of Agriculture in the Collection and Publication of Statistics.

The Commissioner of agriculture is hereby authorized to enter into an agreement with the United States department of Agriculture for cooperative work in the collection and publication of agricultural statistics, such agreement to be subject to the approval of the governor and council."

Chap. 151. "An Act to Provide for the Collection of Agricultural Statistics by Assessors.

Sec. 1. It shall be the duty of the assessors in each city, town and plantation, at the time of taking the valuation for the annual assessment of taxes, to collect such statistics in relation to the principal farm crops, live stock and agricultural resources as may be required by the commissioner of agriculture. Such tabulation of statistics shall be forwarded to the department of agriculture on or before the fifteenth day of May. For such work the assessors shall be paid by the city, town, or plantation at the same rate as they are paid for other services.

Sec. 2. The commissioner of agriculture shall prepare and furnish to the assessors such blanks and instructions as may be necessary for the carrying out of the provisions of the preceding section."

These laws went into effect July 7, 1919.

Schedules are being prepared to be sent to assessors of cities, towns and plantations for use in 1920. Also an arrangement will probably be made with the crop reporting service of the United States Department of Agriculture for cooperative work in collecting and distributing information on crop acreages, conditions, yields, numbers of live stock and other matters.

#### HAY.

The yield of hay, as well as its quality in 1919, was slightly above the average yield and quality. The total cut was a little under one and one-half million tons. All of this ought to be fed in the State and all the manurial value returned to the soil. Such will not be done. A considerable quantity will be shipped out of the State, and, of that fed in the State, a large percentage of the fertilizing constituents will be lost on account of slack methods of handling it. Farmers cannot plead lack of knowledge. For two score years or more they have been told through the press, the institute, the experiment station, the agricultural school and in other ways, what the great loss must surely be on account of their improper methods of treatment of manure, and they also know full well how it may be largely saved. One has small sympathy for him who deliberately throws valuable property out into the destruction of the storm, the wind and the sun; yet many are doing it. It is this class of people who are forever saying that "*farming don't pay.*"

#### CORN.

Corn acreage was considerably below that of 1918, but slightly larger than 1917. The average yield is given as 55 bushels per acre, 10 bushels larger than 1918. Only two states in the country exceed Maine. These are Massachusetts and Connecticut, whose yields were 60 bushels. The average yield in the United States was 28.6 bushels.

The crop of sweet corn was much better than for several years. The total pack was close to 40,000,000 pounds. Price paid, five cents. Value, \$2,000,000. The organization of planters in most of the communities producing sweet corn was a step in the right direction, valuable to the packer and producer

alike, bringing them into closer touch, affording opportunity to consider many problems face to face.

#### APPLES.

The government estimates Maine Crop of Apples for 1919 at nearly 5,000,000 bushels. The estimate of the commercial crop is 600,000 bushels. Practically the whole crop found a ready market. Hundreds of carloads of drops, culls and natural fruit found their way to cider mills mostly outside of the State at prices unheard of before. Canneries made use of large quantities. The total value of apples and apple products in the State is not known, but must reach well up to \$5,000,000. Owing to the loss of many thousands of trees by the severe winter of 1917-18, and the weakening of many others, the volume of fruit in 1919 as well as in 1918 was very much reduced. Going back thirty years in orchard work and orchard conditions we find a great variation in the outlook in different years and periods, due mainly to climatic conditions, insect pests and diseases of tree, of fruit, and prices.

The Maine orchardist has met *many* obstacles and troubles, some of them *exceedingly serious* and discouraging. New troubles seem to come along each year. Yet, such untoward conditions have been met with determination, remedies found, new methods used, and enthusiasm aroused, so we may well say orchard prospects never looked quite so good as they do today. And yet we have not attained the goal of our desire. Far from it! In fact we have just started out. Our work is lying ahead.

There are thousands of orchards—so called at least—that are given little attention except to gather the crop. They need pruning, feeding and spraying. The cost of doing these three things is not large. There are many cases where such work has been taken up in old or neglected orchards and carried along for a few years with financial results that are truly gratifying. What has been done by one may be done by others. What has been accomplished in one orchard may be accomplished in other orchards.

The various fruit associations, about twenty-five in number, are exerting a powerful influence for better fruit. I hope they are willing to extend their work to outsiders, to urge upon them

the vital necessity of pruning, spraying and feeding their trees. Might it not be possible for each association to secure the pledge in writing of a few of their neighbors to spray and prune this season?

Progress in orcharding must be brought about by the most intelligent and enthusiastic members of that great industry. Men of superior ability owe a duty to their profession to strive to elevate its standard. One way to do this is to explain actual demonstrations in the orchard to the less well informed. Orchardists should enter upon such work to a larger extent than ever before.

#### POTATOES.

The acreage of potatoes planted was probably ten per cent. less than in 1918. The yield was twenty per cent. larger, making the total crop close to 25,000,000 bushels. Prices have been good, ranging from \$3.00 to \$6.00 per barrel. The average crop in the United States was estimated to be ninety bushels per acre, while the crop in Maine was 240 bushels. The two states with the next largest yield are Idaho and Nevada, 150 bushels to the acre. Considerable loss was experienced by a few farmers, on account of *boron* in the fertilizer.

#### BORON IN FERTILIZER.

About the middle of the summer word came to the Department of a serious loss menacing some of the potato fields in Aroostook Conuty. Mr. Soule, Director of the Division of Inspection, with several of his men visited the County and made a survey of several fields in each of the towns visited. Later I had the opportunity of accompanying Mr. Soule, inspecting a large number of fields and observing conditions. Mr. Soule was almost constantly in the County, either personally or by representatives, until the potatoes were harvested. Careful study was made of the situation by him, by Dr. Woods, Director; and Dr. Morse, Pathologist of the Maine Experiment Station, as well as numerous scientific gentlemen, also representatives of the fertilizer companies and officials of the Department of Agriculture in Washington. The concensus of opinion seemed to be that the

trouble was due to boron, or some compound containing boron. As a consequence, hearings were given each fertilizer company interested, after the potatoes were dug. Reference may be had to the report of Mr. Soule contained in this volume, for a full statement about this very important matter.

#### BARLEY.

About 6000 acres of barley were sown, yielding twenty-eight bushels per acre. In average yield Maine stands eleventh in the United States.

#### WHEAT.

The acreage of wheat dropped from 22,000 in 1918 to 12,000 in 1919. The yield also fell to nineteen bushels. The United States average is given as nine bushels.

#### BUCKWHEAT.

The planting of buckwheat was about the same as last year, 17,000 acres. The yield was increased over 1918, the crop amounting to about 408,000 bushels.

#### OATS.

The acreage of oats was the same as in 1918. The yield, however, dropped from forty bushels to thirty-four bushels, and the total crop from 6,760,000 bushels to 5,746,000 bushels.

The average yield in the United States was 29.4 bushels, Maine standing the tenth state.

#### LIVESTOCK STATISTICS.

##### *Total Number*

Horses in State,	110,520
Oxen,	5,621
Sheep,	112,061
Swine,	48,329



Dairymen will be interested in this comparative table showing the status of the dairy industry.

	<i>1919</i>	<i>1918</i>	
Cows,	152,617	149,905	
3 year olds,	27,126	27,195	
2 year olds,	44,882	41,394	
	<hr/>	<hr/>	
	224,625	218,594	
<i>Total increase for one year,</i>			6,031
<i>In Milk</i>	<i>1919</i>	<i>1918</i>	
Cows,	152,617	149,905	
3 year olds, (approximate)	22,000	22,000	
2 year olds, (approximate)	11,000	10,000	
	<hr/>	<hr/>	
	185,617	181,905	
<i>Increase in Milch Cows for one year,</i>			3,712
December 31, 1919.			

#### INSTITUTES.

The old-fashioned Institutes have become nearly obsolete in this State. In its place we have institutes devoted wholly to one special subject, lectures before organizations at their meetings, and addresses and papers at meetings called for the purpose of delivering such addresses and papers for a specific end. Many hundreds of lectures are delivered annually. As far as possible the institute work has been done by the office force and thus a considerable sum has been saved the state from the appropriation for Institutes. By this change of method much larger audiences are secured and the minds of those listening are sharply centered upon one subject.

#### AGRICULTURAL FAIRS.

There are about fifty agricultural fairs which receive a stipend from the State. A special appropriation of \$2500. is paid the Maine State Agricultural Society, located in Lewiston; the same sum to the Central Maine Fair at Waterville, and

\$1750. to the Eastern Maine State Fair at Bangor. The sum of two cents per inhabitant, according to the last census, amounting to \$14,847.42, is appropriated to be paid to local fairs. The sum received by each fair is determined by the amount of premiums it pays out, compared with the total amount paid out as premiums by all fair associations properly incorporated.

The stock and crop exhibits this year averaged well with those of previous years, and at some fairs were much better. Attention is called to the very meager exhibits made at some local fairs. Notice is taken that a few fairs have quietly dropped out of existence in the last decade. We note also that a few others might disappear without harm to the State or to their communities. Where a fair association becomes useless, it had better close out its business. To continue along year after year, feebly "going through the motions" of holding a fair, not only is of no advantage to the community, but does actual damage to the industry it is supposed to help, through the feebleness of its work.

In regard to many fairs, we are unable to repeat what we said last year, that "less prominence was given to cheap shows and games." We regret greatly the bringing in of an increased number of shows and games, especially those whose influence is baneful. The time has come when all such shows and games should be kept off the grounds, and, if, by chance, any one is found enjoying unlawful games or shows, he should be thrown off the grounds *instantly*. I have recommended that the State Fair Association appoint a Standing Committee, whose duty it shall be to ascertain the quality of the shows and games that are seeking admission to fairs, and warn the various societies in the State against those shows and games that are illegal, immoral or pernicious.

#### EASTERN STATES EXPOSITION.

This Department made a very creditable exhibit of Maine crops and products in Springfield, Massachusetts, at the Eastern States Exposition, September 15-20. The placing of this fine exhibit was in charge of Deputy Commissioner of Agriculture, Major E. E. Philbrook, who was aided by several men from the Department, and also by Senator Tuttle of Aroostook County.

The main feature of the exhibit was the Aroostook potato. Springfield is well located to advertise Maine potatoes, apples, sweet corn and other products of the farm. Plans are already under way to make an exhibit in 1920 that shall surpass that of 1919. Along with the farm crops and products was a very attractive exhibit from the State Museum, in charge of Prof. T. A. James of the Department of Inland Fisheries and Game.

#### NEW ENGLAND FRUIT SHOW.

The New England Fruit Show held its Exhibition this year at Providence, Rhode Island, on November 10-13. The Maine Exhibit was placed by Major Philbrook and by Horticulturist F. H. Dudley. Although not large it was creditable to the State.

#### ALLIED MEETING OF ASSOCIATIONS.

The annual allied meeting of the Maine Dairymen's Association, Maine Pomological Society, Maine Seed Improvement Association, Maine Live Stock Breeders' Association and Boys and Girls Clubs was held in the city of Bangor, November 18-21. While possibly not the largest exhibition ever held, it was unquestionably the best one considering quality and arrangement, as well as size. It was certainly a creditable exhibit of Maine grown crops, and showed well the marked progress Maine farmers have made in the last few years in the quality of their crops and products.

Along with the fine exhibition went one of the finest agricultural programs ever presented to Maine farmers. At least a dozen of the most skillful farmers and agricultural instructors in the State read papers or delivered addresses. In addition, there were experts from three other New England states, from Nova Scotia and from the Agricultural Department at Washington. Great credit is due the officials of the various Associations for so successful an exhibition.

The Bangor Chamber of Commerce did everything possible to make the exhibition a success.

## UNIFORM APPLE GRADING LAW IN NEW ENGLAND.

During the winter of 1918-19, an effort was made to secure a uniform Apple Grading Law throughout New England. The movement failed for the time being.

The Maine Apple Grading Law was one of the first, if not the first, to be enacted in this country. Other states followed Maine. Observing weaknesses in the Maine law, many of them secured the passage of laws that are an improvement upon ours. Our law also conflicts with United States laws in a few particulars. On this account, I think amendments should be made. Great gain has come to the orchard industry of Maine through the application of this law. The sum of money provided for enforcing it was at first \$1500., but this was later increased to \$3000. This sum is altogether too small. Apples are shipped from upwards of 150 stations. There is need of inspection during several months. Inspectors are paid the meager sum of \$3.50 for each actual day's work. They are allowed seven cents a mile for the use of their auto. Hotel charges are not less than \$3.00 a day. Three thousand dollars will pay one man for continuous service twelve months, or will pay twelve men one month, or a little better. The time has come when inspections should be made more thorough. This cannot be done unless more money is found to pay the increased number of men, who are necessary.

## EUROPEAN CORN BORER.

I call attention to the quarantine on account of the European Corn Borer, notice of which was issued by the National Secretary of Agriculture on September 25, 1918.

UNITED STATES DEPARTMENT OF AGRICULTURE,  
OFFICE OF THE SECRETARY.

## FEDERAL HORTICULTURAL BOARD.

QUARANTINE ON ACCOUNT OF EUROPEAN CORN BORER.

NOTICE OF QUARANTINE NO. 36.

*(Effective on and after October 1, 1918.)*

The fact has been determined by the Secretary of Agriculture, and notice is hereby given, that an injurious insect, the

European corn borer (*Pyrausta Nubilalis*), new to and not heretofore widely prevalent or distributed within and throughout the United States, exists in the territory comprising the townships of Beverly, Danvers, North Reading, Lynnfield, Peabody, Salem, Marblehead, Swampscott, Lynn, Saugus, Wakefield, Woburn, Stoneham, Melrose, Winchester, Medford, Malden, Everett, Revere, Winthrop, Nahant, Lexington, Arlington, Somerville, Cambridge, Belmont, Waltham, Watertown, Newton, Brookline, and Boston, in the counties of Essex, Middlesex, Suffolk, and Norfolk, in the State of Massachusetts.

Now, therefore, I, David F. Houston, Secretary of Agriculture, under the authority conferred by section eight of the Plant Quarantine Act of August 20, 1912 (37 Stat., 315), as amended by the Act of Congress approved March 4, 1917 (39 Stat., 1134, 1165), do hereby quarantine the territory above named, and by this notice of Quarantine No. 36 do order that no corn fodder or corn stalks, whether used for packing or otherwise, and no green sweet corn, roasting ears, corn on the cob, or corn cobs, shall be moved or allowed to move interstate to points outside the quarantined area.

This quarantine places no restrictions on the movement, interstate, through the quarantined area on a through bill of lading, of any of the articles enumerated originating outside of such area.

This quarantine shall not apply to the movement by the United States Department of Agriculture of the products named for experimental or scientific purposes.

Done in the District of Columbia this 25th day of September, 1918.

Witness my hand and the seal of the United States Department of Agriculture.

(SIGNED) D. J. HOUSTON,  
*Secretary of Agriculture.*

In view of the possible shipment of corn into Maine from the quarantine area, the Crop Pest Commission of Maine, made up of the Governor, Attorney General, Commissioner of Agriculture, Pathologist of the Maine Agricultural Experiment Station and the Entomologist of the Maine Agricultural Experiment Station issued the following European Corn Borer Regulations.

## STATE OF MAINE

County of Kennebec, ss.

September 11, A. D. 1919.

By virtue of the authority vested in us by Chapter thirty-eight, Section thirteen of the Revised Statutes of Maine, we hereby authorize the Commissioner of Agriculture to make the following regulations which we deem necessary to prevent the introduction into this State and the dissemination therein of the European Corn Borer, a pest seriously injurious to corn and other vegetation.

## EUROPEAN CORN BORER REGULATIONS.

1. For the better protection of the State of Maine against the introduction of the European Corn Borer and its spread over the State, it shall be the duty of any person or corporation receiving any corn or other vegetation from any area in the United States outside of the State of Maine which now is or hereafter may be quarantined by the United States Department of Agriculture against the European Corn Borer, to forthwith return the same to its source of origin outside the State or to destroy the same or cause the same to be so returned or destroyed; or if in the judgment of the Commissioner of Agriculture such course is practicable, to cause the same to be disinfected in such manner and under such supervision as said Commissioner may direct.

2. For the more effectual enforcement of these regulations, the Commissioner of Agriculture is hereby authorized to appoint inspectors, whose duty it shall be to carefully watch for the presence of the European Corn Borer in this State, performing such duties in that respect as may be required by the Commissioner of Agriculture, and in particular to notify and warn all persons or corporations receiving corn or other vegetation from quarantined areas to comply with the provisions of Section 1 of these regulations.

3. The expense incurred hereunder shall be paid out of any appropriation made for the Division of Plant Industry.

The Corn Borer has spread into many other towns in Massachusetts and New Hampshire. An infested area was found in Eastern New York and another area in the western section of the

State. It has not been found in Maine.

An extract from an article published by the United States Department of Agriculture shows the present situation with regard to this pest and is given below.

### EXTRACT.

#### *Field Corn Not Damaged.*

The only kinds of corn that have been shown to be damaged to any appreciable extent by corn borer are sweet corn and the dwarf flint varieties. The few fields of common field corn (Dent) grown in the invaded area in Massachusetts, both by farmers and as a part of the Department's experiments, were practically free from infestation. In the large area in western New York, determined this fall to be infested and where it is believed the infestation is of ten years' standing, large stalked corn is commonly grown. It was so scantily infested that discovery of the insect in most fields was impossible only by the most intensive search.

#### *Climatic Control Indicated.*

As a single-brooded insect the corn borer has been a negligible factor, even in the production of sweet corn and the dwarf varieties. It is a single-brooded insect in New York, and, by fair inference, will be single-brooded throughout the northern portions of the corn belt. In New York, where the insect has presumably been present for nine or ten years, a great deal both of sweet corn and flint corn are grown, and no appreciable injury was suffered.

#### *Natural Control Developing.*

An important natural control has also developed in a little parasitic fly (*Trichogramma Minutum*) which destroyed fully forty-three per cent. of the eggs of the second generation in the Massachusetts area of infestation. In places, however, this parasitism reached seventy-five per cent. of the eggs. The activity of this parasite greatly restricted the damage which would otherwise have resulted to the late sweet-corn crop.

*Possibility of Cultural Control.*

There is apparently a possibility of cultural control. The only place where appreciable injury has resulted from the corn borer is the trucking and small garden district immediately around Boston, where the truckers have universally complained of a shortage of labor. There has been very general neglect of weed growth along roadways, on waste land, and even in home and truck gardens. The insect—known to have more than 100 food plants—bred in such grass and weeds. The corn growth throughout this area is in patches of from a fraction of an acre to a few acres and evidently attracted and concentrated the insects from the surrounding weeds. The worst infested fields were usually either poorly tilled and weedy or surrounded by neglected, weedy areas. There were notable examples in the center of this district of well-tilled fields of sweet corn with clean surroundings in which injury was negligible.

The menace to the corn crop of the country, then, is minimized by the slight susceptibility of common corn to borer attack; by the practical certainty that the insect will be single-brooded over much of the northern corn-growing areas, and that where single-brooded it inflicts no injury, even on small types of corn; that good culture in clean surroundings appears to be a valuable control measure, and that notable control by an egg parasite already has developed.

*Origin of Corn Borer.*

As a result of the past season's investigations, the Department believes that the corn borer was brought to this country in 1909-10 with importations of about 10,000 tons of broom corn, chiefly from Hungary. Some of this broom corn was used near Boston and some in the region in New York, where the insect was first found in that State. But the bulk of the broom corn went to St. Louis, Chicago, New Orleans, and other western and southern cities and was widely distributed to broom factories. A wide dissemination of the corn borer throughout the Mississippi Valley, therefore, is entirely possible.



*Where Borer is Known to Occur.*

The European corn borer is now known to occur over the entire coastal region of Massachusetts, including Cape Cod and adjacent islands, and over several towns in southern New Hampshire, approximately 1,800 square miles; in New York, in the Mohawk Valley, between Amsterdam and Albany, about 800 square miles; in western New York, over an area of known infestation is constantly expanding as the survey proceeds; and over a limited area in Erie County, Pa.

In view of this known wide distribution and the possibility that it may exist in numerous other localities, and in view also of the large number of plants on which it feeds the Department of Agriculture realizes that extermination of the corn borer is out of the question; that the problem now is to determine the areas infested, the economic importance of the insect in different regions, the possibilities of practical control, and to cooperate in quarantine and other measures to limit or prevent spread, including the cleaning up where possible of outlying areas. For these purposes, Congress has been asked to make an appropriation of \$500,000.

## SUGAR FOR BEES.

Late in the season many bee men found themselves unable to get sugar to winter their bees. The matter was taken up by this Department, and through the month of November sugar was secured for a considerable number of colonies in this section of the State. When December came the refinery refused us more sugar for bees. I advise bee men to organize for protection, if for nothing more. Had they been organized and their officers applied early, it is likely sugar enough might have been obtained to feed all the bees needing sugar.

## VACANT FARMS AND IDLE LAND.

There has been quite a movement this year towards Maine farms. Records show Maine men have bought many Maine farms,— that very few have gone out of the State to buy farms. On the other hand, men from many other states and even from other countries, have come to Maine and bought farms. While

the movement is not large it is significant.

For a whole century the movement has been westward for agricultural land. Prices in the west have gone up to the point where men begin to see the better policy is to move east, where lands are cheaper and where markets are nearer. There are fewer unoccupied farms than one year ago. There are, however, large areas of land left uncultivated from inability to get labor, to pay its prices, and unwillingness to submit to its demands.

The traveller sees thousands upon thousands of acres of field land, covered with only a light stand of poor grubby grass,—*acres*, that, under proper cultivation, might be made to produce large and profitable crops. Such lands (found in many states) must be used in the not distant future, or people are likely to go hungry. I believe that our Legislature should take conditions under advisement, with the view of devising ways and means for the renewed cultivation of such lands.

#### BULLETINS.

The Department of Agriculture publishes four quarterly bulletins each year. Each bulletin is on the topic that is of greatest interest at the time it is published. They average about 75 pages and are usually well illustrated. Those published in 1919 had for subjects, "Seed and Plant Improvement," "Sheep Raising on Maine Farms," "Papers and Addresses Delivered Before the Various Farm Organizations of the State," "Orchard Operations and Packing of Fruit." These bulletins are distributed throughout the State, going into nearly every town and reaching the families of over ten thousand farmers.

#### CONCLUSION.

We are asking farmers to give more attention to ascertaining the cost of production of their products. We are urging them to eliminate all waste and unbusinesslike methods, to produce a better quality of goods, to grade their goods better, to pack them better, and label them honestly.

We are urging organizations to standardize their products to the end that they may have large quantities of uniform goods for sale. We are urging them to give more attention to the market-

ing of these goods, and also that they buy their supplies in larger quantities and distribute them among themselves, saving something in the cost.

We are also specially urging farmers to improve their livestock and keep more of it, and by this we mean cattle, sheep, swine and poultry. That they produce more feed at home and buy less from other sections. We are also urging them to grow more food for the needs of the Maine people, that less may be imported into the State. We are trying to improve the sanitary condition surrounding the production and handling of milk and dairy products. We are trying to suppress insect pests and fungus diseases, and prevent the introduction of new ones. To bring to a minimum point the diseases among sheep and other animals. We are also trying to create among farmers the feeling that they should pay more attention to, and use better seeds, and with that end in view we have introduced a system of certified seeds. We are urging upon farmers to make more of their own fertilizers and buy less, and we are trying to protect them in commercial fertilizers that they may get what they pay for.

The total value of Maine farm products in 1919 was around \$100,000,000.

Men desiring to engage in farm work will find abundant openings on the farms of those desiring additional farm help. Wages are very good. Such employment will give a young man an opportunity to learn the business and secure some training in it. In the meantime he will be able to lay by some money towards the purchase of a farm later.

There are many good farms for sale in the State, with fine buildings and fields ready to work. Such farms lie in good communities, near schools and churches, and the prices are very reasonable.

With grateful appreciation of the good will and assistance I have secured from all classes of our people,

I submit this Report,

JOHN A. ROBERTS,  
*Commissioner.*

## REPORT OF CHIEF OF BUREAU OF SEED IMPROVEMENT.

*To E. E. Philbrook, Chief, Division of Plant Industry:*

I respectfully submit the following report for the Bureau of Seed Improvement for 1919.

This report will date from April 21, when I took over the work from C. M. White who had charge while I was in the army. Mr. White had a definite program for the spring work, and I tried so far as possible to carry it through without any great change.

The last of the month was spent in Piscataquis county where eleven community meetings were held, cooperating with the county agent and forty-three farmers interested in the growing of certified seed potatoes. Immediately following this some work was done in Somerset and Kennebec counties. I refer particularly to those counties, because the very definite reason that work was attempted in them was the hope that some strains of mosaic-free Green Mountains might be found. In Piscataquis county summer inspection was carried on in towns as far north as Shirley and out of forty-three fields only two were mosaic-free. This shows the extent of the prevalence of mosaic and if the seed from the disease-free fields can be distributed among the local growers it will show what I believe to be true seed improvement work.

The usual number of applications for field inspection was filed in June and in order to avoid extra work in July, a preliminary inspection was made to determine the fields totally unfit for further consideration. In July the regular inspection started with three men in Aroostook county and four in Central Maine. The first inspection eliminated several acres and the end of the work September 16, showed that there had been inspected five hundred twenty-two and one-half acres of potatoes; two

hundred fifty-four acres passed both inspections and were entitled to the blue tag; two hundred forty-six were disqualified and twenty-two and one-half acres are carried on our records as recommended seed. By "recommended" seed we mean seed that did not quite come up to our inspection standards, but is much better than the average stock offered as seed.

Regarding other crops, we inspected fifty-two acres of oats of which forty-seven passed and were entitled to the blue tag, providing the weight and germination requirements were met. This brings the total acreage of fall crops inspected to five hundred seventy-four and one-half, and the per cent. passing all inspections was fifty-three.

The season was very favorable for potato production, the per acre yield being higher than the average by thirty bushels, and the quality very good due to the dry season and early maturing of the crop. With the grains, conditions were different and it is probable that the weight per measured bushel for oats was lower this year than for many years. On high ground the drought caused the grain to ripen early, resulting in many small kernels and also a high percentage of hull to kernel.

While the acreage entered for certification was no greater than in previous years, the number of individuals applying was much greater, this due partly to the fact that meetings were held, and the object being to find, if possible, disease-free strains to use for home grown seed to spread the work as rapidly as possible. The cost of the work was greater than ever before, but was still kept within the appropriation. The scattering fields require much travel and the constant use of a small automobile met the demands very nicely. At the close of the season's work, several days were spent with growers, assisting them in hill-selecting some potatoes for next year's seed plot. In all our work whenever a desirable strain has been located, inquiry of the grower shows nearly always that hill-selection has been practiced in the building up of the strain. This cannot be done and then neglected, but should be kept up each year. It is the recommendation of this bureau that hill-selection and the maintaining of a seed-plot separate from the commercial field is almost essential to the production of high-grade stock. At the annual exhibition of the Maine Seed Improvement Association in Novem-

ber, it was noticed that many of the prize-winning potatoes were from certified fields which means to our mind that at least the certified growers are interested in their work.

My report as Secretary of the Maine Seed Improvement Association may be found in another section of this book.

I have tried by every means to keep in touch with the potato situation, especially as regards Maine's seed trade, and also have followed the pathologists in their study of plant diseases in order that our certification standard might be kept abreast of the times, and I think it safe to say that after six years' trial the blue tag issued by this Department really means something. Now is the time for any individual or co-operative organization who wants it, to apply for state inspection and have their seed go out under our tag. Seed buyers in other states will recognize state inspection quicker than they will individual or organization inspection.

Last June the Commissioner of Agriculture sent me to a conference on Long Island, New York. At this meeting the best Plant Pathologists in the world gathered to discuss potato diseases and needless to say I was a close listener. One of the days, in company with two county agents from Maine, I took opportunity to ask several Long Island farmers what they thought of Maine seed, and the conclusion we came to, was that good Maine seed produced from thirty to fifty bushels more per acre than that from any other state. We also learned that much table stock gets on to the Island as seed stock and this does not do well, and it is those fields which hurt the name of Maine seed. Another thing which put Maine in the background has been the fact that other states have done a little more in potato improvement work and a whole lot more advertising. The question was frequently asked of us what we were doing in the way of inspection and certification work and we were forced to admit that our work had been slight, compared to the size of the industry, which is the second largest agricultural crop in our State.

From my knowledge of conditions I believe there is plenty of good seed in Maine for which the trade would be willing to pay, could we get them in touch with the goods, but at present the point of contact between the grower in Maine and the grower on Long Island is weak. In other words the business is done by dealers most of whom are careful and try to get the best by

coming here early and buying only after field inspection, while many others come here and buy from the bin in the storehouse and do not grade at all, but ship what is really table stock and it goes for seed. The result is the field is a poor advertisement for Maine. There is a big difference between seed stock and table stock and if a way could be devised in which the term "Maine Seed Potatoes" would mean that, and could go out from the State carrying a brand of state inspection, our problem would be partially solved.

Right here it may be well to state that this winter a definite attempt will be made to get some organization already existing to handle the marketing end of our certified seed work. This year as in years past this office acts as a clearing house for the grower and the buyer who wants this class of seed. All indications are that the certified supply will give out very soon. The demand being greatly increased over previous years.

Early in December I was sent by the Maine Seed Improvement Association to the joint meeting of the Wisconsin Potato Growers' with the Potato Association of America. Unfortunately for the officials, there came a cold spell and much of the exhibition stock arrived in poor condition, but in spite of this eighteen county booths displayed fine stock. The largest display of ten bushel samples of seed for sale was a good idea I believe. The show itself was larger than any ever held in Maine, for the implement dealers joined with the other associations and added a lot to the exhibition. My conclusion drawn carefully after seeing everything and talking to many people, is that Maine could put up a potato exhibition just as creditable as that of any state, but we are far too modest in advertising our products to the outside world.

In November the annual exhibition of the allied Maine agricultural societies was held in Bangor and the opinion expressed by many was that it was the best attended of any show for many years. This show takes a good bit of work by this bureau each year, but it pays for itself many times over by the program offered to the farmers and general public.

In closing it is always well to enumerate results if there seem to be any, and this year the most gratifying thing to my mind is the fact that much of the certified seed is being purchased by our own growers and another season will show an in-

crease of acreage which will pass our inspection requirements. Another fact worth mentioning perhaps is the result of experiments carried on in Hampden county, Massachusetts, by County Agent Grant in which results showed Northern grown seed much superior to home-grown stock and Maine certified Green Mountains lead all in point of yield.

In two counties where certified oats were grown there is being made a local distribution in order to increase the per acre yield within the county. This seems to be real seed improvement work.

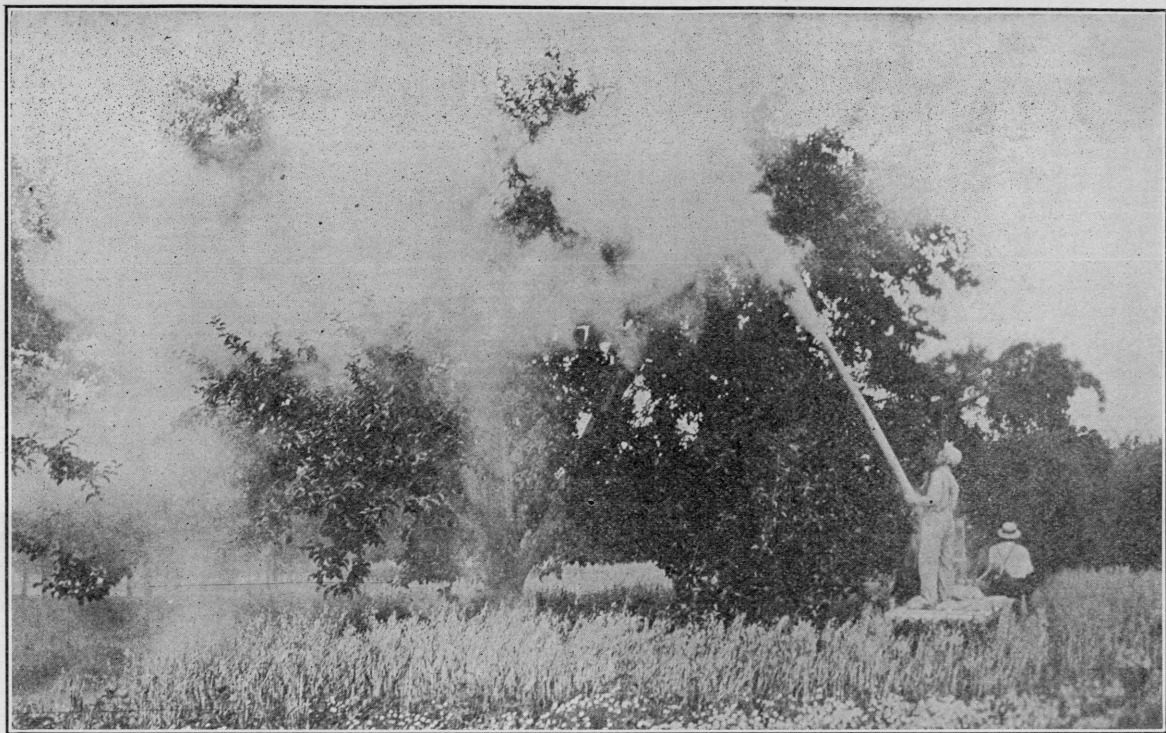
The expanding of the work another season is assured, for I already have nearly all the acreage entered that we can handle, but if we are able to work co-operatively with organizations much more can be taken on.

I wish to thank you for the assistance I have received by being able to use the Gypsy Moth Field men in my work and hope this arrangement will continue another year. I received the best support from all concerned, the members of this Department, the Extension Service, and the farmers themselves and I am grateful to all.

Respectfully submitted,

E. L. NEWDICK,  
*Chief, Bureau Seed Improvement.*





Dusting a Large Baldwin Tree

It is important to cover the top of the tree. The flow of dust must be directed there just before coming abreast of the tree. Thirty to forty acres of trees can be dusted in a day.

(By courtesy of Dr. Reddick)

## REPORT OF THE STATE HORTICULTURIST.

*To Major E. E. Philbrook, Deputy Commissioner, and Director,  
Division of Plant Industry:*

I hereby submit my third annual report as State Horticulturist, it being the eighth report since the Bureau was established. For the six years previous to that, the bureau being that of Entomology.

The apple crop of the state of Maine for the year 1919 has been above both in quality the Federal estimate 601,000 barrels against the sprayed orchards, however, and 415,000 for the fruit as of fair quality. In some orchards, however, and pruning has produced price on account of the received for apples as well as last, assured of a

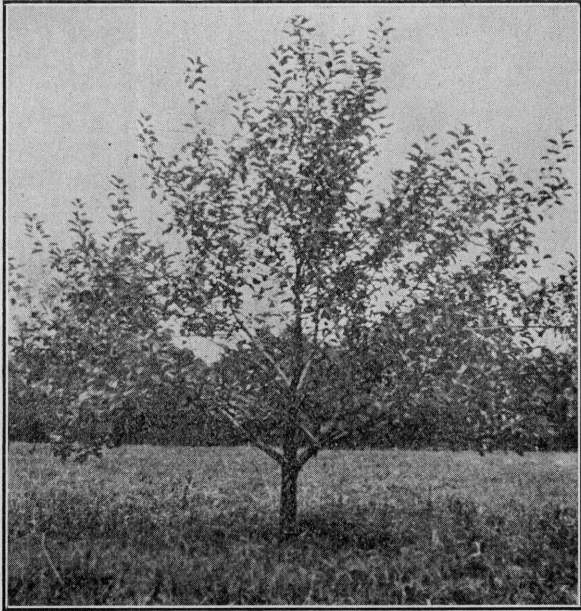
A BILLION DOLLAR  
INDUSTRY.

The horticultural interests of the United States comprise one of the basic industries of the country. The approximate commercial value of the product derived therefrom is fully \$1,000,000,000 annually, according to the estimate of the National Congress of Horticulture, the organization of which was brought about through the persistent efforts of the "American Nurseryman." The welfare of the whole people of the United States depends largely upon the fostering and developing of these interests.

the average, and quantity, estimate being for the commercial 225,000 for 1917, 1916. Well chards have very fine fruit, a whole has been In some orchards, however, and pruning has produced price on account of the received for apples as well as last, assured of a

years to come (as the orchards of Europe have been greatly neglected or destroyed) it is hoped that the orchards will receive better care in the future than in the past.

In regard to pruning, I would refer you to the lecture given by Prof. W. H. Chandler, which appeared in the December number of the Agricultural Bulletin.



Carleton Orchard Tree—Naples.

The measurements of this five-year-old tree were far above the standard for the variety, being as follows: Height, 15 feet; diameter of head, 16x16 feet; and  $4\frac{3}{4}$  inches in diameter one foot above the ground.

## CARLETON ORCHARD CONTEST.

The year 1919 closed the Second Carleton Orchard Contest with a goodly number of contestants.

Walter L. Warren, West Baldwin, won the first prize, which gave him the James J. H. Gregory prize of \$200.00; \$50.00 in cash, and \$50.00 worth of trees from Homer N. Chase & Co., Nurserymen, Auburn; \$10.00 from W. F. Cobb, Nurseryman, Franklin, Massachusetts; twenty-seven apple trees from Chase Brothers Co., Nurserymen, Rochester, New York; also special prize of Empire King Pump, offered by the Field Force Pump Co., Elmira, New York.

Joseph H. Wiley, Naples, won the second prize of 200 Stark Delicious apple trees from Stark Nursery Co., Nurserymen, Louisiana, Missouri; \$50.00 worth of apple trees from Homer N. Chase & Co., Auburn; twenty-seven apple trees from Chase Brothers Co.

Perley D. Batchelder, Naples, won the third prize of \$50.00 worth of apple trees from Harrison Nurseries, Berlin, Maryland; twenty-seven apple trees from Chase Brothers Co.

Walker Brothers, Alna, won fourth prize of twenty-seven apple trees from Chase Brothers Co.

E. W. Dolloff, Standish, won fifth prize of twenty-seven apple trees from Chase Brothers Co.

A. L. Deering, Denmark, won the "Special Prize" of \$50.00 from Homer N. Chase & Co.

The Third Carleton Orchard Contest will start in the spring, 1920. In this contest the first ten or twenty best orchards will receive prizes. It is our wish to have a large number of entries in this contest. Full directions and application blanks will be sent on request.

Five hundred posters have been sent to post-offices to be posted giving the rules and regulations for the third contest.

## SMALL FRUITS.

There is always a market for small fruits and at a good price. Since raspberries and blackberries will not stand long distance transportation, Maine and other New England States cannot be flooded with the southern fruit. I will refer you to the lecture given by Prof. W. H. Wolff, which appeared in the December number of the Agricultural Bulletin.

## EUROPEAN CORN BORER CONVENTION.

Commissioners of Agriculture, State Horticulturists, and Entomologists, to the number of 65, met at Boston August 29, 1919, for the purpose of discussing the European Corn Borer situation. It was reported at this meeting that three states were infested with this pest. Massachusetts having 1400 square miles in the eastern part of the state infested; in the vicinity of Albany, New York, about 40 square miles were infested; 40 square miles in the western part of New York; 40 square miles in Pennsylvania. Three infestations were reported from New Hampshire.

From the State House, Boston, where the forenoon meeting was held, the party went to Arlington, where we were shown through a laboratory in which experiments with the borer were conducted. We inspected fields of corn, and acres of weeds, in several different towns, where we found the pest in its various stages of development; the moth, egg and larva, since the first brood of some overlaps the second of others. Later I again visited several of these places for the purpose of making a further study and securing specimens for educational and exhibition purposes.

## NEW ENGLAND FRUIT SHOW.

The New England Fruit Show was held at the Elks Auditorium, Providence, Rhode Island, November 11-12-13; each of the New England States was represented; this being but the second time since the organization of the Association that this has taken place.

A fine exhibition of fruit, in barrels and fancy displays, was shown. Maine was represented by a fine display, consisting of sixty bushel boxes and twelve barrels showing the commercial pack, also by a fancy display of choice apples in baskets, and mounds of apples.

It is an inspiration to any orchardist to attend such exhibitions, since it clearly demonstrates the kind of fruit which may be grown if proper attention is given to the orchard.

## FRUIT GROWERS' CONVENTION.

The annual convention of the Maine Fruit Growers', was held at Auburn, Maine, February 25-26, 1919, with a total attendance of 384.

Splendid interest was manifested through the five sessions. Orchardists representing several hundred acres of orchards from all points of the state were in attendance.

- The following program was presented:

## PROGRAM

## AUBURN HALL

## FIRST DAY

9:00-10:00 A.M.

Registration

10:00 A.M.

Address of Welcome	President, Auburn Chamber of Commerce
Response	Thomas E. Chase, Buckfield Treasurer Maine Pomological Society
Dust vs Liquid Spray in the Orchard	Wilson H. Conant, Buckfield President Maine Fruit Growers' Exchange
Why We Need the Bee	F. L. Mason, Mechanic Falls

## NOON RECESS

2:00 P.M.

Small Fruits	Prof. W. H. Wolff, Durham, N. H. Assistant Horticulturist, New Hampshire Agricultural Experiment Station
Gipsy Moth ( <i>Illustrated</i> )	Major E. E. Philbrook, Portland Field Agent Gipsy Moth Work
Fancy Packages (Box Packing Demonstration)	James Johnson, Portland

6:30 P.M.

## ODD FELLOWS HALL (Main St.)

Supper

Winter Injury of Orchard Trees	Prof. W. H. Chandler, Ithaca, N. Y. Pomologist, New York State Agricultural College
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Discussion

## AUBURN HALL

## SECOND DAY

9:30 A.M.

Insects and Spraying ( <i>Illustrated</i> )	Prof. Walter C. O'Kane, Durham, N. H. Entomologist, Deputy Commissioner of Agriculture
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Experiences in Orchard Pruning	Prof. W. H. Chandler, Ithaca, N. Y.
Address	Hon. John A. Roberts, Augusta Commissioner of Agriculture
Local Markets	Frank S. Adams, Augusta Chief of Division of Markets
Foreign Markets and Association Work	E. E. Conant, Buckfield Manager Maine Fruit Growers' Exchange
NOON RECESS	
1.30 P.M.	
Cold Storage	John Wiseman, Lewiston
Adjournment	

### QUARANTINES IN MAINE.

The following quarantines are in effect in the State of Maine, prohibiting shipments of corn from infested area in Massachusetts into the state; a total quarantine on shipments of currants and gooseberries in to the state; partial quarantine on fine-leaved white pine. In order to ship pine into the state, permission must be obtained from the Forest Commissioner at Augusta. Also a Federal quarantine prohibiting shipments of Barberry *Canadensis* and *Vulgaris*. This does not deal with the hedging barberry which is the *thunbergii*.

Maine is also in the Gypsy Moth quarantine area.

### THE SADDLED PROMINENT.

During the past two years several bad infestations of the Saddled Prominent have occurred in the forests of this state, and unless something unforeseen happens this winter, 1920 will see the numbers greatly increased, and many acres of woodland defoliated. (Full descriptions on other page of this report.)

While in South Paris the past summer I learned of an infestation of the Saddled Prominent in that place, and upon investigation found the parasite *Calosoma Scrutator*, and *Podisus Modestus*, a predacious insect were present, but not in sufficient numbers to control the pest.

I have thought of using a poison mash to kill these pests in the forest, and may do so the coming summer, as spraying is not practical. A sticky band may be used, however, to protect valuable trees, such as shade and orchard trees, or spraying done in orchards.

APPLE MAGGOT OR RAILROAD WORM (*Rhagoletis pomonella*).

The adult is a fly, smaller than the house fly, with black bands on its wings. It lays its eggs just under the skin of the apple. After hatching, the maggots eat in all directions. The passages made by them turn brown in color. The maggots in the fall enter the ground from the fallen fruit. Therefore, one of the ways to exterminate this worm is to pick up and destroy all the fallen fruit. Spraying with one gallon of molasses and two or three pounds of arsenate of lead to forty gallons of water (or added to regular solution of lime-sulphur and arsenate of lead same number of gallons) has been tried with more or less success, on account of rainy weather.

Extract from an address given by Prof. George E. Sanders of Annapolis Royal, Nova Scotia, at a meeting of the Maine Pomological Society held at Bangor, Maine, November 21, 1919.

*To Eradicate the Railroad Worm*, spray with a poison solution made by adding two and one-half pounds of paste arsenate of lead to thirty gallons of water (or 10-120) for the first spray, and two pounds of paste arsenate of lead to thirty gallons of water (or 8-120) for second spray. If powdered form of arsenate of lead is used, only one-half of the above amount is required.

*When to Spray*. In order to ascertain the exact time to spray, dump a few maggot infested apples in a pile on the ground in the fall. When spring comes, cover with cheese cloth. To make sure of cloth staying in position, it may be tacked to a small box, with top and bottom removed.

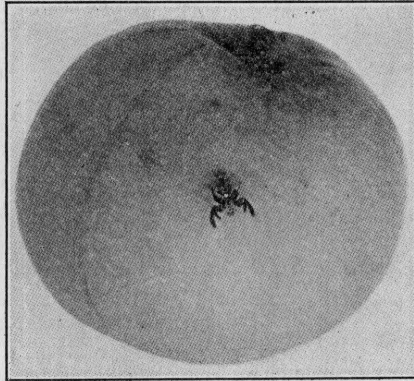
The Maggot enters the ground in the fall and emerges therefrom the following summer. The first emergence may be expected about the ninth of July, others as late as the 21st of July.

When the mature insect, which is a fly, is found under the cloth (see full description of this pest) it is the proper time to use the first spray.

The flies should be killed as fast as seen, if they are found to be still emerging as late as the 21st, use second spray recommended.

This method keeps the foliage and fruit well covered with poison, so that when the flies come in contact with it they are killed.





Railroad Worm  
(Adult)

APPLE APHIS OR TREE LICE (*Aphis pomi*).

The Aphis will first be observed on the young shoots and leaves which are in many cases completely covered with green or pink lice as the case may be. Clustering on the under side of the leaves from which they suck the substance, causing the leaves to curl.

Injury may also be observed on growing buds, on which the lice are clustered, the results being the dwarfing of the young leaves and blossoms, also severe injury to the young fruits if it is a bad infestation.

The eggs of this pest may be observed in the winter time on small twigs as tiny black objects. The first generation are wingless, but the succeeding generations have wings.

The Aphis secretes a honeydew upon which ants feed, therefore the presence of ants in a tree is a good indication of the presence of the Aphis.

*Remedy.* For destroying the eggs of this pest use delayed dormant spray, also Pink Bud spray, with the addition of some nicotine solution, such as "Black Leaf 40", one-third pint to forty gallons of water. If used with lime sulphur do not use soap, but if used alone, add two pounds of hard soap to forty gallons of water.

LEAF SEWER (*Ancylis nubeculana*).

The Sewer is green in color and one-half inch in length. This pest feeds inside the folded leaves. The adult is a brown and white moth.

*Remedy:* Use "Pink Bud" spray and rake leaves and burn them as the caterpillars live over winter in them.

FRUIT-TREE LEAF ROLLER (*Archips argyrospila*).

The full grown worm of this species is about one inch in length, with black head and yellow colored body, over which are scattered a few hairs. The eggs are laid in flat masses on the bark of the trees, and hatch early in the spring.

*Remedy:* Use "Pink Bud" spray.

CIGAR CASE-BEARER (*Coleophora fletcherella*).

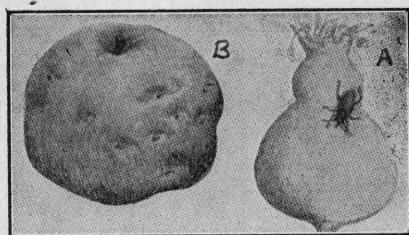
This pest skeletonizes the leaves, and protects its body with a cylindrical case (thus the name Cigar Case bearer).

*Control:* Use "Pink Bud" and "Calyx" sprays.

PISTOL CASE-BEARER (*Coleophora malivorella*).

This Bearer is distinguished from the Cigar Case Bearer by being pistol shaped, and does about the same damage.

*Control:* See Cigar Case Bearer.



Apple Red Bug

THE APPLE-LEAF BUCULATRIX (*Buculatrix pomifoliella*).

This pest skeletonizes the leaf of the apple tree after working when young in mines within the leaf tissue. It is about one-half inch in length and greenish yellow in color, with the segments of the body prominent and rounded.

When numerous, in the fall, they are quite conspicuous as they migrate to limbs and twigs and make small, whitish ribbed cocoons.

*Remedy:* Delayed dormant spray, also "Pink Bud" spray.

#### APPLE RED BUG (*Heterocordylus malinus*).

This bug attacks the young foliage and later the fruit, by making many punctures and sucking the sap, thus causing the leaves to turn red and the fruit to become pitted as when attacked by the curculis.

They are about one-fourth of an inch long and brilliant red in color.

*Remedy:* Add to regular "Dormant Spray" delayed until leaf buds open a very little, also "Pink Bud" spray, some nicotine solution, such as "Black-Leaf-40" one-third pint to thirty-five gallons of water.

#### APPLE-LEAF SKELETONIZER (*Canarsia hammondi*).

This pest may be found in a web in the center of the leaves. It is a small, brown caterpillar, about one-half inch long, when mature, and has four black dots just back of the head, two on the first segment and two on the second. After pupating in the leaves the adults emerge greyish in color, and with wing expansion of one-half inch. Two or three broods appear each season.

*Remedy:* Spray with "Pink Bud" and "Calyx" sprays.

#### SADDLED PROMINENT (*Heterocampa guttivitta*).

This pest is one of the most destructive insects in the forests. The last outbreak took place in 1907-1908, and another is now threatening.

The larva is about one and one-half inches in length with dull reddish markings on the green naked body. The moth is olive green in color with cream white patches and black markings.

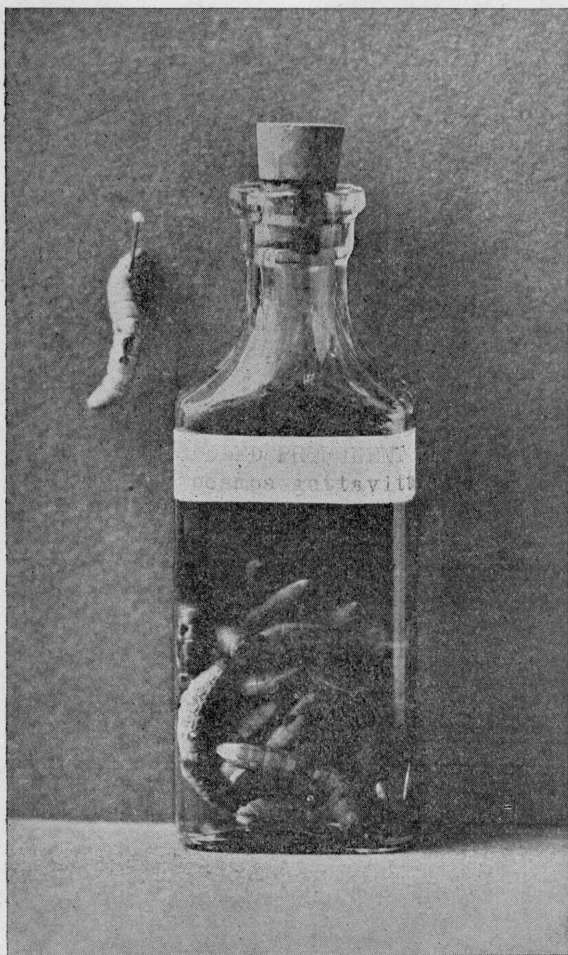
There is but one brood per year in this state. The larvae enters the ground in the fall, and the moths emerge the last of May. The eggs hatch in about nine days, and are layed on the foliage of the trees.

*Remedy:* See description on another page; also "Rosin Sticker" and "Poison Bait."

GREEN FRUIT WORM (*Xylina antennate*).

These are light colored naked caterpillars faintly striped with yellow. The presence of irregular holes eaten into the sides of the apple is an indication that this pest is present.

*Remedy:* Use "Pink Bud" spray to kill the young.



Saddled Prominent  
(Original)

## SPRAY CALENDAR.

Prepared by Frank H. Dudley.



1

**DORMANT SPRAY***When to Spray:*

Any time after leaves drop in the fall until buds burst in the spring. (When it is at least 10 degrees above freezing.)

*What to Spray With:*

Lime-sulphur solution, 1 to 10 and miscible oil such as Scalecide may be used alternate years. (As fungicide.) Arsenate of Lead 2 to 3 lbs., to 35 gallons of water.

*What to Spray For:*

Oyster Shell Scale.  
 San Jose Scale.  
 Blister Mite.) If prevalent, spray  
 Scab            } after buds burst.  
 Aphis or tree lice, if a miscible  
 oil is used  
 Red Bug  
 Blister Mite use delayed dormant  
 spray.

†These pests caused the brown appearance of many orchards 1919.

(Cuts used by courtesy of the Department of Agriculture, Dominion of Canada.)



2

**BUD SPRAY***When to Spray:*

When buds commence to open and grow pink is just the right time.

*What to Spray With:*

Arsenate of lead, 2 to 3 lbs., and lime-sulphur solution, 1 to 35 gallons. (For Aphis, 1-3 pint of "Black Leaf 40.")

*What to Spray For:*

Apple Scab.  
 Black Spot.  
 Canker-worms.  
 Bud-moths.†  
 Aphis or tree lice.  
 Leaf Roller.†  
 Leaf Sewer.†  
 Buculatrix.†  
 Green Fruit Worm.†



3

**CALYX SPRAY***When to Spray:*

Just after the blossoms have fallen. Never when in bloom, as it would kill the farmer's friend, the bee.

*What to Spray With:*

Arsenate of lead, 2 to 3 lbs., and lime-sulphur solution, 1 to 40 gallons. (For Aphis, 5-12 pint of "Black Leaf 40.")

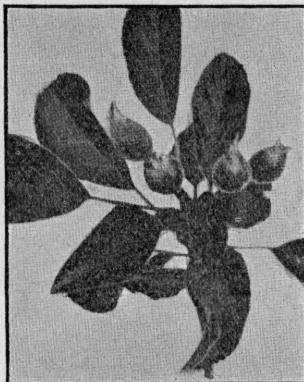
*What to Spray For:*

Codling-moth.  
Apple Scab.  
Black Spot.  
Aphis.

(Get Baume specific gravity or dilution of lime-sulphur solution from your dealer.)

*Do not spray in wet weather* as it may cause burning of foliage and fruit.

(The above directions are for Arsenate of lead in paste form. If powder is used only one-half amount is required.)



4

**FRUIT AND FOLIAGE SPRAY***When to Spray:*

Should be applied three or four weeks later than the Calyx Spray, especially if it has been wet the first part of June.

*What to Spray With:*

Arsenate of lead, 2 to 3 lbs., lime-sulphur solution 1 to 40 gallons.

*What to Spray For:*

Apple Scab.  
Late brood of Codling-moth.

THE TARNISHED PLANT-BUG (*Lygus pratensis*).

This is a small brownish sucking bug, about one-fifth of an inch long, and obscurely marked with dull yellow and brown. The young as well as the adult suck the juices of the leaves and tender stems, causing them to wither and die. The fruit also shows marked dimples, due to egg laying punctures.

*Remedy:* Clean up all rubbish and destroy it.

Spray the young with some nicotine solution such as "Black-Leaf-40", five-twelfths pint to forty gallons of water.

THE ROSE-CHAFFER (*Macroductylus subspinosus*).

Fruit and foliage of apple and plum trees as well as shrubs, roses and grape-vines are eaten by the Rose-Chaffer. Sometimes they are so numerous as to become a great pest. They are about one-third of an inch long, slender and greenish, or dull yellow in color, with long sprawling legs. The larvae of this beetle is a small whitish grub which lives in the ground.

*Remedy:* Add to regular "Pink Bud" and "Calyx Sprays" one gallon of molasses to forty gallons of water, or steep out one pound of whale or fish oil soap, and one-half pound of plug tobacco to five gallons of water and use as spray.

SOOTY BLOTCH (*Phyllachora pomigena*).

The irregular sooty blotches found on many varieties of apples, noticeably the Rhode Island Greening, growing on unsprayed trees, are called Sooty Blotch. The fungus attacks the fruit late in the season, especially is this true of cold wet seasons, or if the trees are unpruned and foliage dense.

*Remedy:* Use fourth spray and then if necessary the same spray three weeks later. (*See spray calendar.*) Trim branches to let the sunshine in onto foliage and fruit, thereby drying out the center of the tree.

PEAR SLUG (*Eriocampa Cerasi*).

The slimy, dark green or nearly black pear slugs are present on pear trees to a greater or less extent every year. At times they become numerous enough to occasion alarm, and they are

capable of doing a great deal of damage. They skeletonize the leaves, causing them to turn brown, and when the infestation is serious the damage is noticeable some distance away, the trees appearing as though swept by fire. The slugs also occasionally feed on the surface of the fruit, causing deformities and blemishes.

The pear slug is the larva of a small black sawfly which appears in the spring and deposits its eggs in the leaves, where they are easily seen as small, round, somewhat translucent, blisterlike spots. When the slugs are full grown, which is usually early in July, they form cocoons about an inch below the surface of the soil, from which the sawflies later emerge. Two broods occur, the second appearing in August and September, and the slugs of this brood spend the winter in their cocoons, producing adults the following spring.

*Treatment.* The pear slug is easily controlled, being very susceptible to applications of contact insecticides, such as kerosene emulsion or tobacco extract, and also to arsenicals. In commercial orchards, the simplest and most economical method of control is a thorough spraying with arsenate of lead, one pound of powder or two pounds of paste to fifty gallons of water, to which the slugs succumb very readily. A dust containing arsenate of lead is also very effective. If an arsenical has been applied in May with the fourth scab spray for other insects, the slugs as a rule will be kept in check, but if it is seen that they are going to be numerous, poison should be included with the fifth scab spray or put on as a special application. With the first brood under control, the second brood usually will give no trouble.

#### ELM LEAF BEETLE (*Galeruca Xanthomeloena*).

This pest came to us from Europe. The adult is a beetle greenish yellow in color when fresh, having two black stripes on the wing covers.

This beetle hibernates in winter under the rough bark of the trees and in leaves and rubbish, ready to attack the new leaves as soon as they are well developed, eating irregular places which have the appearance of being shot full of holes.



The larvae which are yellow with black spots and covered with bristly little tufts of hair, are hatched from yellow bottle shaped eggs laid in double rows on the under sides of the leaves. The larvae soon commence eating and skeletonize the leaf. In the north there is but one brood a year. When the larvae are fully grown they descend to the ground, and under the protection of grass or litter, they change to bright yellow pupae.

*Remedy:* Spray with arsenate of lead one pound to fifteen gallons of water the first of June, the second time the first of July. If found to be still eating use third spray about July 15th. Also scrape rough bark from trunk of tree.

#### BENEFICIAL INSECTS.

Contrary to general opinion not all insects are destructive; quite a variety of insects called parasites are very beneficial to the orchardists and farmer, since they feed upon and destroy many insect pests. To bring to your attention some of these desirable little workers is the object of this article.

*Two Spotted Ladybug.* One of the most common is the two spotted Ladybug (*Adalia bipunctate*) this little insect is reddish in color, having two black spots on the back, one on either wing cover, and is often found in houses during the Autumn where it hibernates. This little beetle feeds on aphid and scale insects. There are several varieties of this family, bearing similar markings, and different species of this beetle have been imported from Australia and other countries for the purposes of controlling scale insects.

*The Calosoma Beetle.* The Calosoma Beetle preys upon caterpillars such as Gypsy Moth and Saddled Prominent. The native is about one and one-half inch in length and dark in color while the imported specimens are iridescent.

*The Podisus Modestus.* The Podisus Modestus is a predacious insect preying upon caterpillars, potato bugs, etc. This bug is about five-eighths of an inch in length, with a spine-like process projecting from the posterior prothorax which is capable of being folded under the body. The body is yellowish red, edged

with dark spots, the central portion of the body is marked with one dot and two short lines running crosswise of the body.

*The Lebia Grandis.* An interesting species of ground-beetle from one-fourth to one-half inch in length, with bright blue wing covers and yellowish thorax and head, has won an important reputation, because of its success in destroying the soft bodied insects which go into the ground to pupate, namely curculio, cutworms, etc.

*Ichneumon Flies.* The Ichneumon flies are long, and slim bodied, the tail being attached to the body by a small thread. These flies do considerable work in control of the Red Humped Caterpillar.

*The Thalessa Lunata.* The Thalessa Lunata is a wonderful parasite with body two and one-half inches long and with a flexible ovipositor six inches long, with which it drills into the tree and lays an egg in the tunnel of the borer; the larva when hatched crawls along the tunnel and fastens itself to the larvae of the borer which it destroys by sucking out the life blood. The larvae changes to pupa within the burrow and the adult gnaws a hole through which to escape.

*Pimpla Conquisitor.* This is one of the most common parasites of the tent caterpillar but has been bred from several other species. It lays its eggs on the pupae.

*Pimpla Inquisitor.* This is a parasite on the Tussock Caterpillars.

*The Tachina-Fly.* This parasite is a representative of the housefly which it somewhat resembles. It attaches its eggs to the skin of young caterpillars, the larva, when hatched burrows into the body of the caterpillar and feeds on its tissues. The caterpillars usually pupate, but the fly emerges instead of the mature insect of the pest.

Wishing to ascertain if the parasites were working on the Cherry Ugly, I secured a few nests and placed them in confinement. Nests from some locations produced as many parasites (Ichneumon and Tachina Flies) as the Cherry Ugly moths.

Sometimes it happens that a parasite of one host is parasitized by a parasite of another host.

## POISON BAIT FOR GRASSHOPPERS AND CUT WORMS.

## (Part 1)

Paris green (or white arsenic) .....pounds 2½, or ounces 4  
 Bran ..... pounds 50, or pounds 5

## (Part 2)

Lemons (pulp and rind finely chopped) .....6, or lemon 1  
 Sirup .....gallon 1, or pint ¾  
 Water .....gallons 5, or quarts 2

Mix thoroughly the ingredients of part 1; next mix together the materials of part 2, first adding to the water the lemon juice and the pulp and rind finely chopped, and finally the sirup. When ready to use, mix thoroughly the ingredients of parts 1 and 2 and add sufficient water to make a wet mash. The mash should be thoroughly scattered broadcast early in the morning, preferably when the soil is damp, at the rate of 3 to 5 pounds per acre. In arid regions the mash should be scattered along damp irrigation laterals, since it hardens and when dry is not eaten by the insects.

Another insect bait is:

Paris green .....pound 1  
 Common salt ..... pounds 2  
 Fresh horse dung .....pounds 60

This mixture is for use against grasshoppers, cutworms, and army worms, and is cheaper than the bran mash above indicated, but is not so effective.

## STICKY BAND FOR TREES.

This may be made according to the following formula:

Rosin .....pounds 5  
 Castor oil .....pints 3

*Place the rosin and castor oil in a pot and heat slowly until the rosin is melted. Add more oil if too thick.*

These sticky bands are sometimes injurious to the trees, but injury may be avoided by spreading the adhesive on a strip of heavy paper encircling the tree trunk. A form of band that

has given satisfactory results is made from cheap cotton batting, and single-ply tarred building paper. The cotton should be cut into strips about two inches wide and wrapped around the tree trunk so as to fill all the crevices of the bark. Over the cotton is placed a strip of tarred paper about five inches wide, drawn tightly and securely tacked where it overlaps. The sticky material is then spread on top of the paper.

The sticky substance must be renewed from time to time, since when it dries out or becomes covered with dust or insects it fails as a barrier to crawling insects. If a combing instrument is occasionally drawn over the band it will serve to lengthen the usefulness of the band by bringing some of the sticky portion to the surface.

Sticky fly paper is used sometimes in place of the sticky bands. This may be attached to the trunk by means of heavy twine tied tightly around the upper and lower edges, and properly should be put over a strip of cotton as described above.

#### SPECIMENS.

Some of the specimens sent in to the office for identification are:

Cherry tree Ugly  
 Army Worm  
 Green Apple Aphis  
 Terrapin Scale  
 Grape Plume Moth  
 Podisus Modestus  
 Pear tree Slug  
 Raphidia  
 Common Corn Stalk Borer (many)  
 Pyralids (that work on corn)

Many apples were sent in to be identified.

#### JUDGING FRUIT AT FAIRS.

During the fall I was called upon to judge fruit at the following fairs:

Central Maine Fair, Waterville  
 Maine State Fair, Lewiston

Somerset Central Fair, Skowhegan  
 Sagadahoc County Fair, Topsham  
 Buckfield Grange Fair, Buckfield

as well as several other fairs which I was unable to attend.

#### LECTURES AND DEMONSTRATIONS.

During the past year I have lectured at Grange meetings, meetings of orchardists, and various public meetings to the number of twenty-three; I have also addressed one meeting outside the state.

I have held twenty-four orchard pruning demonstrations during the year; also two dusting demonstrations.

#### DUSTERS.

There are at the present time, five dusters in this state, owned by W. H. Conant, Buckfield; E. E. Page, East Corinth; F. E. Ricker, Turner; L. W. Staples, Bowdoinham; and Frank Pierce, Hebron.

The Department has a duster to be used for orchard demonstration work, to commence with the "Pink Bud" spray next spring. I believe that dusting has come to stay; the cost, all things considered, is not greatly increased over that of the liquid spray. But it is not how much it costs, but how well we can do the work, and get the work done on time, that counts. We can also attend to more of the work ourselves, as 1,000 to 2,000 trees can be dusted in one day. This duster was on exhibition at the Pomological Society Show at Bangor, November 17-22.

#### GRADERS.

Graders or sizing machines, are a great aid in the proper packing of fruit. The following orchardists now own graders, most of them up to date machines.

J. Merrill Lord, Kezar Falls  
 F. H. Rollins, Farmington Falls  
 Neal D. Stanley, Pittsfield  
 M. C. Cayford, Skowhegan  
 Merrymeeting Fruit Growers' Association, Bowdoinham  
 Mr. Shapiro, Gardiner  
 Highmoor Farm, Monmouth.

THE SELECTION OF PRIZE WINNING FRUIT.

Careful study of the score card will enable orchadists who contemplate competing for prizes to make a more careful selection of fruit. Many exhibitors have failed to win because the fruit shown was not uniform in size or color.

In box packing each point should be carefully studied.

The specimens should be of uniform color and size for the variety shown, also free from blemishes such as bruises, worm hole, scab or Sooty Blotch.

NEW ENGLAND FRUIT SHOW.

Score Card for Barrels and Boxes of a Given Variety.

FRUIT

<i>Box</i>		<i>Barrel</i>	
Texture and flavor .....	100	Texture and flavor .....	100
Size .....	100	Size .....	100
Color .....	150	Color .....	150
Uniformity .....	150	Uniformity .....	150
Freedom from blemishes .	150	Freedom from blemishes .	150
	———— 650		———— 650

PACKAGE

<i>Box</i>		<i>Barrel</i>	
Material .....	30	Staves .....	10
Marking .....	10	Hoops .....	10
Solidity .....	10	Heads .....	10
(nailing, cleats, etc.)		Nailing .....	20
	———— 50	Marking .....	20
			———— 70

PACKING

<i>Box</i>		<i>Barrel</i>	
Bulge or swell .....	100	Facing .....	70
Alignment .....	20	Tailing .....	60
Height of ends .....	60	Pressing .....	70
Compactness .....	80	Racking .....	80
Attractiveness and style .	40		———— 280
	———— 300		

1000

1000

Plate Score Cards for Apples and Pears

Form .....	10	Quality .....	15
Size .....	10	Freedom from blemishes .....	25
Color .....	20		————
Uniformity .....	20	Total .....	100

BARRELS OF APPLES SHIPPED FROM SEPTEMBER 1, 1918, TO  
AUGUST 1, 1919.

	<i>Barrels</i>	<i>Boxes</i>
Maine Central R. R. ....	79,563	
Grand Trunk, R. R. ....	27,163	
Eastern Steamship Co. ....	166	6
Sandy River & Rangeley Lakes R. R. ....	1,794	
Georges Valley Railroad ....	2,382	
Bridgton & Saco River R. R. ....	1,616	
Wiscasset, Waterville & Farmington Ry. ....	3,934	386
Boston & Maine R. R. ....	12,744	185
Bangor Railway & Electric Co. ....	276	
Bangor & Aroostook R. R. ....	2,691	7
	<hr/>	
	132,329	584

BARRELS OF APPLES ACTUALLY SHIPPED FROM TEN LARGEST  
SHIPPING POINTS FROM SEPTEMBER 1, 1918, TO  
AUGUST 1, 1919.

	<i>Barrels.</i>
Auburn .....	5,336
Monmouth .....	3,745
Buckfield .....	2,153
Greene .....	2,082
Winthrop .....	2,007
Norway .....	7,770
Skowhegan .....	2,735
West Paris .....	4,437
South Paris .....	8,837
North Jay .....	1,435
Oxford .....	3,510
	<hr/>
	44,047

FOREIGN SHIPMENTS.

Only a small number of foreign shipments of shrubs and trees have been received the past season for inspection. A new Federal law makes it imperative that all bulbs imported be inspected.

The following parties have received foreign shipments of shrubs and trees the past season:

Mrs. J. I. Kane .....	Bar Harbor .....	24	Boxwoods.
Mount Desert Nurseries ...	Bar Harbor .....	24	Ornamental Shrubs.
		14	Bay trees.
James Crawford .....	Bar Harbor .....	15	Roses.
Alexander Wallace .....	Portland .....	25	Boxwood trees.

The following parties have received foreign shipments of bulbs and trees the past season:

S. S. Kresge Co. ....	Lewiston .....	1250	Narcissus
		4	Bales Narcissus
		1250	Narcissus
		1500	Tulips
		500	Crocus
		500	Narcissus
		2000	Hyacinths
S. S. Kresge Co. ....	Portland .....	1700	Tulips
		500	Crocus
		500	Narcissus
		1300	Hyacinths
Ernest Saunders .....	Lewiston .....	5000	Tulips
		4400	Narcissus
		1800	Narcissus
		2500	Narcissus
		2500	Tulips
		1000	Hyacinths
		2000	Tulips
		2250	Hyacinths
		5400	Narcissus
		6000	Tulips
		3000	Hyacinths
		6000	Tulips
		3000	Narcissus
		4075	Hyacinths
		2850	Narcissus
		1500	Tulips
		1000	Hyacinths
		2500	Narcissus
		200	Lilium Harisii
William Butler .....	Brunswick .....	500	Hyacinths
		1500	Tulips
		1250	Narcissus
		600	Narcissus
		500	Narcissus
		1250	Narcissus



P. M. Olm .....	Bath .....	1500 Narcissus		
		2500 Narcissus		
		1000 Tulips		
		500 Hyacinths		
		2000 Narcissus		
Burr's Greenhouses .....	Freeport .....	500 Tulips		
		4900 Narcissus		
		6250 Narcissus		
		600 Hyacinths		
		2200 Narcissus		
		2000 Tulips		
		2500 Narcissus		
		600 Flowering Jap. Bulbs		
J. W. Minott .....	Portland .....	1 case Narcissus		
		1 case Narcissus		
		1 case Narcissus		
		2350 Narcissus		
		600 Flowering Jap. Bulbs		
		500 Lily bulbs		
		1250 Tulips		
		3750 Narcissus		
		2000 Hyacinths		
		2000 Narcissus		
		1250 Narcissus		
		Allen, Sterling & Lothrop .	Portland .....	2 cases Lily bulbs
				6250 Narcissus
2800 Crocus				
33200 Tulips				
6800 Narcissus				
2925 Hyacinths				
Kendall & Whitney .....	Portland .....	2 bales Narcissus		
		1 case Lily bulbs		
		3500 Narcissus		
		5500 Tulips		
		2100 Crocus		
		10400 Tulips		
		1650 Narcissus		
		1550 Hyacinths		
		1 case Lily bulbs		
		2 bales Narcissus		
		1 case Narcissus		
		3950 Tulips		
1100 Narcissus				
1075 Hyacinths				
2000 Crocus				

Porteous, Mitchell & Braun.	Portland	2500	Narcissus
		2500	Hyacinths
		1000	Tulips
		3000	Narcissus
Charles E. Clark	Portland	2450	Narcissus
		2250	Hyacinths
		500	Tulips
		1000	Narcissus
		2000	Narcissus
Dyer, Small Co.	South Portland	4000	Narcissus
Alex Wallace	Portland	2250	Tulips
		1500	Narcissus
		900	Hyacinths
		500	Crocus
		25	Box Trees
E. B. Davis	Rumford	2500	Tulips
		2000	Narcissus
		2000	Hyacinths
		1250	Narcissus
R. Dunning & Co.	Bangor	8600	Tulips
		2000	Narcissus
		850	Hyacinths
		1600	Crocus
Willis E. Hamilton	Belfast	3750	Narcissus
H. L. Chadwick	Houlton	300	Hyacinths
		1500	Tulips
		500	Narcissus
F. W. Woolworth Co.	Bath	1300	Narcissus
	Sanford	1300	Narcissus
	Portland	2600	Narcissus
	Augusta	1300	Narcissus
	Gardiner	2600	Narcissus
	Bangor	1300	Narcissus
	Lewiston	1300	Narcissus
	Calais	1300	Narcissus
	Rumford	1300	Narcissus
Strout's	Biddeford	1700	Tulips
		4400	Narcissus
		1750	Hyacinths
		500	Crocus
Frank A. Robbins	Augusta	3750	Tulips
		1500	Narcissus
		1300	Hyacinths
Miss Alice M. Richards	Gardiner	15	Hyacinths
		5	Tulips
		200	Narcissus

Mrs. M. K. Simkhovitch . . . Perry . . . . .	200 Tulips
	200 Narcissus
	10 Lilium Harisii
Miss M. E. Clark . . . . . Ellsworth . . . . .	3750 Tulips
	1750 Narcissus
	2000 Hyacinths
	250 Crocus
	1000 Narcissus
	150 Hyacinths
F. G. Danforth . . . . . Skowhegan . . . . .	2500 Tulips
	6000 Narcissus
	3500 Hyacinths
Huff, Florist . . . . . Sanford . . . . .	300 Narcissus
	1600 Narcissus
	1000 Hyacinths
Walter Lorock . . . . . Brunswick . . . . .	1500 Tulips
	1600 Narcissus
	1000 Hyacinths
Beatrix Farrand . . . . . Bar Harbor . . . . .	25 Hyacinths
	200 Narcissus
	325 Tulips
J. O. Elwell . . . . . Kennebunk . . . . .	2000 Narcissus
A. J. Loder . . . . . Bangor . . . . .	2250 Narcissus
George F. Terry . . . . . Waterville . . . . .	11250 Narcissus
Mitchell Flower Store . . . . . Waterville . . . . .	3 cases Lily bulbs
Barrows Greenhouses . . . . . Gorham . . . . .	1 case Lily bulbs
Ralph Whittier . . . . . Bangor . . . . .	250 Tulips
	250 Narcissus
	150 Crocus
Mrs. E. W. Wilde . . . . . Bangor . . . . .	400 Tulips

NURSERY COMPANIES THAT HAVE DELIVERED ORDERS IN THE STATE  
OF MAINE DURING THE YEAR OF 1919.

Name.	Address.	No. of Shipments	
		Spring	Fall
Adams, J. W. . . . .	Springfield, Mass. . . . .	1	
Aiken, G. D. . . . .	Putney, Vt. . . . .	1	
Allen, W. F. . . . .	Salisbury, Md. . . . .	5	1
American Forestry Co. . . . .	Framingham, Mass. . . . .	3	
Baldwin, O. A. D. . . . .	Bridgman, Mich. . . . .	3	
Barnes Bros. Nursery Co. . . . .	Yalesville, Conn. . . . .	2	
Bay State Nursery Co. . . . .	Northabington, Mass. . . . .	15	3
Bedford Nurseries . . . . .	Bedford, Mass. . . . .	2	
Bertrand H. Farr . . . . .	Wyomissing, Pa. . . . .	3	
Bloodgood Nurseries . . . . .	Flushing, N. Y. . . . .	1	
Bobbink & Atkins . . . . .	Rutherford, N. J. . . . .	2	

Breck-Robinson Nursery Co. ....	Lexington, Mass. ....	22	4
Breck, Joseph & Sons .....	Boston, Mass. ....	15	1
Brown Bros. Co. ....	Rochester, N. Y. ....	11	
Brown Nursery Co., F. W. ....	Rose Hill, N. Y. ....	4	
Bryant & Ordway Co. ....	Boston, Mass. ....	3	
Burr, C. R. & Co. ....	Manchester, Conn. ....	1	
Central New York Nurseries ....	Geneva, N. Y. ....	3	
Charlton, John & Sons .....	Rochester, N. Y. ....	4	
Chase Brothers Co. ....	Rochester, N. Y. ....	53	3
Chase Nurseries .....	Geneva, N. Y. ....	3	
Chase, Homer N. ....	Geneva, N. Y. ....	9	
Cobb, W. F. ....	Franklin, Mass. ....	24	2
Conrad-Jones Co. ....	West Grove, Pa. ....	1	
Dingee & Conrad Co. ....	West Grove, Pa. ....	3	
Dows Nurseries .....	Epping, N. H. ....	2	
Dreer, Henry A. ....	Philadelphia, Pa. ....	7	1
Elizabeth Nursery Co. ....	Elizabeth, N. Y. ....	1	
Elliott, Nursery Co. ....	Pittsburg, Pa. ....	2	
Emmons & Co. ....	Newark, N. Y. ....	1	
Empire State Nursery Co. ....	Waterloo, N. Y. ....	9	
Fairview Nurseries .....	Rochester, N. Y. ....	3	
Farquhar, R. & J. ....	Boston, Mass. ....	44	2
First National Nurseries .....	Rochester, N. Y. ....	74	6
Fish, Charles R. ....	Worcester, Mass. ....	4	
Fottler, Fiske & Rawson Co. ....	Boston, Mass. ....	9	
Framingham Nurseries .....	Framingham, Mass. ....	3	
Fruit Growers' Nurseries Co. ....	Danville, N. Y. ....	1	
Galloway Bros. & Co. ....	Waterloo, Iowa ....	2	
Gardner Nurseries .....	Osage, Iowa, ....	1	
Glenwood Nurseries .....	Rochester, N. Y. ....	1	
Glenn Bros. ....	Rochester, N. Y. ....	9	
Green's Nursery Co. ....	Rochester, N. Y. ....	142	4
Grover, F. E. & Co. ....	Brighton, N. Y. ....	2	
Guaranty Nursery Co. ....	Rochester, N. Y. ....	8	
Gurney, H. H. ....	Geneva, N. Y. ....	16	1
Hall Co., L. W. ....	Rochester, N. Y. ....	4	
Harman Nursery Co. M. H. ....	Geneva, N. Y. ....	36	2
Harrigan & Doe Co. ....	Boston, Mass. ....	1	
Harrison Nursery Co. ....	Berlin, Md. ....	3	
Heath & Co. ....	Manchester, Conn. ....	2	
Hicks, Isaac & Son .....	Westbury, L. I., N. Y. ....	2	
Home Nurseries Co., The .....	Dansville, N. Y. ....	3	
Hooker Bros. ....	Rochester, N. Y. ....	1	
Horsford, F. H. ....	Charlotte, Vt. ....	2	
Houston's Nurseries .....	Mansfield, Conn. ....	1	
Hoyt's Sons Co., Stephen .....	New Canaan, Conn. ....	2	
Hussey, J. C. ....	Oakland, Maine ....	2	

Jackson & Perkins Co. ....	Newark, N. Y. ....	4	
Keene Nurseries .....	Keene, N. H. ....	2	
Kellogg, R. M. ....	Three Rivers, Mich. ...	4	
Kelly Bros. ....	Dansville, N. Y. ....	38	3
Kelsey, Harlan P. ....	Boxford, Mass. ....	3	
Knight & Bostwick .....	Newark, N. Y. ....	1	
Little Tree Farms .....	Framingham, Mass. ...	3	
Maloney Bros. & Wells Co. ....	Dansville, N. Y. ....	17	1
Maule, William Henry .....	Philadelphia, Pa. ....	1	
Mitchell Seed Home, .....	Philadelphia, Pa. ....	1	
Neosho Nurseries .....	Neosho, Mo. ....	1	
New England Nurseries .....	Bedford, Mass. ....	39	3
Oakland Nurseries .....	Manchester, Conn. ....	1	
Perry Nursery Co. ....	Rochester, N. Y. ....	10	
Peterson, George H. ....	Fairlawn, N. J. ....	5	
Pierson A. N. ....	Cromwell, Conn. ....	4	
Pomona Ten Cent Nurseries .....	Dansville, N. Y. ....	9	1
Pratt, C. S. ....	Athol, Mass. ....	2	
Reilly, John .....	Dansville, N. Y. ....	2	
Reilly Nurseries, Wm. J. ....	Dansville, N. Y. ....	1	
Rice Bros. Co. ....	New York, N. Y. ....	1	
Rice, T. W. ....	Geneva, N. Y. ....	2	
Rupert, W. P. & Sons .....	Seneca, N. Y. ....	4	
Schmidt & Batty Co. ....	Springfield, Ohio, ....	1	
Sherwins Wholesale Nurseries .....	Dansville, N. Y. ....	1	
Sherwood, Elmer .....	Odessa, N. Y. ....	1	
Smith Co., W. & T. ....	Geneva, N. Y. ....	10	3
Stark Bros. ....	Louisiana, Mo. ....	23	5
Storrs, Harrison Co. ....	Painesville, Ohio, ....	2	
Stuart, C. W. & Co. ....	Newark, N. Y. ....	11	1
Sweet Nursery Co., G. A. ....	Dansville, N. Y. ....	1	
Thurlow's Sons, T. C. ....	West Newbury, Mass. .	8	
Vaughan's .....	Western Springs, Ill. .	1	
Vick's Sons, James .....	Rochester, N. Y. ....	9	2
Walch, M. H. ....	Woods Hole, Mass. ...	3	
Wells Wholesale Nurseries .....	Dansville, N. Y. ....	6	1
Western New York Nurseries .....	Rochester, N. Y. ....	1	
West Side Nurseries .....	Worcester, Mass. ....	11	1
Wood, Allen L. ....	Rochester, N. Y. ....	18	2
Wyman Nurseries .....	Rochester, N. Y. ....	1	

THE RETURNED REPORT BLANKS SHOW SOME OF THE STOCK THAT  
HAS BEEN SHIPPED INTO THE STATE THE PAST SEASON.

(Not a full report.)

Apple Trees .....	1719
Pear Trees .....	384
Plum Trees .....	320
Cherry Trees .....	326
Peach Trees .....	89
Quince Trees .....	8
Raspberry Plants .....	1808
Blackberry Plants .....	842
Strawberry Plants .....	10017
Currant Bushes .....	268
Gooseberry Bushes .....	247
Shrubs .....	2793
Ornamentals .....	2431
Shade Trees .....	344
Asparagus Plants .....	2520
Grape Vines .....	92
Rhubarb Plants .....	76
White Pine .....	550
Apricot Plants .....	25

NURSERIES THAT HAVE HAD STATE INSPECTION FOR THE YEAR 1919

NAME.	LOCATION	ACREAGE	
Adams, Charles E.	Bangor	2 acres	5,000 Evergreens
Allen, Mrs. Thomas	Bangor	1/20 acre	500 Perennials 100 Shrubs 15 Evergreens
Austin, Peter	Auburn	1 acre	Strawberries 65,000 Raspberries
Bearee, S. H.	Auburn	1/2 acre	39,000 Raspberries Strawberries
Call & Preble	Gardiner	1 1/4 acres	Raspberries Strawberries
Chaput, J. P.	Auburn	6/10 acre	78,000 Raspberries
Chase, Homer N. & Co.	Buckfield	3 acres	6,000 Apple 50 Pear 1,000 Raspberries
Churchill, E. P.	Mechanic Falls	1/10 acre	Strawberries
Coleman, George E.	Readfield Depot	3/8 acre	Strawberries
Conant, W. H.	Buckfield	1/2 acre	Raspberries
Eastman, A. A.	Dexter	1/10 acre	1,000 Raspberries
Estes, Charles S.	New Gloucester	1/8 acre	Strawberries
Eveleth, Robert H.	New Gloucester	1/2 acre	Raspberries Strawberries
Fernald, W. Linwood	Eliot	4 acres	200,000 Perennials 5,000 Shrubs 500 Roses 500 Vines

Furbush, E. W.	Greene			16,250	Raspberries Blackberries Strawberries
Hamlin, H. H.	Gardiner	$\frac{2}{3}$	acre		Raspberries
Hancock County Nursery	Surry	$\frac{1}{2}$	acre	500	Apple
				2,000	Raspberries
				4,000	Strawberries
				125	Shrubs
Hoyt, William	Ripley	$\frac{1}{2}$	acre		Perennials
Hussey, J.	Oakland				Spruce Peonies Perennials
Inman, A. E.	Dexter	$\frac{4}{5}$	acre		Raspberries Blackberries Strawberries
Jackson, H. A.	Gorham	20	acres	8,000	Hedge
				400	Fruit Trees
				6,000	Shrubs
				8,000	Perennials
				320,000	Conifers
Jerrow, John M.	Augusta	4	acres		Raspberries Strawberries
Jordan, George C.	Upper Gloucester	$\frac{1}{10}$	acre		Raspberries
Kirk, Edward	Northeast Harbor	$1\frac{1}{2}$	acres	900	Shade Trees
				600	Shrubs
				240	Roses
				600	Evergreens
				150	Hedge
				12,000	Perennials



NAME	LOCATION	ACREAGE	
Lapham, E. A.	Pittston	1/12 acre	1,000 Raspberries
Libby, G. D.	Gardiner	1/8 acre	Raspberries
Loder, A. J.	Bangor	1/40 acre	50 Shrubs
			20 Roses
McCabe, E. T.	Bangor	1/10 acre	150 Shade Trees
			80 Fruit Trees
			200 Shrubs
			75 Roses
			50 Blackberries
			200 Raspberries
McCabe, John C.	Bangor	2 acres	100 Fruit Trees
			800 Shade Trees
			400 Shrubs
			200 Hedge
			25 Evergreens
			50 Roses
McCabe, R. F.	Bangor	1/10 acre	100 Hedge
			100 Shrubs
			50 Fruit Trees
			50 Shade Trees
Mace, W. L.	E. Winthrop		1,000 Raspberries
Macomber, E. R.	Portland	1/2 acre	1,000 Hedge
			100 Shade Trees
			500 Perennials
			500 Shrubs
Mahoney, George L.	Saco	5 acres	800 Shade Trees
			4,000 Hedge

				500 Perennials
				100 Shrubs
				150,000 Conifers
Martin, John	Bangor	1/40 acre		25 Azalias
				25 Shrubs
				50 Perennials
Maxim, H. F.	Locke's Mills	18 acres		400,000 Raspberries
				10,000 Blackberries
				20,000 Strawberries
McGowan, G. E.	Wytopitlock	1/3 acre		Strawberries
Merrill, A. L.	Auburn	1/4 acre		Raspberries
Merrill, Charles	Auburn	1/4 acre		Strawberries
Merrill, Mrs. H. L.	Auburn	1/2 acre		6,500 Raspberries
Miller, William	Bar Harbor	1/5 acre		300 Roses
				200 Shrubs
				12 Shade Trees
				10,000 Perennials
Minot, Co., J. W.	South Portland	1/8 acre		25 Shrubs
				50 Roses
				100 Peonies
				100 Hedge
Mitchell Nursery Co.	Waterville	1/16 acre		500 Shrubs
Morse, Fred H.	Freeport			Blackberries
				Raspberries
				Strawberries
Mount Desert Nurseries	Bar Harbor	50 acres		30,000 Perennials
				6,000 Evergreens
				15,000 Shrubs

NAME	LOCATION	ACREAGE	
			1,000 Shade Trees
			1,000 Fruit Trees
			2,000 Hedge
Palmer, C. R.	North Dexter	1½ acres	19,500 Raspberries
			Strawberries
Pejepscot Paper Co. Nursery	Topsham		5,000 Norway Spruce
Phillips, H. B.	Auburn	3/10 acre	Blackberries
			Strawberries
Phillips, Willard H.	Ellsworth	¾ acre	Raspberries
			Strawberries
Pleasant View Farm	Rockport	1 acre	6,500 Raspberries
			Strawberries
Pollard, D. A.	Auburn	¾ acre	9,750 Raspberries
Roak, G. M.	Auburn	1/10 acre	15 Azalias
			100 Roses
			200 Shrubs
			200 Perennials
Robbins, F. G.	Augusta		Perennials
Saunders, Ernest	Lewiston	1/10 acre	3,000 Perennials
			1,000 Azalias
			100 Shrubs
			250 Roses
Start, A. O.	Union	½ acre	Strawberries
State Forest Nursery	Orono	1 acre	690,000 Pine
			30,000 Spruce
			50 Butternuts
			100 Black Locust

Steele, Joseph F. Strand, S. H. Strout's	Auburn			500 Poplars
	Topsham	1/4	acre	3,900 Raspberries
	Biddeford	1/40	acre	29,000 Strawberries
Swift, Mrs. Julis M.	Farmington	1/4	acre	150 Shrubs
				400 Roses
				500 Perennials
				200 Shrubs
				100 Roses
				150 Hedge
Twitchell, Dr. G. M.	Monmouth	1/8	acre	75 Peonies
				25 Vines
				6 Shade Trees
				Strawberries
Wallace, A.	Portland	1/4	acre	Raspberries
				100 Roses
				100 Shrubs
				500 Hedge
				200 Perennials
				Evergreens
Wheelwright, E. W.	Wilton	1/2	acre	Shade Trees
				Seeding Apples
Woodman, S. B.	New Gloucester	1/2	acre	6,500 Raspberries
Wooster, E. W.	Washington Jet.	3/5	acre	5,000 Strawberries
				2,000 Raspberries
York, H. Q.	New Sharon	1/4	acre	3,250 Raspberries
				Strawberries

# The EUROPEAN CORN BORER

is the caterpillar of a small moth.



The moths lay their eggs in flat masses on the under sides of the corn leaves.

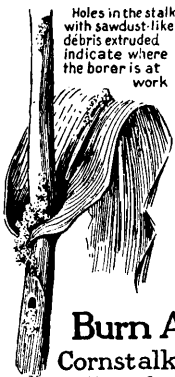


The caterpillars hatch from these eggs and feed at first on the leaves, but soon bore into the tassels, the stalk, the leaf-ribs and the ears

They live in the stalks all winter and in spring change to reddish-brown pupae which soon transform again to moths

*The pest also attacks other garden plants, weeds, and larger grasses, and lives through the winter in the stalks of these plants as well as in corn.*

Broken tassels with extrusions of sawdust-like material at the breaks are the plainest signs of an infested field.



Holes in the stalk with sawdust-like debris extruded indicate where the borer is at work

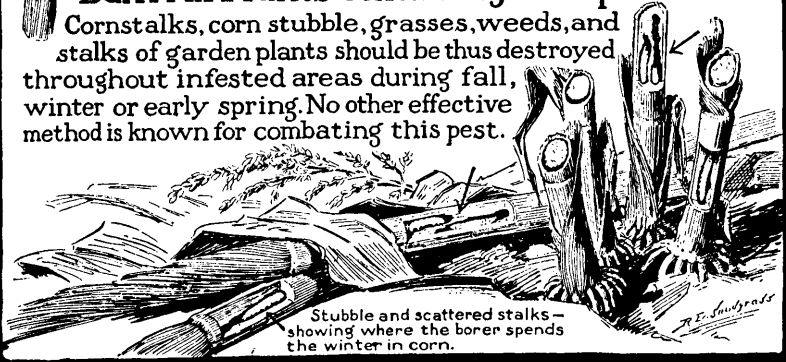


The borer enters the ears through the husks and also through the stem and cob



## Burn All Plants Containing Caterpillars.

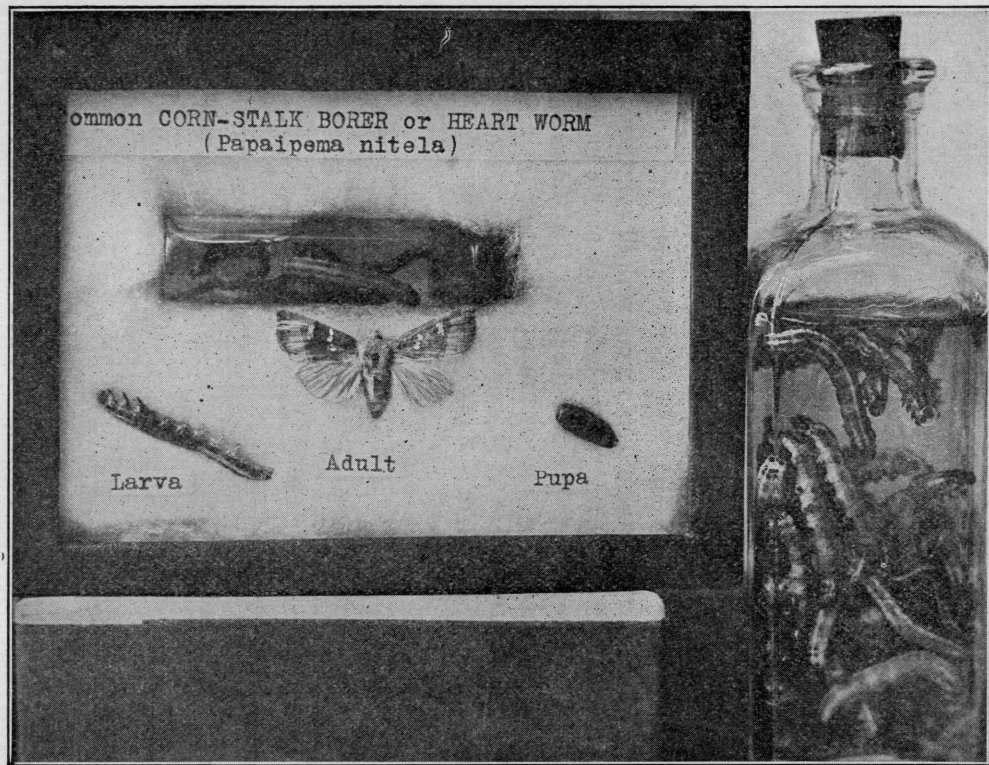
Cornstalks, corn stubble, grasses, weeds, and stalks of garden plants should be thus destroyed throughout infested areas during fall, winter or early spring. No other effective method is known for combating this pest.



Stubble and scattered stalks - showing where the borer spends the winter in corn.

J. F. Saunders

(Courtesy U. S. Department of Agriculture).  
European Corn Borer.



Life History of Common Corn-Stalk Borer. (about three-fourths size of original).

### THE EUROPEAN CORN BORER.

This terrible pest which infests 1400 square miles in Massachusetts, 75 square miles in New York state, several square miles in Pennsylvania, and a small area in New Hampshire, has been called to the attention of the people of this state in the following manner:

Two thousand posters have been printed for distribution, giving the life history of the pest by months, as well as a cut showing the larva of borer infesting the ear of corn.

One thousand colored mailing cards were purchased and distributed; colored framed picture exhibits, also jars containing borers in ears and stalks of corn as well as many borers in bottles which were shown at the fairs. Description of pest may be found in the March and December Department. Bulletins, as well as on another page of this report with illustrations. It was thought best to bring this matter before the people in order that they might become familiar with the pest so that if any are found, this Department might be promptly notified of their presence. I have made two trips to Massachusetts in order to familiarize myself with the workings of the pest.

### THE COMMON CORN STALK BORER.

The Common Corn Stalk Borer have been very numerous the past season. Under my supervision many bad infestations of this pest were cleaned up. Infestations were searched out and directions for their eradication given. Specimens of this pest have been exhibited wherever possible, that its appearance might become known to all.

### FRUIT GROWERS' ASSOCIATIONS.

There are at the present time 24 Fruit Growers' Associations doing business in this state, as well as a central body, the Maine Fruit Growers' Exchange.

I organized three of these Associations during the past season: The Oak Hill Fruit Growers' Association at Standish; Black Mountain Fruit Growers' Association, Sumner; and Highland Fruit Growers' Association, Bridgton.

## EXHIBITS OF INSECT PESTS.

A large and instructive exhibit of diseased specimens and insect pests, including the many additions made during the last three years, also jars containing Corn Borers, both European and Common, was shown at Waterville Fair, Lewiston State Fair, Fryeburg Fair, West Paris Grange Fair, Lisbon Grange Fair, Buckfield Grange Fair, and at the Pomological meeting held at Bangor. The large interest shown at all these places well repays us for the labor and expense incurred.

In conclusion I wish to thank my stenographer and inspectors who have helped me the past season, for their hearty co-operation in the work at hand; C. M. White for helping judge fruit at Waterville, George H. Babb for helping judge at Lewiston and Buckfield, also attending to exhibits; W. L. Maloon for helping judge at Lewiston.

To the Commissioner of Agriculture for his advice, and to you, my dear sir, for support given, I wish to express my appreciation.

Respectfully submitted,

FRANK H. DUDLEY,

*State Horticulturist.*



## REPORT OF THE FIELD AGENT, GYPSY MOTH WORK.

*To Major E. E. Philbrook, Deputy Commissioner, and Chief  
Division Plant Industry:*

I hereby submit a report as Field Agent of the Gypsy Moth force during the year 1919.

Scouting operations were begun January 1st and continued until June. The first part of the year the working force was changed, reducing the force in the field and making fewer inspectors. Lack of funds made it impossible to reach every infected town and city. The inspectors visited property owners in their territory, delivered creosote and explained how to treat the egg clusters.

## EDUCATIONAL METHODS.

On June 1st the burlapping and spraying began. One hundred and twenty-five thousand trees were burlapped and some tanglefoot used. By this method hundreds of thousands of larvae were destroyed. During June, July and the first of August spraying with Arsenate of Lead was done. The towns of Berwick, South Berwick, Sanford and Saco were sprayed with the high power sprayer, the different towns furnishing the lead, the State furnishing the men and machines. Spraying was also done in Portland, Bath, York and Eliot. Spraying is one of the best methods for destroying the Gypsy Moth, millions being destroyed.

The fall scout began in September. The inspectors have used and delivered to property owners five hundred (500) gallons of creosote, millions of egg clusters being treated. The woodland in the western part of the State is badly infested. The State stands ready to help the property owners by furnishing creosote and men to show them how to do the work. When every citizen will take hold of this work then we can get good results. In most cases the inspectors have been well received.

## PARASITE WORK.

The Parasites are doing good work. Where they were planted last year we could see good results. Colonies were planted with *Anastatus* or egg Parasites.

The following towns and cities were colonized:

Auburn	118,000	West Gardiner	50,000
Minot	26,000	Gardiner	41,000
Turner	52,000	Richmond	3,000
Greene	106,000	Pittston	7,000
Webster	28,000	Sidney	11,000
Lewiston	24,000	Augusta	2,000
Lisbon	6,000	Dresden	5,000
Bowdoin	6,000	Bowdoinham	5,000

Also the following counties were colonized:

Lincoln County	750,000	Cumberland and Oxford Counties	750,000
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Total number of *Anastatus* Parasites planted this year, 2,000,000.

On account of bad weather we could not secure as many *Calosoma* Beetles as expected. We planted colonies in Lewiston, Auburn, Augusta, Woolwich and Thorne's Island. We hope another year to be able to plant more colonies. In 1918 there were 8916 square miles infested. In 1919 fifty-one more towns and cities were added to this territory, making a large area infested by Gypsy Moths. We shall encourage property owners to spray, for by this method we exterminate millions of caterpillars.

## THE EUROPEAN BORER.

During the months of July and August the inspectors were looking after the markets and hotels that were receiving corn from out the State. No European Corn Borers were found, although they found the native borer in the corn fields. In cases where they were found they were destroyed.

## CONCLUSION.

In the new methods adopted by the Division, which provides for inspectors whose duty it is to visit as many orchards as possible, and instruct the owners of same the best way to handle the insect, we have been able to enlist the assistance of a great many persons and thereby cover a larger territory. By such an arrangement it has been possible to keep these inspectors employed during the entire year. This is an important factor in the work, as by this method we are able to train and keep the force up to a high degree of efficiency.

Our work on the parasites has been most gratifying and should appeal to everybody in the infested area. There has been no section of that area neglected. Thousands of the parasites have been liberated under the able supervision of Nelson Trafton who has been in charge of this work for several years. How well this work has been performed is apparent by the decrease of the caterpillars in the infested section.

At this time I desire to acknowledge the assistance and advice relative to parasite work, received from the Government agent, A. F. Burgess, who is in charge of the parasite work in New England. To the Inspectors as well as the Foremen and members of the force, I am glad to acknowledge my obligations for their loyalty to the organization.

While the expenditure of large sums of money has been necessary to combat the ravages of the Gypsy Moth in one of the most noted insect warfares ever undertaken, nevertheless, such an expenditure has been fully warranted by the results.

Respectfully submitted,

MELVILLE H. McINTIRE,

*Field Agent.*

REPORT OF THE DEPUTY COMMISSIONER, AND  
DIRECTOR DIVISION OF PLANT INDUSTRY.

*To Hon. John A. Roberts, Commissioner of Agriculture:*

I have the honor to herewith submit my annual report as Deputy Commissioner of Agriculture, and Director Division of Plant Industry.

As Deputy Commissioner of Agriculture, I have not been called upon to perform any of the functions of said office, therefore there is no report as Deputy Commissioner.

In accordance with Chapter 64, Public Laws of 1919, the Division of Plant Industry consists of Gypsy Moth Work, Horticulture, Seed Improvement and Exhibits. M. H. McIntire being in charge of Gypsy Moth work; Frank H. Dudley, State Horticulturist, in charge of the Bureau of Horticulture; and E. L. Newdick in charge of the Seed Improvement Bureau. The Exhibits were in charge of myself personally. I have found that from the grouping of these different bureaus we have derived a great deal of benefit.

At this time I want to express my appreciation of the men who are in charge of these bureaus, each one of them being faithful, conscientious, and thoroughly capable. Mr. Dudley has performed a gigantic work in horticulture. He has covered the entire State and instituted many new and beneficial ideas. His report, which follows, is indeed a marvel and shows what has been done in his bureau.

The bureau of Gypsy Moth work has been well looked after by the chief in charge, who has for many years been connected with this work and is thoroughly familiar with the needs of such labor. The men of this bureau particularly are the best that could be obtained in the State and are men who have been with us for many years, being thoroughly familiar with the workings of the insect pest.

The Seed Improvement Work in charge of E. L. Newdick is one of the most important to my mind in the Department of Agriculture. Mr. Newdick is thoroughly familiar with this work

and has handled the same with a great degree of success. He has represented the Department of Agriculture at Long Island, New York; the Maine Seed Improvement Association at Milwaukee, Wisconsin; he has also been called to Canada to deliver lectures on his work in this State, all of which goes to show the knowledge of his work and his value to us. All of these men I commend to you as being capable and efficient in all that they have undertaken.

The exhibits which have been made this year have greatly increased over previous years. Mr. Dudley has exhibited at all of the large fairs, groups of insects which he has prepared himself, and which is one of the best in New England. It was my good fortune to be asked to stage an exhibit of agricultural products at the Eastern States Exhibition held in Springfield during the month of September. Without doubt this was the most extensive exhibit ever put on by the State of Maine, the space allotted us being seventy-two feet long and sixteen feet in width, in which we exhibited particularly potatoes of the Aroostook County, there being sixteen different varieties shown. In addition to this hundreds of quarts of canned goods put up by the Boys' and Girls' clubs were also exhibited, and both were a great attraction to the visitors. This exhibition at Springfield is one of the best held in the eastern part of our country and without any doubt does the State of Maine farmers more good than any exhibition held in the East. During the exhibition at Springfield 200,000 people were admitted to the grounds, of which 150,000 visited our exhibition and were very much interested in the same.

I also prepared an exhibit of apples for the New England Fruit Show held in Providence during the month of November, at which time we exhibited twenty-seven different varieties of Maine grown apples. This exhibit was a great help particularly to the apple growers of the State of Maine who furnished apples for said exhibit. At this exhibit in Providence I was assisted by F. H. Dudley who is particularly adapted to this sort of work.

In conclusion I wish to express to you my hearty thanks for your kind assistance in conducting the business of this Division. I have always found you ready to cooperate with us in everything which would be of value to this organization. I would also

suggest, or recommend that each of the men in charge of these bureaus be granted a substantial increase in their salaries.

I have the honor to be

Yours respectfully,

EDWARD E. PHILBROOK,

*Deputy Commissioner,  
and Director Division of Plant Industry.*

REPORT OF THE DIRECTOR OF THE DIVISION OF  
INSPECTION ON THE ENFORCEMENT OF  
OF THE PURE FOOD LAW.

*To Hon. John A. Roberts, Commissioner of Agriculture:*

I respectfully submit to you my report of the work covered by the Division of Inspection for the year 1919.

The work of the Division consisted in the enforcement of the law as outlined in Chapter 36, Revised Statutes of 1916, regulating the sale of the following commodities: Agricultural seeds, commercial feeding stuffs, commercial fertilizers, drugs, foods, fungicides and insecticides; also, in the enforcement of the net weight law; thus preventing, as far as possible, adulteration and misbranding. As outlined by the statute, the other duties of the Division included the annual registration of commercial feeding stuffs, commercial fertilizers, fungicides and insecticides, by collecting and filing manufacturers' certificates at this Department, and receiving and accounting for the registration fee for each and every brand of the above mentioned commodities coming under the registration requirements; all necessitating considerable correspondence. The new arrangement of grouping the various Bureaus in the Department of Agriculture into Divisions added the control of the Weights and Measures Law, the enforcement of the law regulating the packing and grading of apples, to the Division of Inspections and embraced within this Division, three Bureaus.

The activities along new lines of food-factory inspection, were continued with special reference to sardine factories, corn canning factories and, in fact, any concern where food was canned or manufactured for sale. As was the experience in numerous other states, and of the authorities at Washington charged with the enforcement of the pure food law, it was found that the work of food inspection demanded considerable attention inasmuch as (because of the very high prices and disturbed conditions) the temptation to adulterate and substitute for financial reasons was great; in order to check this, and to act in be-

half of the consumer, an especially vigilant watch was kept on all food products. General inspection of food products was conducted continuously in the larger cities where, owing to the changes in ownership in some establishments, and the advent of new industries, such inspection was deemed necessary. Numerous samples of drugs were collected and drug store inspection conducted throughout the year by a trained inspector.

The inspection of feeding stuffs and collection of samples was conducted for about nine months of the year. Early in the spring, seed and insecticide inspection was carried on and samples obtained. The usual number of fertilizer samples were obtained during the spring months, and from July to the end of the year, the investigation of very important matters relating to fertilizer inspection, and the enforcement of the fertilizer law, demanded constant attention. It probably can be stated without fear of contradiction that the greatest amount of fertilizer inspection work, for any one year since the fertilizer law was passed in 1885, was performed in 1919, this unusual activity being necessary on account of damage done the potato crop, principally in Aroostook County.

Two hundred and seventy-eight towns and cities of Maine have been visited at least once, and, many several times, by the inspectors in the various kinds of enforcement, and in investigation of the various products coming within the scope of the inspection laws. Without attempting to enumerate or name separately the cities and towns visited in various kinds of inspection work, and list the population embraced by such places, we do desire, however, to present some idea regarding the scope of the work, and the number of people protected by inspection and investigation of their food supply, which can be somewhat indicated by the number of cities and towns inspected and the total population living therein.

Number of cities and towns inspected	278
Total population of towns inspected	680,093

#### SEED INSPECTION.

The seed inspection for 1919 was performed for the most part by the seed analyst from the Experiment Station who visited the seed dealers without obtaining many samples. The Legislature



of 1919 amended the law regulating the sale of agricultural seeds—which had previously been revised by the Legislature of 1905 and 1911—adding a section of considerable importance; the changes being added requirements for a declaration of noxious weed seeds present and a viability and germination guaranty to the purity guaranty. This law became effective in July. As a bulk of agricultural seeds are distributed in the spring very little was done with the enforcement of the new statute in collection of samples in the fall of 1919. As provided for by the statute, a list of seeds was proclaimed as noxious, and the effort has been made to give as great publicity as possible to the new features of the law, this list of weed seeds and regulations relating thereto. The results of the analyses of the samples collected, together with samples submitted by dealers may be found in Official Inspections No. 94.

#### FEEDING STUFFS INSPECTION.

The Feeding Stuff inspection for the year 1919 was conducted with extreme precision and care until late in the summer, when the regular feeding stuffs inspector was assigned duty in fertilizer inspection, and resumed again in November. Bearing in mind the many complications arising in the manufacture and transportation of feeding stuffs by strikes and riots, we have at all times endeavored to be as tolerant as we could, actuated by the desire to impress upon the feed manufacturers and dealers located within and beyond the borders of Maine, the fact of our willingness to cooperate with them in facilitating business whenever consistent with the feeding stuffs laws of the State. It is our belief that the brands which we found upon analysis to be below standard were, with but few exceptions, unintentionally so on the part of the manufacturers. Prosecution of one concern within the State seemed to be warranted, as a flagrant violation was detected, and a fifty dollar fine was paid. A few local concerns also paid fines for misbranding. With the prices of feeds as high as they are, we have endeavored in every possible way to see that the users of them have received the full benefit of the law. If difficulties arose with products entering into interstate shipment, and the situation warranted such action, the cases were referred to the Federal Department. Our recommendations to

the United States Bureau of Chemistry, made upon the strength of our collaborating official's commission, were always met in a direct and courteous manner, which encouraged us in our co-operative work. The following table briefly outlines the scope of our work with relation to feeding stuffs:

Number of brands registered .....	630
Number of samples drawn .....	470
Number of hearings .....	98
Number of carloads seized .....	3

The results of analyses of the samples may be found in Official Inspections No. 92.

#### FUNGICIDES AND INSECTICIDES.

The inspection of fungicides and insecticides was continued as usual during two of the spring months when such products as Bordeaux mixture, arsenate of lead, Paris green, etc., are sold for spraying purposes. Information was also secured by the inspectors concerning the sale of unregistered goods. This phase of the statute, however, is growing to be better understood, and probably less difficulty in arranging registrations was experienced in 1919 than heretofore. As practically no other state in the Union has a similar law, the insecticide law of Maine receives frequent criticism as to its constitutionality, and while up to the present time the work has been largely educational, it is probably desirable to have the legality of the law tested and interpreted by the courts. If any change should be made in the statute, the recommendation we have to offer is that, whereas the law now provides for the registration of materials composed of organic origin without payment of fee, it should be altered to exempt such products entirely from registration.

Not a great number of samples were obtained, but with two exceptions all samples collected were found to be entirely in accordance with their guarantees.

Number of brands registered .....	280
Number of towns inspected .....	70
Samples collected .....	15

## FERTILIZER INSPECTION.

The work of fertilizer inspection has been particularly active. As stated in the beginning of the report, probably more work has been done this season than ever before, in any one year, since the law regulating the sale of fertilizer was placed in the Maine statutes. The fertilizer law was amended by the 1919 Legislature and since July the new statute has been in force. This regulation provides for a statement on each package and certificate indicating the percentage of nitrogen available as plant food, and in the form in which it is present, and also requires marking on the certificate and package, if fertilizer contains untreated substances such as leather, hair, peat and garbage tankage, not available for plant food. The inspection work began in the early spring months with the collection of samples and the reporting of unregistered brands. As usual samples were obtained from store houses, from agents and considerable attention was given to weighing unbroken packages in the hands of distributors and wherever scales that could be considered accurate were available for this purpose. Considerable time was spent in the collection of samples of goods in the hands of individuals. In many instances, on account of the War and disturbed trade conditions, some of the brands that were registered for sale were not shipped and, therefore, could not be sampled, but, in general, the usual number of samples of the various brands were obtained, and, as in previous years, the samples thus obtained were sent to the experiment station without any information, as to the character of the goods, or their sources, for analysis. The results of this sampling and analysis were on the whole satisfactory when considered from the standpoint of agreement between the guaranty and the determinations by analysis, it is realized, of course, that no industry has been more affected by the World War than the manufacture of fertilizer and fully understood that the ingredients entering into the manufacture of fertilizer have been demanded for the making of the various munitions of War. In general, there were few criticisms to make as to the variance of the analysis performed, from the guaranty. Some samples were rather low in nitrogen when it was considered that under the 1919 law an absolute guaranty as to the available nitrogen present was made, and, in some of

tor of the Maine Agricultural Experiment Station and the Plant Pathologist there, in making a rather thorough investigation of the situation in Aroostook County. During the tour they were joined by a soil expert of the Bureau of Soils, U. S. Department of Agriculture, and every condition relating to the potato fields was studied. Practically all of the potato growing area of the county was visited and particular attention paid to complaints from growers that had been received. Some of the fields showed very fine crops, but, for the most part, wherever a complaint had been made and where certain kinds of fertilizer had been used, the growing plants were found to be in very bad condition. Some crops, at this time in July, gave every indication of being a total failure. The injury of the potato plants, that was noted, was that they either showed a stunted appearance, that is, entirely dwarfed as to growth, or else, in some instances, to have grown tall and more slender than those of normal growth, and, apparently lacking greatly in vitality. The leaves, particularly those on the lower set of stalks, showed tinges of yellow. As far as our observation extended these appearances could be considered characteristic. The roots of the plants when removed the brands the available Phosphoric Acid ran considerably low.

Number of brands registered .....	294
Number of samples drawn .....	338

The results of these analyses are given in detail in Official Inpsections, No. 93.

#### BORAX IN FERTILIZER.

The greatest activities, however, of the fertilizer inspection were made necessary on account of the damage to the potato crop, principally in Aroostook County, by fertilizer. This is probably the first time in the history of the Maine fertilizer law that it has been necessary to investigate an adulterant of commercial fertilizer with a toxic effect to growing plants. Complaints, first from Aroostook County and later from other sections of the State, were received by the Division of Inspection about mid summer in regard to the appearance of the potato crop in certain fields. Early in July, in order to investigate these reports, the Chief of the Division of Inspection and the Chief of the Seed Improvement Bureau accompanied the Direc-

from the soil and examined showed a stubbed and burned appearance, and, if very carefully removed so that such operation did not destroy this evidence, it could be observed that the thread-like feeder roots had been burned until they presented a black hair-like appearance and when exposed to the air and touched, even very gently, would crumble and break easily. The lower set of roots, or those coming nearest to the fertilizer, were apparently injured most, while the roots at the upper part nearest the top of the soil showed some strength. The plant was, apparently, dependent upon this set of roots for support. Some of the fields presented an appearance pitiful indeed, a truly lamentable condition. In some plots a distance of fifteen feet could be found on a row where hills were missing and in some cases a few struggling plants would be just showing above the ground, examination underneath the ground at these points, showed the seed was sound enough but no growth had been possible and in some cases plants were found supported only by the upper set of roots with the feeder roots at the bottom entirely destroyed. At this time every care was taken by the Plant Pathologists to differentiate between this characteristic injury so much in evidence and the various plant diseases such as Mosaic, Leaf-Roll, Rhizoetonia and Blackleg, which are likely to attack growing potato plants. In all, on this trip, more than seventy farms were visited in the towns of Presque Isle, Fort Fairfield, Caribou, Mars Hill, Van Buren, St. Agatha, Ft. Kent, Caswell Plantation, and Dyer Brook.

From conferences with fertilizer manufacturers who were also investigating, from inquiries of potato growers, from our own observations and from all evidence that could be collected from any source whatsoever, it was practically decided that the use of certain commercial fertilizer, containing borax, had caused the damage. Careful comparison and dates collected from growers as to formulae of the fertilizer used indicate that in almost every instance the greater amount of potash in a complete fertilizer the higher also was the borax content therein, and the damage of the crop in these cases was also correspondingly greater. Wherever a complaint had been made and any fertilizer was available for sampling, a sample was taken and sent to the Experiment Station for analysis. Samples were also taken by United States Officials. Of some forty samples obtained from

complainants, especially where marked damage to crops was noted, the analyses revealed a borax content in each instance. The amounts of borax found varied from .26 of one per cent. to 2.60 per cent. In some instances well authenticated samples were obtained from lots of fertilizer in sufficiently large amounts, and in unbroken packages to warrant a reliable analysis. At the conclusion of this tour of investigation, the Chief of the Division of Inspection accompanied the U. S. Representative of the Bureau of Soils in an inspection of the fertilizer factory where the fertilizer was manufactured that had caused the greatest amount of damage, and all information with any bearing on the subject obtained. Three other trips were made to Aroostook County, two during the growing season and one during the harvesting when observations were made of the yield and actual weighings made of the crop harvested. On farms where an opportunity was afforded to make comparisons between the crops grown on the fertilizer free from borax content, it was easily determined that the yields were greatly reduced, in the majority of cases, where borax fertilizer had been used. Some crops were almost a complete failure. One case was reported where the crop harvested was only eleven barrels to the acre.

Since the middle of July, when the first complaint was received, up to the present time, inquiries from complaints as to the damage to the potato crop by borax, have been received at the Department. More than 125 complaints have been investigated by actually visiting the fields and noting the conditions. Aside from the investigation in Aroostook County damaged crops were reported and investigation in Penobscot, Piscataquis, Kennebec and Waldo counties. Most of these complaints were isolated cases. An endeavor was made to attend, as promptly as possible, to all complaints made and carefully investigate the same. Wherever such action was not possible a letter was written suggesting to the complainant that if he had on hand any fertilizer remaining from his planting operation that a sample should be sent to the Department in order that a borax determination could be made. Many people who were actually damaged did not complain or, at least they did not report their damage to the Department. It is entirely possible that there were many cases where growers obtained a yield greatly reduced but entirely unconscious of the fact. The cost of production and the margin

between the selling price of potatoes in the Fall and the price that will be received next Spring, must also be considered. The actual number of acres that were damaged, the number of individuals sustaining loss and the actual monetary loss can be only approximately judged, but, it can probably be safely estimated that the potato growers of Maine suffered a loss of a million dollars during the last season. In order to safeguard a repetition of this most unfortunate occurrence you will recall that, under authority granted by the statute, the following ruling was issued under date of November 17:

MAINE DEPARTMENT OF AGRICULTURE.

DIVISION OF INSPECTION.

AUGUSTA, MAINE, NOV. 17, 1919.

*To all Brokers, Fertilizer Manufacturers, and Dry Mixers:*

Under authority granted by the statute for making rules for the administration of the law regulating the sale of commercial fertilizer, the executive will rule:

That boron in any form will be considered as a deleterious constituent when contained in commercial fertilizer, and that any fertilizer containing boron or its compounds will be deemed to be adulterated.

It is realized that boron and its compounds are present as natural constituents in the soil and in plants, and that traces of boron may be found in some of the ingredients used in commercial fertilizer. Nevertheless, the presence of boron or its derivatives in appreciable amount in commercial fertilizer will be deemed an adulteration, and the executive will further rule:

That when manufacturers' certificates are filed with the Maine Department of Agriculture describing the various brands of fertilizer intended for sale in the State of Maine, as required by statute, such certificates shall include a statement indicating that the brand of fertilizer designated does not contain boron or its derivatives in appreciable amount; and the registration of any brand of fertilizer known to contain boron or its compounds will not be accepted, or its sale legalized, in the State of Maine.

This order is the result of investigation and consideration by the Maine Department of Agriculture of the damage to potato crops within the State that has been attributed to the use of commercial fertilizer that contained potash with a high borax content.

JOHN A. ROBERTS, *Commissioner.*

With the publication of this document, communications were received from various fertilizer companies, vigorously protesting against the application of the ruling. Several conferences were held, and the claim was made by the fertilizer manufacturers that they could not safely ship and sell fertilizer in the State of Maine with such ruling in force. The plea was made that the ruling should be changed to conform to the language of the ruling made by the Federal Department, wherein they had agreed that two pounds of borax per acre could be used with safety upon growing crops. At the time of making this report, however, the ruling is still in force.

Boron in commercial fertilizer stands condemned, and in order to prevent a repetition of the unfortunate affair of last season, it has seemed entirely proper to insist that the manufacturers of this commodity place in the hands of the Maine farmers, for next season, a fertilizing product as free from Boron as it is physically possible to produce.

Of the six fertilizer companies whose fertilizer caused damage, four have shown a disposition to make reparation for the damage caused and settle to the farmers' satisfaction. It has been stated as a conservative estimate that the settlements, already made by one fertilizer company with potato growers who sustained a loss of crop, amounts to \$280,000. Late in December five of the companies were cited to hearing and asked to explain why they should not be prosecuted for selling commercial fertilizer which contained a substance deleterious to plant growth, and, therefore, contrary to the statute. In all instances these companies were represented either by an officer of the company or by their attorney and in some instances by both. Evidence that they presented was carefully noted and these cases are now under consideration. One company has asked for a postponement of hearing and this case will be held in 1920. We have the assurances, both from the Maine Agricultural Experiment



Station and from the Bureau of Plant Industry at Washington, that experiments are now being planned to be carried out the coming season for the purpose of determining definitely the toxic effect of borax on growing plants.

The endeavor has been made to inform potato growers of the desirability of keeping a portion of the fertilizer which they procure in 1920 for analysis and with this in mind, a card is now being prepared similar to the directions given in Official Inspections, No. 93, giving directions for sampling and shipping for analysis. It is hoped that everyone will take advantage of this opportunity so that the samples may be examined for borax. Again, to repeat, it is probable that for any one year since 1885, more work of unusual character has been done along lines of fertilizer inspection, especially in investigating the adulteration of commercial fertilizer with an ingredient of toxic effect.

#### DRUG INSPECTION.

The drug inspection work has been performed in a particularly efficient manner, the inspection having been accomplished by a registered pharmacist who has served in the dual capacity of sanitary inspector of ice cream saloons, and soda fountain establishments, outside of the fountains found in the drug stores coming under his observation along with his other line of work.

Quite a large number of samples of drugs were obtained in 1919. The sampling this year extended to rather a different class of drugs than hitherto collected, some of them were Oxide Zinc Ointment, Tr. Nux Vomica, Hydrochloric Acid, Citrate Magneisa, Paregoric and Digitalis; as well as duplicating our performance of previous years in sampling some of the more common preparations manufactured usually by druggists themselves, such as Peppermint, Camphor, Checkerberry, Iodine, Nitre, and Lime Water. Analysis of these samples showed quite a number that were not in accord with the U. S. P. Standard and for some of these violations fines were collected. As some of the samples were obtained late in the year, some cases are still unsettled but will be terminated next year. It seems of utmost importance that a drug—whether recognized by the United States Pharmacopoeia or not—should possess the proper therapeutic qualities and, when administered, produce the desired

physical effect, it is our duty as it has been interpreted to remedy unsatisfactory conditions if found and give impartial enforcement of the law that was found necessary to place on our statute books.

Number of Towns inspected .....	115
Number of samples drawn .....	187
Number hearings arranged .....	22

#### FOOD INSPECTION.

Education, inspection and prosecution have marked the different methods adopted for this line of work. The collection of samples represented only in a small way the amount of work accomplished.

*Grocery Stores and Markets.*—Wherever food is dispensed in grocery stores and markets, the inspectors have noted the general conditions of the place as to the cleanliness of the walls, floors, shelves and counters, and in fly season they have noted particularly if screens were used. Meat rooms and refrigerators have been examined and the condition reported. Inquiry as to the general health of the employees has been made and their condition noted from observation. Dealers have been questioned as to the proper labeling of lard, molasses, sausage and vinegar when sold in substitution for the real article. The general habits of the dealers have also been judged in the matter of wrapping of bread and the protection afforded food at all times.

Numerous technical violations have been treated in an educational way and an attempt made to remedy the conditions found.

*Restaurants.*—The inspection of hotels, particularly the dining rooms, and of lunch rooms, restaurants, lunch cars and in fact, every place where food has been offered for sale, has been carried on as fully as possible with the means appropriated and the force of inspectors employed; particularly noting the light, ventilation and cleanliness of each place and the health of the employees. Reports are made, also, as to the condition of the dishes and utensils used as well as in regard to the refrigerating facilities.

*Bakeries.*—Realizing the great importance that care should be taken in handling bread, we have attempted to investigate the methods used in dispensing this product, not only in the shop

but on the delivery teams and in stores. Bread, when it comes from the oven, is probably in a sterilized condition; this can be truthfully said of both the surface of the loaf and of the interior. However, this is the last sterilizing process the bread receives before being consumed, as a very small amount of bread is subjected to any further heating or toasting process. It is therefore evident that bread should be kept at all times, in order to be suitable for food, carefully protected and, to this end, the inspectors have attempted to advise the drivers of bakery teams to be particularly clean in their habits and in the matter of handling unwrapped bread. In most cases our advice has been gratefully received and usually heeded but there is still chance for improvement. Bakers, in general, have readily agreed that if for no other than economic reasons it was to their advantage to wrap bread. In regulating the sale of bakery products a new situation has arisen brought about by the advent into the State of a system of baking where the whole operation of making, baking and distributing the finished product is attended to under the observation of the purchaser. The bread produced under these conditions is placed on racks immediately behind the counter of the sales room within easy reach of prospective customers and not far enough away to escape the spray from the customers' mouths when they talk, sneeze or cough and the bread thus exposed in the cooling process and the dust of the streets, the dust of the floor which is continually stirred up by the possession of customers coming in. Therefore, in spite of the claims as to proper sanitation, it is evident that the establishments conducted under these conditions are not in a position to deliver as safe and clean a food product as the average baking shop that maintains its baking room entirely apart from the place where the sale of their bakery goods takes place and where care is taken to wrap the bread or insure its purity within a glass case or a closed glass window while displaying it. Our recommendations to them have been that either a partition with or without glass windows shutting off the work room from the sales room or rack coverings completely enclosing the bread racks, should be provided in order that the sale of the bread could be accomplished without offending the clause in our food law providing that food shall, at all times, be carefully protected from dust and flies.

*Bottling Establishments.*—The usual inspection of bottling

shops, where soft drinks are manufactured, has been carried on. Not a great number of samples were obtained, except where an occasional complaint or a special report was investigated. There are, of course, great possibilities of spreading disease by the sale of these products, providing the bottles are not thoroughly sterilized. Our recommendations have been as usual for the installation of soakers for sterilizing their containers.

*Slaughter House Inspection.*—As has been the case in the last two years, by the use of an automobile, it has been possible to continue the inspection of many of the smaller slaughter houses, located in country towns. The supervision of this class of food handling is the most difficult of any phase of the police power granted under the statute. Any animals slaughtered for food purposes that are to be shipped out of the State, receive inspection proper in character, while, for the most part, the products consumed by the people of Maine are from creatures that are never given either an ante mortem or post mortem examination.

We have, therefore, felt it our duty to devote as much time as possible to the inspection of the establishments where slaughtering was done, and to remedy conditions found in every way possible.

There are a few well equipped, well managed abattoirs in this State, and they are not entirely confined to the cities, but the majority of places where slaughtering is done are not at all suitable for the purpose intended. We truly believe that conditions are growing better, as it has been our good fortune to have a report of the building of several new abattoirs in the last year; properly built, cement floors and adequate water supply, with walls sheathed and painted. In almost every instance, the installation of this equipment has been upon our recommendation.

In some cases, moral suasion was of no avail, and it was necessary to adopt the more drastic means of fining the proprietors who persisted in maintaining a dirty, cluttered establishment.

In agreement with our recommendation made in 1918, a bill providing for the licensing of all slaughter houses was presented to the Legislature of 1919. This bill was given two hearings by the Committee, and finally failed in passage of the House by a narrow margin. The need of this legislation is great, and we again repeat the recommendation of last year that some system

of license should be inaugurated of all slaughter houses where commercial slaughtering is done.

*Food Factories.*—We have attempted to investigate as far as possible, and within our means, the conditions of the food supply which would in any way affect the public health, with particular reference to bakeries, slaughter houses, bottling works and canning factories, endeavoring always to assist and advise with the end in view of producing a cleaner and better product. Special endeavor was made to make as complete an inspection as possible of our three leading industries with reference to packing food, namely: Corn, blueberry and sardine factories. It has also been gratifying to note that new factories which are canning clams, mincemeat, squash, apples, and miscellaneous products, have made their appearances in different parts of the State. This, of course, has brought about necessary additional work as new managements are not familiar with old regulations and the education of such industries to the requirements of the department, has been necessary.

#### COLLECTION OF FOOD SAMPLES.

Some of the food products collected for analysis have included ice cream, vinegar, raisins, walnuts, horse radish, butter, lemon extract, cocoa, tea, coffee, various soft drinks, clams, oysters and scallops. The sampling of clams, ice cream, vinegar, raisins and walnuts has been general. The other articles mentioned have been taken as a result of some complaint or for some other special reason. Many of the samples collected showed only a technical violation of misbranding. Some of the samples were found to be adulterated and a satisfactory settlement effected for which there is hardly space here to report in detail the many technical violations thus investigated. Notable among activities of the food work have been the following: Clams, ice cream, walnuts, raisins, vinegar and olives.

*Clams.*—During the spring of 1919 a general sampling was done on clams and a rather different practise was adopted than ever before as the endeavor was made to obtain samples direct from the digger in order to judge their condition at this point. Results of analysis in many cases showed that the clams had been allowed to remain in water and had thus been swollen.

These cases were investigated and the diggers cited to a hearing and asked to explain the violation. Care had also been taken to obtain check samples from the same localities, on the same flats, where diggers' samples, offered for sale, had been dug so that the interpretation of the analyses on these samples were rather accurate. As a result, some twenty or more clam diggers were fined and other cases are now under investigation. The practise of swelling clams and the watering of milk are probably the two practises of food adulteration that are hardest to prevent.

*Ice Cream.*—During the summer samples of ice cream were obtained. A special canvass was made in some of the coast towns and, in spite of previous educational work done in these neighborhoods, several violations were detected. In some cases the use of eggs was responsible for the reduction of the milk fat content and in others the dealers had apparently believed that ice cream could be manufactured from evaporated and condensed milk without any reinforcement of fat, and, in some of these cases, a fine was found necessary. The competition among producers is rather sharp and dealers do not hesitate to say that there is still a profit in ice cream where the legal milk fat content is maintained. We have received several formal requests for a reduction of the standard which now requires a butter fat content of fourteen (14) per cent. Ice cream is no longer a luxury, sold as it used to be for three months in the summer, but is now considered a year round staple article of food. We can only believe that it would be a step backwards to allow a reduction of the standard.

*Raisins.*—As a result of complaints, numerous samples of raisins were collected and examined, these were found to contain considerable amounts of sand. Investigation of these cases showed that in all probability it was not a wilful violation but the sand was present, undoubtedly, for the reason of exposure to sand storms during the process of drying. No prosecutions were made as in every instance the good that were reported, in a condition unfit for food, were returned and the customer reimbursed.

*Walnuts.*—As usual at Thanksgiving and Christmas time a vigilant inspection was maintained of the different articles of food offered for sale. In the course of this inspection considerable amounts of walnuts of inferior quality were found. Detec-

tions of these by examination of a few samples led to the inspection in Portland, Lewiston, Bangor, Belfast, Sanford, Brunswick, Bath, Augusta, Gardiner and Waterville and as a result of these inspections seven tons of moldy, decomposed and shriveled walnuts, that were being offered for sale in these cities, were condemned and shipped back by local dealers to the wholesalers supplying them.

*Vinegar.*—The taking of vinegar samples was carried on during the last season. In each instance, the inspector making a purchase, asked for a quart of cider vinegar. The results of analyses of these samples were for the most part very satisfactory. A few could be considered technical violations; in some instances the measure was slightly short and there was only one case that apparently warranted a fine and that case is now pending. With the price of vinegar greatly increased, an effort is being made to increase the sale of home made vinegar which is highly commendable but there is yet a great amount of vinegar supplied by manufacturers outside of the State.

#### BUREAU OF WEIGHTS AND MEASURES.

The activities and accomplishments of this Bureau, which, since July of this year, has become a part of the Division of Inspections, will be reported in detail by the State Deputy Sealer, and does not call for any detailed report from the Chief of the Division.

Notable among the accomplishments of this Bureau was the condemning of three sets of coal scales found to be in poor condition, that were used for the annual weighing of 4,000 tons of coal in one town. New scales were installed and the people of that community thus insured correct weight of their fuel. In various cities and towns of the State, the sealers have been responsible for condemning 708 weighing and measuring devices.

*Net Weight Law.*—The enforcement of the Net Weight law has been prosecuted with more than the usual vigilance, and in most instances has been educational. While the statute is not a new one, we have hesitated considerably in dealing harshly. This has also been the policy of the Federal Government, and the State statute is very similar to the United States law. The Federal Department now announces that drastic action will be taken

against any misbranding, of this sort, and with the high price of all food, we believe that it is time for the State to follow the lead of the Federal Government and begin prosecutions for omitting from a label the statement as to quantity in a package.

One very important ruling has been made during the past year, relating to the marking of hams and bacon, which were previously not regarded as being in package form when wrapped. In all probability, the increase in price of ham and the increase in weight of the wrapper has influenced, to some degree, this change of ruling, as now all hams and bacon, whether wrapped in cloth or paper, must be plainly and conspicuously marked on the outside with the net weight. Similar rules apply to State enforcement. In general, this phase of the law is being well observed.

#### BUREAU OF APPLE INSPECTION.

While this Bureau, by the new grouping arrangement, was brought within the Division of Inspection in July, the direction of the work was not undertaken by the Chief of the Division of Inspection, at your suggestion, and therefore, no detailed report of this Bureau appears herein.

#### FEDERAL COOPERATIVE WORK.

Throughout the year we have been in constant touch with the Federal Bureau of Chemistry and, especially, with their officers connected with the Boston Station, enjoying at all times the most complete cooperation, which has been distinctly of advantage.

For a third of the year at least, a Federal Inspector has been present in the State, who has worked with the State Inspectors and has assisted greatly in raising the standard of our Maine products. Prominent among the achievements of our joint inspections was the taking of numerous samples of clams at different points along the Maine coast for check samples, in order to obtain an index on what might be expected as to purity and quality of clams offered for sale in the open market.

Early in the summer, a Federal Feed Inspector accompanied our State Inspector on a tour of inspection of the feed stores and grain dealers of the State, covering about two-thirds of the State and in all 490 samples were collected under the United States



seals and numbers and the Federal frank used for shipments during the year. Several collections of patent medicines offending the United States law under the Shirley Amendment Clause have been made jointly. Shipments of canned apples, and of apples in barrels suspected of being misbranded, which were reported to the United States Officials at Boston, as well as reports of returned shipments of moldy and decomposed nuts received prompt attention. During the blueberry packing season, we cooperated and assisted chemists and inspectors from the Federal Bureau in putting up an experimental pack for the purpose of determining the fill of cans. Many other details have been investigated in cooperation and all their assistance greatly appreciated.

#### PROSECUTIONS.

Aside from the fines collected in 1919, from violators of the apple packing law, thirty-four violators paid fines for selling adulterated and misbranded food. Six paid fines for selling adulterated drugs. Four paid fines for selling adulterated and misbranded feeds, and two concerns settled with fines and costs for selling misbranded fertilizer; in all a total of \$800.00 in fines from forty-six violators.

Following is a tabulation of the prosecutions, outlining the reason for prosecution and the amount of the fine:

#### RECORD OF PROSECUTIONS.

Adulterated food (Confectionery)	
exposed to insanitary conditions	\$15.00
Adulterated food	
exposed to insanitary conditions	25.00
Misbranded food (Apples)	
not properly labeled	50.00
Misbranded food	
not properly labeled	10.00
Adulterated food (Clams)	
with added water	5.00
Adulterated food (Clams)	
with added water	10.00

Adulterated food (Clams)	
with added water	10.00
Adulterated food (Clams)	
with added water	5.00
Adulterated food (Clams)	
with added water	30.00
Adulterated food (Ice Cream)	
not up to standard	10.00
Adulterated food (Clams)	
with added water	5.00
Adulterated food	
exposed to insanitary conditions	10.00
Adulterated food (Clams)	
with added water	25.00
Adulterated food (Clams)	
with added water	5.00
Adulterated food (Clams)	
with added water	5.00
Adulterated food (Clams)	
with added water	50.00
Adulterated food (Clams)	
with added water	5.00
Adulterated food (Ice Cream)	
not up to standard	25.00
Adulterated food (Fruit)	
exposed to insanitary conditions	10.00
Adulterated food	
exposed to insanitary conditions	10.00
Adulterated food (Clams)	
with added water	5.00
Adulterated food (Meat)	
product of deceased animal	100.00
Adulterated food (Clams)	
with added water	5.00
Adulterated food	
manufactured in an insanitary slaughter house	50.00
Adulterated food	
manufactured in an insanitary slaughter house	50.00
Adulterated food (Meat)	
manufactured in an insanitary slaughter house	25.00

Adulterated drugs		
not up to U. S. P. Standard		10.00
Adulterated drugs		
not up to U. S. P. Standard		10.00
Adulterated drugs		
not up to U. S. P. Standard		25.00
Adulterated drugs		
not up to U. S. P. Standard		15.00
Adulterated drugs		
not up to U. S. P. Standard		10.00
Adulterated drugs		
not up to U. S. P. Standard		25.00
Feeding Stuffs		
not up to guaranty		50.00
Misbranded Feeding Stuffs		
not registered		20.00
Misbranded Feeding Stuffs		
not registered		10.00
Misbranded Feeding Stuffs		
not registered		10.00
Misbranded Commercial Fertilizer		
registration refused		50.00
Misbranded Commercial Fertilizer		
registration refused		10.00
		<hr/>
Total		\$800.00

## PUBLICATIONS.

In the preparation of this report, we have endeavored to observe brevity, giving just the barest outline of the work involved in the registration of feeding stuffs, fertilizers, fungicides and insecticides, the collection of samples, interpretation of analyses, and the settlement of all cases against violators. For those who desire a more detailed account, it seems rather necessary to submit a list of the rules and regulations emanating from the Division of Inspection in the form of reports, regulatory announcements, and also publications containing the results of the analyses of the samples collected, recently:

- Official Inspections No. 81—Commercial Agricultural Seeds  
1916
- 82—Miscellaneous Drug Preparations
- 83—Maine Packed Blueberries, Corn  
and Sardines
- 84—Commercial Feeding Stuffs 1916-17
- 85—Commercial Fertilizers 1917
- 86—Commercial Agricultural Seeds  
1917. Fungicides and Insecti-  
cides 1916-17
- 87—Miscellaneous Food Materials
- 88—Commercial Agricultural Seeds  
1918
- 89—Commercial Feeding Stuffs 1918
- 90—Commercial Fertilizers 1918
- 91—Drugs and Foods 1919
- 92—Feeding Stuffs 1919
- 93—Commercial Fertilizer 1919
- 94—Agricultural Seeds 1919.  
Fungicides and Insecticides 1919.
- I—Vol. XVI—Practical Suggestions Regarding  
Food Values and the Proper Selec-  
tion of a Nutritious and Economi-  
cal Diet
- Laws of Maine regulating the sale of:
- Agricultural Seeds
  - Feeding Stuffs
  - Fertilizers
  - Drugs
  - Foods
  - Fungicides and Insecticides
- Regulatory Announcement No. 125—Ice Cream
- 126—Protection of Foods
  - 127—Net Weight
  - 130—Shell Fish
  - 135—Dressed Poultry

## SUMMARY AND RECOMMENDATIONS.

To briefly summarize the work of the Division of Inspections, it has been our job to safeguard the food and drug supply, and to investigate the quality and purity of the feeds, seeds, fertilizers and spraying material used by 750,000 people the year around, and to insure proper protection for several thousand more during the summer.

Some of the enforcement problems are discouraging, but when we come to consider that ten years ago practically every closed in window with a dust proof protection at the back was found either in a boot and shoe store or a dry goods store, and that now there is practically no confectionery or fruit store, drug store or up to date grocery in the State of Maine that does not boast of this sort of equipment, we can feel encouraged at the results of our recommendations, as in many, many cases these windows have been installed upon the suggestion of food officials. The clause in the law providing that a dust proof covering shall be offered to all articles of food, which has been enforced largely in an educational way, has been very helpful.

In every town there are bottling shops, ice cream parlors, grocery stores and canning factories where, at the request of inspectors, screens for the windows and doors have been installed, and without protest. There are still many conditions that need remedying. The country slaughter house, and the lack of inspection therein, is to be greatly deplored. While we fully believe that conditions are better than they were two years ago, we feel that more legislation is necessary before the ideal can be attained. We recommend that every animal slaughtered and sold for food be subjected to some sort of an inspection, and some form of license for the slaughtering business be provided for. We advocate that every ice cream parlor should be licensed, not with the idea of obtaining license fees for revenue, but in order to properly maintain the sanitation of the place where this product is dispensed, as ice cream is no longer a luxury and should be dispensed very carefully especially to children. Every bottling establishment should be licensed. Such regulations are now in force in many states.

Some legislation should be enacted to regulate cold storage. There is no doubt but that cold storage plants are a blessing, and

it is not our desire to make a claim against any particular cold storage concern. The cold storage plant is a very useful institution for any community. Here large quantities of food products can be acquired in times of plenty and stored for distribution in times of scarcity. Disregarding any claim that can be made against proprietors of cold storage hoarding of food, nevertheless, they should be regulated. They should not be prohibited; their business should not be hampered; they should not be unnecessarily interfered with; they should not be maligned; but they should be regulated. It is not at all unreasonable to require, in behalf of the consumer of cold storage products, that there should be a specified time that food products may remain in storage and be legally sold. It should not be regarded as interfering with business to have some regulation as to the purity and quality of products when they are subjected to a refrigerating process.

Sections 23 and 24 of the Revised Statutes provide the opportunity for packing food under State inspection. This statute requires registration, payment of a registration fee and calls for official inspection by inspectors of the Department. We urge and recommend to every packer of food in the State the adoption of State inspection. The undertaking of the National Cannery Association has demonstrated fully what organized inspection can do for improvement in a canned product. What is being done by this Association with sardines, we fully believe can be extended in application to corn, apples, clams, blueberries or any product where the inspection can be installed, and we believe that the sales of Maine grown and Maine canned products, whether it be corn, sardines or apples, can be doubled, if the packer would inaugurate the system of State inspection, and thereby have the privilege of branding his product with the legend "Inspected and Passed under the Maine Pure Food Law." It is earnestly hoped that in the coming season this form of inspection can be given a trial.

Another recommendation is for the early publishing of the Food Standards, promulgated and recently re-drafted. These standards have in no way been altered, but from time to time have been re-published over your signature. We urge a new printing of these regulations at the earliest opportunity.

In conclusion, please accept my thanks for your kind advice,

wise counsel, and hearty cooperation in the administration of the affairs assigned to me, especially in the very difficult fertilizer investigation. I also wish at this time to express my appreciation of the valued assistance of my associates in the performance of our duties, and to thank the clerks and deputies who have labored with me. The cooperation of the other Departments of the State House, other Divisions of the Department and of the Federal Government has been of great value to me, and my gratitude to them is hereby acknowledged.

Respectfully submitted,

A. M. G. SOULE,  
*Director, Division of Inspection.*

REPORT OF DEPUTY STATE SEALER OF WEIGHTS  
AND MEASURES

*To A. M. G. Soule, Director of the Division of Inspections:*

As Deputy State Sealer of Weights and Measures, I respectfully submit to you the seventh annual report of the work done by this Bureau.

At the last session of the Legislature there were quite a few amendments to the weights and measures laws, also a new law in regard to the selling, offering for sale, or giving away, any scale or measuring device until the same had been approved by the National Bureau of Weights and Measures.

For the past few years, there have been recommendations that uniform scales and weighing devices should be adopted by the Federal Government. I believe that we are the first state to pass any law giving the National Bureau of Standards the right to say what type of scales and measuring devices should be sold in this State, although I understand that the state of Texas has a similar law. This law may not be perfect, but I believe that it is a move in the right direction, and in time I think most of the states will have a similar law.

The past year I have been able to visit more towns than ever, and I find a very decided improvement in the kind of scales that are being used; also that the local sealers, as a rule, are taking more interest in their work. In order that sealers in cities and towns should be more willing to hold the office of sealer where there is no salary attached, I would recommend that they be paid per diem for services, and that all fees collected be turned over to the municipal officers. There are quite a few towns doing this, and I find that it gives much better satisfaction.

The people throughout the state are taking great interest in the work of the sealers, and I find that the consumer, as well as the tradesman, appreciates more every year the good work which is being done.

In the early part of the summer I was called to visit a town to see what condition the wagon scales were in which were used in



selling coal. Upon examination of the scales I found them in very bad condition, and was obliged to condemn them; I notified the owners that they must not use them until after they had been repaired, and supposed that they would attend to it. Some time after I received word that the coal dealers in that town were selling coal by the shovelful, calling eighty shovelfuls a ton. I immediately revisited this town and found out that was what they were doing. In that town about four thousand tons of coal a year was used. After my second visit there was immediately installed new coal scales, and the people today are getting nearer what they pay for than before. This is only one of the great many calls which the office gets in a year. In the past year there have been quite a number of tradesmen put on probation, as well as some prosecutions.

Also in the past year the towns have been sending to the office their weights and measures to be compared with the state standards; the law requires that this be done once in five years.

On October 28th I held a meeting of the local sealers; although the attendance was not as large as I expected, I had a very good number. There was a large exhibit of scales and oil pumps from the leading manufacturers, and able demonstrators for same. Next year I plan for a two days convention, as quite a number of manufacturers of weighing and measuring devices do not think it profitable to come so far for one day conventions. We were very fortunate to have with us F. S. Holbrook, from the National Bureau of Standards; Charles P. Murray, President of the Massachusetts Sealers' Association; Daniel J. Moynihan, representing the Moneyweight Scale Co.; Frank B. Foster, with John Chatillon and Sons; Matthew D. Ribble of the Standard Scale Co.; Daniel C. Palmer, of the Measuregraph Co.; Mr. Yates of the Gilbert & Barker Co., Oil Pumps; Mr. Higbee of the W. and L. E. Gurley Co.; Mr. Rice of the Dover Stamping Co.; also a representative of the Bowser Pump Co.; all of whom gave very interesting talks on weights and measures.

I wish to call your attention to the Sealers' Bulletin, that for the first time since the formation of the Sealers' Association they put before the public the best bulletin that any Sealers' Association ever had printed, and they wish to thank their patrons who so generously helped to make the same a success. I wish to thank Mr. Parker for the manner in which he managed

the soliciting of the advertising and the publishing of the bulletin without any expense to the Association or the state.

In connection with this report you will find a tabulated report from the local sealers representing four hundred and ten towns. This gives valuable information in regard to the good work which they are performing.

In conclusion, I wish to thank the Governor and Council for the courtesies extended to me, and especially I wish to thank you and Mr. Roberts for your good advice and hearty cooperation in all matters pertaining to this office.

Respectfully submitted,

LEVI S. PENNELL,  
*State Deputy Sealer.*

SUMMARY

Counties	Number Tested							Number Condemned							Adjusted		
	Scales	Weights	Dry Measures	Liquid Measures	Yard Sticks	Automatic Pumps	Milk Jars	Scales	Weights	Dry Measures	Liquid Measures	Yard Sticks	Automatic Pumps	Milk Jars	Automatic Pumps	Scales	Weights
Androscoggin Co.	1,357	1,751	416	530	95	185	1,250	21	12	11	24	9	6	9	..	..	..
Aroostook Co.	818	1,196	46	265	93	246	29	28	4	..	13	1	11	..	..	..	..
Cumberland Co.	2,349	2,453	501	827	44	329	631	170	101	15	6	1	2	..	14	..	..
Franklin Co.	285	344	41	105	33	72	..	8	1	6	..	3	2	..	..	..	..
Hancock Co.	734	1,178	141	527	49	137	59	14	..	..	19	2	5	2	..	..	..
Kennebec Co.	561	986	61	382	25	200	1,440	8	4	4	2	2	1	..	..	..	..
Knox Co.	828	1,792	178	628	100	136	1,043	30	271	14	18	8	7	26	..	..	..
Lincoln Co.	279	617	19	136	127	39	237	2	..	..	2	1	..	4	..	..	..
Oxford Co.	619	521	54	263	39	192	656	5	1	..	2	1	..	..	..	..	..
Penobscot Co.	1,588	2,723	264	1,016	112	546	193	25	10	..	9	..	5	1	6	9	5
Piscataquis Co.	226	426	21	87	16	59	31	5	..	..	..	..	..	..	..	..	..
Sagadahoc Co.	420	429	95	434	54	54	128	49	19	11	13	19	2	7	..	..	..
Somerset Co.	459	727	67	173	55	94	..	7	5	4	7	..	4	..	..	..	..
Waldo Co.	439	426	23	204	22	132	..	2	..	..	..	1	..	..	..	..	..
Washington Co.	824	1,424	197	503	119	198	200	12	..	..	9	3	5	..	..	..	..
York Co.	1,111	2,530	303	405	114	207	5,282	20	..	..	4	2	..	1	..	..	..
	12,897	19,523	2,427	6,485	1,097	2,826	11,179	406	428	65	128	53	56	50	20	9	5

## DIVISION OF ANIMAL INDUSTRY.

HERBERT M. TUCKER, DIRECTOR.

BROOKS BROWN, DAIRY INSPECTOR.

CHARLES H. CRAWFORD, SHEEP SPECIALIST.

## REPORT OF HERBERT M. TUCKER, DIRECTOR.

*To. Hon. John A. Roberts, Commissioner of Agriculture :*

I herewith present my third annual report of the Division of Animal Industry.

The work along Animal Industry lines the past year has progressed very satisfactorily, although not all our efforts have been expended directly in that direction. It is the practise in this Department to "change work" so to speak, when necessity seems to require it. During last summer the Division of Markets had a big job on its hands in organizing the sweet corn growers, and it called for several men in the field at the same time. To help along this worthy cause at a critical time, both Mr. Crawford and myself gave liberally of our time until the Sweet Corn Growers' Association was an assured fact. Surely no one can question the wisdom of this, when they consider what this organization stands for and what it is accomplishing.

The work of this Department for the New England Milk Producers' Association has been comparatively small the past year, because that Association is now grown to that strength and maturity where it is perfectly capable of walking alone and conducting its own business, without aid or assistance from any state.

During the past year I have addressed forty-seven public meetings, with a total attendance of one thousand six-hundred and sixty-eight. The most interesting of these meetings to me, and I think those that will prove of the greatest benefit, were those lectures and demonstrations in selecting and judging, both live stock and poultry, before classes in agriculture in High Schools. I fully believe that this work should be largely increased for the betterment of Maine agriculture in the future. It

is very much easier to guide a young and receptive mind into modern up-to-date channels of thought, than to get an older person who has formed habits to change his methods. It is to the young, who are to grow up and take our places, that we should look for the greatest improvement in all lines of work.

#### CATTLE.

The cattle on our Maine farms are showing a very satisfactory increase as the following table indicates:

	April 1 1917	April 1, 1918	Increase	April 1, 1919	Increase
Cows	141,135	149,905	8,770	152,617	2,712
3 year olds	24,141	27,195	3,054	27,126	-69
2 year olds	41,033	41,394	361	44,882	3,488
1 year old	50,361	57,737	7,376	62,115	4,378
Oxen	5,809	7,351	1,542	5,621	-1,730
Sheep	99,999	106,775	6,776	112,059	5,284

From the above table it will be seen that in two years prior to April 1st, 1919, there was a cow increase of 11,482, or 8.1 per cent. Three year olds increase of 2,985 or 12.4 per cent. Two year olds increased 3,849 or 9.4 per cent. One year olds increased 11,754 or 23.3 per cent. Oxen increased between April 1st, 1917 and April 1st, 1918, 1,542 head, but from April 1st, 1918 to April 1st, 1919, they decreased 1,730 head or 188 head since 1917. Sheep increased 12,160 head in the past two years or 12.2 per cent.

The facts regarding the increase or decrease of farm stock has very little bearing upon the actual prosperity or profit of the business. A marked decrease of dairy cows for instance, might mean a decided improvement in the dairy business, and might show a very forward step by the dairymen of Maine, if the cows disposed of were the low producers that are always with us, taking space, feed and labor, that should be used on animals that are profitable producers. In a very careful survey by the county agents, made something over a year ago in the state of Illinois, it was found that out of a total cow population of 1,200,000, one-third of 400,000 were unprofitable producers. It would be very interesting to know how many head of profitable cows it took to

make up the deficit caused by these poor cows. Very likely it would take the major part of another third, so what a great benefit it would be if that state sent her unprofitable cows to the butcher, and there is no reason to believe that conditions in Maine are any better than in Illinois. The New England Milk Producers' Association has done, and is doing a wonderful work for New England dairymen, in equalizing prices on dairy products and advancing them in proportion to cost of production. This could only be done when contractors, regional milk commission, committees of investigation, and the consumer were shown definite figures that could not be questioned, regarding the cost of milk. The dairymen at large are under great obligation to the comparatively small per cent, who were business men enough, to keep accurate figures on the cost of production, but these for the most part were men that eliminated their boarder cows as fast as their records showed them to be such. Consequently, the cost prices submitted was the cost of milk from good herds in most cases. As one goes into different sections of the state, we hear many complaints that the present price is not sufficient to show a profit, and doubtless this is true, but it is also true that in very many cases the trouble is not with the price, but with either the man or his cows, or both. The price of dairy products should not be such as to put a premium on inefficiency. Extremely high prices will surely reduce consumption and while the farmer of Maine should receive just compensation for his time, be it eight or sixteen hours per day, interest on investment, depreciation, overhead, and every other item entering into the cost, yet the farmer should be a business man and study to keep these items as low as possible and should retain only such animals on his farm as the Almighty intended to be profitable producers with proper care and feed. Let the N. E. M. P. A. and other kindred farm organizations do their work. They are extremely necessary, yes, indispensable, yet it is not right to put all responsibility for success or failure on these organizations. There is a part each one must do for himself if he would succeed in any branch of business, and that part no association can ever do for him. In all my educational work among the farmers of Maine I am trying to emphasize this point.

## POULTRY INTERESTS.

During the past year the poultry of Maine has come back in a wonderful degree. It is doubtful if there is yet the hen population there was before the war, but it is making good healthy growth.

What I said regarding the profitable production of dairy products is equally true of poultry. There are expensive boarder hens that eat up the profits of the workers just the same as with the cows. To the up-to-date poultryman, the elimination of these unprofitable birds is a comparatively easy task, and the breeding for egg production is not half as complicated a job as many think. The quickness with which one can get results in breeding poultry makes it a very interesting subject, as an experiment can be tried and definite results recorded, all within a year, or a year and a half at most for a full year's laying period. It is gratifying to know that many breeders are spending much time and energy along these lines of breeding and culling, and there is no question but their flocks will show a very much increased profit by so doing. To aid along this line of work, this Department has held a series of poultry institutes to explain methods of selecting the profitable producing hen, and so breeding her to produce a flock of high layers. That more money could very profitably be spent for educational work along these lines, is apparent to every one interested in poultry. For the past five years, the State by special appropriation, has given one thousand dollars to the various poultry shows of the State for utility features, and this money has been carefully expended to encourage these qualities among the pure-bred breeds. At the last regular session of the legislature a bill was introduced to increase this appropriation to two thousand dollars. The bill received the unanimous support of the committee on agriculture, and passed both branches of the legislature, but complications arose and it was cut down to the former amount. This was a mistake, as the money was needed by the poultry associations to carry out an educational program that would be a drawing feature of these exhibits, as well as prizes for utility conformation. It is certainly to be hoped that nothing will arise next year to prevent this increased appropriation, and if this Department had funds to keep a poultry specialist in the field all the time, it would prove

of wonderful assistance to one of Maine's most important industries.

The work of milk and dairy inspection under Brooks Brown, and that of C. H. Crawford, as Sheep Specialist, has been carried on in a very satisfactory manner, and I wish to commend both gentlemen for the energy, zeal and efficiency shown in their Departments. A full report of each covering in detail their activities the past year, is appended.

In closing I cannot refrain from speaking of the harmony and good feeling that has prevailed in every branch of your Department, and for the wise counsel and guidance you have given. I know that I am voicing not only my sentiment, but that of every one under you, when I say we are one in promoting everything that is for the betterment of Maine Agriculture.

Respectfully submitted,

HERBERT M. TUCKER,  
*Director, Division of Animal Industry.*



## REPORT OF DAIRY INSPECTOR.

*To Herbert M. Tucker, Director of the Division of Animal Industry:*

I respectfully present my second annual report as Dairy Inspector for the year 1919.

The work of this Bureau has followed about the same course as in previous years. I have not collected as many samples of milk and cream as I did in 1917, but more time has been devoted to the inspection of dairies and milk depots. It is unfortunate that even more time could not be given to this latter part of the work, as it is very important.

It is true that there are some unscrupulous dairymen and milk dealers in the state, as is indicated by the figures given below, but the vast majority are doing their best to furnish the public with a safe, unadulterated product at a reasonable price.

A few restaurants have been notified to comply with Section 7, Chapter 130, of the Revised Statutes of 1916, which states that: "No person shall by himself, his clerk, servant or agent, furnish oleomargarine in any hotel, restaurant or boarding-house, or at any lunch counter, to a guest or patron thereof, instead of butter, without notifying said guest or patron that the substance so furnished is not butter." Violations of this law are being investigated almost wholly by the Bureau of Inspection.

## MILK AND CREAM ANALYSES.

Four hundred and sixty-one samples of milk and cream were purchased during the year from retail dealers residing in sixty-four different towns and cities scattered throughout the state. Frequent visits to a number of cities were necessary, due to an inferior product being put out by a few dealers.

Of the samples collected, seventeen were found to be below the standard in fat, required by law, and twenty-three, in total solids; seventeen were watered, six skimmed, and seven were dirty. Many samples showed sediment but not enough to be classed as dirty. Five persons have been prosecuted and con-

victed as a result of the violations mentioned. Sixteen more cases are pending.

While I feel sure that the number of samples of adulterated milk and cream, in proportion to the whole number taken would not hold true, if samples could be obtained from all dealers in the state, yet I do believe that with more samples being taken, more unscrupulous dealers would be discovered and brought to justice. This can only be done by employing more inspectors.

#### INSPECTIONS OF DAIRIES AND MILK DEPOTS.

This important branch of the work is being developed as much as is possible with our limited appropriation. Two hundred and fifty dairies and milk depots have been visited during the year 1919. Several visits have been necessary in many cases. I have endeavored to inspect at least a few of the places supplying milk to each of our larger towns and cities. The percentage of dairies visited compared to the total number in the state is small, but most of those visited in the past will not, I believe, have to be visited very frequently in the future.

The majority of the dairies inspected have been satisfactory from a public health standpoint. The owners have evidently tried to put a good, clean product upon the market, and have endeavored to handle their milk and cream according to sanitary methods. There is, however, a fairly large minority of retail dealers in this state who, either because of carelessness or insufficient knowledge of their business, are daily putting out a product which, while it may not in most cases be dangerous to health, yet, has very great possibilities of contamination.

Permit me to mention briefly some of the conditions I have occasionally observed:

1. Cows which had not been properly brushed and cleaned for a considerable length of time.
2. Manure under cows, which must have accumulated for many days.
3. Horses, cows and hogs kept in same tieup.
4. Milk pails, cans, etc., with seams containing dried milk and dirt.
5. Cans, filled in the tieup for distribution to customers.
6. Bottles, filled without washing in some instances, and in

other cases they were simply rinsed in cold water, after being returned by the customer.

7. Free access to cans, bottles, etc., by flies that may have been visiting the nearby manure pile.

8. Dogs and cats, passing with the greatest freedom in and out of the room used for handling the milk.

9. Milk bottle caps, kept in uncovered boxes containing a large amount of dust and dirt.

10. Utensils, washed in water obtained from wells located in barnyards and near manure piles.

I do not want you to gain the impression that the conditions such as I have mentioned are very numerous, because they are not. However, I do believe the situation demands more attention by the citizens of the State of Maine. Most of the dairymen, with conditions such as I have described, have been very ready to correct their faults after having them called to their attention.

The amendment passed by the Seventy-ninth Legislature, to Section 5, Chapter 37, granting the Commissioner of Agriculture authority to bring action against a milk dealer for the purpose of revoking his license has been used only once. The court decided the case in our favor. Three other dealers have voluntarily given up their licenses rather than comply with our requirements or have the matter taken into court.

#### INSPECTION OF DAIRIES WHOSE PRODUCT GOES TO CREAMERIES SUPPLYING THE BOSTON MARKET.

I have recently been in communication with Dr. R. E. Dyer of Boston, who is in charge of the Dairy Inspection Division of the Massachusetts Department of Health, regarding patrons of creameries in this state whose product is being shipped to Boston and who have been excluded, because of insanitary conditions, from continuing this practice. If the milk sold by these dairymen is not satisfactory to the citizens of Boston, it should not be satisfactory to the citizens of Maine.

I have received a report on about two hundred dairies excluded during the past year, by the Massachusetts Department of Health, and if the insanitary conditions described are not greatly improved by the time it becomes possible for this Bureau to

investigate them, the owners should not be permitted to dispose of their product in this state.

These investigations will be made at the earliest possible moment, but since I believe the greater part of my time should be devoted to investigating retail dealers, and dairies supplying retail dealers who are disposing of their milk and cream in our own cities and towns, this work may necessarily be prolonged.

#### CREAMERY INSPECTION.

Eighteen creameries have been inspected and the sanitary conditions of each have been found to be very satisfactory. There are, however, some criticisms to be made as to the methods employed in using the Babcock Test.

Most of the creameries inspected did not place the test bottles in a bath, after taking them from the centrifuge. Of those that did use the bath, only one used a container of sufficient depth to bring the water line above the fat column. In a few instances the samples were kept at a high temperature by forcing steam into the centrifuge, and permitting the bottles to remain there until removed for the purpose of measuring the fat column. A number of the men employed to do the testing did not use callipers for measuring the fat column. None of the creameries visited employed any means for testing the strength of the acid they were using.

The chief criticism which I have to make is in regard to the length of time elapsing between tests. With one exception, all of the creameries in the state, in so far as I am aware, test their patrons milk only once each month. The one shining exception tests every two weeks. During the warm weather and under ordinary creamery conditions, composite samples will not keep in a satisfactory condition for testing much longer than fifteen days.

During the past summer I have seen many samples from which, because of their decomposed condition, it would be absolutely impossible to make an accurate test.

It does not necessarily follow that the test would be unfair to the patron, in fact it might favor him; nevertheless, only by chance, would it be accurate and fair to both creamery and pa-

tron. This is a condition which should be remedied as soon as possible.

Patrons of creameries have taken advantage of the new creamery law, Chapter 170, Public Laws of 1919, in only a few instances. I believe, however, that as soon as creamery patrons become more familiar with this statute we will receive many requests for assistance.

“CHAPTER 170, PUBLIC LAWS OF 1919.

“An Act relating to the inspection of creameries, cheese factories, condensaries or receiving stations for milk or cream.

“SEC. 1. The commissioner of agriculture, or his deputy, may enter upon the premises of any creamery, cheese factory, condensary or receiving station for milk or cream, and may take possession of any or all samples of milk or cream drawn for the purpose of testing their butter fat contents, which are on the premises or in possession of any employee, or may take samples from patrons' deliveries, and then and there test the same. The owner, operator or manager of any creamery, cheese factory, condensary or receiving station for milk or cream shall, if requested by said commissioner or his deputy, give him full access to all creamery records appertaining to the tests thereof, and said commissioner or his deputy may make transcripts therefrom. The results of the tests made by said commissioner or his deputy may, at the discretion of said commissioner, be communicated to the owner, operator or manager or to any of the patrons of the creamery, cheese factory, condensary or receiving station for milk or cream from which such samples have been taken and tested, or to all of them. The owner, operator or manager of any creamery, cheese factory, condensary or receiving station for milk or cream at which tests, under the provision of this section, are made by said commissioner or his deputy, may require said commissioner or his deputy to take duplicate sealed sub-samples of all samples thus tested and to promptly forward the same to the Maine Agricultural Experiment Station for further test, in which case no communication of the results of the tests made by said commissioner or his deputy shall be made to the patrons of the creamery, cheese factory, condensary or receiving station for milk or cream, unless the same shall substantially agree with the

results of the tests made by said Maine Agricultural Experiment Station, or unless the commissioner is notified by the Maine Agricultural Experiment Station that the samples were received in a condition unfit to analyze. The owner, operator or manager of a creamery, cheese factory, condensary or receiving station for milk or cream, who shall require the taking and forwarding of sub-samples shall pay in advance all the carriage charges thereon and said Maine Agricultural Experiment Station for all tests made under the provisions of this section at the rate of ten cents for each milk sample and fifteen cents for each cream sample. The money thus received shall be used to defray the expenses incurred by said agricultural experiment station in connection with this act, but any balance that may remain after paying said expenses shall be paid by the director of said Maine Agricultural Experiment Station to the state treasurer. Said Maine Agricultural Experiment Station shall report in duplicate to the commissioner of agriculture and to the owner, operator or manager of any creamery, cheese factory, condensary or receiving station for milk or cream, the results of all tests made by it. If samples are received in poor condition said Maine Agricultural Experiment Station shall not be required to analyze the same, but in such case the advance payments required by this section shall be returned to the party making the same.

“SEC. 2. The commissioner of agriculture, or his deputy, may enter the premises of any creamery, cheese factory, condensary or receiving station for milk or cream, and may inspect all apparatus and materials used for making tests for the purpose of determining the accuracy of the same, and for ascertaining whether the provisions of sections twenty-eight, twenty-nine, thirty and thirty-one of chapter thirty-seven of the revised statutes are being complied with. Said commissioner of agriculture may order any testing apparatus to be repaired or may condemn the same or any part thereof or any materials used in making tests, and may give such instructions regarding the making of tests as he deems proper.

SEC. 3. Any owner, operator or manager of a creamery, cheese factory, condensary or receiving station for milk or cream, wherein milk or cream are bought and paid for on the basis of their butter fat contents, who credits any patron or patrons delivering milk or cream with a greater or less percentage of fat

than is actually contained in the milk or cream so delivered, or who shall hinder, impede or obstruct said commissioner of agriculture, or his deputy, in the discharge of his duty under this act, or who shall refuse him access to his testing apparatus or his records of tests, or who shall neglect to follow the instruction given him by said commissioner of agriculture in accordance with the provisions of this act shall be fined not more than one hundred dollars nor less than twenty-five dollars for each offense."

#### LOCAL MILK INSPECTION.

In 1916 there were about half a dozen local milk inspectors in the state. A few of these men were doing all they could toward improving their local sanitary conditions. At the present time there are thirty-three men engaged in this work in the larger towns and cities of the state. The majority are taking an interest in their duties and much good is being accomplished. This Bureau is cooperating with them in every possible way.

#### MEETINGS AND EXHIBITS ATTENDED.

At the request of the Commissioner of Agriculture, I have delivered a short talk on some phase of dairy and milk sanitation at seven different meetings, having an aggregate attendance of about eight hundred. I assisted Major E. E. Philbrook, Deputy Commissioner of Agriculture, in arranging the state exhibit at the Eastern States Exposition, Springfield, Massachusetts, Prof. L. S. Dorsey of the University of Maine, and I acted as judges of dairy products at the Central Maine Fair in Waterville. I also judged the dairy products at Topsham Fair. Some slight assistance was given to the establishment of a milk station in Lewiston, during the early part of the summer.

#### RECOMMENDATIONS.

1. An increased appropriation for milk and dairy inspection in this state is vitally necessary if the consuming public and careful, honest dealers and dairymen are to be protected. A great deal of this work should be along educational lines, but compulsion is necessary in many cases.

The Seventy-ninth Legislature voted "Ought not to pass" on a bill authorizing a fee of one dollar to be paid by each person, firm, or corporation to whom a license is issued, and the money to be used for the enforcement of the dairy laws. Many of the Representatives who opposed this bill assured me that they would gladly favor a bill authorizing an increased appropriation for the work. Their only objection was in regard to the method of raising the extra funds. I believe that an appropriation of \$10,000 each year is necessary to do justice to this important work.

It is very evident, I believe, that one man's efforts can accomplish comparatively little in the various branches of the work supposed to be done by this Bureau.

2. The Commissioner of Agriculture should, in my opinion, have some direct oversight, fixed by the Legislature, over the Local Milk Inspectors. This is chiefly necessary because of the failure of some Inspectors to fulfill the duties of their office.

3. Some penalty should be fixed in regard to towns and cities failing to comply with Section 12, Chapter 37, of the Revised Statutes of 1916. (As amended by Public Laws of 1917) "Inspectors of milk, appointment. The municipal officers of cities and towns containing not less than three thousand inhabitants, and the municipal officers of all other towns on application of ten voters therein, shall appoint annually one or more persons to be inspectors of milk, cream, butter and all other dairy products, substitutes therefor and imitations thereof, who before entering upon their duties, shall give notice of their appointment by publishing the same for two weeks in a newspaper published in their towns, if any, otherwise by posting such notice in two or more public places therein; and they may receive such fees as said officers establish."

4. The Commissioner of Agriculture should be granted more authority in the making of regulations pertaining to the dairy industry, and especially in regard to the methods employed in the use of the Babcock Test.

5. A revision of the Dairy Laws should be made since the meaning of many phrases are very obscure and difficult of interpretation.



In closing this report, I wish to express my gratitude to the Hon. John A. Roberts, Commissioner of Agriculture, and the other members of this Department for their kindly assistance, freely given at all times.

Respectfully submitted,

BROOKS BROWN,  
*Dairy Inspector.*

## REPORT OF SHEEP SPECIALIST.

*To Herbert M. Tucker, Director of the Division of Animal Industry:*

I herewith submit my annual report for the year 1919.

As a result of study and observation in my work during the year 1918, I was convinced that the first step to be taken in establishing the sheep industry on a good permanent paying foundation, would be to eliminate as far as possible the diseases most common among the flocks. I was also convinced that in order to accomplish much along this line of work it would be necessary to make a thorough canvass in the sections where these troubles were most common; the calls for assistance coming mostly from those who were meeting with severe losses, while many flocks in the immediate vicinity were affected with the same trouble. While a large percentage of these men realize that they have some trouble in their flocks, many of them seem reluctant to admit it, thus making the work more difficult to accomplish, also making a flock to flock canvass necessary.

It is with a great deal of satisfaction, however, that I can say there has been a marked improvement during the year along these lines as a result of individual work, lectures, and the bulletin on "Sheep Raising on Maine Farms," issued in June, having heard from many flock owners by word and letters that they had received the bulletin and had read it carefully, and by so doing had discovered the trouble with their sheep, and by following the directions given had obtained satisfactory results. During the year 1918 it was most impossible to get any one to prepare and administer the remedies, without some assistance from someone who had had experience, but during the past year I have received many reports from men who have prepared and administered the remedies with perfectly satisfactory results, all of which shows that the work of cleaning up the flock is meeting with very satisfactory progress. It will, however, be necessary to keep these common diseases and their treatment before the flock owners continuously for a long time, as the demands on the

farmers' time are many and quite naturally something must be put off, and as it has been the common practice for many years to give the sheep the last consideration, it being common knowledge that they are the only animal on the farm that can be neglected without fatal results. Many farmers however, are coming to realize that when they balance up for net profit, the flock of sheep when properly fed and cared for, stand at the head of the line.

#### WORK IN NORTHERN AROOSTOOK COUNTY AND ALONG THE ST. JOHN VALLEY.

Early in February I was requested to visit some flocks in northern Aroostook County, so decided to investigate the possibilities and conditions of the industry along the St. John Valley. The matter was taken up with the representatives from that section, who arranged for meetings to be held where I could meet and talk to the farmers along the different lines of the sheep growing business.

Although somewhat handicapped by being unable to talk the French language, with the assistance of interpreters I succeeded in explaining to the large numbers present, the necessity of good care and feeding, during the winter months, while the sheep were forced to remain in the barn, also the advantages in using pure-bred sires in building up their flocks, both as to size and production. Much interest and enthusiasm was displayed during the meetings; following the address was a general discussion by nearly every one present, with a mixture of French and English language. These meetings were followed by visits to the farms through the day where the flocks were inspected, and advice given according to the needs of the individual flocks. Although it is a little difficult to carry on work in that section owing to the fact that nearly every farmer speaks the French language, yet I believe there is a great field for work, especially along the lines of sheep husbandry. In most cases the fields are under a high state of cultivation and the pastures are well drained, well supplied with water, and produce a good supply of feed of good quality. At present nearly every farmer owns a small flock of from five to fifteen sheep, it having been the practice for many years

to produce only enough wool for the family use, none being sold for manufacturing purposes.

Climatic and other conditions are very favorable to the sheep industry all along the northern section of the state, and especially along the St. John Valley, as the temperature is seldom extremely hot during the summer season, and there is usually a sufficient amount of rainfall to insure a good supply of feed during the growing season. The cropping system as practiced by the farmers is ideal for the sheep industry, as potatoes and grain are the principal crops grown. This insures a continuous supply of good clover hay for winter, also a sufficient amount of oats for the flocks when needed.

The sheep should, and I believe would be doubled in numbers in a very short time with the necessary assistance and advice which would prove to be very profitable. Another reason why the sheep industry should be encouraged in this section is, owing to the fact that they are so far from the consuming markets they cannot enter into the dairy business; neither can they grow crops that are profitably grown in the central and southern sections, as they are subject to frosts nearly every month during the growing season. The winter season is ideal for sheep as the air is for the most part dry and cold, which is much appreciated by sheep. Wool and lambs find a ready market wherever produced, distance from markets having very little effect as they are not perishable.

The central and southern sections of Aroostook County are well adapted to the sheep industry, and it is believed that on many of these farms sheep could be made to return a profit that would prove very satisfactory. The interest in sheep is gradually growing throughout the entire country. The sheep industry in Aroostook County is not only taking on a steady, healthy growth in numbers, but quality is being considered. There is a greater demand for pure bred rams than in any other section, and many of those who have recently entered into the business have started with purebred stock, which not only makes the flock more profitable, but much more interesting. The increase in numbers of sheep in this county has been very substantial. As a county it is the leader in the industry and is destined to continue so.

Penobscot and Somerset counties show a very marked improvement in the physical conditions of the flocks, due to special

work in eliminating the parasitic diseases, and also in better care and feeding. In these counties as in others, the sheep men must get their eyes open to the fact that better breeding goes hand in hand with better care and feeding, and that it takes the combination to make the industry a success. It is especially noticeable in these two counties that the farmers are beginning to realize the advantage in growing rape to fatten the lambs for market, and to turn the breeding ewes onto, to give them a long boost toward fitting them for the breeding season and winter. Many of them are coming to realize the value of turnips for winter feed, and are growing a good supply. Every sheep man who furnishes his sheep with a good fall run, either by sowing rape or giving them a run in the fields where they get the aftermath, or in any way gets them in a thrifty condition before coming to the barn, and then has a good supply of turnips, need not worry about the high price of grain, as his sheep will not need any until just before the lambing season.

Reports from the different sections of the state show a substantial increase in interest as to care, in culling the old ewes, and selection of ewe lambs to keep the flock up to a standard, both as to quality and numbers.

Farmers are coming to realize more and more the advantages in keeping purebred sheep. Many inquiries have been made for a good place to purchase ewes, and the demand for purebred rams for 1919 has nearly if not quite, doubled over that for 1918. There have been a number of inquiries as to where small flocks could be bought, these coming mostly from men who wish to start new in the business.

Everything considered I feel that the sheep industry has had a steady, healthy growth during the past two years, and that there is every reason to expect that this growth will not only continue but will become more rapid as the owners learn that purebred sires, good selection, good care and feed will rapidly advance the profits.

The best possible education for any sheep raiser, be he man or boy, is to receive for his wool and lambs just what they are worth, no more and no less. In the case of wool, it has been practically impossible for many of the farmers who own small flocks to get for their wool what it was actually worth; in many cases they are forced to sell as soon as the clip is taken off, as

they must have the money. The wool buyer realizing this, usually buys at a low figure and makes the real profit that rightfully belongs to the producer.

The greatest cry coming from the sheep men is for a better market system for their wool, and it is very gratifying to know that the Maine Sheep and Wool Association is about to launch a plan for selling the wool produced in the state cooperatively. Undoubtedly this Association will supply the long felt need, and this with other projects under contemplation such as castrating and docking lambs, dipping for ticks and lice, should go a long way in making the industry profitable.

During the past year I have visited and inspected 122 flocks, comprising 4213 sheep, have addressed 27 Grange meetings, sheep meetings and dairy Associations, with an average attendance of 61, have bought and sold 21 purebred rams and have located and assisted in selling many more.

There has been in the past many pamphlets issued on the phases of sheep husbandry, but no attempt made to get together the material for the bulletin, covering the conditions in Maine. Realizing the great need and the great amount of good such a bulletin would do, I attempted to get together the material for the bulletin "Sheep Raising on Maine Farms." While it does not go extensively into the different subjects, it takes up the most troublesome questions in a way that should appeal to all sheep men.

The number of sheep has met with a healthy, gradual increase during the past two years which to my mind is much more to be desired than a spasmodic increase, as any abnormal increase is more subject to reaction.

The total number of sheep in Maine April 1, 1917 was 99,999. Total number April 1, 1918, was 106,775, making a net gain in one year of 6,776. The total number for April 1, 1919, was 111,059, making a net gain of 4,284. This shows a falling off in net gain for 1919, which is due more to a heavy culling in the flocks by taking out all unprofitable ewes and reducing the flock to a healthy sound number, which will prove more profitable and should prove to be the foundation for a much greater increase in the near future.

## MEETING OF SHEEP SPECIALISTS.

Prof. F. R. Marshall in charge of sheep extension work for the Bureau of Animal Industry, Washington, D. C., made arrangements for a meeting of the sheep specialists from the different states to be held in Chicago, November 26, 27, 28. The meeting was called for these dates in order that the men could have an opportunity to take in the International Live Stock Show which opened November 29th.

At the meeting of the sheep specialists the various questions affecting the different sections were discussed. One of which was "Problems of fitting range sheep and lambs for market." Many of the ranges, and in fact most of them according to reports, are subject to droughts during August and September, just at a time when the sheep and lambs should be fitted for the market, making it necessary to ship everything to a northern and eastern section where fresh grazing can be found. Thousands of carloads of these thin, unfitted sheep and lambs, however, are shipped direct to the stock yards at Chicago and other shipping centers. There they are culled by experts from the big packing houses, the fat ones taken out and slaughtered, and the undersized and thin ones sold to be taken back to the ranches where they are fed the aftermath of the stubble fields, and in many cases are turned in the corn fields where they get the small ears and eat more or less of the stalks. In this way they are fattened and once more shipped to the market where they are again culled by the packers and, as often happens, the culls are for the third time bought by some man having a ranch with a surplus of feed consisting of alfalfa and clover hay, and in many cases a large amount of immature corn which is often left on the stock, and the lambs allowed a free run and in this way are well finished for the market. It often happens that this is the man who reaps the great financial returns; one of the specialists reported on the results of demonstrations carried on in feeding range lambs, and reported that in some cases between two and three dollars per head net profit had been obtained. This handsome profit is made possible by there being so many unfinished lambs forced on to the market during and toward the end of the shipping season, thus creating a broken market, giving the buyer a chance to take advantage of the overcrowded market and buy at a very low figure. And

usually when these lambs are fitted and returned the rush of the shipping season is over and the demand for good lambs is sharp. In this way the feeder gets the advantage at both ends of the deal. Other subjects discussed were: "Advantages in castrating and docking," "Marketing wool cooperatively," "Use of pure-bred rams instead of grades," and "Cross-breeding for both wool and mutton." While in most cases the reports of demonstrative work, and lectures related to range conditions, yet there was much that could be applied to New England conditions.

#### A VISIT TO THE STORE HOUSE OF THE NATIONAL SHEEP AND WOOL GROWERS' ASSOCIATION.

While this Association is national in scope, as it does business on a commission basis and receives wool from every section of the United States, it is not a part of the state and national movement to cooperatively sell the wool for the producers. At the store house of the National Sheep and Wool Association we were given a chance to examine the thousands of tons of wool (mostly range wool) that had been sorted and graded, each grade in a huge pile by itself. We were given a demonstration on sorting and grading by an expert grader and was allowed to examine and grade, or rather pass our judgment as to grades (needless to say, this caused some amusement). Then it was passed upon by the grader who explained the necessary qualities of the several grades.

#### A VISIT TO THE YARDS.

Arrangements were made for us to visit the yards to see the lambs unloaded from the trains as they arrived, in many cases direct from the ranges. We were given an opportunity to examine the lambs in the pens, pass our judgment as to weight (both average weight and lot weight), and market value. As they were arriving quite freely we had an opportunity to compare the stock from the different states. Finally an expert buyer from Swift & Co. gave a talk on sorting and buying for the packers; also on the great loss to the producers by growing and selling uncastrated and undocked lambs, how the price of mutton and lambs were kept even from day to day. One of the surprising features of this talk was the wonderful knowledge the packing companies



had relative to demand for the different qualities of lamb in different places. The speaker mentioned several cities and told what grades or quality of lambs each would handle, and even what section of the city wanted the fore-quarters, the saddles and the hind quarters. The advantage in this talk would be in getting these facts before the producers in such a way that they would know when their mutton and lambs were in condition to supply the best trade, and would get for them the best prices. From the yards we were taken to the refrigerators and packing houses. Here the greatest surprise of all awaited us. The men employed in these departments took us down the long lines of carcasses and pointed out the various grades, told the section of country in which they were raised and the probable causes of poor quality. The great surprise was the fact that in most cases of poor quality, the carcasses were those of uncastrated lambs, demonstrating the great loss annually to the industry through failure to properly castrate and dock the young lambs.

#### INTERNATIONAL LIVE STOCK SHOW.

About twelve hundred sheep and lambs from the various sections of the United States and provinces of Canada were shown at the International, nearly all breeds were on exhibition. The great wonder is how they were brought to such a high state of perfection. To the ordinary eye each individual was perfect, but to the eye of the judges many fell so far short of the mark that they were hardly considered. One cannot fully appreciate the great amount of skill required in feeding and fitting sheep for such a contest, without first having an opportunity to witness the real work. It usually requires a number of years' experience as a feeder and trimmer, before a shepherd can expect to qualify in fitting for big contests. However with modern ideas and conveniences, and a natural taste for the business, young men often spring to the front in a short time. This is true in the case of Maine's youngest shepherd, who by the way, is the first Maine man having the courage to attempt to place Maine on the map as a producer of high quality sheep. H. W. Brock, Proprietor of Ashmont Farms of Alfred, after having only two years experience as a shepherd prior to 1918, decided to try and show the breeders from other states that the best Dorsets in the world

could be produced in Maine. Mr. Brock first took in the circuit of Fairs in Maine where he swept everything clean, not leaving any pickings for any one. Then he packed up his little bunch of Dorsets and started for Chicago to show the old breeders, like the Hawthorne Farms of Illinois, Hamilton Farms, New Jersey, Hearts Delight Farm of Chazey, New York, Kansas Agricultural College, and other old time exhibitors that real Dorsets could be grown in Maine. The first question to be asked by those long haired old-time winners was, who the young fellow was with the bunch of Dorsets, and what was he there for?—he couldn't stand a show with them! However they did not have long to wait for soon the different classes of Dorsets was called to show the ring; then the judge commenced the performance that makes all exhibitors perspire freely. To the great astonishment of the old timers the judge began giving certain signs and salutations which gradually sent them toward the foot of the line and young Brock to the head, until finally he came back to Maine with the winnings and among them, the prize of all prizes, the Grand Championship on his yearling Dorset Ram. Mr. Brock not only came home with many prizes but with the promise from the old timers that it would be the last time he would come to the International and carry off the prizes. Soon after arriving home from the International of 1918, Mr. Brock began to lay the foundations for an exhibit for 1919, believing that with the experience gained at the previous show, he could still improve his flock enough to be safe for another winning, realizing full well that he must have much more quality the next time. When the time arrived once more young Brock packed his kit of Dorsets and started for Chicago. And once more on arriving was informed that he had better have stayed in Maine as he would not get a single prize, that those Farms having millions of money behind them had come prepared to lug off all the prizes, but alas, once again disappointment was waiting for them. After the smoke of battle had cleared away it was found that Ashmont Farms of Alfred, Maine, had bagged nearly all the winnings as follows:

*Second* on aged ram, *first* on senior ram lambs, *first* on yearling ewes, *first* on senior ewe lambs, *first* on aged flock, *first* on young flock, and Grand Champion Ewe. When the vast amount of experience and money that opposed Ashmont Farms at the International this year is considered, every lover of sheep in Maine

should throw up their hats and shout "Hooray" for the first and only Maine man, to exhibit and bring back prizes from the great International.

Respectfully submitted,

C. H. CRAWFORD,  
*Sheep Specialist.*

## REPORT OF DIRECTOR OF THE DIVISION OF MARKETS.

*To Hon. John A. Roberts, Commissioner of Agriculture:*

I herewith present my third annual report as Director of the Division of Markets.

The activities of this Division, as in the past, have been along the lines of organization and helping to strengthen the local units that already exist. The Division received a small increase in its appropriation and so I have been able to have extra help since July 1st. C. M. White was appointed Field Agent of the Division, and I am glad to say that he is very helpful and efficient in his work, visiting the old locals and helping them to establish a uniform and simple system of bookkeeping, assisting them in canvassing to get new members, selling stock, also organizing new locals.

Many of the projects outlined in the report for 1918, as possible lines for the Division of Markets during 1919, have resulted in accomplishments far beyond anything it was thought could have been accomplished in so short a time. A notable example of this is the expansion of the activities of the New England Milk Producers' Association. This organization has always received the support of this Department, and at the annual meeting, February 28, 1919, the head of the Division of Markets of this State was elected to the directorate and later to the presidency of the Association. While it had been expected that eventually this Association must not only be used for collective bargaining, but must also expand in such a way as to be able to provide marketing facilities for the dairymen of New England, these hopes during the year have rapidly approached realization in negotiations with the Turner Center Dairying Association. Plans have been completed and carried out so that this Association is now known as the Turner Center System and will be reorganized within the next five years on a strong cooperative plan, to be owned by the actual producers of dairy products in the territory served by the system. This creamery had its inception at Turner Center some thirty-five years ago, at which time it was organized by the

farmers as a cooperative creamery. Owing to difficulties and lack of support it had a narrow escape from complete suspension of business, but due to careful management and financial support from a few of the members, the business survived and has grown steadily from an annual income of \$20,217.26 in 1885 to \$4,759,814.62 in 1918. While the Turner Center Dairying Association has been practically a close corporation during the greater part of its existence, nevertheless it is doubtful if any other concern handling dairy products has succeeded to so great an extent in keeping the good-will and support of its patrons. Their method of buying milk and cream is proving to be one of the most just that has, as yet, been developed the plan followed being to pay for the butterfat according to the market price of butter, and in addition to the butterfat contents of the milk or cream, to pay for the bulk of the skim-milk by the hundred weight, according to its value in the market as fluid milk. While this is simple, it has proven to be at the same time elastic enough to adjust the price readily to market fluctuations, and since its adoption by the Turner Center has been copied by many other concerns. Another plan which at first met with considerable opposition, but which later proved much more economical and satisfactory, was for each producer to own his own cans in which to transport milk from the farm to the skimming station, as by so doing the cans received better care and there was not such a heavy charge for loss. Another plan, which has been particularly pleasing to the patrons, and is now to be used in reorganizing the concern upon a cooperative basis, is that of paying out a portion of the legitimate profits of the year's business to the producers, in the form of a dividend according to the amount of milk or cream sold through the Association. The rate paid in 1918 was three and three-quarters per cent. According to the plan of reorganization adopted, the system will have three classes of stock, to be known as preferred stock, common stock, and cooperative stock. The preferred stock, as its name implies, is preferred only in a guarantee of interest and protection by the assets of the Company, but carries no voting power. The common stock is the now existing stock of the corporation, and is to be retired by the proceeds from the cooperative stock to be issued. This cooperative stock will be issued in lieu of a trade dividend, which has been paid to the producers for the last few years from the profits of the

system, and it is expected that this trade dividend, or cooperative stock in the next five years will retire all of the common stock now held by individuals. By this plan the producers will have voting power in the system on the basis of "one man, one vote," and the original owner of the stock will be entitled to vote. Should he dispose of his stock to other parties it would carry no voting power. Following out this same plan, should it happen for any reason that all the now existing common stock should not be retired at the end of five years, as the by-laws of the system have been revised, it will carry no voting power, neither will it draw interest. While the plan has taken a great deal of time to perfect and many have criticised the slowness of the work, nevertheless, the importance of the task undoubtedly justifies a great deal of care in working out the details. This has been exercised and the results promising to more than fulfil expectations.

This has been a progressive year in organization work. I spent two weeks in Aroostook County last February, accompanied by Theo Wade of the Federal Bureau of Markets, and at this time, after holding a series of meetings in different parts of the country, assisted by the County Agents J. L. Scribner, O. B. Griffin, and George V. Brown, the Federation of Aroostook Farmers' was organized at Caribou, a county-wide organization. Since then, twenty locals have been organized in different parts of the County. Their organization is for buying fertilizer, selling potatoes, and looking after any economic question affecting their industry. The organization was formed too late last year to do much at selling, but is proving to be a satisfactory business in buying fertilizer for its members, especially chemicals for home mixing. This year a Sales Manager has been engaged and is going a good business in selling potatoes for the members of the organization. They are organized along right methods and backed by a good, strong, membership and their success is already assured. This Association has already taken action so that when the tariff is revised they will be in a position to make their strength felt.

Last March, owing to one of the companies, that own and operate several corn factories in Maine, endeavoring to make a cut in the price paid farmers for their corn so low, that figures furnished by the farm management, under the Director of the Extension Division of the University of Maine, showed that the

price to be paid for 1919 per pound, would not pay for the cost of production. Immediate plans were made for organization, and by-laws were formulated by the Division of Markets, similar to those of the New England Milk Producers' Association. As the work was urgent, it required not only a great deal of the time of the head of this Division and its Field Agent, but also the assistance of C. H. Crawford, Sheep Specialist, and H. M. Tucker, Director Division of Animal Industry, cooperating with several County Agents and Farm Bureaus. A successful campaign of organization was begun. At the close of the year sixty locals had been organized out of a possible seventy with a membership of twenty-one hundred. I am pleased to say that in negotiations with the packers, everything has been very satisfactory to all concerned.

The Sheep and Wool Growers' Association, a volunteer organization that has been in existence some three years to promote the sheep industry of the state, are about to reorganize and are getting ready to be incorporated, so they can be in a position to sell the wool for its members, and surplus sheep and lambs.

The older farm organization, the Farmers' Union, was never more prosperous. As outlined in last year's report, it was hoped to get in closer touch with the various Local Farmers' Unions and on the 21st of April, C. M. White took up the work of Field Agent. During the year Mr. White has called on thirty-four locals; introduced a system of bookkeeping in four different Unions, audited books for six, and attended ninety-one meetings for various purposes, at which there was an average attendance of thirty-three. The subjects discussed being the marketing of milk, Fruit Growers' Associations, Farmers' Unions, Sweet Corn Growers' Associations, and other related subjects. This work should be pursued more closely the coming year and if possible, emphasis should be placed upon a better system of bookkeeping, as in many instances some of the difficulties of the Locals may be easily overcome, if the Directors and Managers cooperate more closely with one another, and keep the books posted in such a way as to clearly show just how the Union stands. Then if a deficit is occurring, take means to correct it. Five new Locals have been organized during the year, one at Calais; one at Harrison; one at South Paris; one at Etna; and one at Levant. Several that have been doing a car delivery business, have either leased or pur-

chased buildings, and started in on a regular business method with well stocked stores in charge of a competent manager, open for business every day. Speaking of the new Unions, perhaps most notable of these is that of Calais, which has evidently profited by the lessons learned in other Unions in regard to lack of finances. This Local is composed of farmers and railroad employees. They are doing such a large business that it requires five men in their store and their prospect for the future is very satisfactory. We see no reason why this could not be worked in other sections, cooperation on the part of farmers and artisans, to buy cooperatively, and the result may be that the farm members can supply the other members with some of the supplies they raise on their farms, to the mutual advantage of both classes. This Union is unique in that no subscriptions have been made for less than five shares of stock, and when the store opened for business on July 22nd, \$3,000 had been paid in as capital stock. Since that time this Union has grown by leaps and bounds and is doing a business of nearly \$15,000 per month. A movement to induce Local Unions to properly capitalize the Farmers' Union Grain & Supply Company has received our hearty support, and it is hoped early in 1920 to see all the stock of this Central wholesale house in the hands of Local Farmers' Unions in \$500 blocks, and the Locals will be in a position to have a cooperative deal from the ground up. The plan to be followed in both the Locals and the wholesale house being to pay a reasonable dividend of six or eight per cent. on the stock issued, and the remainder of the profits to be distributed as a trade dividend, in proportion to the amount of business which each individual or Local Union transacts. In many instances this will be issued in the form of stock until such time as the Local or Central Organization is properly financed to conduct its business. The stockholders of both companies at their annual meetings voted to give the Directors of their respective companies authority to consolidate, and the Farmers' Union Grain & Supply Company amended their by-laws so that their annual meeting would come the last Tuesday in June, the same time as the annual meeting of the Farmers' Union, and at their annual meetings in June, 1920, it is expected that the companies will consolidate. At the present time all the stock of the Farmers' Union is owned by Locals, and most of the stock of the Farmers' Union Grain & Sup-



ply Company, and we are in hopes that what little stock is held by individuals, will be all absorbed by the Local Unions, before the annual meeting in June. The business has largely increased the past year and the Locals are getting on a more permanent basis. There are now one hundred thirty Locals.

The Fruit Growers' Exchange has had a very successful year in the selling of fruit for its members. They employed a Sales Manager all through the market season. They have certainly demonstrated that they have the right method of marketing. The members turn over their crop to the Exchange to be packed, graded, and marketed, the grading being done through this agency. That insures a uniform grade and the brand is a guarantee that the fruit is packed and graded intelligently and honestly,—in other words, this brand is a common language between the producers and consumers, which they both understand. The inspection system has not been satisfactory to any parties interested. Where individual growers each pack their own crop there are as many standards as there are growers. Through these associations the members are able to comply with the economic laws of trade by assembling their crop and selling through one agency, and they can insure the trade a continuous supply through the season and a uniform grade, with the agency back of it. This method of buying apples through one agency, dealers prefer in preference to buying of individual farmers, so now when apple dealers come into the state they prefer to buy through this agency. That being the case, the fruit growers that are not organized are at a disadvantage. While the work is being gradually extended over the state, an effort will be made to extend it more rapidly, so that all the fruit growing sections of Maine may be organized and sell fruit through this agency. This agency has always been very successful in buying the supplies needed in the production of fruit, like fertilizers and spraying materials, and barrels and boxes for packing the fruit. Some of the Associations own warehouses where they can pack their apples and store their supplies. This is very important and we wish that more might own their own warehouses.

#### WORK FOR THE FUTURE.

More organization work in communities where it seems to be necessary. This is especially true of the Fruit Growers' Associa-

tion in the orchard sections of Maine. They have demonstrated their method as the right way to sell fruit, and as the dealers are showing a preference to buy through these organizations, communities that are not organized will be handicapped in marketing their product. While we have special Associations for marketing certain crops, there are also some commercial crops that are not taken care of by any cooperative market organization, namely, hay, potatoes, outside of Aroostook County, and certain other crops that are grown to some extent, like beans, turnips, cabbage, and other market truck and small fruit. I believe that our Local Farmers' Union might be the unit in the country to assemble and grade these products. The Manager of these Locals could find out, by sending out questionnaires, what the members have for sale, that is not already provided for by some other market agency. The Central Association could hire a Sales Manager of known ability (along this line of business) to go into the market for the purpose of selling. In order for this method of marketing to be a success, the members would have to sign an agreement to sell all, or part of their crop through this agency, so the Sales Agent would know when he has an opportunity to make a sale, just where he could find the product to fill his order, otherwise the Sales Agent would not be sure that he could fill any orders that he might take. Since last July C. M. White has worked most of his time as Field Agent for the Division of Markets. The results that have been attained have justified the increased appropriation that was asked for last Legislature. This kind of work should be extended.

#### MORE PERSONAL CONTACT AND SUPERVISION BY THE DIVISION OF MARKETS.

##### *A Uniform Standard of Business along Good Business Principles.*

There is no Association, no matter how good the cause it represents that will extend its work and prosper, unless it is well organized and well supervised. There must also be hearty cooperation on the part of the members, and the members of the different farmers' organizations in Maine must come to believe that it is of as much importance to be in a position to sell crops raised satisfactorily, as it is to grow them. This is a fact that is well known by all successful manufacturing corporations. These

corporations consider their sales departments of equal importance with their manufacturing plants. The farmers of Maine until recently have been producing products every year without any Sales Department. Locals are the foundation of a Central or Market Association. If the Associations are to prosper there must be strong Locals, and this can only be by the individual members giving their Locals a hearty, moral, and financial support. Someone has said that we have too large a class of citizens in this country who are constantly talking about "my rights," without any consideration about their duties as patriotic American citizens, so we want members of each local association to consider their duties as good members, as well as their rights.

In order to successfully market farm crops, three conditions must exist: The trade must be assured of a continuous supply, of a uniform grade, and an agency back of it to guarantee these two conditions. This can only be done through groups of organized farmers representing their different industries. The Division has put in much time and effort along organization work, and as this report will show, has made fairly good progress during the past year. We are also a Bureau of Information, getting information from the Departments of Agriculture in the different states, as to the production of crops and condition of markets, and having on file in the office a list of the reliable commission houses. This information we have been sending out from time to time to the different farm locals, and other agencies in the state, also to the public press. In the future the Division will try to get more direct methods of marketing stuff like market truck, small fruit, poultry products, etc., by getting information from the hotels, and other local market centers, as to what supplies they may want from day to day, and the prices for same, giving this information out to the different farmers' organizations.

We have in Maine two kinds of farm organizations,—collective bargaining based on the idea of cost, plus a reasonable profit, and I want to say that I believe the basis of fixing cost should be on farm products, as this is the foundation of prosperity, what it costs under efficient management, or the amount of labor it takes to produce a bushel of wheat, pound of butter, or bushel of potatoes. When you get off this basis you have a one sided proposition and the result will be what you see now in New Eng-

land, the young men leaving the farms, because labor organizations are fixing the prices without any regard as to what it costs to produce food. Collective bargaining is necessarily limited by a small group of farmers producing a certain article with a limited area of production, like the milk producers of New England that are producing market milk for the cities of New England, or the Sweet Corn Growers' of Maine that are producing sweet corn for the canneries.

To sell potatoes or apples, or other farm crops that are produced, not only in this country but in foreign countries, cannot be done by collective bargaining. It must be done by an organization with more efficient methods of marketing, so that the producers can get more of the consumers' money, and that is the method that is being worked out by our Fruit Growers' Associations, Aroostook Federation, and Farmers' Union.

Before closing, I want to mention the paper that has been started in the interest of our farmers' organizations, called the "Organized Farmer." All manufacturing organizations, commercial associations, labor unions, have their organs so that the local members can constantly get in touch with the doings of the several Associations. This seems to be absolutely necessary to acquire the full measure of success, and it is just as necessary in our farmers' associations. This paper is organized on the plan of each Local Union, including subordinate granges to take one share of stock at \$10.00 a share, then a 100 per cent. subscription list from all the locals. If this can be fully carried out it will give us a subscription list of some two thousand, and make it one of the strongest agricultural papers in this part of the country. This method of organization insures that it will always be composed of the farmers, and all the profits will be used to make it a bigger and better paper. To make this the success that it should be, it must have the hearty cooperation and support of the members of all the different local farm associations, and this will also be a medium for this Division to disseminate information as to markets and market conditions, to the farmers of the state through this Local Organization.

Respectfully submitted,

F. S. ADAMS,  
*Director, Division of Markets.*

## REPORT OF SWEET CORN INDUSTRY.

*To Hon. John A. Roberts, Commissioner of Agriculture:*

I herewith submit my report on special work in the interest of the sweet corn industry.

The sweet corn industry has for many years been considered one of the leading industries in the state, or especially in those sections where it can be successfully grown. But like most all other branches of farming, little or no attention had been given to profit or loss until within a comparatively short time. Many of the farmers had been accustomed to grow their piece of sweet corn, and as it had been a custom of long standing, it seemed quite necessary to grow the usual amount, often time not receiving enough for the cut corn to pay for the fertilizer used in planting. This was called bad luck and they were ready to try again.

About 1915 the county agents began a systematic study of the sweet corn business and soon found that while a few of the most successful growers could actually show a net profit at the end of the year, the larger numbers were growing at a loss. In order to get these facts before the grower in a way that would cause them to consider this as a business proposition, in which the question of profit and loss must be considered, demonstrations were started under the direction of the County Agents, the grower being required to adopt the most modern methods in distributing the fertilizer, planting, cultivating and harvesting. All these methods were intended to increase the production, and lower the cost of the same, and finally to get the farmers to learn the cost of producing the various crops produced. As most farmers had never attempted to keep any accurate accounts with the various branches of their farming operations this looked like a big job, and most of them were rather slow in getting started. However, now and then someone would start an account with his sweet corn and quite naturally this man's crop would be watched very carefully through the entire season. After the county agent got the account balanced, every sweet corn grower was eager to

learn whether there was a profit or a loss on this piece of corn. This as well as all other good movements was destined to bring forth good results, for as a result of this demonstration work, the growers were gradually learning that growing sweet corn for canning was not as profitable as it had appeared, that a more thorough study of the modern methods of production was necessary, that an increase in both production and price was necessary for the industry to remain permanent.

As a means of getting higher production per acre, good seed corn was suggested. Most growers were found to be both willing and anxious to save some of the best of their corn for seed, but in this as in many other matters that looked to be much better for the grower, and just as well for the packer, the farmer in most cases was told that only corn grown from seed purchased from the factory would be accepted. This ruling of course ruined all hopes for an increased production from that source. A gradual increase in the price of labor, fertilizer, and most everything that entered into the production of sweet corn, together with two or three cold wet seasons prior to 1918 had so discouraged the growers that many of them had reached the breaking point and were ready to quit. When, owing to war conditions, the packers announced that they would give a war bonus of one cent per pound for cut corn, making a total price of five cents per pound, even with this price only the best growers could realize a profit, owing to the rapid advance in the price of everything entering into the cost of production, leaving the majority still producing at a less than cost. But with a price of five cents per pound for cut corn the growers were taking on new courage, were more careful in preparing the soil and caring for the growing crops, in full hope that they would get the cost of production at least, and that the price of fertilizer, labor and all other material entering into the cost of production would be gradually lowered with the price of corn. But in this they were in for disappointment. Early in April the announcement came from some of the packers that the price for 1919 would be four cents per pound, and that the contracts giving a price of five cents were cancelled. This proved to be more than the growers would stand and resulted in a general stirring up. There had been in the minds of a few men for a long time the necessity of an organization to both protect the

interests of the growers and promote the industry in every way possible.

This seemed to be the opportune time to set the necessary machinery in motion to perfect such an organization. The advisability of such a movement was first submitted to Commissioner J. A. Roberts and then to Leon S. Merrill, director of Extension Work, University of Maine, for their approval. The forces of both the Department of Agriculture and Extension Service including County Agents, Farm Bureaus and all allied organizations were set to work getting the growers together and perfecting local organizations wherever there was a canning factory. The first meeting was called at Benton where a large number of growers assembled and completed the first local organization. Soon after starting these organizations, the packers decided they could and would pay five cents per pound. In this as in many other instances the farmers were found slow to anger but mighty in battle. When it was found that victory was won before it was asked for, instead of resting on the laurels already won, they continued to bring in reinforcements until nearly every place where there is a cannery has a local branch of the Maine Sweet Corn Growers' Association.

The first local branch was organized at Benton, April 15, 1919. At present there are sixty locals with seven more localities to organize. There are nine county associations in the following counties: Androscoggin, Cumberland, Franklin, Kennebec, Knox and Lincoln, Oxford, Penobscot, Somerset and York. The State Association was organized at Waterville, October 8, 1919, with the following officers: President, H. A. Plummer, Benton; Vice President, W. S. Townsend, Newport; Secretary and Treasurer, C. H. Crawford, Department of Agriculture; the members of the Executive Committee are the President, Vice President, Secretary and also George E. Merrill, Gray, and C. Fred Tripp, Canton Point.

The purposes of the Association are to use every means for the upbuilding of the industry by encouraging modern methods of production, looking toward a higher production per acre, and a lower cost of production, more consideration of quality, believing this to be necessary in maintaining price.

On December 17th a joint meeting of the Maine Cannery Association and the Maine Sweet Corn Growers' Association was

held at Portland; at this meeting many important questions concerning both growing and canning were taken up for discussion. The principal questions brought up by the growers were as follows: *A Uniform Form of Contract* covering the following questions:

*First.* The question of placing an equal responsibility upon both grower and packer at time of inspection and delivery of corn.

*Second.* The question of better seed. It is believed that the production per acre can be materially increased by a more general use of native grown seed. The packers were requested where possible, and as far as is consistent, with the production of first class corn for canning purposes, that all seed should be grown in the section where its products are to be canned. Many complaints have been made that seed furnished by the packer has been put out regardless of the nature of the soil to be planted; very often men having heavy wet soil impossible of early planting is furnished with late maturing seed, forcing the grower to take chances of light production and early frosts. This in spite of the claims of the packers that their local managers not only know every grower but also the nature of his soil. One of the purposes of the Maine Sweet Corn Growers' Association is to assist as far as possible in regulating conditions of this kind by helping the grower to a more thorough understanding of his soil and the kind of seed necessary for high production and high quality.

*Third.* The question of a standard method of weighing and sampling at the cannery was also considered. Considerable dissatisfaction is displayed as a result of the method of handling, cutting and weighing now in use at many factories. The grower is obliged to stand all losses after delivery. In the opinion of the Association the responsibility of the grower should end when the corn is dumped on the yard of the packer, and that all losses from any cause from that time on should be borne by the packer. By adopting a standard method of sampling and weighing at the time of delivery, the corn when dumped is the property of the packer, he having an opportunity to handle and pack as he wishes.

An earlier time of payment was requested. In some cases the grower was not getting pay for his corn until sixty to seventy-



five days from the date of closing the cannery. In view of the fact that many of the growers buy and pay for their fertilizer early in the winter, they are compelled by those who make late payments to bear the expense and risk of producing and delivering a crop for ten months. Many others who depend upon the sweet corn crop to pay for hired help and fertilizer, are obliged to hire money for the same; in view of these facts the Association feel justified in asking for an early payment.

A special committee of four men from each Association were appointed to consider the requests of the growers and were instructed to draw a uniform contract covering the above mentioned requests. It was agreed that the contract when finally accepted, should be used by every packer in the Association. The members of the Committees were as follows:

From the Canners' Association, J. P. Baxter, C. L. Baxter, George B. Morrill and S. H. Soule. From the Growers' Association, H. A. Plummer, W. S. Townsend, George E. Merrill, and C. Fred Tripp.

It is expected that this committee will agree on a contract that will be much more equitable than many that are in use at the present time, and should go a long way in eliminating many of the difficulties that both the packer and grower have been subjected to in the past.

C. H. CRAWFORD,  
*Secretary, M. S. C. G. A.*

REPORT OF PROCEEDINGS  
OF THE  
MAINE DAIRYMEN'S ASSOCIATION  
AND  
MAINE SEED IMPROVEMENT ASSOCIATION  
City Hall, Bangor.  
November 18-21, 1919.

The meeting was called to order at 9 A. M., by the President, L. C. Holston, of Cornish, who delivered the annual address, as follows:

Our purpose as an organization, as stated in our constitution and by-laws, is to improve the dairy interests in the State of Maine. Now that means a whole lot, gentlemen, to improve the dairy interests in the State of Maine. Perhaps the best example of what has been done to improve the interest in the State of Maine is for practically every dairyman who is a member of this Association to join the N. E. M. P. A., for with their help I believe there is a chance for the dairymen of New England. Without it, it is questionable, because we are up against the proposition at the present time of producing milk with grain at four cents a pound, hay from a cent to a cent and a quarter a pound, and with labor costing us half a cent a minute. The organization of the Maine Dairymen's Association should be right behind the N. E. M. P. A., pushing it with all their might. We should cooperate with the N. E. M. P. A.; we should use our forces,—personal forces, and our money, to help this organization.

We, of course, are here to help the interests of dairying in the State of Maine, and so perhaps it would be well to call to our minds some of the things that perhaps the N. E. M. P. A. should do, that we think they are not doing, or perhaps not doing right. Now we do not want to come here with the idea of criticising the N. E. M. P. A., because I think they are doing everything that can be done at the present time. They have made wonder-

ful strides. But still there are some things that need correcting, and without doubt, they may come to pass without our saying anything about it, but it is just as well to call their attention to it. What is to become of the milk industry of New England, the whole milk industry? Perhaps New York conditions may give us an idea of what is going to happen in New England in time. Four years ago there was only one small concern in New York State putting out milk powder, and now a new factory building is being put up to manufacture milk powder at a cost of \$5,000,000. With an outlay of that kind we can see that they figure that there is something in the milk powder proposition. It is feared in New York city that in a short time there will be no whole milk to speak of delivered in that city. What will that mean ultimately to New York? And if it reaches New England, as of course it will in time, what will it mean to the population of this country, to the populations of the cities? Growing children need whole milk. It is necessary for their growth and development. There is a thing, gentlemen, that we have got to fight. Now this milk powder proposition has come about through surplus, that awful word "surplus" which we hear so much spoken of, especially since the N. E. M. P. A. has been organized, and it is an awful bugbear. We have got to find some way to cut down that surplus. The demand for cream is good. I have very little doubt but what the cream situation, if we could induce our farmers to sell cream to a larger extent than they are now doing, that it would obviate a good part of this surplus. And in cutting out the surplus, of course it would cut down the manufacturing, or the canning of milk products. Now of course a certain amount of canned product is needed. But I believe that there is being too much of that kind of stuff put on the market at the present time, very often at a lower cost than is warranted by the price of whole milk. I might say in passing that surplus is a drug on the market, although the manufacturers of milk powder last year made a net profit of 174 per cent. Figure that out as you will—you know what an awful drug surplus was on the market—as milk powder clearing a net income of 174 per cent. on the manufacture. No wonder they are going into the milk powder business.

Now there is another thing, gentlemen, that strikes us all more or less, and that is the discrepancy in the price of milk in

the low butter fat content, and the high butter fat content. Everything is figured on a three and one-half per cent. basis by the N. E. M. P. A., as you all know, and with the extra amount of four cents for every unit of butter fat above three and one-half per cent. Now you figure that out and you will find that the man who is selling milk which tests over three and one-half per cent. butter fat is not receiving sufficient compensation for this extra amount. Now we have got to do something, either as a Maine Dairymen's Association or as member of the N. E. M. P. A., to get those things on an even basis, that is, to figure so that a man who is selling five per cent. milk shall be paid according to the amount of butter fat. I believe, that the proposition is right here, that the milk has got to be paid for on the butter fat basis entirely. I do not think the skim milk proposition should come into the figures at all.

Now we have got to look these things in the face and they must be worked out.

Another thing that we ought to do as an Association, is to advertise our products. Milk, as you know, is the cheapest but the best food, and the people of our cities are not aware of that fact, and it has got to be driven home to them in some way, and the only way that a business concern can get these facts before the people is by advertising. They do not wait to let people find it out for themselves, but let the people know what they have got and the benefits that are to be derived from their products. Isn't it up to the Dairymen's Association to put through some propaganda by which we can bring to the attention of the uneducated, I might say, the proposition of cheapening the cost of living by using more milk?

The Secretary made his report. It was voted to accept it.

## REPORT OF TREASURER.

### RECEIPTS.

1918		
Nov. 25,	Balance from last year,	\$177.85
Dec. 10,	Received of E. L. White for 15 mem- bership dues,	15.00
Dec. 27,	Received of H. M. Tucker for 31 membership dues,	31.00

1919		
Feb. 20,	Received of H. M. Tucker for 6 membership dues,	6.00
May 1,	Received Coupon from Liberty Bond,	2.00
Nov. 1,	Received Coupon from Liberty Bond,	2.00
Nov. 14,	Received Interest on Bank Deposit,	3.00
		\$236.85

## EXPENDITURES.

1918		
Dec. 4,	Paid for badges,	\$ 12.34
Dec. 27,	Paid L. C. Holston expenses for attending Milk Meeting Portland and Executive Com. Meeting,	15.08
1919		
Feb. 28,	Paid L. C. Holston expenses for attending N. E. M. P. A. Annual Meeting, Boston,	19.20
Apr. 4,	Paid L. C. Holston expenses attending hearing before Legislative Committee,	19.44
Apr. 24,	Paid L. C. Holston expenses attending Federation meeting,	8.66
Feb. 18-19, Meh. 10-11,	Paid L. E. McIntire expenses attending hearing at Augusta,	17.16
Oct. 28,	Stationery and Postage,	2.07
	Unexpended Balance on Liberty Bond,	100.00
	Deposit in Bank,	42.90
		\$236.85

Respectfully submitted,

F. S. ADAMS,  
*Treasurer.*

Voted to accept the report.

The following committees were appointed by the President:  
 Nominations: A. E. Hodges, H. H. Nash, and L. S. Corbett.  
 Resolutions: C. L. Pike, Dr. Chas. D. Woods, and W. W. Pike.

Dr. Woods in behalf of F. S. Adams of the Experiment Station Council gave a report on the progress of Animal Breeding for Milk Production, being conducted by the Station as follows:

As the results which I am about to outline are going to be printed as a bulletin available to all, I shall consequently take only sufficient of your time to go over them briefly.

The work has been energetically pushed toward the publication of the results already obtained and to the solution of other problems of importance to us as dairymen. Six papers pertaining to this subject have been published during the year, or are in press.

a. Variations and Mode of Secretion of Milk Solids. By John W. Gowen.

b. The Variation of the Milk of Ayrshire Cows in Quantity and Fat Content of their Milk. By Raymond Pearl and John Rice Miner.

c. Studies in Milk Secretion. (V) On the Variations and Correlations of Milk Secretion with Age. By John W. Gowen.

d. Studies in Milk Secretion. (VI.) On the Variation and Correlations of Butter-Fat Percentage with Age in Jersey Cattle. By John W. Gowen.

e. Studies in Milk Secretion. (VII.) Transmitting Qualities of Jersey Sires for Milk Yield, Butter-Fat Percentage and Butter. By Raymond Pearl, John W. Gowen and John Rice Miner.

f. Conformation and its Relation to Milk Producing Capacity in Jersey Cattle. By John W. Gowen.

The first of these reports deals with the manner in which the butter-fat and solids-not-fat are secreted in the udder to form the milk.

The second presents the variations of Scottish Ayrshire cows in the quantity of their milk and butter fat. The average milk yield for these cows under the conditions of Scotland was six teen five-tenths gallons with a butter fat percentage of three and eight-tenths for the average weekly yield for one lactation.

The two studies, one on the milk yield, and the other on butter fat percentage of a herd of pure bred Jerseys, takes up the question of how much reliance can be placed in the milk yield or

butter-fat percentage of any lactation, as a measure of what may be expected of a cow in future lactations.

The paper on the type of the cow in relation to milk yield considers to so-called triple wedge shape, the size and shape of the udder, etc., in relation to the milk yield of the cow. It was found that the type of the cow as a whole showed most clearly the cow's possible milk production. Closely following this in diagnostic value were the size and shape of the milk veins, the size and elasticity of the udder, especially the rear udder and the shape and size of the barrel. The seven day milk yield was compared with the points of conformation to determine their relative merits for choosing the high milking cow over the low milker. It was found that a seven day test had two and a half times the value of any point in conformation in picking out the high from the low producer.

The work on the Jersey breed, to determine the transmitting qualities of Jersey sires, for milk production, butter-fat per cent and butter-fat has been completed. The effect of every bull in this breed, where records for two or more daughters or sons were available, has now been worked out and tabled and is being prepared for the press. It gives for the first time in the history of live-stock husbandry a comprehensive and scientific measure of the true breeding worth and value of the various blood lines of a breed of animals. From a purely practical standpoint it is probable that no work which the Station has done along animal husbandry lines is of so direct and immediate value to farmer, the dairyman, or the breeder.

There are two hundred twenty-four Jersey Registry of Merit sires which meet the requirements of this performance test for their transmitting qualities in milk production. One hundred and five of these sires, or less than one-half, raise the milk production of their daughters over that of the dams of these daughters. The largest number of daughter dam pairs is thirty-nine for the sire Hood Farm Pogis 9th, 55552. Of those sires which have a large number of pairs, Hood Farm Torono, 60326 with thirty-four pairs stands first in his transmitting qualities raising the milk production of his daughters on the average 2620.1 pounds.

Among the other sires standing well up in the lists might be mentioned Queen's Raleigh, 88232; Sans Aloi, 81012; Ternisia's

Interested Prince, 71698; The Plymouth Lad, 89792; and Chief Engineer, 47148.

Two hundred and twenty-five sires are included in the sires which met the requirements of the daughter-dam performance test for transmitting qualities of butter-fat percentage. Out of this number one hundred and one sires raised the butter-fat percentage of their daughters' milk as compared with the butter-fat percentage of the dams of these daughters.

The leading sire in this butter-fat percentage performance test was Clear Brook Chief, 74685, raising this daughter on the average 1.338 per cent. of butter-fat. This sire had two daughter-dam pairs. The dams were both in the lowest group for butter-fat percentage (class D) and this sire raised his daughter from these dams to the highest group (class A).

Among the sires with a fair number of daughter-dam pairs, which raised the butter-fat percentage to a marked degree, might be mentioned Irene's Kind Pogis, 73182; Merry Maiden's Grandson, 71003; Pogis 75th of Hood Farm, 94501; Jacob's Emanon, 84177; and Golden Fern's Son, 78687.

Hood Farm Pogis 9th leads in number of daughter-dam pairs with forty-two. This bull raised the butter-fat percentage of his daughter on the average of 0.243 per cent., over the butter-fat percentage of the dams of their daughters.

The sires mentioned as superior in the milk transmitting ability, Hood Farm Torono and Spermfield Owl, do not check up so well in their ability to transmit high butter-fat percentage. Hood Farm Torono caused his daughters on the average to be 0.225 per cent. of butter-fat below what the dams of these daughters produced. Spermfield Owl only raised his daughters on the average 0.027 per cent of butter-fat over what the dams of these daughters produced.

There are two hundred and twenty-four sires of known transmitting ability for net butter-fat. Of this number only ninety-nine sires raise the butter-fat production of their daughters over that of their dams. The sires which raised the production of their daughter's butter-fat most were Sans Alois 81012, Signal's Successor 72758, and Golden Glow Chief 61460. The sires which made the deepest impression on the breed by raising the butter-fat of the largest number of daughters, over that of their dams, was Hood Farm Torono with thirty-four pairs and an average in-



crease for each daughter of 121.51 pounds. The next bull, Spermfield Owl, with twenty-six pairs, raised the butter-fat production 97.71 pounds on the average for each of his daughters. Some of the bulls lowering the production of their daughters mark were Gertie's Son of Washington 83799, Hood Farm S. Tormentor 96311, and Oxford Lad's Owl 75599.

The information summarized above was arranged to reveal the transmitting qualities for milk production, butter-fat percentage and butter-fat of Jersey sires to their sons. There were in this table one hundred and fifty-nine sires which had sons whose progeny performance was known. Of this number sixty-nine or significantly less than half had sons who raised the butter-fat production of their daughters over that of their dams. Among these sires who had sons of merit, Signal's Crown Prince 61621, and Chief Engineer 47148 are the leaders. Among those sires whose sons lowered the butter-fat productions of their daughters may be mentioned Merry Maiden's Grandson 91003, and Etheel 2nd's Jubilee 18249.

The sires of superior merit are defined as those which raised the milk production and butter fat percentage of their daughters as compared with that of their dams. The inferior sires are defined as those sires who lower the milk production and butter-fat percentage of their daughters as compared with the same variables in their dams.

There are twenty-eight sires in the group of sires superior in their transmitting qualities for milk production and butter-fat percentage. In the group of sires inferior in their transmitting ability for these two characters there are forty-seven sires, a ratio of one to one and seven-tenths. Such a difference speaks for itself. It emphasizes with startling clearness the need of exact knowledge of the transmitting qualities of bulls to be bred as sires, and of the necessity for exact knowledge of the inheritance of milk production and butter-fat percentage. In fact the future usefulness of this work depends on a knowledge of this inheritance. As you know the Station at your request is by means of its crossbred herd, trying to obtain these laws.

The same kind of information as that just described for the Jerseys is available for the Guernsey breed. It will be remembered that certain of these results were presented in last year's report. These perhaps as some of you may know, were copied in

their entirety by the Hoard's Dairyman. I will not go into detail on these results.

Doctor Gowen has all of the material and is present at this meeting. He will be glad to talk to anyone or show them anything he can with regard to the work.

Before this report closes, I want with your permission to ask Doctor Gowen to go over with you some very important results thus far accumulated from the study of the inheritance of milk yield, as analyzed by the crosses of the crossbred herd. The results now being obtained may be likened to those of a man who plants an orchard. The work of planting, cultivating, spraying, etc., has been done. The orchard is just beginning to bear fruit. Each year these amounts will no doubt increase. The results up to the present time have such an important bearing that I wish you to hear and so far as possible see them first hand for they are as much your results as ours since it was at your request that this work was started.

This was followed by a series of lantern slides illustrating the points brought out in the report. The nominating committee reported the following officers for next year: President, J. A. Ness, Auburn; Vice President, H. H. Nash, Camden; Secretary, H. M. Tucker, Augusta; Treasurer, F. S. Adams, Augusta; Trustee, L. E. McIntire; Committee to Federation of Agricultural Associations: C. L. Pike, and L. C. Holston; Member Experiment Station Council, F. S. Adams; Visitor to College of Agriculture, A. E. Hodges.

On motion of A. E. Hodges, voted that the Association purchase one share of stock in the Organized Farmer of Maine at \$10.00.

Discussion relative to the price of butter-fat, voted that the executive committee of this Association take into consideration the advisability of holding a joint meeting with the other statewide Associations the same as for two years past.

Voted to adjourn.

H. M. TUCKER,  
*Secretary.*

## BUSINESS MEETING OF THE MAINE LIVESTOCK BREEDERS' ASSOCIATION

BANGOR CITY HALL, Nov. 19, 1919.

The meeting was called to order by H. J. Shaw of Auburn. There was a short address by A. E. Hodges of Fairfield, president of the Maine Livestock Breeders' Association.

E. W. Morton of Woodfords, secretary of the Association was the next speaker and in the absence of the treasurer, A. H. Ellis of Fairfield, Mr. Morton gave the treasurer's report and also that of the secretary, both of which were voted to be accepted and filed.

Nov. 12, 1918 Amount on hand.....	\$180.09
Nov. 3, 1919 Received of E. W. Morton .....	13.90
	\$193.99

It was voted not to read the reports of the last meeting.

The following were appointed by the Chair as a committee on nominations: L. D. Holston, H. J. Shaw and L. J. Corbett.

The Committee on Resolutions consisted of L. C. Holston, Harry Woods and N. H. Rich.

Various members of the breeders' Association were called upon to give informal talks about the work which they have observed and come in contact with during the past year.

Meeting adjourned until 1.30 o'clock.

Afternoon session of meeting called to order and the following reports were read and accepted:

### REPORT OF COMMITTEE ON NOMINATIONS.

President: Myron C. Peabody, South Portland.

Vice Presidents: Dr. J. A. Ness, Auburn; Arthur Sylvester, Mars Hill; Dr. H. M. Moulton, Cumberland Ctr.; Ray Bridges, Wilton; Charles M. Whitcomb, Ellsworth Falls; George S. Smith, Monmouth; Harold H. Nash, Camden; George Pastoris, Damariscotta; C. W. Farrington, Fryeburg; E. D. Page, Bangor; Frank

Chandler, Dover; L. G. Trafton, Skowhegan; W. B. Kendall, Bowdoinham; S. A. Piper, Troy; C. L. Pike, Lubec; W. B. Deering, Hollis.

Secretary: E. W. Morton, Portland.

Treasurer: A. H. Ellis, Fairfield.

Executive Committee: H. J. Shaw, Auburn; J. A. Ness, Auburn; W. B. Kendall, Bowdoinham; L. E. McIntire, Waterford.

Delegates to Maine Federation: C. L. Pike, Lubec; G. G. Young, Livermore.

Member of Experiment Station Council: L. C. Holston, Cornish.

Visitor to College: Mrs. B. B. Mansfield, Jonesport.

#### REPORT OF COMMITTEE ON RESOLUTIONS.

WHEREAS, it is the purpose of the Maine Livestock Breeders' Association to promote and assist in the improvement of Maine livestock be it

RESOLVED, that the Association thoroughly endorses and is heartily in accord with the movement inaugurated by the United States Department of Agriculture to improve quality of live stock through use of good purebred sires.

WHEREAS, tuberculosis is a most serious disease that is affecting our cattle and endangering the lives of our citizens, be it therefore

RESOLVED, that the Maine Livestock Breeders' Association in annual meeting assembled go on record as approving such a bill as will require the annual treatment of all neat stock six months or more of age. Further be it

RESOLVED, that we are in hearty accord with the Federal Tuberculosis tests and their system of recognition of accredited herds.

Recognizing the efforts and generosity of the City of Bangor and Chamber of Commerce, be it

RESOLVED, that we express our thanks and appreciation for their cooperation in making this meeting a success.

L. C. HOLSTON,  
HARRY M. WOODS,  
N. H. RICH,  
*Committee.*

Respectfully submitted,

E. W. MORTON,  
*Secretary.*

BUSINESS MEETING MAINE SEED IMPROVEMENT  
ASSOCIATION

ANNUAL ADDRESS OF THE PRESIDENT.

GUY C. PORTER.

I am very sorry indeed that there are not more people here this morning, and I sincerely hope that there will be a larger audience for the real speakers this afternoon.

We are now attending the Tenth Annual Meeting of the Maine Seed Improvement Association. Many changes have taken place in the short life of our organization. We are still in the formative period and our plans are still incomplete. We have however, made considerable progress and are destined, I believe, to be of a great deal of service to the farmers, not only the farmers of our own state but to those of our sister states as well.

Under Article Two of our constitution we state that it is the purpose of this Association "To promote the agricultural interests of the State, First, by establishing more cordial relations between the farmers of the State; Second, by carrying on such investigations and experiments and by growing and disseminating such new and superior varieties of farm seeds and plants as shall be of benefit to all parties interested in progressive agriculture; Third, by distributing literature bearing upon the work of the Association and other agricultural investigations; Fourth, by holding an annual meeting for the discussion of topics and experiments beneficial to the members.

Perhaps it would be well to pause a moment and consider how well we are living up to our declaration of purposes, First, Are we establishing more cordial relations between farmers of the State? I believe we are. Many times we have been disappointed because the farmers have been slow to take hold of this work, yet there is no doubt but that the influence of the Maine Seed Improvement Association has been felt in every County of Maine. Under the second purpose, we have been growing and disseminating large quantities of seed, but I fear that we have not dis-

tributed as much seed within the state as we should. We have concentrated our energies upon growing and shipping certified seed to the outside purchasers, hoping to get, and in most cases, getting prices above the average. This has been mostly potato seed.

We were at first discouraged because the demand for certified seed was so limited, and we were not able to sell as much seed as we had certified. These conditions this year are now reversed and we have a call for more certified seed than we have to sell.

Our third purpose is to distribute literature bearing upon our work. I feel that perhaps we have not advertised our work as much as we should, neither in nor out of the state. It has been my personal opinion in the past, relative to this Organization and some others with which I have been connected, that it was best to do things first. By this I mean really accomplish something before we made very much talk about it, but I am learning of late that in working in any public enterprise, constant advertising must go along with the work. It is quite as important to advertise outside of the state as in it.

Our fourth purpose is to hold an annual meeting for the discussion of topics and experiments beneficial to our members. This last purpose we have lived up to faithfully, and we have only to look at the present program to see that our Secretary has arranged to bring to us, speakers who will each have a message for us which will be of real benefit to our members.

I have always been disappointed in the small number of real farmers who attended our annual meetings. I do not know why they do not attend better, perhaps it is because we have not properly advertised, anyway it is to be regretted that five hundred farmers are not present to hear the speakers. We are especially fortunate in having William H. Stuart with us today. Few of us realize the work Professor Stuart has been doing in potato breeding. He is recognized as the highest authority on potato varieties in the United States, and we therefore, should heed well what he will have to say this afternoon in regard to the production of High Grade Seed Potatoes.

You will notice when the Secretary reads his report that we have been able to certify very few Green Mountain Potatoes. This was largely on account of the Mosaic disease. It would seem to me that we, as members of the Seed Improvement Association,

should watch for strains of Mountains which are free from this disease, with the idea of having such strains distributed to members within the state.

There is plenty of work for our organization to do, and I believe that we are now well enough organized and have had enough experience, so that we may progress much more rapidly in the future than we have in the past, and live up more fully to our declaration of purposes.

I do not know that there are any Green Mountains within the state that are absolutely free from mosaic. There are one or two plots that are quite free. Mr. Gilbert has some, fifteen hundred bushels, I understand. There is one man in Houlton, a Mr. Hagan, who has probably two carloads of the Green Mountain variety which are as good as any in the state. This young man picked out some seed seven or eight years ago, and eliminated until he got the one strain he wanted, and these potatoes are apparently free from mosaic this year. The County Agent said he had been all over the piece and could not find a trace of mosaic. Now this young man has decided to sell this for table stock, keeping out enough for his own use. It seems to me that where this is practically the only stock in the state that has been found free, or apparently so, from mosaic, that some one ought to look out that this stock does not go out of the state for table stock. It seems to me that somebody might be delegated to watch him, and when he gets ready to sell the potatoes, to buy them all. Of course, they have never really been inspected by anybody except Mr. Philbrick, the County Agent, but he says he feels sure that they are all right, and he would not say that they were free from mosaic, unless he was pretty sure about it. It seems to me that if anything is to be done about it, the Maine Seed Improvement Association is the one to do it. Perhaps after the delegate or committee, got there, there would be something radically wrong, but as I say, if these potatoes are free from disease, as they appear to be, I think it is our duty to keep them from going out of the state.

After a short discussion of this matter, Mr. Porter said that he thought the Aroostook Federation of Farmers would look after these cars of potatoes, and keep a line on them in cooperation with the Maine Seed Improvement Association.



REPORT OF ACTING SECRETARY OF MAINE SEED  
IMPROVEMENT ASSOCIATION.

*To the officers and Members of the Maine Seed Improvement Association:*

I wish to submit the following report as Secretary from April 1919, to date.

Upon my return from the army in April, Mr. White resigned as secretary, and your executive board appointed me as acting secretary, and as such I will make this report. During the entire season, there was inspected a total of five hundred and twenty-two and a half acres of potatoes; this is disregarding the number of acres that were gone over on a preliminary inspection. Of these last I kept no account, but this system aids greatly when the real inspection starts, for it eliminates all false moves as regards travel and hotel expense of the regular inspecting crew. Two hundred and fifty-four acres passed and are entitled to the blue tag. Two hundred and forty-six acres were disqualified and twenty-two and one-half acres I am carrying as recommended seed; by this, I mean that these acres would not quite come up to our standard, but it is seed that is much better than the average.

Regarding other crops, we have inspected fifty-two acres of oats, forty-seven of which passed and will be entitled to the blue tag, providing the weight and germination requirements are met. The total acreage of all crops inspected was five hundred seventy-four and one-half, and the per cent passing all inspections was fifty-three. This shows that the percentage of fields passing has decreased from year to year. Our records show that when Mr. Rogers was secretary, he called your attention to the slight increase of mosaic at that time, and since then the increase has been greater. In my work I have tried to keep abreast of the times as regards this disease. I have watched the work of the best authorities, attended conferences and studied the plants in our regular field work, but there does not seem to be much definite knowledge available, except that the spread by plant lice has been proven. It is hoped that some of our Plant Pathologists will in time discover the source and not until then can a remedy be applied. All that we can do now is to use that seed which carries no mosaic or at

least a small percentage. We have a speaker who will tell us this afternoon just what advances have been made.

Mr. White whom I succeeded as Secretary, had arranged for some work in Piscataquis County co-operatively with the County Agent, Mr. Bodwell. In April I went into this county, and we held several community meetings with the result that forty-three growers entered one acre each for certification. My object in this was the hope that we might uncover some new sources of disease-free seed. We went as far as Moosehead Lake and I regret to say that out of forty-three lots we found only two that would pass our standards and get the blue tag. We carried thru the first and second inspections and in many cases we went back the third time and helped the grower stake some healthy hills. To me this is real seed improvement work, and while no charge was made on those fields turned down, I believe it money well invested. If you do not agree with me I wish you would say so.

We also did some work of this kind in one or two other counties and succeeded in locating some very good seed, small acreages it is true, but very healthy plants. In St. Albans, we found a very good thirty-four acre piece, and two more in Harrison and Waterford. These pieces were given a thorough inspection, as three different inspectors visited each one in order that a safe determination might be made. These potatoes are to be held in the state and some from each lot have already been purchased by an Aroostook County grower.

As for our future, I can only say that as I go about the state I hear a little more each year about certified seed. It has occurred to me many times that our work better go slow rather than too fast, and certify seed that will reflect on our standard. I would like to add that we were visited four or five times in the field by potato buyers from other states, and they seemed to be satisfied with our method of inspection. One group of potato growers from Long Island, New York, have purchased a farm in Corinna, and we did a lot of roguing for them this year trying as best we could to start some good Maine seed toward the Long Island market.

An inspection such as we do costs money and this year we have been obliged to pay our men \$4.00 a day, and do not believe good men could be hired for less. As an example of how much time it takes, we inspected eleven acres on one farm and removed

3,700 plants; 1,500 of them mosaic. This seems like a large number of plants but it is only about two per cent., but to examine all the plants required time and eternal vigilance. To obtain good seed the work must necessarily be slow, for it is not a hurry-up proposition, that enthusiasm and nothing else will accomplish.

It is my belief now as in the past that the marketing end is our weak point. The field work I feel we can do all right, but a marketing plan must be found. This winter I shall attempt to hold a meeting or meetings with some organizations, such as the Aroostook Federation of Farmers, taking to them a concrete plan of certification. We to attempt the field work and the organization to handle the marketing end. I have already mentioned this matter briefly to Mr. Brown, the Federation Secretary, and Mr. Porter, the Sales' Agent, and we all have hopes that something definite can be done.

As I have said there has been a great many acres turned down, and I have made no effort to collect for any of this work. In some few instances I returned the entry fee, when Fall came and I saw we could afford to do it. Some of our bills have not been paid and it is my policy not to hurry the grower until a sale is made. At present, our financial standing is as follows:

In Bank .....	\$361.69
Due from Growers .....	691.12
	<hr/>
Total .....	\$1,052.81

It will be seen from these figures that eventually more than \$1,000 will be returned to the state from our four thousand dollar appropriation. A small amount of study will show to you that we cannot increase the volume of our work very much without more assistance from the state.

Beside my seed work, I have made several trips into Aroostook County with Mr. Soule, of our Department. He has been obliged to conduct an investigation because of the damage done by poor fertilizers, and in my humble way I have done all that he has asked of me.

I have had the best of co-operation from all with whom I have come in contact. To the officers of the society I extend my thanks for their assistance, both in the field work and help in getting ready for this exhibition.

It is discouraging sometimes, to think that the attendance is not greater at these meetings, but the more one looks into the situation it appears that we have a great many one-man farms, and it is not always possible to be away over night. We regret that this condition exists, but it is true and it remains for those of us who are present to keep alive our exhibition and work, as our contribution to the agriculture of Maine.

Respectfully submitted,

E. L. NEWDICK,  
*Acting Secretary.*

Voted to accept report of Acting Secretary.

REPORT OF TREASURER.

RECEIPTS.

Cash on hand November 21, 1918	\$124.94
Received from Secretary account dues	85.00
Miscellaneous receipts	19.83
	————— \$229.77

EXPENDITURES.

Expense of two Executive Committee Meetings	\$ 42.33
Delegate to Federation of Agricultural Associations	8.66
Miscellaneous Expense	21.65
Cash on Hand November 10, 1919,	157.13
	————— \$229.77

Respectfully submitted,

C. M. WHITE,  
*Treasurer.*

Voted to accept report of Treasurer.

The Secretary read the report of W. G. Hunton, a member of the Experiment Station Council.

ANNUAL REPORT OF W. G. HUNTON ON SEED IMPROVEMENT WORK  
FOR YEAR 1919.

On Maine Experiment Station farms, investigations have been carried on with oats, beans and corn, with some special work on sweet corn, to improve production and shorten maturity.

The investigation on oats is each year proving more valuable, not only in increased yield, but also in producing a straw that will hold up the fruit until ripe. As a practical farmer, I believe they have demonstrated varieties that properly fertilized and planted with a seeder will not lodge enough to seriously damage the yield. This discovery, for the future oat production in Maine will pay many times for all that seed investigation has cost.

## BEANS.

The bean investigation proves that they have succeeded in propagating a strain of yellow eyes that are great producers and practically rust proof, but on account of unfortunate harvesting conditions the crop this year is mouldy. To what extent this will effect their germination will be ascertained. The result of the experiment is valuable, and the strain should be distributed at a fair price for seed.

## SWEET CORN.

The fact that the entire crop of two acres, this year, has so attracted the attention of the packers, that they bought the crop in the field and have harvested and cured for seed, to be planted by their patrons next season, demonstrates more forcibly than anything else, that the Station is doing valuable work in sweet corn.

## FLINT CORN.

The exhibit at this meeting shows the character and efficiency of the result of past efforts to produce superior flint corn seed.

## STATE APPROPRIATION FOR THE WORK.

The existence of this Association in Maine made it possible last year, when Federal and other appropriations, on account of increased cost of labor and material, were found to be inadequate,

to continue and complete the valuable lines of seed investigation, for the officers to cooperate with the Director and obtain from the state an appropriation, sufficient to carry on the work.

Respectfully submitted,

W. G. HUNTON,  
*Member Experiment Station Council.*

Voted, that the president appoint a committee on resolutions and a committee on nominations. The following were appointed.

Committee on Resolutions: Dr. Chas. D. Woods, A. E. Hodges, C. M. White.

Nominating Committee: L. C. Holston, M. D. Jones, Frank Lowell.

Voted, to hear the reports of the Committees in the afternoon after the program was completed.

ADDRESS: "Aims and Purposes of the Sweet Corn Growers' Association," Harry A. Plummer, Pres., Benton

ADDRESS: "My Experience with a Tractor."

A. E. Hodges, Fairfield.

Several members present related their personal experience with a tractor.

Motion to adjourn until 1.30 P. M.

At the afternoon session the following papers were given and while there is not room here to print them, they will be made available during the year in some of the quarterly bulletins issued by the State Department of Agriculture.

ADDRESS: "The Production of High Grade Seed Potatoes."

Wm. Stuart, Horticulturist, U. S. Department of Agriculture

ADDRESS: "Some results of Plant Breeding at the Maine Agricultural Experiment Station."

Dr. Jacob Zinn, Biologist, Orono

ADDRESS: "Potato Wart Disease."

Dr. W. J. Morse, Pathologist, Orono

Progress report of work on Mosaic by Dr. Folsom.

## REPORT OF COMMITTEE ON RESOLUTIONS.

RESOLVED, that this Association misses the familiar face of Benjamin Tucker of Norway, who by his constant attendance and advice at these conventions, has contributed much to the progress of Maine's Agriculture and extends its sympathy to his family at this time.

RESOLVED, that this Association extends its thanks to the Bangor Chamber of Commerce for the facilities which they have provided; to the Extension Division of the University of Maine for their help in the installation of the exhibits; to the press of the State, and that of Bangor in particular, for the publicity given both before and during the exhibition.

RESOLVED, that this Association stands on record as being emphatically in favor of having as its aim the continued development of true democracy along the line of the highest American ideals."

C. D. WOODS,  
A. E. HODGES,  
C. M. WHITE,

*Committee.*

It was moved and seconded that this report be accepted.

## REPORT OF COMMITTEE ON NOMINATIONS.

The following report of the Committee on Nominations was read by Mr. Lowell:

President: H. H. Rich.

Vice-President, A. E. Hodges.

Secretary, E. L. Newdick.

Treasurer: C. M. White.

Executive Committee: H. J. Shaw; G. C. Porter.

Member Experiment Station Council: W. G. Hunton.

Delegates to Federation: R. L. Copeland, John Leland.

Visitor to College of Agriculture: A. E. Hodges.

Voted, to accept the report and the secretary was instructed to cast one ballot for the officers named therein.

The next question was brought up by Secretary Newdick in regard to the time and place of the next meeting. It was moved

by Mr. White that the time and place be left to the Executive Committee, which motion was seconded and carried.

Voted, to leave the question of sending a delegate to the Wisconsin Seed Show, which is to be held in the near future, to the Executive Committee.

Voted, that the Executive Committee meet Mr. Roberts' suggestion to appear before the Budget Committee in the matter of sufficient appropriation to carry on Seed Certification work.

Motion to adjourn.

Respectfully submitted,

E. L. NEWDICK,

*Secretary.*





# **STATISTICS OF AGRICULTURAL SOCIETIES.**

## OFFICERS OF AGRICULTURAL SOCIETIES.

NAME OF SOCIETY	President	P. O. Address	Secretary	P. O. Address	Treasurer	P. O. Address
Maine State Agricultural Society	L. M. Carroll . . .	Norway . . . . .	H. V. Wilson . . .	Lewiston . . . . .	T. F. Callahan . .	Lewiston . . . . .
Eastern Maine State Fair	Harry A. Chapman	Bangor . . . . .	Samuel T. White .	Bangor . . . . .	Edw. E. Piper . .	Bangor . . . . .
Central Maine Fair	Harvey D. Eaton .	Waterville . . . .	R. M. Gilmore . .	Waterville . . . .	Wm. A. Knauff . .	Waterville . . . .
Maine State Pomological Society	A. C. Macomber . .	Dryden . . . . .	E. L. White . . . .	Bowdoinham . . .	T. E. Chase . . . .	Buckfield . . . . .
Maine State Poultry Association	E. E. Philbrook . .	Portland . . . . .	J. F. Tilton . . . .	Woodfords . . . .	F. H. Jordan . . .	So. Portland . . .
Androscoggin County . . . . .	John Look . . . . .	North Jay . . . . .	Chas. D. Dyke . . .	Livermore Falls .	George W. Dyke . .	Livermore Falls .
Androscoggin, Greene Town Fair Association	L. C. Mendall . . .	Greene . . . . .	E. B. Sanderson . .	Greene . . . . .	J. C. Wood . . . . .	Greene . . . . .
Androscoggin Leeds Agricultural Association	H. E. Lincoln . . .	North Leeds . . .	H. W. Lincoln . . .	Leeds Center . . .	W. B. House . . . .	Leeds . . . . .
Androscoggin Valley . . . . .	W. W. Rose . . . . .	Canton . . . . .	F. B. Woodward . .	Canton . . . . .	A. F. Russell . . . .	Canton . . . . .
Aroostook, Caribou Trotting Park and Fair Association	John H. McDaniel .	Caribou . . . . .	Frank Riley . . . .	Caribou . . . . .	O. L. Farnsworth .	Caribou . . . . .
Aroostook, Houlton . . . . .	George H. Benn . . .	Hodgdon . . . . .	A. J. Saunders . . .	Houlton . . . . .	A. E. Carter . . . .	Houlton . . . . .
Aroostook, Northern Maine Fair Association	J. Frank Guion . . .	Presque Isle . . .	Ernest T. McGlaulin	Presque Isle . . .	John E. Bishop . .	Presque Isle . . .
Cumberland, Bridgton . . . . .	Chas. H. Cook . . .	Bridgton . . . . .	Howard W. Jones . .	Bridgton . . . . .	Joseph T. Bardsley	Bridgton . . . . .
Cumberland County . . . . .	Chas. W. Chaplin . .	Gorham . . . . .	F. E. Moulton . . .	Cumberland Ctr. .	Harry C. Palmer . .	Gorham . . . . .
Cumberland Farmers Club . . . .	F. L. Haskell . . . .	S. Windham, R.F.D.	Willard Wilson . . .	Cumberland Ctr. .	Willard Wilson . . .	Cumberland Ctr. .
Cumberland, Freeport Poultry Association	C. I. Davis . . . . .	Waterville . . . . .	L. G. Cushing . . . .	Freeport . . . . .	L. E. Curtis . . . . .	Freeport . . . . .
Cumberland, New Gloucester and Danville . . . . .	H. C. Edwards . . .	New Gloucester . .	L. A. McKnight . .	Auburn, R.F.D. 7 .	C. H. Nelson . . . .	New Gloucester .
Franklin County . . . . .	Bert H. Farrington .	Dryden, R. F. D. . .	George D. Clark . .	Farmington . . . .	C. H. Pierce . . . .	Farmington . . . .
Franklin, North . . . . .	Bion Wing . . . . .	Phillips . . . . .	Otto A. Badger . . .	Phillips . . . . .	Floyd E. Parker . .	Phillips . . . . .
Hancock County . . . . .	Alonzo S. Witham . .	Bluehill . . . . .	Alonzo S. Witham . .	Bluehill . . . . .	Max R. Hinckley . .	Bluehill . . . . .
Hancock, Eden . . . . .	J. L. Fogg . . . . .	West Eden . . . . .	Julien Emery . . . .	Salisbury Cove . .	Charles F. King . .	Eden . . . . .
Hancock, North Ellsworth . . . .	Sidney R. Moore . .	Ellsworth, R.F.D. .	Vira C. Ellis . . . .	Ellsworth, R.F.D. .	John McNamara . .	Ellsworth, R.F.D. .
Kennebec, Cochenewagan . . . . .	H. H. Witherell . .	Monmouth . . . . .	W. E. Reynolds . . .	Monmouth . . . . .	Charles H. Berry . .	Monmouth . . . . .
Kennebec County . . . . .	E. E. Peacock . . . .	Readfield . . . . .	E. E. Peacock . . . .	Readfield . . . . .	F. A. Walker . . . .	Readfield, R.F.D. 27
Kennebec, South . . . . .	Leslie B. Hisler . .	Cooper's Mills . . .	Arthur N. Douglas .	Gardiner, R.F.D. 9	Jasper S. Gray . . .	Windsorville . . .
Knox, North . . . . .	W. E. Berry . . . . .	Union . . . . .	H. L. Grinnell . . .	Union . . . . .	George S. Hawes . .	Union . . . . .
Lincoln, Bristol . . . . .	George A. Huston . .	Damariscotta . . .	J. Wilbur Hunter . .	Damariscotta . . .	Chas. B. Woodward	Damariscotta . . .
Lincoln County . . . . .	George D. Pastorius .	Newcastle . . . . .	J. A. Perkins . . . .	Nobleboro . . . . .	Harvey E. Winslow .	Damariscotta . . .
Oxford County . . . . .	L. E. McIntire . . .	East Waterford . .	W. O. Frothingham .	South Paris . . . .	W. O. Frothingham .	South Paris . . . .
Oxford, North . . . . .	Young A. Thurston .	Andover . . . . .	John F. Talbot . . .	Andover . . . . .	Fred A. Milton . . .	Andover . . . . .

Oxford, West	C. W. Farrington	Fryeburg	Benj. T. Newman	Fryeburg	Alvin D. Merrill	Fryeburg
Oxford, Western Maine Poultry Association	H. E. Lovejoy	Norway	E. P. Crockett	South Paris	D. H. Bean	South Paris
Penobscot, Bangor Poultry Association	Wm. H. Northrup	Bangor	Harry I. Bolton	Bangor	Harry I. Bolton	Bangor
Penobscot, North	C. M. Lombard	Springfield	J. R. Averill	Prentiss	J. C. Butterfield	Springfield
Penobscot, West	E. M. Atkins	Dexter, R. F. D. 3	E. E. Colbath	Dexter, R. F. D. 3	F. C. Barker	Exeter, R. F. D. 1
Sagadahoc Agricultural and Horticultural Society	L. T. Skelton	Bowdoinham	E. C. Patten	Topsham	I. R. Morrell	Brunswick
Sagadahoc, Richmond Farmers' Club	J. C. Shepard	Richmond	N. H. Skelton	Richmond	E. H. Stewart	Richmond
Somerset, Central	E. T. Goodrich	Skowhegan	S. H. Bradbury	Skowhegan	J. W. Fogler	Skowhegan
Somerset, East	R. J. Goodrich	Pittsfield	H. H. Coston	Pittsfield	H. H. Coston	Pittsfield
Somerset, Embden	C. K. Williams	North Anson	Grant Witham	Solon	Wallace Hodgdon	North Anson
Somerset, Four County Fair Association	A. H. Burse	Pittsfield	Nellie M. Burse	Pittsfield	W. L. Pushor	Pittsfield
Somerset, Harmony Grange Fair Association	E. A. Pattee	Harmony	J. L. Johnson	Harmony	W. S. Bemis	Harmony
Somerset, Madison	Mark Gray	Anson	J. F. Withee	Madison	W. G. Hilton	Anson
Somerset, Solon	A. C. Heald	Solon	Joseph Matson	Solon	John McCollar	Solon, R. F. D. 1
Somerset, Wesserrunnett Valley Fair Association	Harvey D. Eaton	Waterville	H. N. Flanders	Athens	James E. Chapman	Athens
Waldo and Penobscot	M. S. Jellison	Belfast	F. H. Putnam	Monroe	G. A. Palmer	Monroe
Waldo, New Belfast Fair						
Waldo, Tranquility Grange Agricultural Society	H. A. Miller	Lincolntonville	H. C. Buzzell	Belfast	T. Frank Parker	Belfast
Waldo, Unity Park Association	C. A. Plummer	Unity	I. O. Eugley	Lincolntonville	J. W. Fernald	Camden
Washington, Machias Valley	William G. Means	Machias	C. D. Comer	Unity	C. D. Comer	Unity
Washington, West	R. M. Allen	Columbia Falls	Frank S. Ames	Machias	Chas. W. Dinsmore	Machias
York, Cornish	James M. Haley	Cornish	W. S. Coffin	Harrington	S. H. Allen	Columbia Falls
York, Shapleigh and Acton	Guy R. Thyng	Alfred, R. F. D.	Leon M. Ayer	Cornish	Samuel G. Sawyer	Cornish
			Fred K. Bodwell	Acton	Geo. H. Twombly	Emery Mills

ANALYSIS OF EXHIBITIONS.

NAME OF SOCIETY.	Number of horses and colts.	Number of thoroughbred bulls and bull calves.	Number of thoroughbred cows, heifers and heifer calves.	Number of grade cows, heifer and heifer calves.	Number of oxen and steers.	Number of animals for beef.	Number of cattle shown in herds.	Total number of neat stock.	Number of sheep.	Number of swine.	Number of poultry (coops).
Maine State Agricultural Society .....	48	68	195	5	72	24	90	412	174	120	1,800
Eastern Maine State Fair .....	—	57	146	—	—	—	179	—	94	19	561
Central Maine Fair .....	35	98	260	—	46	70	153	560	485	60	1,200
Maine State Pomological Society .....	—	—	—	—	—	—	—	—	—	—	—
Maine State Poultry Association .....	—	—	—	—	—	—	—	—	—	—	1,500
Androscoggin County .....	—	4	14	12	48	2	8	88	19	6	9
Androscoggin Greene Town Fair Association .....	3	6	20	9	4	—	32	—	—	3	7
Androscoggin, Leeds Agricultural Association .....	55	—	5	—	7	—	—	67	8	12	12
Androscoggin Valley .....	34	2	4	13	66	6	—	125	7	—	3
Aroostook, Caribou Trotting Park and Fair Association .....	7	10	40	—	—	—	12	69	7	15	—
Aroostook, Houlton .....	99	67	203	20	1	8	75	473	16	67	413
Aroostook, Northern Maine Fair Association .....	218	97	225	15	8	—	165	563	120	78	381
Cumberland, Bridgton .....	22	11	25	7	36	6	21	128	11	2	—
Cumberland County .....	75	16	43	66	162	12	70	444	27	51	190
Cumberland Farmers' Club .....	—	—	—	—	—	—	—	—	—	—	—
Cumberland, Freeport Poultry Association .....	—	—	—	—	—	—	—	—	—	—	841
Cumberland, New Gloucester and Danville .....	7	6	38	9	4	—	1	57	4	9	12
Franklin County .....	19	42	141	68	150	60	69	462	154	7	140
Franklin, North .....	28	5	11	60	75	8	40	180	48	25	50
Hancock County .....	11	4	6	21	40	12	18	83	20	16	—

Hancock, Eden .....	—	2	1	18	—	—	—	21	6	5	20
Hancock, North Ellsworth .....	11	—	—	12	6	—	—	—	7	—	7
Kennebec, Cochnewagen .....	23	15	51	16	4	—	—	109	1	41	12
Kennebec County .....	76	35	60	42	94	12	24	296	30	18	47
Kennebec, South .....	3	12	12	20	62	10	7	119	4	—	—
Knox, North .....	18	11	27	27	62	8	28	181	25	2	11
Lincoln, Bristol .....	7	1	—	27	22	—	—	50	—	—	3
Lincoln County .....	7	4	2	—	18	2	—	33	3	—	24
Oxford County .....	91	38	106	66	266	22	72	661	35	12	160
Oxford, North .....	26	8	16	24	48	8	24	128	17	2	18
Oxford, West .....	20	16	48	35	112	15	8	186	46	18	19
Oxford, Western Maine Poultry Association .....	—	—	—	—	—	—	—	—	—	—	599
Penobscot, Bangor Poultry Association ..	—	—	—	—	—	—	—	—	—	—	709
Penobscot, North .....	7	1	—	12	—	—	5	—	—	—	—
Penobscot, West .....	30	28	109	39	31	4	78	214	80	75	92
Sagadahoc Agricultural and Horticultural Society .....	49	26	280	48	48	28	64	470	83	66	345
Sagadahoc, Richmond Farmers' Club .....	9	1	4	25	5	—	—	34	—	—	15
Somerset, Central .....	21	14	40	29	20	10	—	127	86	9	135
Somerset, East .....	31	2	3	13	2	—	5	27	43	4	144
Somerset, Embden .....	16	5	21	—	—	—	15	35	7	—	—
Somerset, Four County Fair Association ..	6	15	60	28	—	—	25	134	102	10	150
Somerset, Harmony Grange Fair Association ..	11	3	14	17	8	—	29	45	3	5	—
Somerset, Madison .....	24	6	15	21	30	6	5	107	6	3	17
Somerset, Solon .....	36	9	35	31	16	—	20	82	33	57	3
Somerset, Wesserrunnett Valley Fair Association .....	7	9	50	9	42	—	12	—	2	21	—
Waldo and Penobscot .....	17	7	11	13	12	3	14	77	41	3	3
Waldo, New Belfast Fair .....	80	7	25	16	—	21	33	69	14	17	175
Waldo, Tranquility Grange Agricultural Society .....	7	1	—	1	4	—	—	6	—	—	12
Waldo, Unity Park Association .....	—	4	4	6	4	4	8	32	—	—	3
Washington, Machias Valley .....	14	5	3	—	4	1	—	27	1	7	11
Washington, West .....	9	3	4	10	4	—	—	30	—	—	2
York, Cornish .....	10	14	30	15	124	8	28	229	6	8	25
York, Shapleigh and Acton .....	—	—	—	4	80	4	—	88	—	—	15
	1,327	795	2,407	922	1,880	376	1,437	7,328	1,875	873	9,895

ANALYSIS OF AWARDS.

NAME OF SOCIETY.	Amount of premiums awarded trotting bred stallions.	Amount of premiums awarded trotting bred brood mares.	Amount of premiums awarded draft stock stallions.	Amount of premiums awarded draft stock brood mares.	Amount of premiums awarded roadster brood mares.	Amount of premiums awarded family horses.	Amount of premiums awarded gentlemen's drivers.	Amount of premiums awarded matched carriage horses.	Amount of premiums awarded farm teams.	Amount of premiums awarded colts.	Amount of premiums awarded horses for draft.	Amount of premiums awarded race horses.	Amount of premiums awarded horses drawing match.	Amount of premiums awarded matched work horses.
Maine State Agricultural Society ..	\$ 45.00	\$ 36.00	\$ 60.00	—	—	\$ 27.00	\$ 40.00	\$ 20.00	—	\$ 30.00	\$ 105.00	—	—	—
Eastern Maine State Fair .....	—	—	—	—	—	—	—	—	—	—	—	\$20.00	—	—
Central Maine Fair .....	51.00	11.00	—	—	—	—	38.00	—	—	15.00	65.00	—	—	—
Maine State Pomological Society ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Maine State Poultry Association ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Androscoggin County .....	—	—	4.00	—	—	—	—	—	—	5.00	74.00	—	—	—
Androscoggin, Greene Town Fair Association .....	—	—	—	—	—	—	—	—	—	1.50	14.00	—	—	—
Androscoggin, Leeds Agricultural Association .....	—	—	—	—	—	—	—	—	—	—	65.00	—	—	—
Androscoggin Valley .....	4.50	5.50	3.50	—	—	—	—	—	—	3.50	88.50	—	—	—
Aroostook, Caribou Trotting Park and Fair Association .....	—	—	16.00	8.00	—	—	—	—	—	3.00	—	—	—	—
Aroostook, Houlton .....	25.00	15.00	107.50	42.00	—	8.00	5.00	—	—	98.50	143.00	—	—	—
Aroostook, Northern Maine Fair Association .....	25.00	12.00	145.00	62.00	17.00	—	65.00	10.00	—	204.00	108.00	—	—	—
Cumberland, Bridgton .....	—	—	8.00	6.00	—	6.00	—	7.00	—	30.00	50.00	—	—	—
Cumberland County .....	20.00	8.00	6.00	20.00	—	—	—	—	—	40.00	70.00	—	—	—
Cumberland Farmers' Club .....	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cumberland, Frapeort Poultry Association .....	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cumberland, New Gloucester and Danville .....	7.00	5.00	—	—	—	9.00	3.00	—	—	5.50	22.00	—	—	—
Franklin County .....	9.00	18.00	13.00	23.00	—	18.00	15.00	12.00	—	—	135.00	—	—	—
Franklin, North .....	—	3.00	—	2.00	—	—	6.00	—	—	8.00	30.00	—	—	—
Hancock County .....	5.00	—	—	—	—	—	3.00	2.00	—	8.00	—	—	—	—

Hancock, Eden											8.00			
Hancock, North Ellsworth											21.60			
Kennebec, Cochewagen			1.00	1.00							3.00			
Kennebec County	20.00	18.00	8.00	9.00		6.00	6.00	5.00			9.00			
Kennebec, South											5.00			
Knox, North			3.00			3.00	2.50	2.50					46.00	
Lincoln, Bristol											1.50			
Lincoln County	2.00					2.00	2.00				4.00		12.00	
Oxford County	33.00	23.00	6.00	8.00			25.00				33.00		232.00	
Oxford, North	4.00	12.00		12.00			12.00				14.00		60.00	
Oxford, West	8.00		21.00					17.00			20.00		59.00	
Oxford, Western Maine Poultry Association														25.00
Penobscot, Bangor Poultry Association														
Penobscot, North	1.50		1.50				2.50						5.00	
Penobscot, West	7.00			3.00		8.00	8.00				13.50		107.00	
Sagadahoc Agricultural and Horticultural Society	13.00	5.00	11.00	5.00		8.00					42.00		90.00	
Sagadahoc, Richmond Farmers' Club						1.50			4.00		.50		20.00	
Somerset, Central	5.00		5.00			5.00	20.00	10.00	18.00		12.50		72.00	
Somerset, East	6.00	9.00		5.00			15.00				11.00		105.00	
Somerset, Embden											4.00		20.00	
Somerset, Four County Fair Association			5.00	4.00							2.00		25.00	
Somerset, Harmony Grange Fair Association		3.00		2.00							5.00		8.00	
Somerset, Madison	5.00	5.00				3.00	3.00	3.00			2.00		20.00	
Somerset, Solon											20.00		100.00	
Somerset, Wesserunscott Valley Fair Association				2.00							4.00		8.00	
Waldo and Penobscot	6.00					6.00					3.00		105.00	8.00
Waldo, New Belfast Fair													22.00	
Waldo, Tranquility Agricultural Society				2.00				4.25			1.50			
Waldo, Unity Park Association		2.00	2.00	2.00			3.00				2.00		8.00	
Washington, Machias Valley			9.00	4.50							23.00		4.50	
Washington, West			12.00					12.00					8.00	
York, Cornish		4.00						4.00			24.00			
York, Shapleigh and Acton														
	<b>\$302.00</b>	<b>\$194.50</b>	<b>\$447.50</b>	<b>\$222.50</b>	<b>\$17.00</b>	<b>\$110.50</b>	<b>\$290.00</b>	<b>\$110.75</b>	<b>\$22.00</b>	<b>\$712.20</b>	<b>\$2,159.60</b>	<b>\$20.00</b>	<b>\$25.00</b>	<b>\$8.00</b>



ANALYSIS OF AWARDS—Continued.

NAME OF SOCIETY.	Amount of premiums awarded thoroughbred bull and bull calves.	Amount of premiums awarded thoroughbred cows, heifers and heifer calves.	Amount of premiums awarded grade cows, heifers and heifer calves.	Amount of premiums awarded fat oxen and steers.	Amount of premiums awarded herds.	Amount of premiums awarded working oxen and steers.	Amount of premiums awarded matched oxen and steers.	Amount of premiums awarded trained steers.	Amount of premiums awarded beef cattle.	Amount of premiums awarded town teams.	Amount of premiums awarded oxen and steers for draft.
Maine State Agricultural Society	\$ 426.00	\$ 585.00	\$ 35.00	—	\$ 396.00	\$ 75.00	\$ 97.00	\$ 15.00	\$ 139.00	\$ 90.00	\$ 175.00
Eastern Maine State Fair	366.00	763.00	—	—	724.00	—	—	—	—	—	—
Central Maine Fair	687.00	849.00	—	—	394.00	40.00	68.00	5.00	625.00	40.00	259.00
Maine State Pomological Society	—	—	—	—	—	—	—	—	—	—	—
Maine State Poultry Association	—	—	—	—	—	—	—	—	—	—	—
Androscoggin County	8.00	27.00	18.00	—	4.00	4.00	22.00	39.00	4.00	10.00	—
Androscoggin, Greene Town Fair Association	2.50	4.00	—	—	6.00	—	—	—	—	—	—
Androscoggin, Leeds Agricultural Association	—	.50	—	—	—	—	20.00	—	—	—	—
Androscoggin, Valley	5.00	15.00	36.00	—	—	105.50	29.00	—	12.00	36.00	—
Aroostook, Caribou Trotting Park and Fair Association	57.00	174.00	—	—	21.00	—	—	—	—	—	—
Aroostook, Houlton	376.25	875.00	34.00	—	111.75	6.00	—	—	23.00	—	—
Aroostook, Northern Maine Fair Association	548.00	882.00	58.85	27.00	252.00	—	12.00	—	—	—	—
Cumberland, Bridgton	28.00	46.00	6.50	—	28.00	8.00	30.00	10.00	8.00	20.00	65.00
Cumberland County	40.00	106.00	91.00	—	167.00	43.00	25.00	24.00	22.00	26.00	199.00
Cumberland Farmers' Club	—	—	—	—	—	—	—	—	—	—	—
Cumberland, Freeport Poultry Association	—	—	—	—	—	—	—	—	—	—	—
Cumberland, New Gloucester and Danville	19.00	55.00	15.50	—	10.00	—	—	2.00	—	—	—
Franklin County	87.50	196.00	106.00	—	102.00	72.00	113.00	6.00	43.00	140.00	101.00
Franklin, North	6.50	9.45	16.95	—	14.00	4.00	6.00	—	8.25	15.00	30.00
Hancock County	17.00	16.00	44.00	—	15.00	29.00	7.50	—	7.50	—	10.00

Hancock, Eden .....	4.50	—	—	—	—	—	—	—	—	—	—	—
Hancock, North Ellsworth .....	—	14.00	3.00	—	—	3.00	—	—	—	—	—	—
Kennebec, Cochnewagen .....	12.75	42.00	9.75	—	25.50	—	4.50	—	—	—	—	—
Kennebec County .....	50.00	55.00	36.00	—	12.00	32.00	6.00	9.00	9.00	—	—	—
Kennebec, South .....	32.00	21.75	23.50	—	13.50	20.75	17.50	9.00	17.75	41.00	12.25	—
Knox, North .....	22.00	33.00	27.75	—	22.00	14.00	17.00	—	6.00	33.00	66.00	—
Lincoln, Bristol .....	5.00	—	7.00	—	—	4.75	1.00	—	—	—	—	—
Lincoln County .....	12.00	3.75	2.00	—	—	—	8.00	—	4.50	—	—	—
Oxford County .....	168.00	220.00	159.00	—	117.00	171.00	66.00	—	66.00	113.00	311.00	—
Oxford, North .....	18.00	60.00	60.00	—	15.00	50.00	25.00	5.00	8.00	15.00	12.00	—
Oxford, West .....	97.00	189.00	140.00	—	70.00	355.50	78.50	4.00	27.00	120.00	94.00	—
Oxford, Western Maine Poultry Association .....	—	—	—	—	—	—	—	—	—	—	—	—
Penobscot, Bangor Poultry Association .....	—	—	—	—	—	—	—	—	—	—	—	—
Penobscot, North .....	3.00	—	15.00	—	5.00	—	—	—	—	—	—	—
Penobscot, West .....	110.00	280.00	52.75	—	112.00	40.00	14.00	15.00	6.00	—	—	—
Sagadahoc Agricultural and Horticultural Society .....	85.00	692.00	120.00	—	154.00	66.00	40.00	9.00	24.00	48.00	245.00	—
Sagadahoc, Richmond Farmers' Club .....	.25	3.20	4.35	—	2.00	1.50	—	—	—	—	3.00	—
Somerset, Central .....	52.00	109.00	65.00	—	—	16.50	17.00	—	21.00	28.00	24.00	—
Somerset, East .....	7.00	15.00	26.00	—	4.00	5.00	—	—	5.00	—	—	—
Somerset, Emden .....	11.00	6.00	—	—	8.00	—	5.00	—	—	—	—	—
Somerset, Four County Fair Association .....	69.00	135.00	69.00	—	56.00	—	—	—	—	—	—	—
Somerset, Harmony Grange Fair Association .....	4.50	14.50	12.00	—	22.00	9.00	—	—	—	—	—	—
Somerset, Madison .....	6.00	12.50	20.00	—	3.00	7.50	6.50	—	3.00	18.00	20.00	—
Somerset, Soton .....	15.00	25.00	14.00	—	30.00	—	—	—	25.00	—	—	—
Somerset, Wesserrunnett Valley Fair Association .....	5.00	18.00	—	9.00	20.00	9.50	12.00	—	—	23.02	—	—
Waldo and Penobscot .....	20.00	74.00	20.00	—	10.00	—	112.00	5.00	5.00	—	—	—
Waldo, New Belfast Fair .....	12.00	35.00	38.50	—	35.00	14.00	—	—	21.00	—	14.00	—
Waldo, Tranquility Agricultural Society .....	2.00	—	1.50	—	—	—	3.00	—	—	—	—	—
Waldo Unity Park Association .....	3.00	2.00	5.00	—	—	2.00	4.00	—	5.00	16.00	—	—
Washington, Machias Valley .....	20.70	18.70	—	—	—	7.50	—	3.00	2.70	—	—	—
Washington, West .....	21.00	—	38.00	—	—	—	24.00	—	—	—	—	—
York, Cornish .....	45.00	115.00	55.00	—	22.00	51.00	68.00	4.00	20.00	92.00	57.00	—
York, Shapleigh and Acton .....	—	—	5.50	—	—	6.00	18.00	13.00	6.00	35.00	12.00	—
	\$3,586.45	\$6,817.35	\$1,500.40	\$36.00	\$3,002.75	\$1,273.00	\$976.50	\$177.00	\$1,173.70	\$959.02	\$1,709.25	

ANALYSIS OF AWARDS—Concluded.

NAME OF SOCIETY.	Amount of premiums awarded sheep.	Amount of premiums awarded swine.	Amount of premiums awarded poultry.	Amount of premiums awarded grain and root crops.	Amount of premiums awarded fruit and flowers.	Amount of premiums awarded bread and dairy products.	Amount of premiums awarded honey, sugar syrups, etc.	Amount of premiums awarded agricultural implements.	Amount of premiums awarded household manufactures and needle-work.	Amount of premiums awarded objects not named above.	Amount of gratuities.	Total amount of premiums and gratuities awarded.
Maine State Agricultural Society	\$ 520.00	\$ 228.00	\$ 783.00	\$ 75.00	\$ 462.00	\$120.00	\$ 28.00	—	\$ 182.25	\$ 190.00	—	\$ 4,984.25
Eastern Maine State Fair . . .	347.50	47.00	361.00	—	212.75	87.45	—	—	—	504.50	—	3,433.20
Central Maine Fair . . . . .	660.00	194.00	567.65	227.50	312.00	195.00	26.50	—	217.49	208.00	—	5,755.14
Maine State Pomological Society	—	—	—	—	1,245.25	—	—	—	—	—	—	1,245.25
Maine State Poultry Association	—	—	896.58	—	—	—	—	—	—	25.24	552.35	1,474.17
Androscoggin County . . . . .	13.00	6.00	5.00	29.75	21.90	30.30	—	21.50	36.75	—	—	383.20
Androscoggin, Greene Town Fair Association	—	1.00	2.25	13.05	14.70	4.50	—	—	8.90	20.25	—	92.65
Androscoggin, Leeds Agricultural Association	3.00	11.00	9.00	6.10	9.70	6.80	—	—	10.00	11.65	—	152.75
Androscoggin Valley . . . . .	6.00	—	3.00	6.50	6.50	1.50	1.09	—	10.30	65.00	—	443.89
Aroostook, Caribou Trotting Park and Fair Association . . . . .	15.00	61.00	132.65	58.25	46.00	22.50	9.50	—	94.20	23.90	—	742.00
Aroostook, Houlton . . . . .	29.50	129.94	250.25	136.55	81.30	27.05	11.50	—	221.15	44.75	—	2,801.99
Aroostook, Northern Maine Fair Association . . . . .	426.35	477.50	308.00	169.15	189.50	48.25	56.50	—	309.00	591.25	52.40	5,055.75
Cumberland, Bridgton . . . . .	7.00	5.00	—	4.00	—	1.10	11.75	—	55.60	22.25	10.00	473.20
Cumberland County . . . . .	29.00	44.00	372.00	36.50	43.65	35.75	2.00	—	95.50	39.50	—	1,604.90
Cumberland Farmers' Club . . . .	—	—	—	—	—	—	—	—	—	—	—	—
Cumberland, Freeport Poultry Association . . . . .	—	—	725.95	—	—	—	—	—	—	—	—	725.95
Cumberland, New Gloucester and Danville . . . . .	3.00	15.00	5.25	24.35	19.90	2.65	2.50	—	28.65	20.00	—	274.30
Franklin County . . . . .	182.00	13.00	115.15	60.40	79.25	40.30	30.70	—	74.00	150.50	—	1,954.80
Franklin, North . . . . .	32.25	5.50	51.75	17.80	5.85	4.60	1.00	—	45.00	4.25	—	327.15
Hancock County . . . . .	16.50	18.00	—	47.20	26.50	6.85	5.10	—	34.45	460.00	—	778.60

Hancock, Eden .....	4.00	10.00	17.00	53.20	28.00	9.15	—	—	24.15	2.00	—	152.00
Hancock, North Ellsworth .....	7.00	—	6.00	20.25	30.60	1.25	—	—	14.00	.50	—	107.60
Kennebec, Cochenewagan .....	—	11.00	8.50	19.00	57.00	.75	—	—	24.00	65.15	—	306.50
Kennebec County .....	16.00	6.00	37.50	52.50	61.00	18.50	—	—	59.00	71.50	—	636.00
Kennebec, South .....	8.00	—	—	20.10	21.90	4.30	3.50	—	40.20	6.00	—	318.00
Knox, North .....	19.50	5.00	10.00	9.25	35.20	2.75	2.50	—	32.90	56.37	—	471.22
Lincoln, Bristol .....	—	—	3.00	11.65	8.90	3.50	—	—	46.30	7.05	—	99.65
Lincoln County .....	1.50	—	26.50	45.25	24.55	1.00	.75	—	29.55	34.50	—	212.85
Oxford County .....	32.00	35.00	205.00	88.75	400.00	16.75	72.75	27.00	101.75	310.00	—	3,040.00
Oxford, North .....	10.00	5.00	15.00	24.00	18.00	12.00	24.00	—	60.00	40.00	—	608.00
Oxford, West .....	52.00	23.00	32.00	74.75	23.25	35.00	22.40	—	136.55	170.50	—	1,894.45
Oxford, Western Maine Poultry Association .....	—	—	759.46	—	—	—	—	—	—	—	—	759.46
Penobscot, Bangor Poultry Association .....	—	—	737.00	—	—	—	—	—	—	—	—	737.00
Penobscot, North .....	—	—	—	50.00	125.00	5.00	—	—	68.50	—	—	282.00
Penobscot, West .....	90.00	93.00	82.00	75.90	68.85	6.00	8.50	—	68.95	233.60	—	1,503.05
Sagadahoc Agricultural and Horticultural Society .....	98.00	60.00	240.00	198.00	94.00	25.00	—	—	102.81	243.00	—	2,717.81
Sagadahoc, Richmond Farmers' Club .....	—	—	2.55	8.50	9.45	1.90	1.60	—	23.60	2.40	—	90.30
Somerset, Central .....	215.00	3.00	94.00	26.25	38.00	32.00	1.50	—	69.75	72.00	—	1,031.50
Somerset, East .....	124.50	13.00	91.00	40.50	6.50	13.50	1.75	—	20.50	14.50	—	538.75
Somerset, Embden .....	7.00	—	—	4.00	—	—	—	—	—	6.00	—	71.00
Somerset, Four County Fair Association .....	211.50	15.00	180.04	20.00	10.75	—	—	—	61.75	23.50	—	887.54
Somerset, Harmony Grange Fair Association .....	2.00	7.00	—	20.00	8.50	—	—	—	4.00	—	—	121.50
Somerset, Madison .....	4.00	3.25	6.00	10.95	3.50	1.45	.50	—	5.75	—	—	172.90
Somerset, Solon .....	8.00	14.00	6.00	14.00	—	—	—	—	5.00	11.00	—	287.00
Somerset, Wesserunsett Valley Fair Association .....	1.50	4.00	—	9.00	2.25	1.25	2.25	—	8.75	—	—	139.52
Waldo and Penobscot .....	68.00	12.00	2.25	35.25	60.45	15.25	10.25	—	83.50	55.30	—	725.25
Waldo, New Belfast Fair .....	15.00	13.00	98.50	21.00	61.61	—	—	—	19.00	—	—	419.61
Waldo, Tranquility Agricultural Society .....	—	—	6.50	9.20	18.85	1.50	—	—	11.35	19.05	—	80.70
Waldo, Unity Park Association .....	—	—	6.00	20.00	9.30	5.00	6.00	4.00	75.00	8.00	9.00	198.30
Washington, Machias Valley .....	1.00	4.50	13.32	42.87	68.41	7.15	4.35	—	65.78	123.17	—	424.85
Washington, West .....	—	—	1.75	29.50	49.25	12.00	3.00	—	58.20	—	—	289.70
York, Cornish .....	5.00	19.50	46.00	—	36.50	—	—	—	80.00	104.00	—	852.00
York, Shapleigh and Acton .....	—	—	15.00	50.50	40.00	7.25	—	—	68.75	27.00	—	304.00
	\$3,290.60	\$1,612.19	\$7,336.35	\$2,016.22	\$4,196.32	\$873.80	\$351.74	\$52.50	\$2,889.58	\$4,087.13	\$623.75	\$53,183.15

FINANCES.

NAME OF SOCIETY.	Amount received from State.	Receipts for membership.	Receipts from loans.	Entry fee for poultry.	Receipts from entry fees for trotting purses.	Receipts from all other sources.	Total receipts.
Maine State Agricultural Society .....	\$ 2,500.00	\$ 860.00	\$11,950.00	—	\$ 1,791.00	\$ 34,494.95	\$ 51,595.95
Eastern Maine State Fair .....	1,750.00	2,620.00	—	—	1,548.00	27,796.82	33,714.82
Central Maine Fair .....	2,500.00	—	4,300.00	—	1,400.00	10,726.34	18,926.34
Maine State Pomological Society .....	1,999.57	82.00	197.98	—	—	209.50	2,489.05
Maine State Poultry Association .....	756.63	67.00	—	501.25	—	350.00	1,674.88
Androscoggin County .....	68.93	14.00	—	—	—	1,091.00	1,173.93
Androscoggin Greene Town Fair Association ..	35.31	—	—	—	—	157.11	192.42
Androscoggin, Leeds Agricultural Association .	—	4.00	—	—	25.00	288.32	317.32
Androscoggin Valley .....	177.44	15.00	—	—	150.00	1,165.70	1,508.14
Aroostook, Caribou Trotting Park and Fair Association .....	304.25	—	500.00	—	1,225.00	5,976.35	8,005.60
Aroostook, Houlton .....	1,127.96	—	1,800.00	—	687.00	7,819.41	11,434.37
Aroostook, Northern Maine Fair Association .	2,475.91	46.00	—	—	2,307.00	27,778.17	32,607.08
Cumberland, Bridgton .....	225.45	—	—	—	802.50	2,174.52	3,202.47
Cumberland County .....	591.85	160.00	—	—	432.25	6,020.98	7,205.08
Cumberland Farmers' Club .....	48.14	—	—	—	—	—	48.14
Cumberland, Freeport Poultry Association ..	456.57	38.00	300.00	356.50	—	316.50	1,467.57
Cumberland, New Gloucester and Danville ...	134.07	10.00	—	—	321.00	1,885.58	2,350.65
Franklin County .....	825.87	835.00	2,179.00	—	682.00	8,205.55	12,727.42
Franklin, North .....	145.54	304.00	600.00	—	282.50	742.06	2,074.10
Hancock County .....	212.81	—	—	—	393.75	31.00	637.56
Hancock, Eden .....	93.74	—	—	—	115.00	756.12	964.86
Hancock, North Ellsworth .....	—	12.00	—	—	—	61.91	73.91
Kennebec, Cochenwagen .....	90.18	—	—	—	—	190.91	281.09
Kennebec County .....	363.35	10.00	—	—	—	676.00	1,049.35

Kennebec, South .....	150.43	—	—	—	72.50	2,104.15	2,327.08
Knox, North .....	252.19	1.00	—	—	51.00	3,507.00	3,811.19
Lincoln, Bristol .....	18.00	1.50	—	—	—	236.67	256.17
Lincoln County .....	118.91	2.00	—	—	—	2,137.69	2,258.60
Oxford County .....	1,307.97	26.00	4,500.00	—	462.50	4,439.15	10,735.62
Oxford, North .....	261.32	2.00	—	—	190.00	1,334.85	1,788.17
Oxford, West .....	733.03	135.00	2,200.00	—	460.00	5,498.35	9,026.38
Oxford, Western Maine Poultry Association ..	604.92	11.00	—	—	—	695.20	1,311.12
Penobscot, Bangor Poultry Association .....	587.23	34.00	600.00	328.25	—	175.45	1,724.93
Penobscot, North .....	112.07	1.00	—	—	75.00	2,500.00	2,688.07
Penobscot, Orrington .....	40.60	—	—	—	—	—	40.60
Penobscot, West .....	609.98	33.00	—	—	400.00	3,871.36	4,914.34
Sagadahoc Agricultural and Horticultural Society .....	—	30.00	400.00	—	645.00	10,704.75	11,779.75
Sagadahoc, Richmond Farmers' Club .....	16.84	2.00	—	—	—	116.53	135.37
Somerset, Central .....	438.14	250.00	1,200.00	—	560.00	5,254.48	7,702.62
Somerset, East .....	240.45	30.00	—	—	—	2,085.90	2,356.35
Somerset, Embden .....	27.89	—	—	—	—	69.50	97.39
Somerset, Four County Fair Association .....	405.52	—	1,000.00	—	228.00	2,971.30	4,604.82
Somerset, Harmony Grange Fair Association ..	24.35	—	—	—	—	289.07	313.42
Somerset, Madison .....	—	—	86.25	—	120.00	391.05	597.30
Somerset, Solon .....	—	—	—	—	—	343.38	343.38
Somerset, Wesserunsett Valley Fair Association	—	3.00	—	—	—	173.50	176.50
Waldo and Penobscot .....	383.28	—	—	—	186.25	2,575.27	3,144.80
Waldo, New Belfast Fair .....	161.83	40.00	—	—	483.00	3,745.35	4,430.18
Waldo, Tranquility Grange Agricultural Society	—	—	—	—	—	102.74	102.74
Waldo, Unity Park Association .....	302.26	—	—	—	336.00	1,470.30	2,108.56
Washington, Machias Valley .....	243.32	100.00	—	—	—	5,974.94	6,318.26
Washington, West .....	314.74	—	206.55	—	140.00	2,183.00	2,844.29
York, Cornish .....	358.15	—	360.00	—	520.00	3,809.25	5,047.40
York, Shapleigh and Acton .....	—	184.20	120.00	—	—	22.57	326.77
	\$24,596.99	\$5,962.70	\$32,499.78	\$1,186.00	\$17,091.25	\$207,697.55	\$289,034.27

FINANCES.

FINANCES—Concluded.

NAME OF SOCIETY.	Amount expended in improvements.	Amount expended in trotting purses.	Expenses during the fair.	Amount expended for purposes not named above.	Total amount paid out including premiums and gratuities.	Value of property belonging to the society.	Amount of liabilities.
Maine State Agricultural Society .....	\$ 1,780.00	\$ 5,418.99	\$ 8,288.75	\$ 31,205.03	\$ 51,677.02	\$ 82,000.00	\$ 34,449.39
Eastern Maine State Fair .....	44.30	4,340.00	2,845.34	24,640.01	35,302.85	27,221.57	29,840.00
Central Maine Fair .....	2,232.42	1,370.00	8,674.25	17,344.45	35,376.26	3,704.22	31,068.11
Maine State Pomological Society .....	—	—	766.47	858.99	2,870.71	2,370.00	200.00
Maine State Poultry Association .....	—	—	1,150.00	—	2,624.17	500.00	—
Androscoggin County .....	—	533.75	210.00	—	1,126.95	—	—
Androscoggin, Greene Town Fair Association .....	—	—	80.10	—	172.75	—	—
Androscoggin, Leeds Agricultural Association .....	—	—	93.19	—	245.94	—	—
Androscoggin Valley .....	200.00	500.00	624.57	75.00	1,843.46	3,500.00	2,477.74
Aroostook, Caribou Trotting Park and Fair Association .....	700.00	2,850.00	4,576.36	—	8,868.36	35,000.00	19,000.00
Aroostook, Houlton .....	2,128.69	3,216.00	1,698.71	3,470.14	13,315.53	25,372.15	6,550.00
Aroostook, Northern Maine Fair Association .....	7,417.72	6,000.00	8,983.07	3,164.64	30,621.18	65,000.00	12,000.00
Cumberland, Bridgton .....	225.00	1,650.00	564.80	—	2,913.00	3,300.00	1,000.00
Cumberland County .....	—	1,768.75	2,360.42	940.42	6,674.49	7,000.00	—
Cumberland Farmers' Club .....	—	—	—	—	1,000.00	1,000.00	—
Cumberland, Freeport Poultry Association .....	—	—	208.34	—	934.29	900.00	500.00
Cumberland, New Gloucester and Danville .....	72.74	740.00	266.10	629.40	1,982.54	2,500.00	—
Franklin County .....	1,049.90	1,705.00	6,769.94	271.99	11,751.63	2,000.00	—
Franklin, North .....	25.00	725.00	171.50	825.52	2,074.17	2,000.00	2,367.48
Hancock County .....	225.38	630.00	2,945.34	—	4,579.32	1,000.00	—
Hancock, Eden .....	150.00	400.00	510.00	—	1,212.00	2,500.00	115.00
Hancock, North Ellsworth .....	99.10	35.00	199.55	515.16	956.41	1,000.00	—
Kennebec, Cochnewagen .....	—	—	59.05	—	365.55	—	—
Kennebec County .....	260.00	50.00	40.00	38.00	1,024.00	—	115.50

Kennebec, South .....	91.88	642.50	342.90	1,060.15	2,455.43	1,500.00	—
Knox, North .....	250.00	431.00	566.88	877.21	2,596.31	1,500.00	—
Lincoln, Bristol .....	—	—	137.68	105.65	342.98	1,200.00	100.00
Lincoln County .....	—	450.00	913.16	895.44	2,471.45	5,000.00	2,700.00
Oxford County .....	1,359.44	1,150.00	2,102.05	1,384.61	9,036.10	20,000.00	5,500.00
Oxford, North .....	274.57	550.00	125.00	—	1,557.57	2,500.00	—
Oxford, West .....	45.62	1,200.00	1,023.85	3,132.94	7,296.86	—	—
Oxford, Western Maine Poultry Association .....	5.00	—	227.56	604.33	1,596.35	500.00	—
Penobscot, Bangor Poultry Association .....	—	—	—	400.70	1,137.70	—	—
Penobscot, North .....	700.00	750.00	900.00	—	2,632.00	5,000.00	—
Penobscot, Orrington .....	—	—	—	—	—	12,000.00	—
Penobscot, West .....	649.33	1,135.00	655.67	198.00	4,141.05	5,000.00	4,200.00
Sagadahoc Agricultural and Horticultural Society .....	750.00	1,685.00	1,350.00	4,856.94	11,359.75	10,000.00	—
Sagadahoc, Richmond Farmers' Club .....	—	—	49.70	—	140.00	—	—
Somerset, Central .....	237.20	1,400.00	870.47	1,818.06	5,357.23	8,000.00	4,200.00
Somerset, East .....	250.00	1,060.00	1,032.63	165.00	3,046.38	2,500.00	1,802.59
Somerset, Embden .....	96.50	—	11.80	—	179.30	5.00	6.80
Somerset, Four County Fair Association .....	776.31	1,425.75	1,994.63	—	5,084.23	8,312.21	—
Somerset, Harmony Grange Fair Association .....	—	—	27.00	—	148.50	—	—
Somerset, Madison .....	21.13	300.00	80.34	18.00	592.37	1,000.00	740.00
Somerset, Solon .....	—	—	—	30.15	317.15	—	—
Somerset, Wesserrunnett Valley Fair Association .....	—	—	8.00	37.50	185.02	—	—
Waldo and Penobscot .....	83.32	817.50	924.63	—	2,550.70	3,500.00	1,052.00
Waldo, New Belfast Fair .....	1,411.62	1,065.00	711.87	272.46	3,880.56	2,500.00	—
Waldo, Tranquility Grange Agricultural Society .....	15.00	—	25.00	8.65	129.35	2,000.00	—
Waldo, Unity Park Association .....	165.00	925.00	589.99	—	1,878.29	—	282.49
Washington, Machias Valley .....	—	1,477.50	3,252.20	—	5,154.55	—	—
Washington, West .....	254.69	934.00	868.49	120.56	2,467.44	1,926.00	1,500.00
York, Cornish .....	250.00	1,200.00	1,400.00	2,208.28	5,910.28	4,500.00	400.80
York, Shapleigh and Acton .....	—	—	29.00	55.05	388.05	2,000.00	—
	\$24,296.86	\$50,530.74	\$72,306.35	\$102,228.43	\$302,545.53	\$368,311.15	\$162,167.90

FINANCES.





ANNUAL REPORT

OF THE

**State Pomological Society**

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**1919**

MAINE STATE POMOLOGICAL SOCIETY.  
OFFICERS FOR 1919.

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C. C. CLEMENTS, Winterport

*Vice-Presidents*

A. C. MACOMBER, Wilton

H. W. BEARCE, Hebron

*Secretary*

E. L. WHITE, Bowdoinham

*Treasurer*

T. E. CHASE, Buckfield

*Executive Committee*

THE PRESIDENT, FIRST VICE-PRESIDENT, SECRETARY AND TREASURER, *ex-officio*

E. W. DOLLOFF, Standish

W. C. ROBINSON, No. Anson

F. H. DUDLEY, Augusta

*Members of Experiment Station Council*

W. H. CONANT, Buckfield

*Delegates to Federation of Agricultural Associations*

C. C. CLEMENTS, Winterport

W. H. CONANT, Buckfield

E. L. WHITE, Bowdoinham

*Trustees for 1919.*

*Androscoggin County*—ARCH D. LEAVITT, Turner

*Cumberland County*—E. W. DOLLOFF, Standish

*Franklin County*—J. E. COLLINS, Farmington

*Hancock County*—C. L. MORANG, Ellsworth

*Kennebec County*—CLEMENT & TAYLOR, Winthrop

*Knox County*—FRANK H. LENFEST, Union

*Lincoln County*—W. C. FORD, Whitefield

*Oxford County*—W. H. CONANT, Buckfield

*Penobscot County*—ERNEST PAGE, East Corinth

*Piscataquis County*—LYMAN K. LEE, Foxcroft

*Sagadahoc County*—R. A. DOUGLASS, Bowdoinham

*Somerset County*—W. C. ROBINSON, North Anson

*Waldo County*—C. C. CLEMENTS, Winterport

*Washington County*—MILLARD H. WISWELL, East Machias

*York County*—C. E. FELCH, Limerick

## MEMBERS OF THE SOCIETY.

## LIFE MEMBERS

- Allen, W. H. . . . . Buckfield  
 Andrews, Charles E. . . . . Auburn  
 Atherton, Wm. P. . . . .Hallowell  
 Atkins, Charles G. . . . .Bucksport  
 Averill, David C. . . . .Temple  
 Barrows, Greenhouse Co. . . .Gorham  
 Bearce, Harry W. . . . .Hebron  
 Bennoch, John E. . . . .Orono  
 Rickford, Lewis I. . . . .Dixmont Center  
 Bisbee, George E. . . . .Auburn  
 Bisbee, Stanley . . . . .Rumford Falls  
 Blaisdell, A. L. . . . .Winterport  
 Blossom, O. E. . . . .Turner Center  
 Bowman, H. G. . . . .Hebron  
 Bradbury, Mrs. Bert . . . . .Buxton Center  
 Briggs, John . . . . .Turner  
 Brown, F. Howard . . . . .Marlboro, Mass.  
 Brunberg, A. E. . . . .Camden  
 Buck, O. C. . . . .Hebron  
 Burleigh, Miss Clara M. . . . .Vassalboro  
 Butler, Charles M. . . . .Wiscasset  
 Butler, Alonzo . . . . .Union  
 Butman, J. W. . . . .Readfield  
 Chadbourne, C. L. . . . .North Bridgton  
 Chandler, Mrs. Lucy A. . . . .Freeport  
 Chase, Henry M.,  
 103 Federal St., Portland  
 Chase, Homer N. . . . .Auburn  
 Chase, Thomas E. . . . .Buckfield  
 Clement, D. S. . . . .Winthrop  
 Clements, C. C. . . . .Winterport  
 Conant, A. A. . . . .Hebron  
 Conant, E. E. . . . .Hebron  
 Conant, George I. . . . .Hebron  
 Conant, H. L. . . . .Hebron Station  
 Conant, W. H. . . . .Buckfield  
 Conant, W. G. . . . .Hebron  
 Corbett, Herman . . . . .Farmington  
 Cottle, A. S. . . . .R. 37, Waterville  
 Crowell, Mrs. Ella H. . . . .Skowhegan  
 Crowell, John H. . . . .Farmington  
 Cummings, Marion L. . . . .Hebron  
 Dana, Woodbury S. . . . .Westbrook  
 Dawes, S. H. . . . .Harrison  
 Dearborn, Hall C.,  
 Hampden Highland  
 DeCoster, Virgil P. . . . .Buckfield  
 Dennison, Mrs. Cora M. . . . .Harrison  
 DeRocher, Peter . . . . .Bradentown, Fla.  
 Dirwanger, Joseph A. . . . .Portland  
 Dolloff, E. W. . . . .Standish  
 Douglass, C. S. . . . .Douglass Hill  
 Dunham, W. W. . . . .North Paris  
 Emerson, Charles L. . . . .South Turner  
 Farnsworth, B. B. . . . .Portland  
 Farrington, Mrs. G. H. . . . .Brewer  
 Felch, Charles E. . . . .Limerick  
 Fish, Mrs. Benjamin . . . . .Winterport  
 Flint, John M. . . . .West Baldwin  
 French, H. C. . . . .Rumford Center  
 Gardiner, Robert H. . . . .Gardiner  
 George, C. H. . . . .Hebron  
 Goddard, Lewis C. . . . .Woodfords  
 Goding, M. T.,  
 50 St. Lawrence St., Portland  
 Graves, Grace A. . . . .Augusta  
 Grover, Franklin D. . . . .Bean  
 Gulley, Alfred G. . . . .Storrs, Conn.  
 Gurney, F. E. . . . .Hebron  
 Hackett, E. C. . . . .West Gloucester  
 Hall, Mrs. H. A. . . . .Brewer  
 Hardy, E. E. . . . .Farmington  
 Hardy, Walter M. . . . .Brewer  
 Hayes, William . . . . .Gardiner  
 Heald, U. H. . . . .Paris  
 Herrick, A. A. . . . .Norway  
 Hinds, W. C. . . . .Winthrop  
 Hitchings, E. F. . . . .Orono  
 Hoyt, C. E. . . . .New Portland  
 Hoyt, Mrs. Frances . . . . .Winthrop  
 Jones, Elwyn . . . . .Dryden  
 Jackson, F. A. . . . .Winthrop  
 Keene, Charles S. . . . .Turner  
 Keyser, Howard L. . . . .Greene  
 Lang, Ivan E. . . . .Augusta  
 Lapham, E. A. . . . .Pittston  
 Leavitt, L. C.,  
 322 West St., Biddeford  
 Lee, Lyman K. . . . .Foxcroft  
 Lincoln, E. L. . . . .Wayne  
 Litchfield, J. H. . . . .Auburn  
 Littlefield, Harry W. . . . .Brooks  
 Lombard, Thurston M. . . . .Auburn  
 Lord, J. Merrill . . . . .Kezar Falls  
 Luce, Willis A. . . . .Mabton, Wash.  
 Macauley, T. B. . . . .Montreal, Can.  
 Martin, John J.,  
 270 Center St., Bangor  
 McAllister, Zaccheus . . . . .West Lovell  
 McCabe, George L. . . . .North Bangor  
 McLaughlin, Mrs. Edna G. . . . .Exeter  
 McLaughlin, Henry . . . . .Bangor  
 Merrill, H. H. . . . .Hebron  
 Merrill, Oliver F. . . . .Gardiner  
 Merrill, Rupert B. . . . .Gardiner  
 Millspaugh, L. H. . . . .Winthrop  
 Minot, Clarence M.,  
 426 Summer St., So. Portland  
 Mitchell, Frederick H. . . . .Turner  
 Mitchell & Co. . . . .Waterville  
 Moody, Charles H. . . . .Turner  
 Moody, J. F. . . . .Hebron  
 Moore, William G. . . . .Monmouth  
 Moor, F. A. . . . .Waterville  
 Morse, F. H. . . . .Waterford  
 Morse, W. J. . . . .Orono  
 Mosher, C. M. . . . .Wilton  
 Newell, G. E. . . . .Turner  
 Page, E. E. . . . .East Corinth  
 Page, F. W. . . . .Augusta  
 Palmer, George L. . . . .Kent's Hill  
 Parsons, Howard G. . . . .Turner Center  
 Patten, Mrs. E. C. . . . .Topsham  
 Pingree, Arthur E. . . . .Wiscasset  
 Prince, Edward M., West Farmington  
 Pope, Charles S. . . . .Manchester

Pulsifer, D. W. ....	Poland	Sweetser, F. R. ..	Cumberland Center
Ramsdall, E. H. ....	Ripley	Taylor, Miss L. L. (Lakeside)	
Rich, N. H. ....	Charleston		Belgrade
Richards, John T. ....	Gardiner	Taylor, Frank H. ....	Winthrop
Richardson, Herbert A.,		Thomas, William W. ....	Portland
82 Best St., Woodfords		Thomas, D. S. ....	North Auburn
icker, A. S. ....	Turner	Thurston, Edwin ..	West Farmington
Ricker, Fred P. ....	Turner	Townsend, Mrs. B. T. ....	Freeport
Roak, George M. ....	Auburn	True, John W. ....	New Gloucester
Robinson, W. C. ....	North Anson	Twitchell, George M. ....	Auburn
Rogers, Mrs. Jeanette,		Verrill, H. E. ....	Hebron
	North Newburg	Verrill, Harry M. ....	Portland
Sawyer, Andrew S. ..	Cape Elizabeth	Vickery, James ....	Portland
Sawyer, Charles F. ....	Hebron	Walker, Charles S. ....	Peru
Saunders, Ernest ....	Lewiston	Walker, Elmer V. ....	Oxford
Seavey, Mrs. G. M. ....	Auburn	Waterman, Willard H. ....	East Auburn
Skellings, C. W. ....	North Auburn	Waugh, F. A. ....	Amherst, Mass.
Smith, Frederick O. ..	New Vineyard	Weston, Joseph ....	Gardiner
Smith, V. N. ....	Buckfield	Wheeler, Charles E. ....	Chesterville
Stanley, H. O. ....	Winthrop	White, Charles M. ....	Bowdoinham
Stanley, N. D. ....	Pittsfield	White, Mrs. Annie ....	Bowdoinham
Staples, George W.,		White, Edward L. ....	Bowdoinham
904 Main St., Hartford, Conn.		Whitman, L. E. ....	Hebron
Stilphen, Asbury C. ....	Gardiner	Woods, Charles D. ....	Orono
Strout, Charles S. ....	Biddeford	Wright, Frederick ....	Augusta
Supt. Maine Sanatorium Farm	Hebron	Yeaton, George A. ....	Augusta
		Yeaton, Samuel F.,	West Farmington

## ANNUAL MEMBERS FOR 1919.

Bass, Lizzie E. ....	Wilton	Nason, Elroy A. ....	Mechanic Falls
Bass, Mary A. ....	Wilton	Page, E. D. ....	Bangor
Cobb, C. E. ....	Denmark	Phillips, Dr. Geo. A. ....	Bar Harbor
Curris, L. S. ....	Dixmont	Reynolds, W. E. ....	Monmouth
Cushman, L. B. ....	Ellsworth	Roberts, John A. ....	Augusta
Doloff, E. W. ....	Standish	Shaw, H. J. ....	Auburn
Dudley, F. H. ....	Augusta	Smith, C. M. ....	Amherst
Dunn, Charles, Jr. ....	Portland	Smith, Geo. S. ....	Monmouth
Elder, Geo. K. ....	Lewiston	Staples, Rev. L. W. ....	Bowdoinham
Hall, Henry H. ....	Monmouth	Thompson, D. H. ....	Bangor
Humphrey, Mildred L. ....	Augusta	Walker, C. E. ....	Monmouth
Jordan, Ira ....	Milbridge	Watson, Dr. W. L. ....	Monroe
Leland, J. W. ....	Dover	Williams, C. E. ....	Strong
McCable, E. T. ....	Newport	Wing, Earl C. ....	No. Anson

ANNUAL MEETING  
OF  
MAINE STATE POMOLOGICAL SOCIETY.

CITY HALL, BANGOR, NOVEMBER 20, 1919.

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The meeting was called to order by the President and the following reports were heard.

The President appointed as a committee on resolutions the following gentlemen:

Dr. Woods, G. A. Yeaton and E. W. Dolloff.

ADDRESS OF WELCOME.

C. C. CLEMENTS, PRESIDENT MAINE STATE POMOLOGICAL SOCIETY,  
PORTLAND.

*Ladies and Gentlemen:*

It is a pleasure to welcome you to this, the Fifty-sixth annual meeting, and to congratulate our members on the splendid crop of fruit produced and exhibited this year. The past few years have been very discouraging to our fruit growers, with the loss of a large number of our trees, small crops, and the loss of our foreign markets. All of these conditions have resulted in small returns, and have caused many of our orchards to be neglected and few new ones to be set out. But the large crop of fruit that we have this year, and the markets of the world again open to us, should put new life into every grower and stimulate him to set out more trees, take better care of the old ones, and grow more and better fruit.

One of the greatest needs of our fruit growers today is to grow cleaner fruit. Too large a percentage of our apples have had to go for canning for the reason that they were affected with one or more of the fungus diseases that attack our apples and which can be controlled by the right sprays or dust.

In setting out new orchards great care should be used to see that the conditions are right for growing good, healthy trees that can be made to produce clean fruit.

A large per cent of our apples are grown on farms where other lines of farming are carried on, which the farmer has thought paid better than apples, with the result that the trees have had little attention, but the returns that some of our growers of good clean fruit are receiving this year, should encourage others to take better care of their trees, for an apple orchard is too valuable a piece of property to be neglected.

I wish at this time to express in behalf of this Society our appreciation of the efforts of our Commissioner of Agriculture, and of the valuable service rendered by that Department, also our appreciation of the assistance rendered by the College of Agriculture, University of Maine, through their county agents.

The Society has held four field day meetings in the several parts of the State along educational lines, and a large number of growers were reached. The interest these received should spur us on to greater efforts in the future in carrying on our educational campaign for better fruit, better grading, more business organizations among our growers,—that better returns may be received. To accomplish this our Society needs the support of every fruit grower in Maine, and I believe an effort should be made to enroll every one of them as a member.

#### REPORT OF SECRETARY.

The Executive Committee was called together by the President early in the year at Augusta to go over the work of 1918 and make preparations for 1919.

It was voted to hold a conference at Orono, Farmers' Week, in March. Prof. Gurley of Durham, N. H., was engaged as a speaker on "Cultivation"; also practical men from Maine, which made these meetings a source of great help to the orchardist. A greater effort should be made to interest more of the farmers to attend these meetings at Orono-Farmers' Week.

Plans were made to have W. H. Conant, H. P. Sweetsir, F. H. Dudley, and Prof. Gurley speak at four field meetings in August. The first one was held at East Sumner and about fifty-one were in attendance. The second was held on Hilton Hill in Skowhegan, with one hundred and fifty in attendance. Lyman K. Lee

kindly invited us to hold our third one in his orchard in Foxcroft, with an attendance of about forty. The fourth one was held at the Grange Hall at Exeter Mill, with about sixty in attendance.

At all of these meetings more interest was manifested in fruit growing than has been noted for several years, and it seemed that a renewed effort was being made to go into the orchard work with better business methods than ever before.

With the large crop of 1919 there is a great demand for *Number One* fruit, demonstrating that there is always room for the fellow who takes good care of his fruit trees to sell his products at good prices.

At the several field meetings held this summer it was noticed that very few young men attended. I think a greater effort should be made to interest the boys and girls in fruit growing.

Early in the year the officers of several State-wide organizations met in Augusta to form plans for the second allied meetings, to be held in Bangor, and these meetings have proven the great advantages of this move.

Let us all work together, demonstrating that the farmer can organize and push forward his own business.

Respectfully submitted,

E. L. WHITE,  
*Secretary.*

Voted, that the report of the Secretary be accepted.

## REPORT OF TREASURER.

### *Receipts*

1919			
Jan. 1	Working funds on hand, as shown on last report	.....	\$ 422.78
13	Rec'd Interest on stocks and bonds	.....	38.50
17	Sale of apples	.....	29.00
25	From State Treasurer	.....	287.84
Feb. 17	Sale of space at annual show	.....	5.00
Mar. 13	From State Treasurer	.....	766.25
May 3	Sale of space at annual show	.....	5.00
July 8	Interest on stock	.....	16.00
26	Interest on Bonds	.....	42.50
Sept. 20	Two life membership fees	.....	20.00
23	Credit voucher from Executive Dept.	.....	8.27
Oct. 31	From State Treasurer	.....	431.00



Nov. 3	One life membership fee .....	10.00
28	Interest on Liberty Bond .....	20.00
Dec. 31	Life Membership fees .....	50.00
31	Annual Dues .....	10.00
1920		
Jan. 1	Discounted note .....	197.98
2	Interest on stocks and bonds .....	42.50
6	Life Membership fees .....	30.00
6	Sale of apples .....	11.00
8	State Treasurer .....	470.80
20	E. L. White—annual dues collected .....	22.00
Total Receipts .....		<u>\$2,936.42</u>

## Permanent fund invested as follows:

Four shares Farmington National Bank Stock .....	\$ 400.00
Two \$500 Bonds Stockton Springs Water Co. ....	970.00
One Liberty Bond .....	1,000.00
On Deposit in Savings Bank .....	90.00
Due for transfer from working funds .....	110.00
Total .....	<u>\$2,570.00</u>

*Disbursements*

Order No.		
1	Paid Wallace S. Ladd, printing .....	\$ 6.79
2	W. H. Conant, Speaker .....	21.64
3	J. H. Gourley, Speaker .....	44.62
4	Howard W. Selby, Speaker .....	26.96
5	W. C. Robinson, Executive Com. expense .....	14.22
6	F. H. Dudley, Executive Com. expense .....	13.44
7	A. C. Macomber, Executive Com. expense .....	16.90
8	Premiums on 1918 Annual meeting .....	144.00
9	E. L. White, 6 months salary .....	75.00
10	E. L. White, 6 months expense .....	37.78
11	C. C. Clement, President expense .....	20.79
12	A. C. Macomber, Executive Com. expense .....	9.66
13	E. W. Dolloff, Executive Com. expense .....	20.01
14	W. C. Robinson, Executive Com. expense .....	3.85
15	T. E. Chase, 6 months salary and expense .....	20.65
16	W. H. Conant, expense (special committee) .....	2.63
17	Treasurer's Bond for 1919 .....	5.00
18	H. P. Sweetser, expense, Speaker, field meetings .....	11.29
19	J. H. Gourley, Speaker, field meetings .....	84.74
20	W. H. Conant, Speaker, field meetings .....	46.10

22	Executive Dept. by voucher on two bills for printing ..	8.27
23	Bastian Bros., Badges for annual meeting .....	22.27
24	Portland Chamber of Commerce, dues .....	25.00
25	F. H. Greeley, Judge, annual meeting .....	40.53
26	A. K. Gardner, Judge, annual meeting .....	34.38
27	William Stuart, Speaker annual meeting .....	59.62
28	Geo. E. Sanders, Speaker, annual meeting .....	55.70
29	Bangor Railway & Electric Co., lantern .....	7.00
30	Geo. A. Yeaton, Judge, annual meeting .....	33.81
31	A. M. White, Clerk, annual meeting .....	15.13
32	E. L. White, expenses .....	46.62
33	E. L. White, 6 months salary .....	75.00
34	Banquet tickets for speakers and guests .....	15.00
35	E. F. Hitchings, Judge annual meeting .....	25.00
36	H. C. Chapman Hotel Co., board of officers, speakers, etc. ....	202.15
37	Transfer of 1918 life membership fees .....	20.00
38	Chas. C. Clements, expenses .....	53.44
39	W. C. Robinson, Executive Com. expense .....	9.00
40	Frank W. Morse, carpenter work annual meeting .....	148.17
41	Premiums at annual meeting .....	527.25
42	Premiums at annual meeting bbls. and boxes .....	718.00
43	L. B. Raynes, annual meeting, stenographer .....	40.00
44	T. E. Chase, expense .....	15.53
45	E. W. Dolloff, Executive Com. expense .....	9.92
46	A. C. Macomber, Executive Com. expense .....	10.42
47	T. E. Chase, 6 months postage .....	1.00
48	T. E. Chase, 6 months salary .....	12.50
49	Chas. H. Glass Co., printing (2 bills) .....	4.40
50	Treasurer of Maine Dairymen for 1/3 space let at show	10.00
51	Treasurer of Maine Seedmen for 1/3 space let at show	10.00
52	E. L. White, M. C. R. R. freight .....	9.53
	<b>Total</b> .....	<b>\$2,870.71</b>
	Jan. 20, 1920 Cash on hand (including \$110 due for transfer) ..	65.71
		<b>\$2,936.42</b>

Respectfully submitted,

T. E. CHASE,  
*Treasurer.*

Voted, that the report of the Treasurer be accepted.

Mr. W. H. Conant, as the representative of the Pomological Society on the Council, gave the report of the Experiment Station Council.

MAINE STATE POMOLOGICAL SOCIETY.  
OFFICERS FOR 1920.

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*President*

A. C. MACOMBER, Dryden

*Vice-Presidents*

NEAL D. STANLEY, Pittsfield  
W. G. CONANT, Hebron

*Secretary*

E. L. WHITE, Bowdoinham

*Treasurer*

T. E. CHASE, Buckfield

## EXECUTIVE COMMITTEE

THE PRESIDENT, FIRST VICE-PRESIDENT, SECRETARY AND TREASURER, *ex-officio*

F. H. DUDLEY, Augusta  
E. W. DOLLOFF, Standish  
W. C. ROBINSON, No. Anson

*Member of Experiment Station Council*

W. H. CONANT, Buckfield

*Delegates to Federation of Agricultural Associations*

W. H. CONANT, Buckfield  
E. L. WHITE, Bowdoinham  
A. C. MACOMBER, Dryden

*Committee on Resolutions*

GEORGE A. YEATON, Norway  
DR. CHAS. D. WOODS, Orono  
E. W. DOLLOFF, Standish

*State Vice President of American Pomological Society*

GEORGE A. YEATON, Norway

*Vice President New England Fruit Show*

JOHN A. ROBERTS, Augusta

## OUTLINE OF APPLE WORK IN 1919.

BY W. H. CONANT.

The Council of the Maine Agricultural Experiment Station consists of the President of the University, the Director of the Station, three members of the Board of Trustees of the University, the Commissioner of Agriculture, a representative from the State Grange and one from each of the State-wide organizations co-ordinate with the Pomological Society, the Dean of the College of Agriculture, and the Heads and associates of the Station Departments. An annual meeting is held at Orono. Previous to this a typewritten report prepared by the Director and his associates, which gives in much detail a statement of work completed, work in progress, and suggestions for new work, is placed in the hands of each member of the Council. At the annual meeting this report is carefully gone over, step by step. All new work is first approved by the Council, and suggestions for new work may come from any member of the Council, whether on the Station staff or not. Usually one or more summer meetings of the Council are held at the experimental farms in order to obtain first hand information regarding the progress of the work there. Your representative was present at the annual meeting at Orono in April and has at other times visited the Station at Orono and at Highmoor Farm, and has conferred with and advised with different members of the staff relative to the work in progress.

The "high cost of living" has hit the Station even harder than it has most individual citizens. Thanks to an appropriation made by the Legislature of 1919 for the present and next calendar years, which was granted at the request of members of this Society, the Seed Improvement Society and others, the work at Highmoor Farm has been carried on as usual.

When the work with apples was first begun at Highmoor Farm, a horticulturist, who was essentially an experimental pomologist, was employed. It soon became evident that the activities of an individual employed for such work in Maine would be confined largely to the following lines: Orchard management,

such as fertilization, cultivation and pruning; studies on growth and productivity as influenced by these various factors, as well as by the inherent differences possessed by individual trees, strains or varieties; breeding, both to obtain varieties better adapted to Maine conditions and to discover what could be learned relative to the fundamental laws of inheritance as applied to apple breeding; apple diseases and their control; insects beneficial and injurious. Such is the nature of the work being carried on at the farm. Much valuable data has been accumulated, some of immediate practical nature which is being published from time to time, and other which show progress but which will require years to complete.

No one person could be an expert on all of these lines. The Station was fortunate in having for a Superintendent at Highmoor a man with many years of practical experience in general Horticulture, both at the University and on private estates. In different departments it had on its staff specialists in these distinct, though related lines of inquiry. It seemed that more would be accomplished and greater progress would be made, if each of these specialists should assume the responsibility for the part of this work which would naturally come in his province, than would be the case where a single person, employed as a horticulturist or pomologist, should attempt to do it all. Therefore when the former horticulturist resigned this change was made. The different phases of the apple work at Highmoor are now in charge of the Director, the heads of the departments of Biology, Entomology, Plant Pathology and the Farm Superintendent, but all work is closely co-ordinated.

In the limits of this report it is possible only to outline the progress that has been made in the chief lines of work in orcharding at Highmoor Farm during the year.

The breeding work with the apple has from the start been an important feature. This year for the first time may be seen at the exhibit in the hall, seeding apples that have fruited.

The work on cross breeding apples for the purpose of studying the laws of inheritance in apples and of producing new types of fruit is continued. A number of hand pollinations were made last spring. The seed from the apples thus obtained will be planted in the cold frame this fall.

The seedling trees previously obtained were transferred to the

seedling orchard. These trees are set 7 x 9-feet apart. This will allow sufficient room to bring each tree into bearing after which the worthless ones will be removed. This orchard now contains over 1500 trees.

As fast as opportunity for handling the seedlings will permit new pollinations are being made. In the present state of our knowledge on apple breeding, it is only by growing large numbers of seedlings and discarding the worthless, that any progress can be made.. Careful records are kept of all steps in these breeding operations, and it is hoped that in time these will throw some light on the method of inheritance of certain important characters.

An extensive experiment on the mutual influence of stock and cion, as outlined in previous reports, was continued during 1919. In 1915 a new orchard of nearly 500 trees was set from the stock and cion nursery. Ten different varieties were used, viz: Larue, Porter, Stark, Wealthy, Spy, Baldwin, McIntosh, Gravenstein, Rolf and Milding. Half of the trees set from each variety had been budded on French Crab stock, the others had been budded on Tolman Sweet stock. In addition to the results from the stock and cion experiment, this orchard will be a valuable addition to the apple work at Highmoor.

Besides the experimental breeding work outlined above, careful records are kept of every individual tree in the orchards. This data includes notes on the general vigor and appearance of the tree, the time and amount of bloom, the set of fruit, the June drop, amount and kind of injury, etc. In addition the actual weight of apples picked from each tree and the measured amount of wood growth are recorded. These records are all transferred to the punched card system used by the U. S. Census Bureau, so that by electrically driven machinery they can be handled at the rate of many hundreds per hour and the facts there recorded, analyzed and tabulated at a small outlay for machinery rental. A large number of clerks could not tabulate these results with the precision and the rapidity of the machine. This data is giving very valuable information.

Does the conformation of the apple tree affect its yield, is a problem of direct practical interest and application constantly borne in mind by the Experiment Station in its orchard work. In 1917 it was found that the Ben Davis trees could be divided into

three main types according to the shape of the growth of the tree. The manner of this growth was found to be little influenced by the pruning. It appears inherent in the trees as they stand. The trees in the orchards have been classified for these types. Studies now nearly completed for publication show that there is a direct and significant relationship between yield and these types. Since unfortunately we do not know the exact ages of all the trees in the orchard, (the supposition is that in general they were planted at the same time) it is conceivable that the difference in type might be an age difference; in which case a close relationship between type and yield would be expected. Consequently it became necessary to determine how much yield depends on the circumference of the tree and how much it depends on growth. The results showed that yield was closely correlated with the tree's circumference and more loosely, although quite significantly correlated with rapid growth. As was expected, it was found that trees of larger circumference grew faster than those of smaller circumference. The type of the tree was also directly associated with growth. From these results, it appears that type itself is a potent factor in apple yield, irrespective of any relation it may have to growth. This, in fact, proved true for having the above correlations between type, yield, and growth, it is possible to determine the influence of type on an orchard when all the trees are of the same circumference and growth. The analysis leads therefore to the conclusion that the type of the tree materially effects the yield.

The practical and theoretical importance of these results need little exemplifying. The results indicate that within the variety of Ben Davis trees there are distinct differences probably inherited, which influence yield. *The nurseryman should, therefore, be extremely careful in choosing his cions from the proper stock, so as to obtain the full benefit of these inherent differences.* The practical orchardist and the buyer of an orchard will as the above results indicate, make a neat profit by selecting his trees for these points.

While we have been more fortunate at Highmoor Farm than has been the case with many privately owned orchards, we have lost some trees during the last two seasons as the result of the severe winter of 1917-18. Among these have been representatives of the different types mentioned above. As a further check

on these results we are to make use of cross sections of these winter-killed trees to determine the ages of the different trees of each type.

#### ORCHARD SPRAYING EXPERIMENTS.

For the experimental spraying a part of one of the Ben Davis orchards is used, the plots being shifted around from year to year. It would hardly be possible to find in the State an orchard where a spraying material or a spraying program would be put to a more rigorous test. In the first place the Ben Davis fruit is easily russeted by spray materials and the foliage is quite susceptible to spray injury. The scab fungus also finds it an easy victim. Either the strain of Ben Davis set at Highmoor is extremely susceptible to scab, or else local conditions are particularly favorable for the development of the scab fungus. The use of the most approved methods frequently fail to secure entirely satisfactory control year in and year out. Hence one of the important objects of the spraying experiments, is to test promising methods of scab control, repeating each a sufficient number of times to prove its value or lack of value. It is felt that a spray combination which will thoroughly control scab on Highmoor Farm orchards, and yet not injure the foliage or fruit of a variety like the Ben Davis, is safe to recommend for use anywhere in the State. On account of the Station's finances during the war, it did not seem wise to go to the expense of purchasing a dusting machine to try out this method of scab control under the conditions that exist at Highmoor. It is hoped that some arrangement can be made to do this during the coming year.

Because of the fact that the time between harvest and this meeting is so short, the detailed results for the immediate year cannot be given, I am again this year, as in the past, reporting the spraying work one year behind.

The spraying experiments continue to yield valuable and interesting results. In 1918 twelve different plots and treatments were used. These experiments differ from most any others which have been carried on in this country. In the first place instead of drawing conclusions on the results obtained on a few trees, bearing relatively small numbers of apples, these plots, with one exception, are uniformly 24 trees each, making a total of 287



trees in use last year. In the second place no attempt is being made to draw definite conclusions from a single year's work, and the results of succeeding years have repeatedly demonstrated the wisdom of such a policy.

Some of the questions asked in planning the experiments for 1918 were: To what extent do lime-sulphur and arsenate of lead contribute to the fungicidal action of the combined spray, and is the fungicidal action of either impaired by such combination? Do different forms of arsenate of lead have a different fungicidal value when used alone, or in combination with lime-sulphur? Has arsenate of lime any fungicidal value, and how does this value compare with arsenate of lead when used alone, or in combination with lime-sulphur? Will our modified spraying program continue to give good results year after year? Is our home prepared lime-sulphur as efficient as the commercial article?

Briefly stated the results for the single year, 1918, show that: As compared with lime-sulphur used alone, the addition of arsenate of lead to lime-sulphur decreased the fungicidal action. Likewise the amount of russeting was increased by the combined sprays. All forms of arsenate of lead continued to show marked fungicidal value, but none of them were equal to lime-sulphur used alone. On the other hand much less fruit russeting was obtained than where lime-sulphur was used alone. In the single trial arsenate of lime also showed high fungicidal value. When added to lime-sulphur it increased rather than decreased the scab control. Combined with lime-sulphur it caused somewhat less fruit russeting, than where arsenate of lead was used in like manner. The modified spraying program continued to give good results. The commercial lime-sulphur gave better scab control than the home-made article, but this advantage was partially offset by increased russeting of the fruit.

In 1919 some fourteen treatments or modifications of treatments are being tried. A part of these are repetitions of these tested in the past, while a part have not been used before.

Voted, that the report be accepted.

## APPLE SPRAYING.

G. E. SANDERS.

IN CHARGE OF INSECTICIDE INVESTIGATIONS, ENTOMOLOGICAL  
BRANCH, OTTAWA.*Mr. President and Members of the Maine State Pomological  
Society:*

I can assure you that it is a great pleasure to be again called upon to address your Society. Since I last was here advances have been made in the combining and applying of spraying material, and there are under experiment at the present time many other new materials, and methods which I am sure will still farther advance our ability to economically combat insect pests and plant diseases.

We are today interested in the combating of insect pests and diseases of the apple. This means mostly either spraying or dusting the apple. The benefits of spraying are on the whole so well known that it is almost unnecessary for me to go into detail on the benefits of general spraying. We know now that if we follow the approved spraying programme in any locality that we can grow apples practically free from insect injuries and fungus diseases. It is true that it is more difficult to control pests on some varieties than on others, and also we get certain injury from certain spraying materials or combinations of materials, such as leaf yellowing and fruit russetting from 4-4-50 Bordeaux, burning from soluble sulphur and lead arsenate and removal of fruit from lime-Sulphur in certain localities. These injuries vary to a great extent and the main portion of my paper today is to deal with safening our spraying and dusting materials, as well as rendering them more efficient and cheaper.

Regarding the benefits of spraying we all know, and have had demonstrated to us, that we can grow clean fruit by spraying, and that we must spray in order to grow clean fruit. Few of us yet realize the fact that our crops depend largely on the spraying of the previous year. Realizing this some years ago I set about

to demonstrate it. I sprayed one row of Golden Russets and left the next unsprayed.

Golden Russet foliage is very susceptible to apple scab and where we did not spray, the foliage as usual, was ruined by September, and the trees practically defoliated by the middle of October, while the sprayed trees held their foliage until well into November. The following year we had a good bloom and a good crop from the trees sprayed the previous season and failure in bloom, as well as apples, from the trees that were not sprayed the previous season. To show how this works out in a large way: In 1916 we received information that the apple foliage in Ontario had been seriously damaged by apple scab, and had dropped very early in the season. We at once publicly predicted that Ontario would have a failure in apples in 1917. The next season our prophesies came true and Ontario had the smallest crop in ten years. This idea is also borne out by Heinicke in Cornell Bulletin No. 393 in which he shows the blossoms on vigorous fruit spurs require less pollination, than those on spurs in poor condition. The way to make the fruit spurs vigorous in the spring is by keeping the leaves healthy and vigorous the previous fall and that can only be attained in a scab year by spraying. Some years ago it was stated that trees that had been sprayed were more resistant to frost or winter injury. The reason given was that the cell sap on sprayed trees, holding their leaves later in the fall was richer in sugar and of higher specific gravity, therefore, had a lower freezing point. Last winter at the Rochester meeting I had the pleasure of hearing Prof. Chandler, of Cornell, give a talk on winter injury. He found that trees that had a crop of heavy foliage the previous year suffered the least from winter injury, while spindly trees of the same variety that had borne a thin crop of foliage suffered the most. Another proof of the value of spraying in increasing the crop of the coming years is the crop in Nova Scotia. Having but little land outside of their orchards to cultivate and grow crops of potatoes, beans, wheat, etc., demanded during the war, the Nova Scotians could only, in the main, do as usual and attend to their apple trees, although the amount of potatoes and beans produced there was enormous when the character of the farms is considered. As a result of this continuous care Nova Scotia has this year the largest apple crop in her history, while most other sections in Eastern America have

a small crop as a result of neglect. We have got to realize that the first essential to a crop of apples is healthy foliage the previous year. Neglect of spraying means a lot more than one dirty crop of fruit. It usually means a short crop the next year, and in severe winters it means more winter injury. I am dwelling on these two points because they are usually not touched by spray men, while the more obvious benefits of spraying, the control of insects and fungus diseases is realized by all.

#### SPRAYING COMBINATIONS.

In most sections where I have worked, the burning question has not been whether spraying was beneficial or not, but what was the best spraying or dusting material. Not whether to spray, but what to spray with.. We have had to do a great deal of work on spraying combinations in Nova Scotia for our climate is worse than yours in two ways. First we have greater difficulty in controlling apple scab, and our trees are so susceptible to lime-sulphur injury that we have had to abandon it as a spray. We have yet to go a long way in the combining of spraying material before we find a perfect spray or dust. All of the materials that we have today have some defects which makes them either dangerous or inefficient in the hands of inexperienced men. Until someone discovers the perfect spraying or dusting material we must use the materials at hand, but by properly choosing and combining them we can usually get very good results on any variety and in any locality.

#### LIME SULPHUR.

Lime sulphur is the most popular material today for summer apple spraying in America.

In most localities where there is plenty of sunlight we have no trouble following its use at a dilution of one to forty. In some Maritime localities like Nova Scotia, New Zealand, England and certain other sections very severe leaf injury followed by the dropping of fruit follows the application of lime sulphur. Sometimes on some varieties the dropping of fruit is very serious, while the leaf injury is scarcely noticeable. Localities which can use lime sulphur without injury should certainly be advised to continue, as it is a cheap and convenient material to use. As an

insecticide with it we have four choices. First and best is triplumbic lead arsenate which to my knowledge is the safest material to use. In some of the Pacific Coast sections it is the one insecticide recommended.' Of the other three arsenicals, namely, standard or lead hydrogen arsenate, arsenate of lime and magnesium arsenate, I do not know which will eventually prove the best. Probably for all localities lead hydrogen arsenate. When lead hydrogen or standard lead arsenate is added to lime sulphur a reaction takes place that we formerly thought produced lead sulphide and arsenate of lime, but which we are now quite sure is merely the lead hydrogen arsenate changing to lead sulfo arsenate. We have in Nova Scotia used a great deal of arsenate of lime with lime sulphur, this year we have a number of comparison plots going, and one cannot tell the difference between those sprayed with lime sulphur arsenate of lead, and those sprayed with lime sulphur arsenate of lime. In some cases where we got traces of injury from arsenate of lime with lime sulphur, we have been able to eliminate it by adding a couple of pounds of hydrated lime. The question of arsenate of lime versus arsenate of lead with lime sulphur is essentially one of climate.

The only way to settle the question is by experimenting in each locality.

A new and most promising insecticide for use with lime sulphur is magnesium arsenate. Our tests of this material were all very favorable to it and it may prove a desirable poison for use with lime sulphur.

#### BORDEAUX MIXTURE.

Bordeaux was abandoned by the Nova Scotia growers in 1912 and I presume was abandoned here about the same time. It was recognised by all as an excellent fungicide but the formula then used 4-4-50 had the defect of russetting the fruit and yellowing the foliage. Since we have found so much injury and loss of crop from lime sulphur in Nova Scotia, the growers there have been going back to Bordeaux very rapidly. The formula used by G. L. Thompson of Berwick—two pounds of bluestone, ten pounds of lime, to fifty gallons of water is one of the most popular. Since the discovery by Mr. Thompson that 2-10-50 Bordeaux was harmless to foliage, we have done a great deal of experimenting with

the formula for excess lime Bordeaux. We have found that a Bordeaux made up of three parts of lime to one of copper sulphate, is safe on apple foliage at all times. The amount of copper sulphate used does not count very much in foliage injury, it is the form of the copper sulphate. In other words a 5-15-50 Bordeaux is approximately as safe on foliage as a 1-3-50. To have a Bordeaux safe on apple foliage the copper must be in the form of a double hydrate and we do not get hydrates of copper until we have added three times as much lime as copper sulphate. Another thing a dolomite or high magnesium lime makes a very much safer Bordeaux for apple foliage than a high calcium lime. We are using this type of Bordeaux for the two sprays before the blossoms, and one spray two weeks after the blossoms in about 80 per cent of the orchards in Nova Scotia at the present time. The first spray is a 3-10-50, the second or pink spray a 2-10-50 and the fourth applied two weeks after the blossoms a 2-10-50. On account of its low cost and safety we are using arsenate of lime in our Bordeaux on the apple, but lead arsenate and magnesium arsenate are both suitable for use on apple foliage although more costly.

We find that by substituting some other spray for Bordeaux on the after blossom or calyx spray, that we get very little russetting of the fruit in Nova Scotia, and that none of a serious type. We find 3-10-50 Bordeaux a better fungicide than lime sulphur, and it has the advantage in Nova Scotia that it does not cause the fruit to drop. In localities where lime sulphur gives perfect satisfaction however, one is not justified in advising Bordeaux on account of the slight russetting and loss of colour which invariably results from its use.

#### SOLUBLE SULPHUR AND SULFOCIDES.

Sodium polysulphide is sold under these two trade names. The first is a soluble powder, and the second a concentrated solution. When they were introduced the makers recommended arsenate of lead with them. In all cases there was very serious injury from the combination, as the reaction involved produced sodium arsenate which is soluble and dangerous. We have found the formula of one pound soluble sulphur, one-half pound arsenate of lime, and five pounds hydrated lime to fifty gallons of

water safe for the calyx application. In apple foliage, and some eighty per cent. of the sprayers in Nova Scotia are using it for the calyx application. It is possible that magnesium arsenate will replace arsenate of lime with soluble sulphur, as it seems to be somewhat safer. Soluble sulphur and sulfocide do not remove apples in Nova Scotia like lime sulphur. They are somewhat lower in protective fungicidal value than lime sulphur or Bordeaux, but have the advantage of giving higher finish to the fruit than either of the others. One of our largest growers in Nova Scotia has used nothing but soluble sulphur and arsenate of lime for years.

During the past two seasons Prof. Brittain has used Black Leaf 40 with soluble sulphur, on account of soluble sulphur or sulfocide being the only fungicides that we can drench trees with immediately before and immediately after the blossoms in the Annapolis Valley, and not get either leaf or fruit injury. We have found the combination of three pounds soluble sulphur and one pint Black Leaf 40 to 120 gallons of water one of the safest and most effective combinations for outbreaks of sucking insects, and more than that we find that we can clean up outbreaks of canker worms if it is applied before the larvae are half grown more rapidly with it than with any arsenical. The soluble sulphur-Black Leaf 40 kills the canker worms by contact, and they die at once instead of waiting around, feeding for a couple of days, as when they are treated with arsenicals. Sulfocide is of course as safe and efficient as soluble sulphur.

#### STRAIGHT LEAD ARSENATE.

Discovery of the high fungicidal value of lead arsenate is one of the things that we have to thank your Prof. Morse for. For the past three years I have been testing lead arsenate in triple strength, that is three pounds of the dry to 50 gallons of water. We usually get a little leaf yellowing but it is a very fair fungicide and gives an excellent finish to the fruit. In localities where codling moth is very bad it would seem worth while testing triple strength lead arsenate for the calyx application. At the rate of three pounds of dry lead arsenate to fifty gallons of water we find it a better fungicide than soluble sulphur, and almost equal to lime sulphur or 2-10-50 Bordeaux. We have found that the

addition of a small quantity of lime will reduce the leaf yellowing from straight lead arsenate, but we have reason to believe that the addition of the lime also slightly reduces the fungicidal value.

#### DUSTS.

Up to the present we have always favored liquid sprays over dusts on account of the higher fungicidal value of most liquid sprays. During the past year we have paid a great deal of attention to dusts on account of the saving in labor in application, realizing that if we can get a dust that will control fungus and insect pests, that the labor saved will amount to between ten and fifteen cents per barrel of apples grown, and would allow the orchardist to carry on his regular farm work in all fine weather, and use only dewy mornings and foggy days for dusting. Both dewy mornings and foggy days are useless for farm work, and for spraying, but are the very best for dusting.

#### 90-10 SULPHUR-LEAD ARSENATE DUST.

For a number of years this has been a standard material which has been variously reported upon. Last year in Michigan it was found that much better fungus control was obtained by dusting when the trees were damp. Following this I applied all of my 90-10 dust this year in the early morning when the trees were damp with dew. The results have been variable but very little different from our liquid sprays in scab control. The same has been true of dusts in the hands of commercial growers. Some of the growers dusted one orchard in the evening and another in the morning, and invariably got better results from the trees dusted when the dew was on in the morning. As a rule they used from 50 to 75 pounds per acre per application.

#### COPPER-LIME-ARSENATE DUST.

About one and one-half years ago I devised a dust made up of dehydrated copper sulphate, hydrated lime and arsenate of lime. To my surprise I found it safe on both apple and potato foliage. Last season we used it on potatoes, and this season on both apples and potatoes. For the apple we used eight pounds



of dehydrated copper sulphate, eighty-eight pounds of hydrated lime and four pounds of arsenate of lime. When we came to use the material in a field we found that it spread almost twice as far pound for pound as sulphur dust. In spite of this we got excellent control of fungus from it. On account of its spreading value being so high we are next season going to use on the apple a mixture made up of ten pounds of dehydrated copper sulphate, eighty-five pounds hydrated lime, and five pounds of arsenate of lime. Results from this season's work are very promising, and a number of growers are going to use it after seeing the results, in spite of the fact that we are not recommending it at all, and do not expect to have it in shape to definitely recommend for two years.

In cost the new Copper-lime-arsenate dust will settle around 25 per cent. higher than the cost of liquid material for the same area while the time spent in applying dust is from one-fifth to one-tenth that spent in applying liquid spray. Dusting should be done in weather or time that is unsuitable for any other farm purpose, while liquid spraying takes from five to ten times as much time and of the very finest weather.

Some fifty growers in Nova Scotia used dust in 1919 and every man of them is a dust enthusiast on account of the results obtained. I look for at least 90 per cent of the new outfits placed in Nova Scotia to be dusters. I attribute the uniformly good results from dusting to the fact that this year practically all of the dust was applied either on still dewy mornings or on still foggy days. In applying dust on dry windy days it seems to me that the majority of it blows away, while on still dewy mornings the cloud of dust seems to hang in the trees for quite a period and then settle on the leaves and stick there almost as well as liquid.

Taking it all in all our experience indicates that dusting has a place in the orchard and will eventually take the place of liquid spraying for many purposes, but we are not yet ready to recommend it over liquid spraying.

#### WHEN AND HOW THE MATERIALS SHOULD BE APPLIED.

Excess lime or 3-10-50 Bordeaux may be applied when the leaf is the size of a ten cent piece and again two weeks after the blossoms, with practically no russetting of the fruit. For the

pink spray it will give some slight netting which might be serious on many varieties such as Ben Davis. On the Calyx spray the russetting on practically all varieties is so serious as to prevent its use.

Soluble sulphur in the formula previously indicated may be used at any time, but on account of its low protective value should be used oftener than Bordeaux or lime sulphur. Both Thomsen Bordeaux and soluble sulphur may be applied with a spray gun in any direction.

Lime sulphur gives almost as high a finish to the fruit as soluble sulphur or sulfocide. We have found that the damage from lime sulphur is increased when it is directed against the underside of the leaf or when it is shot up out of a spray gun. In using lime sulphur out of a spray gun stand off from the tree and let the spray fall on the leaf. Do not direct it at high pressure against the underside. In Nova Scotia we find that the spray of lime sulphur applied two weeks after the blossoms, is the one that does the most injury and often removes or reduces the crop.

Sulphur dust should be applied on still dewy mornings and like soluble sulphur should be applied oftener than either lime sulphur or Bordeaux. Sulphur dust like soluble sulphur gives excellent foliage and finish to the fruit.

The new copper-lime-arsenate dust, like Bordeaux, should not be applied on the calyx: application on account of fruit russetting. Like sulphur dust it should be applied a little oftener than lime sulphur and should be applied on still dewy mornings. It is nice to see the dust go on as a white powder and turn to a blue Bordeaux when it is wet by the dew on the leaf. Bordeaux combination is not made until the material is on the plant.

#### CONTROL OF SPECIAL INSECTS.

##### APPLE MAGGOT OR RAILROAD WORM.

This year I had the pleasure of carrying on a demonstration in the control of apple maggot in the Province of New Brunswick near your Maine Boundary line. We used straight arsenate of lead, applying the first spray on July 12th, and the second spray on July 24th. On the first spray we used ten pounds of paste

lead arsenate to 120 gallons of water, and on the second we used four pounds of dry lead arsenate.

Last year the *Crimson Beauty*, *Duchess* and *Dudley* in the orchard were 100 per cent. infested with more than one puncture, and the orchard next door was equally bad. All of the soft varieties in both orchards being useless. This year the counts in the sprayed orchard ran:

*Crimson Beauty.*

Apples with one puncture .....	4.5%	
Apples with more than one puncture .....	1.3%	Total 5.8%

*Duchess.*

Apples with one puncture .....	1 %	
Apples with more than one puncture .....	1.5%	Total 2.5%

*Dudley.*

Apples with one puncture .....	3.4%	
Apples with more than one puncture .....	1 %	Total 4.4%

In the orchard next door where no spraying was done the counts ran:

*Duchess.*

Apples with more than one puncture .....	100%
--	------

*Red Astrachan.*

Apples with more than one puncture .....	100%	
Irish Peach .....	infested .....	100%
Gideon .....	do .....	100%
Alexanders .....	do .....	100%

In the orchard that we treated we left no checks and we sprayed every leaf and apple thoroughly so that the adult flies in feeding could not miss getting a quantity of the poison in their food. The demonstration proved conclusively as the work of Prof. Brittain in Nova Scotia earlier proved, that commercial control approaching extermination of the apple maggot can be obtained in one year by two applications of lead arsenate. The essential points are that you apply your first spray slightly in advance of the first emergence of flies, or about July 12th in New Brunswick and Maine, following it about twelve days with a second application, and that you cover every portion of every tree in the orchard.

*Oyster Shell Scale.*

We have been doing some work in Nova Scotia this year on Oyster Shell. In one orchard the owner held up his calyx spray until the young of the oyster shell had emerged and then applied soluble sulphur three pounds and Black Leaf 40 one pint to 120 gallons of water. He made the best job of cleaning up oyster shell that I have ever seen. It is much better than a dormant application and I believe is the best control that there is for the oyster shell.

*Green Apple Bug.*

This insect has never been reported from Maine, but I am of the opinion that it is to be found in Maine at the present time, as I have found two serious outbreaks in New Brunswick near the Maine Border, one at Grand Falls and one at Fredericton. The green apple bug is one of our most serious pests in Nova Scotia, where it attacks only certain varieties of apples, the Nonpareil or Roxbury Russet being most seriously injured. In New Brunswick the Bethel seems to be the most susceptible variety. The film that I have with me shows the work of the green apple bug and the remedies. The characteristics of an outbreak are partial failure of the tree to bear and gnarling and twisting of the fruit borne. You will be able to identify the insect more readily from the film than from any description that I could give you. It is rather a difficult insect to control but high pressure spraying or drenching with soluble sulphur and black leaf 40, both immediately before and immediately after blooming, can be relied upon to give control and bring the trees back to normal in a couple of years.

## CONCLUSION.

I could continue indefinitely on the control of Bud Moths, Fruit Worms, the Brown Tail Moth, Tent Caterpillars, the Canker Worm and the Codling Moth, but I am afraid you are now so fed up with sprays that you will never want to see me again. We have made some changes in spraying and dusting materials and we can see the prospects of still greater changes in the future which may render the task of controlling our insect and fungus pests not only shorter and cheaper but more complete.

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