PUBLIC DOCUMENTS

OF THE

STATE OF MAINE

BEING THE

REPORTS

OF THE VARIOUS

PUBLIC OFFICERS DEPARTMENTS AND INSTITUTIONS

FOR THE EIGHTEEN MONTHS

JANUARY 1, 1921-JUNE 30, 1922

AGRICULTURE OF MAINE

TWENTIETH ANNUAL REPORT

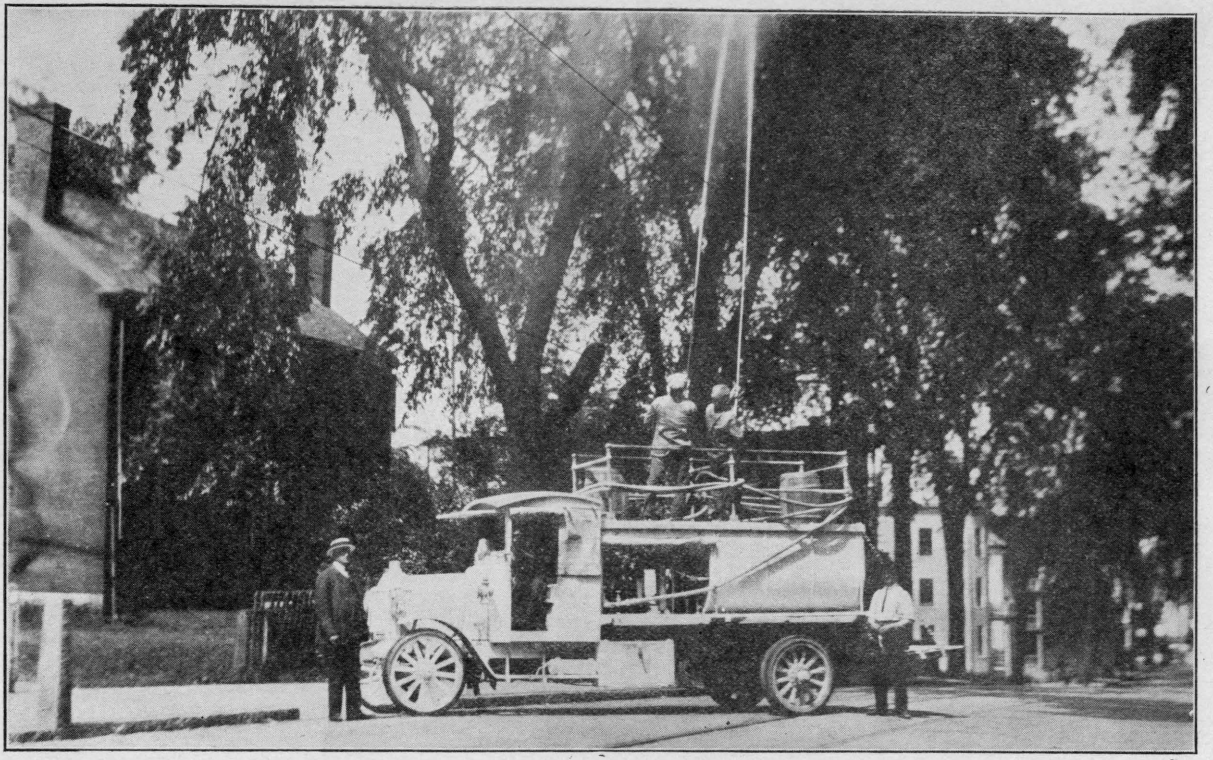
OF THE

Commissioner of Agriculture

OF THE

STATE OF MAINE

1921



Gypsy Moth Control Work.
Power sprayer owned by the Maine Department of Agriculture in operation.

DEPARTMENT OF AGRICULTURE.

To His Excellency, Percival P. Baxter, Governor of Maine, and Council:

I herewith submit the twentieth annual report as commissioner of agriculture of the State of Maine, for the period from January 1, 1921, to June 30, 1922.

F. P. WASHBURN,

Commissioner.

Augusta, June 30, 1922.

MAINE DEPARTMENT OF AGRICULTURE.

Commissioner, F. P. WASHBURN, Augusta
Deputy Commissioner, * E. E. PHILBROOK, Portland

STAFF.

Chief, Division of Inspection, A. M. G. SOULE, Augusta
Chief, Division of Plant Industry, E. L. NEWDICK, Augusta
Chief, Division of Animal Industry, H. M. TUCKER, Yarmouthville
Chief, Bureau of Markets, C. M. WHITE, Augusta
Dairy Inspector, † BROOKS BROWN, Dover
Sheep Specialist, C. H. CRAWFORD, Dexter
Horticulturist, ‡ F. H. DUDLEY, Auburn
Sealer of Weights and Measures, ¶ L. S. PENNELL, Portland
Field Agent, Bureau of Markets, J. T. DIONNE, Skowhegan
Field Agent, Gypsy Moth Work, M. H. McINTIRE, South Berwick
Assistant, Bureau of Seed Improvement, GUY C. PORTER, Houlton

CHIEF CLERK.

MILDRED L. HUMPHREY.....Augusta

CLERKS AND STENOGRAPHERS.

LOUISE G. FOLSOM.....Augusta
BLANCHE E. YEATON.....Augusta
DOROTHY M. LIPPINCOTT.....Augusta
HENRIETTA F. BURNS.....Augusta
DOROTHY E. RUNDLETTE.....Augusta
ALICE H. ALIFF.....Augusta
INEZ L. MORTON.....Augusta

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* Resigned February 1, 1922. Position now vacant.
† Resigned June 11, 1922.
‡ Resigned March 11, 1922. G. A. Yeaton of Chelsea appointed.
¶ Up to April 14, 1922. E. L. Palmer of Portland appointed.

ANNUAL REPORT OF THE COMMISSIONER OF AGRICULTURE.

The Legislature at its session of 1921 established the fiscal year as ending June 30th, and further provided that each state department should on the 30th day of June, 1922, submit its report for the preceding eighteen months. The following report accordingly covers the period from January 1, 1921, to June 30, 1922, and the appended financial statement covers the same period but is divided into two statements, one for the six months from January 1 to June 30, 1921, and one for the full fiscal year, July 1, 1921 to June 30, 1922.

During the eighteen months covered in this report the farmers of Maine have been engaged in a struggle to adapt themselves and their business to post-war conditions. Practically every line of business has felt the effect of the depression, the uncertainty, and the losses naturally occurring at such a time, but it is probable that in comparison with other industries agriculture was most unfavorably affected by conditions growing out of the war and its inflated values. Farmers were the first to find the value of their products reduced and the last to benefit by any lowering of the cost of production. Gradually, however, they are adjusting themselves and their operations and while severe losses have been sustained and a certain amount of discouragement has sometimes been apparent, there are now indications that the worst has passed and that the tillers of our soil are displaying recuperative powers far greater than those manifested in other quarters of the business world.

Farm labor while not yet greatly reduced in cost is nevertheless more abundant and the cost of materials used on the farm, particularly fertilizers, is gradually finding a more normal level. The season of 1921 was generally favorable to the growth of Maine crops. Fairly mild winters have prevailed during the past two years, and with the exception of a severe drouth in the eastern and some central sections of the State which did much damage to forage crops in the summer of 1921, the output of our

farms so far as yield was concerned has been most satisfactory. The department of agriculture has endeavored to stimulate production along those lines wherein there is not already indication of an over supply, and we have at all times advocated better packing, grading and methods of shipping of our products, also cooperation and combined effort in buying and selling.

Crops. According to returns compiled by the United States Bureau of Markets and Crop Estimates in cooperation with our Maine Department of Agriculture, the following are the acreages and production of some of the principal crops of our State in 1921:

Potatoes.

Maine appears this year so be the banner state in the production of potatoes, our total yield exceeding that of any other state by practically three and one-half million bushels, the figures for the four leading potato states being as follows:

Maine	37,152,000	bushels
New York	33,990,000	"
Minnesota	27,525,000	"
Michigan	27,200,000	"

Prices which were satisfactory during the earlier part of the shipping season gradually declined and a great portion of the crop was disposed of at a loss. Following closely after similar conditions in 1920 this has entailed great hardships upon Maine potato growers but it is gratifying to note that they have not lost courage and are prepared under favorable seasonal conditions, to again equal last year's production.

Apples.

Apples proved the one uniformly profitable crop all over the State, the total production being practically double that of 1920, the most definite estimate being given as four million sixty thousand bushels. Prices were most satisfactory with fancy stock selling as high as ten dollars per barrel and the bulk of the pack at three to three and one-half. The large returns from our orchards last year has led to increased interest in this line of

agricultural work. An unusual number of new trees has been set and much attention given to their care as well as to the pruning and spraying of older orchards.

CORN.

The total acreage of corn was probably about normal, but disagreement between packers and growers led to a material cut in the acreage planted to sweet corn. This condition was not, however, without its advantages as it led to the building of an unusual number of new silos and the storing of a large quantity of fodder which was a valuable adjunct to the short hay crop and undoubtedly prevented the sacrifice of many yaluable farm animals. Indications now point to a practically normal acreage of sweet corn for 1922.

WHEAT, BARLEY, ETC.

The production of wheat, while far below the abnormal figures of war years, showed a substantial gain over 1920, with one hundred eighty-seven thousand bushels, total, from eleven thousand acres. Four thousand acres of barley were sown, and thirteen thousand acres of buckwheat.

OATS.

Approximately one hundred twenty-five thousand acres of oats were sown in the State and four and one quarter million bushels threshed. This yield is slightly less than that of 1920, but again the low production of hay must be reckoned with as doubtless many fields of oats were cut green and used for fodder. The work of improving the varieties of oats used by our farmers goes on effectively under the stimulus given by the Maine Agricultural Experiment Station.

HAY.

Slightly less than one million tons were harvested, a yield of eight-tenths tons per acre for the State. In most sections the harvest was made under unusually favorable weather conditions and a good quality of hay was the result. Good prices prevailed throughout the year and some western hay was brought in.

Livestock.

The shortage of hay resulted in some reduction in the number of animals wintered on many farms. The prices prevailing for all live stock and meat products have been very low and such reductions were made at a loss. It should be noted, however, that in most instances the least valuable and least profitable animals were sacrificed. Everywhere farmers are learning that only the best stock can be kept at a profit and are becoming more and more determined to weed out the scrubs.

Through the cooperation of the United States Department of Agriculture, this department has been able to secure the services of an expert wool grader for two or three weeks each year, thus giving our wool growers an opportunity to learn the proper methods of grading their product in order to secure the most satisfactory returns. In July, 1921, in accordance with an act of the last legislature, this department took over the livstock sanitary work formerly carried on under the direction of the livestock sanitary commissioner. This work is fully treated in the report of the chief of the division of animal industry. It is believed that the change is a satisfactory one and has tended to increase efficiency and reduce administration expenses.

The following is the number of animals now owned in the State:

Horses	108,400
Colts	5,103
Cows	150,426
three-year-olds	27,077
two-year-olds	35,613
one-year-olds	37,934
Oxen	4,922
Sheep	86,977
Swine	38,695

Roadside Markets.

This direct method of dealing between producer and consumer has already assumed sufficient importance in our State to be mentioned here. It has evidently come to stay and should be encouraged. There is an unfortunate tendency in some cases to overcharge for produce. The policy of proprietors of such

markets should be to offer goods of the highest quality at reasonable prices. Undoubtedly a saving may be made under this method in the cost of distribution and such a saving should benefit the consumer as well as the producer.

Cooperation.

It has been the policy of the department to encourage the farmers of the State in all reasonable projects for organization and cooperation. It is fast becoming a recognized fact that the solution of many of the farmer's problems can come only through cooperation, particularly in the buying and selling of their supplies and products. Individual action on the part of the farmer benefits no one except the middleman. The single shipper of small and occasional quantities of farm produce is not concerned with either quality or the satisfaction of his customer. Farmers' cooperative organizations will promote the shipping of larger quantities and the establishment of a standard quality which must be lived up to and which will demand careful grading and packing. The best interests of consumers as well as producers require that farmers' cooperative marketing organizations be fostered and encouraged.

Several new cooperatives have been established in Maine during the period covered by this report. The Maine Farmers' Exchange was established in place of the old Farmers' Union Grain and Supply Company of Waterville, and designed to serve as a central purchasing agency for all local farmers' unions and cooperative stores that desire to make use of it. The department devoted considerable attention to the organization of this exchange and to instructing the farmers in the value of the movement. A satisfactory organization was perfected and the new exchange is ready for business. Its success depends solely upon the support given by the farmers of the State. We note also the establishment of the Aroostook Potato Growers' Association, an organization which promises much in the line of improved grading and marketing for Aroostook County's great product. The Fruit Growers' Exchange has added to the number of its locals and several promising movements have been started among growers of sweet corn and blueberries toward cooperative canning of their own products.

Farmers' Institutes.

The former policy of the State in introducing special speakers into each county for the purpose of holding what were known as farmers' institutes has been gradually discarded, and institute work is now done in connection with meetings of the granges and other farm organizations. Experience has taught the wisdom of this change. More people can be reached and at less expense. Members of the department and special speakers engaged for the work have appeared at some three hundrd meetings during the year 1921, and addressed more than twenty thousand persons. With a very few exceptions caused by previous engagements every such call has been answered, and in every case a most cordial reception has been accorded the visiting speakers. I believe there is no instance where any hall rent or other expense of holding such meetings has been charged to the department. A very successful fruit growers' convention was held in Auburn during the winter of 1921, and in Lewiston in 1922. At each of these meetings several out of the State speakers were provided who delivered lectures of interest and value.

Bulletins.

In March, 1921, the department issued a bulletin on "Some Suggestions for Landscape Designing for Public and Private Grounds," followed in September by the "Packing and Shipping of Farm Products." Owing to excessive cost of printing, the June and December bulletins of this year were omitted and circulars containing the livestock sanitary regulations and a list of Maine farms for sale were issued instead. In March of the present year the bulletin published contained all the agricultural laws in the State revised to date.

Agricultural Fairs.

In the year 1921 fifty-four fairs were held in the State, most of which contained features of great benefit and encouragement to our agricultural interests. The annual exhibit of the seed

improvement society, and allied organizations at Bangor in November was particularly beneficial and the poultry shows at Portland, Freeport, South Paris, and South Berwick were most helpful to those interested in this important branch of Maine agriculture. A small proportion of our fair associations appear to have lost sight of the real purpose for which they were organized and I have been compelled to withhold the stipend in a few instances where the laws against gambling and immoral shows were not enforced. It seemed necessary to use some emphatic method of reminding these associations that the funds received by them from the State are for the encouragement of agriculture and not for the promotion of amusements of doubtful value.

Eastern States' Exposition.

Our State was again able to stage a most successful exhibit of Maine products at Springfield, Massachusetts, in September, under the capable management of Deputy Commissioner E. E. Philbrook. Probably many thousands of people receive from this exhibit each year a new idea of the agricultural and other resources of our State. Many dealers in Maine farm produce have reported that their business receives a new impetus as a result of our display at Springfield.

Finances.

A detailed account of the receipts and expenditures of each division for each of the fiscal periods covered in this report is appended. I have endeavored to act in accordance with the policy of your administration and keep within the amount of our appropriations. This I have been able to do with the single exception of the division of animal industry. Under the laws of the State and the regulations of the United States Department of Agriculture we have considered ourselves compelled to carry on the work of tuberculosis eradication after the appropriation made by the legislature for that purpose was exhausted, a policy which was after mature consideration approved by your excellency and the executive council, and which has met the very hearty approval of our best dairymen and the consumers of dairy products throughout the State. Future appropriations for this division should not be less than eighty thousand dollars per

year and if the work of stamping out tuberculosis among our cattle is to be pushed vigorously in all sections of the State, one hundred thousand dollars per year will undoubtedly be required.

Some definite and uniform policy should also be adopted regarding the disposal of fees received by this department for inspections, fines, licenses, and certification of seed. At present a part of these are credited to the department and a part reverts to the State treasury. The demand for and the cost of this inspection and certification work is constantly increasing. A uniform policy of crediting fees to the appropriation under which the work is done would take care of at least a part of the increasing expense, and would, I believe, prove more satisfactory to the dealers and growers who contribute the fees.

Suggested Legislation.

At present there seems little likelihood that the department will have many matters of importance to present to the next legislature. It has been suggested that the law requiring local assessors to collect agricultural statistics of crops and livestock be made more effective. This is an important matter to which, unfortunately, but little attention is paid. Sooner or later, the State must consider the wisdom of legislation which will compel landowners to clear their roadsides of unsightly and insect breeding rubbish. I suggest also some legislation that will protect the labels applied to seed certified by the State. At present these are being imitated and the term "certified seed" misused to an extent which seriously meances the good name of our product.

The Department Force.

I cannot speak too highly of the services and character of the men and women who have been my assistants during the past eighteen months. Without exception they have displayed the keenest interest in the work of the department and a genuine solicitude for the improvement of agricultural conditions in our State. Many of the positions require unusual ability. Our division chiefs and heads of bureaus must be men of education, possessing technical knowledge of the work to which they are assigned and at the same time they should be in most instances

practical farmers in order that they may meet the problems of every day farm life in an intelligent manner. These are qualifications which require long and unusual training and a specialist in any line of agricultural work ranks today with the professional men or the skilled engineer. In general the salaries now allowed my employees are too low, and resignations are, and will continue to be, frequent. Unless our present scale of compensation is revised we cannot expect to long retain the services of persons trained in both the practical and technical phases of agricultural work in the face of the superior inducements offered by other states and by commercial establishments that are always seeking such expert assistance.

Conclusion.

This department has enjoyed to an unusual extent the hearty and sympathetic cooperation of the other various organizations and agencies in the State which are devoted to the improvement of agricultural and rural life conditions. The granges, farm bureaus, and extension service have ever been ready to join us in every forward movement. Our appreciation is also due to your excellency for your patient, fair consideration of all our problems, both great and small, and to the members of your executive council who have given careful consideration to all our representations. Such cooperation among all the agencies concerned cannot fail to bring about improved conditions upon our farms and to advance the campaign of education and understanding which will ultimately restore Maine agriculture to the sound position which the welfare of our State demands.

Respectfully submitted,

F. P. WASHBURN,

Commissioner.

REPORT OF CHIEF OF THE DIVISION OF INSPECTION.

To the Hon. Frank P. Washburn, Commissioner of Agriculture:

I respectfully submit to you my report of the work covered by the division of inspection for the years 1921-1922.

As outlined by the statute, the work of the division of inspection has consisted in the enforcement of the law regulating the sale of agricultural seeds, commercial feeding stuffs, commercial fertilizers, drugs, foods, fungicides and insecticides, including the duties involved by the annual registration required for commercial feeding-stuffs, commercial fertilizers, fungicides and insecticides; also, the enforcement of the weights and measures law and the enforcement of the law regulating the packing and grading of apples.

The passage by the legislature of a statute requiring a health officer in every town has added to the efficiency of enforcing health measures and a great deal of cooperative work has been done by inspectors of the division and the health officers in various cities and towns, thus greatly broadening the scope of the inspection work.

The usual inspection of seeds began early in the spring and the collection of samples was continued until past planting time.

The inspection of feeding stuffs and the collection of samples was conducted for about twelve months out of the eighteen months covered by this report.

The usual number of fertilizer samples were obtained during the spring months, 275 towns and cities having been visited at least once and many several times.

Almost constant inspection has been given in the three largest cities of the State, in food and drug matters, where inspectors of the department have cooperated with the health officers. At least 685,000 of the total population of 768,014 have been afforded protection by inspection of their food supply.

SEED INSPECTION.

The seed inspection for 1921-1922 was performed for the most part by our regular inspectors, who covered practically the whole State and obtained many samples. The legislature of 1919 amended the law regulating the sale of agricultural seeds and added a section of considerable importance, requiring a declaration of the noxious weed seeds and a viability and germination guaranty. The findings of the inspectors and the results of analyses of the seeds collected were, in some instances, not very satisfactory. The results of the analyses of the samples collected together with samples from dealers may be found in OFFICIAL INSPECTIONS No. 102.

FEEDING-STUFFS INSPECTION.

The feeding-stuffs inspection for eighteen months, 1921-1922, has been marked by the registration of a greater number of brands than has ever been offered for registration in the history of the division. In general, the samples collected have been found, upon analysis, to accord with the guaranties in the certificates and on the packages. It has been necessary to arrange numerous hearings on account of non-registration. If difficulties have arisen with products of interstate shipment and the cases warranted action, such cases have been referred to the Federal department. The following table briefly outlines the scope of our work with relation to feeding-stuffs:

	1921	1922 (6 months)
Number of brands registered.....	769	629
Number of samples drawn.....	308	227
Number of hearings arranged.....	38	5

The results of analyses of the samples taken may be found in OFFICIAL INSPECTIONS No. 100.

FUNGICIDES AND INSECTICIDES.

In the inspection of fungicides nad insecticides, the endeavor was made to obtain, during the spring months, such products as

bordeaux mixture, arsenate of lead, paris green and any other products usually used for agricultural purposes for repelling and mitigating the attacks of insect pests. The following table shows the extent of our work in this particular branch:

	1921	1922 (6 months)
Number of brands registered	280	249
Number of samples collected	52	44
Number of hearings arranged	18	24

Fertilizer Inspection.

Considerable work has been done with the fertilizer inspection for 1921-1922. Apprehensive of further trouble from the use of borax, tours of inspection were made to the potato section of the State during the growing season. The analyses of samples collected showed that practically all of the goods offered for sale in Maine were free from borax. The usual number of official samples were obtained from storehouses and from agents. Particular attention was given to the weighing of unbroken packages in the hands of dealers where scales, that could be considered accurate, were available for this purpose. Following is a table outlining the work accomplished with relation to fertilizer:

	1921	1922 (6 months)
Number of brands registered	304	291
Number of samples collected	282	* 453
Number of hearings arranged	12	10

* Many brands sampled in duplicate.

Drug Inspection.

The drug inspection work has been performed efficiently, according to our belief. The drug samples collected, during these eighteen months, have consisted of the more common preparations manufactured usually by druggists themselves, such as peppermint, camphor, checkerberry, iodine and nitre. It is highly important that drugs, whether recognized by the United

States Pharmacopoeia or not, should, when administered, produce the desired therapeutic effect. Our inspectors were able to collect, in cooperation with the Federal Department, numerous samples of worthless products. The following list gives a general idea of the drug work accomplished by this division.

	1921	1922 (6 months)
Number of towns inspected.....	94	81
Number of samples collected.....		130
Number of hearings arranged.....		17

Food Inspection.

In the work of food inspection, the collection of samples has represented only in a small way the amount of work accomplished. As has been our custom, we have endeavored by different methods to effect the best results—that is by education, inspection and prosecution.

Grocery Stores and Markets.—The deputies of this department have made numerous inspections, reporting as to the general condition of the place, the cleanliness of the walls, floors, shelves and counters, the condition of meat rooms and refrigerators, and the general habits observed as to the proper labeling of lard, molasses, sausage and vinegar when sold in substitution for the real article.

Restaurants.—The inspection of hotels, particularly the dining rooms, lunch rooms, restaurants and lunch carts has been carried on as fully as the funds available and the force of inspectors employed permitted. Particular attention has been paid to the condition of dishes and utensils used and the refrigerating facilities noted.

Bakeries.—It is very important that care should be taken in handling bread, and we have attempted to investigate as fully as possible the methods used in dispensing this product, not only in bake shops but on delivery teams and in stores. Bread, as it comes from the oven is in a sterilized condition. This is the last sterilizing process that bread receives before being consumed, as a very small amount of bread is subjected to any heating or toasting operation. It is obvious, therefore, that bread

in order to be suitable for food should be at all times carefully protected. Inspectors have instructed drivers of bakery teams to be particularly cleanly in their habits in the matter of handling bread. It is gratifying to report that there has been a marked improvement in the general condition of the bake shops throughout the State of Maine during 1921-1922.

BOTTLING ESTABLISHMENTS.—The usual inspection of bottling shops, where soft drinks are manufactured, has been carried on and quite a number of samples have been obtained. The use of saccharine in food, especially in carbonated beverages, which really contain such a small amount of food value, is a vicious practice. Not only has saccharine been adjudged by eminent authorities as a menace to health, and on this ground could be very well condemned, but when used as a substitute for sugar, constitutes the perpetration of a fraud and imposition upon the consumer. Bottled sodas and soft drinks of all kinds, if manufactured with sugar, do contain food constituents in small amounts. If manufactured with saccharine, no food value is insured. The use of such a substitute can well be regarded as a punishable offense.

SLAUGHTER HOUSE INSPECTION.—It has to be admitted that the supervision of this class of food handling is the most difficult of any phase of the police power exercised by this division. Animals slaughtered for food purposes that are shipped to Massachusetts or having a destination beyond the borders of our State receive inspection proper in character, while the products consumed by the people of Maine are, for the most part, from creatures that are never given either an ante-mortem or a post-mortem examination. In the absence of such regulations to insure the safety and purity of such a product, we have felt that it was our duty to devote as much time as possible to the inspection of establishments where slaughtering was done, and we have, therefore, endeavored to do more or less slaughter house inspection work throughout this period.

There are a few well equipped, well managed abattoirs in the State, and they are not entirely confined to the cities. Some of the larger country towns can boast of such establishments, but the majority of places where slaughtering is done, either in the city or country are not at all suitable for the purpose intended.

However, we feel that conditions are growing better. We have been gratified to note that during the last year and a half several new slaughter houses, with cement floors and sheathed walls, and with an adequate water supply, have been built, but, on the other hand, it is our painful duty to report that we have had cases where moral suasion was of no avail, and it was necessary to fine the proprietors of some establishments, who persisted in maintaining a dirty and cluttered place.

The better class of butchers are, as a whole, not satisfied themselves with conditions under which they are operating. It is only occasionally that we meet a man who arbitrarily declines advice regarding sanitation.

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 inspction as possible of our three leading industries with reference to packing food, namely: Corn, blueberries 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 appearance in different parts of the State. This of course has brought about necessary, additional work, as new managements are generally not familiar with food regulations.

Food Poisoning.

Aside from general inspection work and the collection of official samples, special investigations of food and drug matters, resulting from complaints where it was believed that poisoning had taken place from the use of certain foods or drugs, have, as usual during these eighteen months, demanded considerable time and attention.

Collection of Food Samples.

Some of the food products collected for analysis have included ice cream, vinegar, lemon extract, cocoa, nuts, various soft

drinks, clams, oysters and fish. The sampling of clams, ice cream, extracts, and vinegar 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.

CLAMS.—During the fall of 1921, a general collection of clam samples was made from various dealers throughout the State. The results of analysis in many cases showed that the clams had been allowed to remain in water and had thus been swollen. Violators have been cited to a hearing and these cases are now pending settlement.

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 in these neighborhoods, several violations were detected. A phase of violating the law which is difficult to handle, is the practice of many proprietors of ice cream parlors to sell an imitation product—that is, a product below the required standard in butter fat—for ice cream. Such action on their part can well be regarded as constituting a fraud upon the consumer and for such violations, hearings have been arranged and fines have been imposed.

BUREAU OF WEIGHTS AND MEASURES.

As the activities and accomplishments of this bureau will be reported in detail by the deputy sealer of weights and measures, it hardly seems fitting that any statement regarding the work of this bureau should be made a part of this report.

BUREAU OF APPLE INSPECTION.

The enforcement of the law providing for the grading, packing and branding of apples has been carried on as extensively as the funds available for that purpose would permit. Two inspectors have been employed during the apple shipping season, and their findings, after the law has been in effect for nine years, have not been entirely satisfactory. Numerous cases of adulteration and misbranding have been detected by the inspectors. Probably about 15,000 barrels of apples have received actual inspection during this period, but even with the cooperative arrangement of charging our regular food inspectors with the

duties of apple inspection, the State cannot be properly covered with such a small force and the limited funds available for this class of inspection work. Many of the violations detected have been only technical and, apparently, entirely due to ignorance of the law. About forty of the more flagrant violators have already paid fines and there are still many cases under consideration pending settlement.

Federal Cooperative Work.

All through these eighteen months the cooperative work carried on with the Federal Bureau of Chemistry, especially with the officers of the Boston Station, has been of decided advantage in the accomplishment of our inspection work and the splendid support given us has been greatly appreciated.

Following are tabulations of the prosecutions for adulterated and misbranded foods and drugs, outlining the reason for prosecution and the amount of the fine:

Record of Prosecutions.

1920.

Adulterated Ice Cream, W. E. Lincoln, Vinal Haven	$25 00
Adulterated Ice Cream, Robert A. Conner, Castine...	25 00
Misbranded Apples, F. A. Ricker, Turner.....	20 00
Misbranded Apples, I. G. Wright, Camden.....	10 00
Misbranded Apples, Walter E. Cunningham, Belfast..	10 00
Misbranded Apples, G. L. Slipp, Belfast.....	10 00
Misbranded Apples, R. C. Plaisted, Gardiner.....	10 00
Misbranded Apples, N. F. Barrett, Camden.....	10 00
Misbranded Apples, F. H. Chandler, New Gloucester	10 00
Adulterated Milk, Striar & Pickman, Bangor.....	10 00
Adulterated Milk, Manhatten Cafe, Bangor.....	10 00
Adulterated Milk, Mike T. Corey, Bangor.....	10 00
Adulterated Milk, Bangor Home Bakery, Bangor.....	10 00
Adulterated Milk, Walter Baker, Portland.....	10 00
Adulterated Milk, Home Restaurant, Portland.....	10 00
Adulterated Milk, The Nut Shell, Bath.....	10 00
Adulterated Milk, Victory Lunch, Bath.....	10 00
Adulterated Milk, Opera Cafe, Bath.....	10 00

Adulterated Milk, Buffet Lunch (G. Roberts), Bath..	10 00
Adulterated Milk, West End Lunch Room, Portland..	10 00
Adulterated Milk, Rex Lunch, Portland.....	10 00
Adulterated Milk, R. B. Buzzell, Waterville.....	10 00
Adulterated Milk, Union Lunch Co., Portland.....	10 00
Adulterated Milk, Colonial Sea Grill, Portland.....	10 00
Adulterated Milk, E. F. Cote (Cote Bros.), Waterville	10 00
Adulterated Milk, Oriental Restaurant, Bangor.....	10 00
Adulterated Milk, M. A. Bartone, Lewiston.....	10 00
Adulterated Milk, Alexander Albert, Lewiston.....	10 00
Adulterated Milk, Hammond and McLean, Lewiston.	10 00
Adulterated Milk, Astoria Dairy Lunch, Bangor.....	10 00
Adulterated Milk, C. Thibeault, Lewiston.....	10 00
Adulterated Milk, Royal Restaurant, Lewiston.....	10 00
Adulterated Milk, Fournier & Provost, Lewiston.....	10 00
Adulterated Food, Rose Rubin, New Auburn.....	15 00
Adulterated Food, B. Matel, New Auburn.....	10 00
Adulterated Food, Federal System of Bakeries, Portland	10 00
Adulterated Food, Joseph Cooper, Bangor, (Meat)...	50 00
Adulterated Food, Hyman Merson, Lewiston.....	10 00
Adulterated Food, Frank Bartkus, Lewiston.....	10 00
Adulterated Food, Great Atlantic & Pacific Tea Co., (Lemon Extract)	25 00
Bottled Soda, Ingall Bros., Portland.....	50 00
Bottled Soda, Forest City Bottling Co., Portland....	50 00
Bottled Soda, Liberty Bottling Co., Bath.....	50 00
Bottled Soda, Clovis Morneault, Presque Isle.....	25 00

Record of Prosecutions.

1921.

Misbranded Apples, L. J. Andrews, East Sumner.....	$10 00
Misbranded Apples, E. H. Cook, Waterville.....	25 00
Misbranded Apples, Dow & Payne, Inc., East Newport,	25 00
Misbranded Apples, W. B. Ferguson, Dixmont.....	10 00
Misbranded Apples, G. J. Folsom, Exeter.....	100 00
Misbranded Apples, Frost & Walker, Dexter.....	100 00
Misbranded Apples, F. A. Morse, Greene.....	25 00
Misbranded Apples, F. H. Moıse & Son, Waterford..	10 00

Misbranded Apples, Percy L. Scribner, Searsport.....	10 00
Misbranded Apples, Fred C. Small, Cornish.....	10 00
Misbranded Apples, E. W. Towle, North Vassalboro..	10 00
Adulterated Ice Cream, J. W. Boynton, West Pembroke	10 00
Adulterated Ice Cream, I. C. Cole, Gardiner.....	10 00
Adulterated Ice Cream, H. H. Johnson, Broad Cove..	10 00
Adulterated Food, Apollo Candy Store, Portland.....	25 00
Adulterated Food, Sidney C. Atwood, Lewiston, (meat)	25 00
Adulterated Food, Brooks Farmers' Union, Brooks...	10 00
Adulterated Food, Harry Dalton, Portland.....	5 00
Adulterated Food, Mrs. Rocco Frallicerarado, Portland	10 00
Adulterated Food, Edward King, Orono, (meat)....	10 00
Adulterated Food, Lincoln Cafe, Portland.....	10 00
Adulterated Food, Moustakis Bros., Portland.....	25 00
Adulterated Food, Throumoulos Bros., Biddeford....	25 00

Record of Prosecutions.

1922 (6 months)

Misbranded Apples, C. S. Dudley, South Paris.....	$10 00
Misbranded Apples, M. G. Farrar, Buckfield.....	50 00
Misbranded Apples, C. P. Gowell, Greene.....	10 00
Misbranded Apples, A. S. Hall, Buckfield.....	50 00
Misbranded Apples, E. E. Twitchell, Norway.....	10 00
Misbranded Apples, E. L. Wellington, Hartland.....	10 00
Adulterated Food, Kentron Grocery Co., Biddeford, (olive oil)	10 00

Summary and Recommendations.

To briefly summarize the work of the division of inspection, it has been our duty, as outlined by the statute, to safeguard the food and drug supply, to investigate the quality and purity of feeds, seeds, fertilizers and spraying materials, and to insure just weights and measures of these commodities used by the people of the State of Maine.

There are many conditions that need remedying. The country slaughter house and the lack of inspection therein is to be greatly deplored. Before the ideal can be realized, it is our belief that more legislation is necessary. We recommend that some form

of license for the slaughtering business be provided. We believe that every animal slaughtered and sold for food should be subjected to some sort of inspection, considering that it is just as essential that the people of the State of Maine should have beef that has been slaughtered under State inspection as for the people of Massachusetts to have Maine beef killed under Federal inspection.

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 can be acquired in times of plenty and stored for distribution in times of scarcity. 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 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.

We also advocate that every bottling establishment should be licensed. Many other states do not permit an ounce of carbonated beverage to be bottled except under licensed provisions. Regulations governing the use of other manufacturers' bottles should also be included in the license requirements and thus assist the bottlers in the very difficult problem with which they are now contending.

We fully believe that every ice cream dealer should be licensed, not with the idea of obtaining revenue for State requirements, but in order to properly maintain a sanitary condition in ice cream parlors and the purity of the product there dispensed. Ice cream can almost be regarded as a staple article of food. It is no longer regarded as a luxury, and as every ice cream parlor is patronized by children, special care should be taken to insure to them a product free from contamination.

Another recommendation which we regard as important is that as early as possible the food standards which were recently redrafted be published. These standards have in no way been altered but, from time to time, have been published over the commissioner's signature and we urge a new printing of these regulations at the earliest opportunity afforded.

In conclusion, please accept my thanks for your kind advice, wise counsel and hearty cooperation in the administration of affairs assigned to me. 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 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 SEALER OF WEIGHTS AND MEASURES.

To A. M. G. Soule, Chief, Division of Inspection:

I herewith respectfully submit to you the ninth annual report of the work done by the bureau of weights and measures. As I have been in this office only a short time, this report must be of a statistical nature principally.

The records of this bureau show that a large amount of work in the nature of inspection and advice has been done by the various local sealers throughout the State. The majority of the towns and cities have efficient sealers who are honestly endeavoring to enforce the weights and measures regulations. There are extensive commercial enterprises which must always be carefully observed, such as those dealing in coal, ice, groceries, meats and corelated lines of trade. The reweighing of fuel deliveries has been given close attention and a substantial decrease in the percentage of error found was noted.

The State Sealers' Association held a well attended convention in Portland in the month of October, and a great deal was learned by the various sealers in regard to new ideas and methods in the way of weighing and measuring devices. It is the aim of this office to make a better and larger association, and to have instructions given in all new lines in regard to the office of a sealer.

At this time I would like to recommend that the fee system in payment of the local sealers be done away with, and that they be paid per diem, and a reasonable amount be made available for transportation and other necessary expense.

You will find in the form of a summary arranged by counties, a report of the activities of the various sealers throughout the State.

I wish at this time, to thank Mr. Levi S. Pennell, the former deputy sealer of weights and measures, for his kindness in aiding and instructing me in the duties of this office.

I also wish to thank you for your advice and cooperation in all matters pertaining to this bureau.

Respectfully submitted,

EDWIN L. PALMER,

State Deputy Sealer.

REPORT OF CHIEF OF THE DIVISION OF PLANT INDUSTRY.

To Hon. F. P. Washburn, Commissioner of Agriculture:

I respectfully submit the following as a report of the division of p'ant industry for the period ending June 30, 1922. The legislature of 1921 changed the fiscal year for all State departments so that this report will cover the period from January 1, 1921, to June 30, 1922.

During this period several changes have taken place in the division which I think should be noted at this time. Major E. E. Philbrook, who was connected with this department for fifteen years and for a greater part of the time as head of this particular division, resigned in February, 1922, to accept a Federal position. Major Philbrook had served under practically every administration since the department of agriculture was organized and should be given credit for being the pioneer in Gypsy and Brown-tail work in this State, having it in charge since its inception in 1906.

Mr. F. H. Dudley of Auburn, who for a period of more than five years was state horticulturist, resigned in April, 1922, to go into commercial work. Following these resignations I have, by your appointment, carried on the work of the division and feel fortunate in having associated with me, Geo. A. Yeaton of Chelsea as state horticulturist. Mr. Yeaton is probably better known by Maine orchardists than any other individual, and has had years of experience in his chosen field.

It may not be out of place at this time to summarize the work of the division for the period which this report covers. The first thought coming to my mind is that whoever started the work of the division of plant industry in its early days could hardly picture the amount of work which the future had in store for it.

The Gypsy moth work, which at one time seemed a minor proposition, has grown to such an extent that the department is continually receiving reports from the southern and central counties of the state, telling of the ravages of this pest. Speaking in a general way, I feel it my duty to say that instead of reducing the Gypsy moth colonies in the State, we are finding more each year. It has never been the policy of the department to ask for a big sum of money for this work, and after many years of experience I would not want to ask for a large appropriation because the work done has not proved to us that we could spend our money to good advantage. It has been suggested that the department ask for more money for the purpose of doing more to stop the spread of this pest, but if we do not know by what means to combat this enemy, it seems hardly the thing to try to do it by guess-work. As head of the division, I shall, however, have the following in mind as a general plan for the work:

First, cooperation in every way possible with the Federal Parasite Laboratory at Melrose Highlands, Massachusetts, securing their assistance in making as many parasite plantings as possible in Maine;

Second, spraying in those towns on our western border along the main highways to prevent as far as possible a spread towards the central and eastern part of the State. To carry out this idea, we have this year put in operation the latest type auto-sprayer, capable of putting several thousand gallons of spray each day on our tallest trees;

Third, furnishing cresote for destroying egg clusters to all those who apply for it, and giving instructions as to how, when and where to use it.

Fourth, continuing a campaign of education through all the agencies in our department, for there are still many throughout the State who are unfamiliar with the Gypsy moth.

In this connection I should like to recommend that more money be made available for the purchase of additional auto-sprayers. I think that the towns will cooperate with the department in handling a part of the expense of this type of work.

During the past few years it has been called to my attention that money spent on moth work is thrown away, but in my humble opinion no fight was ever won or no advantage ever

gained in any proposition by lying down on the job. It seems, rather, to be the duty of the State department to protect the shade and forest trees as much as we possibly can. There are many fruit trees in our State which have been neglected so many years that they are a menace to the healthy trees, serving only as a breeding place for insects. A suggestion has been made that some law be passed which would make it compulsory for an owner to destroy this type of tree on his property. In spite of all the discussion that is going on about insect pests of various kinds, it seems that there never was a time when the good orchards of our State were receiving such excellent care as they are at present, and while these pests are a menace, there does not seem to be any given cause for worry, for the good orchardist will protect his trees from injury just as the potato farmer sprays for the Colorado beetle.

Generally speaking, we have no large amount of data on the effectiveness of parasites for destroying the Gypsy and Brown-tail moths except we know that we are liberating parasites which feed upon them, but to what extent has never been determined. This is work which requires a great deal of study and technical knowledge, and we believe it holds out more hope for the future than any of the different lines which are used to get rid of these pests.

Summary of Horticultural Work.

During both of the seasons covered by this report, the bureau of horticulture has taken an active interest in nursery stock inspection, and the use of dust as compared with liquid spray. It is probable that a larger part of pioneer work in the dusting of trees in Maine has been done the past two years and enough has already been accomplished to encourage us to continue our demonstration work. The division is not in a position to say that dusting is the only thing, but we do believe that when properly carried on, it is much quicker and as reliable as the liquid spray. No recommendations should be made for a radical change until more evidence is discovered about dusting material.

An enterprise the size of our orcharding industry should, we believe, be given more attention, and with this in mind we will plan to make available for horticultural work more money than

has been used in the past. It is recommended that at the next legislature this item receive more attention when the division funds are being asked for.

A new project taken on by the bureau last year, namely, bee work, received a hearty response and there has been made available for those who are interested a complete inventory of the bee-keepers of our State. Two inspectors were sent out to get a line on the prevalence of European Foulbrood and while some colonies were located, it is with considerable satisfaction that we are able to report no serious condition. In view of the fact that there are many new fruit trees being set out it is hoped that the interest in bee keeping will grow, because the tree and the bee are certainly closely allied.

The horticultural bureau was very fortunate in its exhibition work last year and was able to make a very creditable showing at several of our State fairs, at the New England Fruit Show at Concord, Hartford, Springfield and several other places.

The quality and quantity of the fruit displayed was better than it has been for a great many years as we had a wonderfully long growing season. The keeping quality of the fruit was not as good as usual owing to the effects of over-ripening. Our apple growers had one of their best years, growing a fine crop, and owing to a shortage in many other states we were able to maintain a good price throughout the season. The result is that this spring there has been an increased demand for young trees to plant and the accompanying report from the present horticulturist will give this matter in detail.

Summary of the Seed Improvement Bureau.

The work of the seed improvement bureau has increased by leaps and bounds and the acreage has increased 625% over two years ago, making this bureau a factor to be considered when the next legislation is asked for. We believe that this bureau should be self-supporting, and a proper fee should be received for the work in order that this may be brought about. Report in detail covering this work will follow.

The division employs continually eight men and at times during the year has as many as twenty-five or thirty on its pay-roll, and even then it is not able to do all the work which should be done along these different lines.

Report of Bureau of Seed Improvement.

In view of the limited space offered for a report, an attempt will be made to pick out the events which seem of the greatest importance and apparently are a mark of progress in the work. From January to May, 1921, shipping inspection was made on nearly sixty cars of certified stock which was being moved out of the State. Experience has shown that some of those with whom we come in contact must be dealt with in a way to make them understand that they must put up a good grade of stock before they are granted the blue tag of this department. Each year we have tried to make our standards a little more exacting than the year before, and quite naturally our ideas have gone into competition with some growers who felt that most anything was good enough for seed stock. Taking the shipping season referred to above as a whole, we had a minimum of trouble and our growers received a much better price than they could have if their stock had not been certified.

In March, 1921, a committee which had been appointed by the Maine Seed Improvement Association, met in Orono to consider rules and regulations which should govern our field inspection, and this required much consideration on the part of those interested. This committee consisted of Dr. W. J. Morse, director of the experiment station, Dr. Donald Folsom, pathologist of the experiment station, M. D. Jones, farm management demonstrator of the experiment service at the University of Maine, Guy C. Porter of Houlton and E. L. Newdick of Augusta. Great credit should be given Doctors Morse and Folsom for the preparation of the material which was gone over to serve as a basis for our standards, and in view of the fact that the office receives numerous inquiries as to our standards, it is believed that they are worthy of publishing in this report. They are as follows:

RULES AND REGULATIONS FOR SEED POTATO CERTIFICATION.

Maine Department of Agriculture, Augusta, and the Maine Seed Improvement Association Co-operating.

Pre-requisites to Entering Potatoes for Certification.

1. It is recommended that potatoes being entered for certification be grown upon land that was not in potatoes the previous season, and

that fields so entered be isolated as far as possible, from other fields planted with other strains of seed.

2. It is recommended that the seed used be as free as possible from common scab and rhizoctonia and be disinfected with formaldehyde or corrosive sublimate, preferably the latter.

3. It is required that the plants be well sprayed with bordeaux mixture to control late blight. If plant lice become prevalent upon them it is desirable that nicotine solution or some other material be applied to destroy those insects as soon as they appear.

4. It is required that the crop be well cared for, and be kept reasonably free from weeds and from insect injuries.

Number of Inspections.

There shall be at least three regular inspections during the season. The first shall be of the plants during the time of bloom; the second of the plants as late as possible—while they are still green; the third shall be an inspection of the crop at shipping time. At the option of the chief inspector additional examinations may be made of individual fields and stocks of tubers.

First Inspection—Field.

1. More than 1.5 per cent varietal mixtures will disqualify.

2. More than 5 per cent mosaic, 1 per cent curly dwarf, 2 per cent leaf-roll, 0.5 per cent blackleg, 0.5 per cent wilt, or 3 per cent other weak hills will disqualify. A total of 8 per cent of the various diseases just enumerated, including weak hills, will disqualify.

Second Inspection—Field.

1. More than 0.5 per cent varietal mixtures will disqualify.

2. More than 4 per cent mosaic, 0.5 per cent curly dwarf, or 1 per cent other weak hills will disqualify. At the second inspection on a total of 5 per cent of the various diseases just enumerated, including weak hills will disqualify.

3. All weak and badly diseased hills to be removed during inspection.

4. At this inspection a sufficient number of hills per acre shall be dug in such a manner as to secure a representative sample. Five per cent producing conspicuously less than average yield will disqualify. (In case of doubt, check results.)

Third Inspection—Shipping Time.

1. Maine certified seed potatoes shall equal or exceed U. S. Grade No. 1.

2. The inspector present at this inspection will be instructed to put up such seed stock as he would like to receive if he were the buyer.

It must be remembered that any set of rules and regulations so established can be successful only when put in operation by inspectors who are practical and not too theoretical in their application of said rules. The members of the committee tried to do their duty to the best of their ability and the report of the committee was accepted at the last annual meeting of the association and will be enforced this year.

1921 was practically the first year that the bureau did not have to do more or less missionary work and seek out those who were interested in certification work, and when it came time for field inspection July 1, there was on file one hundred and eighteen applications. These applications represented one thousand two hundred and eighty-five acres and of these, six hundred and seventy-seven were disqualified and six hundred and eight passed.

	Passed.	*Disqualified.*
Cobblers	318	341
Spaulding Rose	95	27
Green Mountains	182	200
Giants		70
World's Fair	11	1
Bliss		5
Mills Pride	2	28
Russetts		5
	608	677

Three applications were filed too late and the thirty acres involved could not be inspected. The pencentage passing is holding about the same as it has the preceding years, or forty-seven per cent.

The number of acres of oats entered was forty-nine and one-half, twenty-three and one-half passing and twenty-six disqualified. The total acreage of all crops entered was one thousand three hundred and four, an increase from the previous year of approximately five hundred acres. In terms of acres this is a small increase, but looking at it in another way it was encouraging to those in charge because it showed that while we had made some mistakes and heard some criticism, on the whole we were making progress.

During the summer it required seven men to do the field work where in years past we had been able to get along with but four. The problem presented was not the amount of acreage but the fact that it covered a large territory and necessitated a good deal of traveling. The principal factor involved is the time, because work cannot be started until the plants are sufficiently high to show mosaic, and it is not effective during the latter part of the season when plants are dying from various causes. Besides the two regular field inspections, there was a third

inspection made at digging time which gave to the bureau accurate information as to whether or not it was believed the crop being dug was of sufficiently good quality to warrant selling for certified stock. In many cases recommendations were made that the grower give up selling his stock for seed owing to the many over-size potatoes which were noticed.

For some reason certified stock started moving earlier in the fall of 1921 than it had in any previous season, because a few cars were moved before extreme cold winter set in. In former years we have not had any shipping inspection work to do before January or February, but there seems to have grown up an earlier market. Throughout the winter and continuing until May of the present year, shipments were being made until practically one hundred cars, or twenty-five thousand barrels, were moved under the blue tag of the State department of agriculture. It is interesting to note that this stock has been shipped into twelve states, and it is hoped that another year even a larger territory may be interested in purchasing our stock. The bureau makes no pretence of perfection but has tried hard to put a good, fair sort. We have had but few complaints. Four cars of the one hundred shipped were not satisfactory to the purchasers, at least that was the number signifying that they were dissatisfied. The average price received for this stock was, as near as we can judge, from $1.50 to $2.00 per barrel more than the table stock market at the time of shipments, and it can readily be seen that the few growers who had this stock for sale got a fair return on their investments.

The season of 1922 is upon us with an entry at this time of three thousand six hundred and twenty-eight acres in nine counties and fifty-two towns. While there is a fee charged for this work, it has never been adequate to cover the cost of the same, and I would recommend that at another session of the legislature sufficient funds be asked for to carry on the work, and that a fee be placed upon each acre so that the total amount will make the service practically self-sustaining, such fees to revert to the State to cover as nearly as possible any appropriation made. In my opinion the growers whose fields pass inspection are only too glad to pay for the work, but each year there has been about fifty-three per cent of the fields offered for inspection that did not pass, and some definite stand must be taken regarding the share of expense which those who are turned down must pay.

The department has been lenient in this respect during the years it has been building up this work in that it has not always collected from those growers whose fields did not pass, or even from those whose fields passed but did not make a sale. In other words, it is believed that we have passed through the educational stage of certified seed work and that it must now go on a business basis. The question has arisen as to whether or not our certified growers should form an association for the marketing of their stock and this matter will be carefully gone over with them this fall.

The details involved in following seed potato stock from planting time to its final resting place in the car for shipment are many, and while we have a fair check on the stock we must insist upon the cooperation of the growers. Any movement of this sort which is so broad in its scope must be popular and must have the backing of the industry or it cannot be successful. We have been assured within a short time that the growers in our large potato growing section of Aroostook county were ready and willing to get behind us, and we shall give them a chance when the next legislature meets to say whether or not they want the work.

Looking ahead to the future, there are several problems connected with this work which must be attended to, but among the most important in my mind is proper advertising outside of the State advising what we have to sell. Other states having certified seed for sale are in our markets and in the test plots being run on Long Island, New York and New Jersey will be found stock from Wisconsin, Michigan, Vermont, New York, New Brunswick as well as from Maine, and the growers of these different states are all looking for a market. It is the belief of the bureau that some organization should be of sufficient strength to send one of its officers to the seed buying territory to visit fairs, take notes on seed plots, arrange for demonstrations, have signs printed and in any and every way, boost Maine seed potatoes. It should be done by some agency other than this department, because while we are willing to do all that we can, we should not become involved in the marketing end. The actual inspection work is enough for this department to be responsible for.

Right here it may be of interest to note that through this bureau there is being tried out on Long Island this year, nine-

teen lots of seed stock from this State, and the report from the first disease readings has recently come to our desk. While there are two lots which carried a higher percentage of mosaic than we had expected, on the whole the report was a very favorable one to us, showing many of our samples carrying 0.5 of 1% mosaic and some cases no mosaic at all. It is such lots as these with which we want our own growers to become more familiar in order that our crop may increase in value each year.

Briefly, the work of this bureau summed up amounts to simply this: we must ship out of our State a product which when opened by the buyer can be emptied from the sack onto the floor of his warehouse and every potato look sound and fit for use. Until we arrive at that point, we still have something for which to strive. It hardly seems fitting to close a report of this bureau without mentioning our connection with the Maine Seed Improvement Association and the annual exhibition held by that society. For many years the bureau and the association have worked together, and about two weeks of our time each year is devoted to the work of putting on an exhibition, settling premiums and other matters incidental to such an affair. Last year the show was held in Bangor, November 15th to 18th and it is altogether probable that the exhibition was the best ever held by the association. There were three hundred and eight exhibits entered by one hundred and thirty-one exhibitors and the following table shows how these were entered by counties:

	Exhibits.	*Exhibitors.*
Kennebec	94	29
Penobscot	80	32
Washington	17	8
Franklin	28	4
Lincoln	2	1
Cumberland	12	5
York	19	15
Androscoggin	5	3
Piscataquis	20	14
Hancock	11	5
Somerset	14	10
Waldo	6	5
	308	131

The reason for giving these figures is that the county farm bureau show has grown to be the feeder for our State-wide exhibition, and we want to point out the fact that the credit for the large exhibition which we are not able to hold, goes in a measure to the county show.

If we had increased our exhibition only in the number of exhibits we would not have made our point, but it is conceded by all that the quality has grown each year. The writer has been connected with these shows for several years and has noted the improvement in quality. It is also gratifying to observe that some of our exhibitors have learned a lot about how and what to select for exhibition purposes from their various crops. The only regret we have in this connection is that there are not more interested in these meetings who can spare the time to attend and hear the lectures concerning the various phases of farm crops. The fall meeting in 1922 will be held in Lewiston and we are looking forward to an increased interest in our exhibition. After watching the exhibitors over a period of years we believe that the true husbandman enjoys bringing the best that he can grow into clean, honest competition with his brother farmer and that they can both derive a benefit from the work of one another.

In closing this brief report, I wish to thank you personally for the opportunities which you have given me to discuss matters with you and the advice you have given on these different occasions. To my co-workers in the department, to the extension service of the College of Agriculture, and to the workers at the Maine Agricultural Experiment Station, I wish to also extend my appreciation for the help which they have given to me in my work, and to all I pledge allegiance in the months to come.

Respectfully submitted,

E. L. NEWDICK,

Chief, Division of Plant Industry.

Raspberry field protected for winter.

REPORT OF STATE HORTICULTURIST.

To Hon. Frank P. Washburn, Commissioner of Agriculture:

I herewith submit my report as horticulturist for the period beginning March 17, 1922, and ending June 30, 1922.

I have endeavored to follow the lines laid down by my predecessor so as to cause as little interruption in the work as possible. We have had the most hearty cooperation of the Maine Fruit Growers' Exchange, Maine Pomological Society, Maine Experiment Station, College of Agriculture, the Grange, and other kindred organizations interested in better fruit for Maine.

The Maine Fruit Growers' Exchange ordered sixty thousand apple trees for the farmers of our State from nurserymen in Maryland, New York, Connecticut and Canada. I inspected these for disease and insect pests at the nurseries where grown, discarding everything that showed any defects. We believe that this inspection of the nursery stock has saved the farmers of the State many thousands of dollars. We have been called to inspect many trees that had been ordered through agents and in most cases found them all right. There was one exception to this, and we have had to condemn many trees from that company, whose name we will furnish on request, and we have refused to grant a license to agents representing that concern in the State.

I have spoken at sixteen grange meetings and four miscellaneous meetings with an aggregate attendance of fifteen hundred and eighty. I have held seven pruning and grafting demonstrations at which one hundred and eight took part. I have conducted twenty-six dusting demonstrations for the control of insects and fungi in the orchard in eight counties with a total attendance of seven hundred and forty-two. These were held in the following counties: Cumberland, Franklin, Knox, Lincoln, Oxford, Sagadahoc, Somerset and York. At this time

I want to thank the several county agents who assisted in arranging those meetings, through the orchard project leaders of the farm bureau.

I feel that we should emphasize the benefits that the orchardists have received at these meetings by bringing in specimens of disease and insects which infested their orchards, and having them identified and a remedy given for their control. This work has been wholly educational for the purpose of allowing the fruit growers to judge the relative value of dusting as compared with spraying. The cost of the two methods is practically the same. The material for dusting the orchard is somewhat more expensive than that of the spray, but the time saved in the former is enough to more than offset this difference. The insects have been more numerous this season than usual and many specimens have been sent into the office to be identified. This feature of the work is increasing as the season advances, and the people find that we are willing to give this information.

Small Fruits.

The growing of small fruits on the home farm has been encouraged when it has been practical, and we have looked over a number of fields to determine whether the soil and conditions were right for commercial growing of the several small fruits. Strawberry culture has given the largest returns for the time and labor spent in their production. Raspberry growing when conditions are right has proved profitable. Under our climatic conditions the canes should be protected either by laying them down or by covering with a light mulch of coarse litter. Blackberry and blueberry growing has been encouraged.

Landscape gardening or beautifying the home grounds has come in for its share of attention from this department. We have by letters and personal calls assisted in this work. In a few cases we have used dwarf apple and dwarf pear trees for a background to increase value and at the same time the attractiveness of the place.

Bees.

The horticulturists of the State realize the importance of bees in the orchards to assist in the pollenization of the blossoms in

seasons when conditions are not favorable for the pollen to float, and pollenization in the natural way would be almost impossible without the assistance of the bees. In order to have their aid, we believe that the bee keepers must have not only encouragement but assistance in their work, and to this end we have been ready to inspect the colonies for foul brood and other troubles which may confront them. At all times we have been ready to furnish bulletins and all the available data pertaining to the work, and have encouraged the closest cooperation with the beekeepers.

CONCLUSION.

1. The inspection of nursery stock has saved the State many thousands of dollars in cash and much disappointment in results of the orchard's production.

2. Speaking at the grange and other farmers' gatherings has been the means of increasing the planting of small fruits.

3. The dusting demonstrations have set the farmers to thinking about forming dusting circles of from six to eight orchardists in the several communities.

4. Identifying insects has resulted in giving methods of control.

Respectfully submitted,

G. A. YEATON, *State Horticulturist.*

REPORT OF FIELD AGENT, GYPSY MOTH WORK.

To Hon. F. P. Washburn, Commissioner of Agriculture:

I have the honor to submit my report as field agent of the Gypsy moth work for the period ending June 30, 1922.

Beginning February 1, 1921, time was spent painting out egg clusters in the worst infested sections and also in those towns where reports received would indicate that some immediate help would prevent serious spread. This work continued until May 15th. At this time we were able to begin spraying and work in those towns which were willing to share the expense with us. These towns are in York county and badly infested, and the residents realize the seriousness of the moth situation. Some larva scouting was done the latter part of June but the most of the time was taken up spraying. This continued until July 15th when larva scouting was again resumed and continued until August 25th.

Due to the season the moth began earlier than usual to deposit her eggs and the latter part of August the work of scouting and creosoting egg clusters was resumed and continued until January 15th of the present year.

At about this time Major E. E. Philbrook, chief of the division of plant industry resigned and Mr. E. L. Newdick was appointed to take his place. Owing to the large amount of work which had been done and knowing the amount of money which would be necessary in the spring, the men were laid off at this time and the work of scouting was discontinued except for a few men. These men kept on, being employed in the delivery of hundreds of gallons of creosote in many sections of the State. Visits were made to different parties who wrote in and asked for information relative to egg clusters and the methods of treatment.

Spraying.

The spraying season of 1921 was successful as far as the machines which we had at that time were concerned. We were using two small hundred gallon sprayers and one with a four hundred gallon tank. These were all horse-drawn machines and did good work but could not be moved from place to place fast enough. The latter machine was sold to the city of Bath last fall and this year we have purchased a new Fitz Henry-Guptill auto-sprayer. More territory has already been covered than in any previous year, the high power giving the best of service and, we believe, doing efficient work. We estimate that we will cover more than twice the territory that we did with the horse-drawn machine. We began spraying May 22nd and have been delayed quite a bit on account of bad weather but will continue until the 15th of July. Work was started in South Berwick and then we went onto the coast and took all the towns to and including Saco.

Educational and Correspondence.

During the year I have made it a point to answer all letters and requests, and have either personally visited or have sent an inspector, to all who required assistance.

Inspector Babb has been of great assistance in visiting granges and schools giving lectures on the Gypsy moth pests.

Although we had an exceedingly mild winter and a large number of egg clusters hatched, we do not believe that the larvæ fed as much as usual in the month of June owing to the large amount of rain and so much damp weather.

Parasite Work.

I believe our two best methods of handling the moth situation are spraying and parasite work. We have received much assistance from A. F. Burgess, Melrose Highlands, government expert in charge of moth work, and I strongly recommend close cooperation between the Federal officials and our department in this work.

Inspector Trafton who has been in charge of the parasite work for our department for several years, has made the following plantings this spring:

Leeds	49,000	Anastatus
Livermore	10,000	"
Wayne	23,000	"
Readfield	3,000	"
Manchester	6,000	"
Sidney	4,000	"
Vassalboro	6,000	"
Windsor	4,000	"
Chelsea	16,000	"
Auburn	1,666	Blepharipa
Standish	500	Apanteles M.
Baldwin	500	" "
Cornish	500	" "
Limington	500	" "

Making a total of 121,000 Anastatus, 1,666 Blepharipa, and 25,000 Apanteles M. liberated in the State of Maine this season. The towns selected for planting were chosen because of their geographical location as regards previous parasite plantings already made and are part of the government plan for testing the efficiency of the parasites in exterminating the Gypsy moth.

Besides making these plantings we have made collections for experimental purposes in the parasite work, one hundred fourth and fifth stage Gypsy larva from each of the following towns: Pittston, Sidney, Manchester and Leeds; also one hundred and fifty of the fifth stage larva from Biddeford. These went forward to Mr. C. W. Collins, entomological assistant at Melrose Highlands, who will make determinations as to whether or not the parasites already planted are doing the work which we would like to have them do.

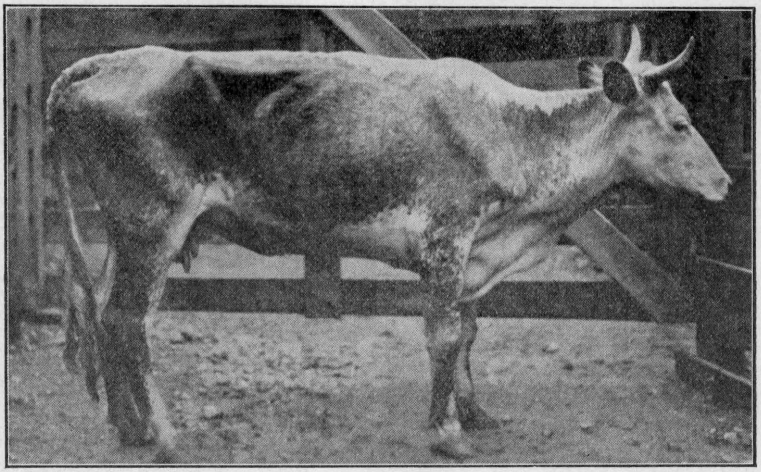
Conclusion.

I wish to thank you and Mr. Newdick as well as all the inspectors for the assistance given me in the work. With the new auto sprayer which we have and the increased knowledge of parasite work, we are looking to the future with renewed courage.

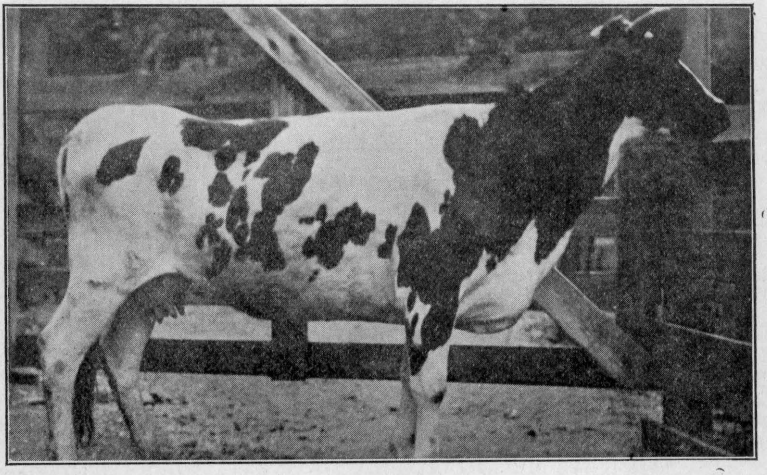
Respectfully submitted,

MELVILLE H. McINTIRE,

Field Agent, Gypsy Moth Work.



No. 1. Cow condemned by the turberculin test. Post mortem report showed a slight infection, although her physical condition would indicate a very bad case, which shows that it is very easy to be deceived by the looks of an animal.



No. 2. Cow condemned by the tuberculin test. Post mortem report showed well marked lesions in several places, although one would be lead to believe by outward appearances that she was perfectly healthy.

REPORT OF CHIEF OF THE DIVISION OF ANIMAL INDUSTRY.

To Hon. F. P. Washburn, Commissioner of Agriculture:

I herewith present my fifth annual report as chief of the division of animal industry.

The past year has shown a still further decrease in the live stock in Maine. My last report showed a decrease in all classes, except cows, three year olds and two year olds, with a total decrease of 22,890 head. The past year there has been a decrease in all classes of 44,268 head, or nearly twice the decrease of the previous year, which makes a total loss in the two years of 67,158 head. This is, I believe, partly due to short hay crops the past two years and to unsatisfactory market for dairy products. For quite a good many years past the tendency has been to sell fluid milk instead of cream until the fluid milk market was over-supplied. This is causing a readjustment of the dairy business in many sections with the result that the cream separator is again being used and the skimmilk kept on the farm to feed calves, pigs and poultry instead of being sent long distances, oftentimes to eventually be turned into the sewer. This will in the long run, I believe, work out to the advantage of all concerned, but in the meantime a great deal of uncertainty and change is apparent, and in certain localities a change of cows, and in some instances a change of breed, is found advisable.

Dairy and Milk Inspection.

Brooks Brown as milk inspector, with M. R. Umberhind as his assistant, has rendered wonderfully good service during the past year.

The law passed by the last legislature placing a fee of one dollar on each milk license, such money to be expended in extra

work in this department, is working out very nicely and furnishes the revenue for much needed increase in work along milk and dairy inspection lines.

I am very sorry to have to report that a much more lucrative position was too great a temptation for Mr. Brown and his services are now lost to this division and to the State. A report by Mr. Umberhind, our assistant inspector, will be found appended.

Sheep Department.

During the war a great deal of effort was brought to bear upon the sheepmen of Maine to induce them to increase their flocks, and with good success. With the close of the war and with large quantities of government wool in stock and an uncertain market facing manufacturers, there was no demand whatever for Maine wool. However, through the untiring energy of our sheep specialist, C. H. Crawford, an organization known as the Maine Sheep and Wool Growers' Association was formed, and by having the wool manufactured into a variety of cloths, yarns and blankets, has been able to realize a very satisfactory price indeed for our Maine wool. This has required an amount of thought and work little realized by the wool growers and much credit is due Mr. Crawford for carrying this enterprise through to such a success, details of which will be found in his report.

Live Stock Sanitary Work.

The last legislature passed an act repealing the act creating the office of live stock sanitary commissioner and transferred the duties of said office to the commissioner of agriculture to be exercised by him through such chief of division, deputy, assistant or other agency as he might determine, with the approval of the Governor and Council.

By your appointment in accordance with this act I assumed these duties on July 9, 1921.

I found it necessary to make some changes in the rules and regulations governing this work and especially in the manner of making appraisals on condemned cattle. These changes caused considerable protest by a few who had found the State a very

profitable purchaser of old, emaciated cattle commonly classified as "canners," some of which were found tubercular while others were not. After studying carefully the workings of the system of appraising by the veterinary doing the testing I found that while in most cases the appraisal was not high enough to cause much criticism, yet it was generally higher than the market would warrant at that time, and in a few cases, as stated above, the State was paying a good price for "canners" or belogna cattle. After I had satisfied myself that a change must be made in order to safeguard the money appropriated by the State for this work, I sent word to every veterinary that in the future no appraisal should be made by them on reactors but that such animals should be held in quarantine on the premises of the owner and the test charts immediately sent to this office. Once a week I order these cattle shipped to the abattoir where I meet them and make appraisal. This applies to all reactors except those found by our regular cooperative inspectors who are working for the State and Federal bureau and are under no obligation to the owner. They make their appraisals according to instructions, which are: "In no case shall the combined appraisal of the State and Federal bureau exceed the actual market value of the animal appraised." This change in method of appraising has proved a great saving to the State. In a somewhat heated letter from a dealer, who had sent in for my appraisal several extremely poor specimens, (some of which I classified as "canners" and on some I refused to allow any compensation, as they were of no value whatever and were not found to be tuberculous upon slaughter), he informed me that up to the time I commenced making the appraisals he had never received less than the maximum allowed by law, which, for a grade animal is $75.00.

Cooperative Test Work.

Five years ago this State entered into a cooperative agreement with the Federal bureau of animal industry relative to tuberculosis eradication. At first this work was slow, and scattered among the stockmen, but the demand for the accredited herd test has rapidly increased. Twenty-eight cities, towns and villages have passed ordinances, either by vote of the towns at their

annual meetings, or through the local boards of health requiring that the tuberculin test be applied to the cattle supplying their dairy products, and in some instances to all cattle within the town. The following are the places that require this test at the present time, all but one or two of which have received one test and several have received their second test: Auburn, Augusta, Baileyville, Bath, Bangor, Belfast, Biddeford, Bar Harbor, Brewer, Brunswick, Bristol, South Bristol, Calais, Dover-Foxcroft, Freeport, Hallowell, Houlton, Jonesport, Lewiston, Old Town, Orono, Phillips, Presque Isle, Rockland, Stillwater, Southwest Harbor, Waterville. In addition to this area work, we are commencing this season to cooperate in further area work with the county farm bureaus in four counties, namely, Kennebec, Piscataquis, Penobscot and Hancock.

The time has come when tuberculosis eradication work must be confined largely to area work because so much more can be accomplished. The old method of jumping all over the State testing a herd here and a herd there is very inefficient compared with the thorough testing of a whole town or county. In some of these areas where two tests have been applied, three per cent of the cattle were found to be diseased the first time and upon applying the second test one year later only seven-tenths of one per cent were found to be tuberculous.

The assistance given by the Federal bureau of animal industry has grown and the whole movement has developed efficiency both in working out details and in conducting the test. At the present time the intradermal, or "skin" test, is being used almost exclusively with the opthalmic as a check test. This is proving very efficient, as my records show that of all the reactors sent to the abattoirs by our cooperative inspectors and slaughtered under Federal inspection during the past year, lesions of tuberculosis were found in 97.8% of the cases.

At the present time we have six cooperative inspectors, three paid by the State and three paid by the Federal bureau. In addition to these three inspectors the Federal bureau furnishes a veterinary inspector in charge, Dr. J. B. Reidy, and a clerk. The Federal bureau also pays the traveling expenses of these four men, and furnishes all the tuberculin used in the cooperative test work. The sum total of our Federal aid amounted to something over $36,000.00 the past year.

WORK ACCOMPLISHED FROM JULY 1, 1921, TO JULY 1, 1922.

Cattle tested by our cooperative inspectors	37,997
Cattle tested by veterinary practitioners	7,795
Cattle tested for interstate shipment	4,935
Total number tested	50,727
Total number reactors	1,288
Percentage of reactors	2.53%
Paid for condemned cattle	$77,146.70
Average price paid per animal, including both grades and purebreds	59.89
Paid for 33 Brighton reactors	1,853.16
Received and turned into State treasury for salvage on condemned cattle	8,114.02

It will be seen by the above figures that by far the greatest number of cattle have been tested than in any previous year, and the percentage of reactors is the smallest. When we consider that 2.53% is the lowest percentage of any state east of the Mississippi and north of the Mason-Dixon line, and that other north eastern states are up against the proposition of fighting a percentage ranging from 10 to 30 per cent we realize how far Maine is in the lead in tuberculosis eradication and how much money other states have got to expend before they can begin to approach Maine's standing. Other states that have shut their eyes to the necessity for this work are obliged to face the situation, because the public is demanding it from a public health standpoint. New York is a good example of this and is now facing the problem of eliminating 30% tuberculous cattle from her herds, and last year she expended over a million dollars in eradication, which, by the way, was only a drop in the bucket. If a few hundred dollars could be spent in judicious advertising regarding the quality and freedom from disease of Maine cattle it would bring buyers from all over the country and there would be a boom in our live stock industry, which, to my mind, is Maine's most hopeful line of agricultural work.

ACCREDITED HERDS.

The cooperative work of the Federal bureau is all toward establishing accredited herds. An accredited herd is one that

has passed two annual or three semi-annual tuberculosis free tests made by a cooperative veterinary inspector. If reactors are found in a herd, cooperation is continued until the herd has successfully passed the required number of disease free tests to entitle him to an accredited herd certificate. After such certificate has been issued the herd is turned back to the owner and in the future it is his job to keep it free from disease, and by employing a veterinary who has passed the accredited herd examination to test his herd annually he can keep it on the accredited list and get his certificate each year. Cattle from an accredited herd may be shipped anywhere in the United States within the time of accreditation without further test by reporting to this office and getting interstate papers, which are furnished free of charge. The accredited herds in the State now number well over the 500 mark.

A number of herds that were once accredited have for one reason or another been dropped.

The following is a list of veterinarians who have successfully passed the accredited examination and hold the State and Federal certificate designating them as accredited veterinarians:

List of Veterinarians Qualified to Test Accredited Herds in Maine.

P. R. Baird, Waterville
C. L. Blakely, Davidson
J. N. Brown, Pittsfield
W. H. Corey, Newport
C. F. Davis, Rumford,
W. E. Fairbanks, Lewiston
C. F. French, Rockland
E. E. Gibbs, Saco
Geo. R. Inglis, Auburn
H. S. Irish, South Windham
A. Joly, Waterville
R. E. Libby, Richmond
W. S. Lord, West Baldwin,
L. E. Maddocks, Augusta, R. 2
M. E. Maddocks, Augusta
C. M. Merrill, South Paris
J. T. Moran, Berwick
A. J. Neal, Bangor
J. A. Ness, Auburn
W. H. Robinson, Portland
C. L. Ryan, Dexter
E. E. Russell, Farmington
F. L. Russell, Orono
I. L. Salley, Skowhegan
R. B. Stanhope, Belfast
H. L. Stevens, Rockland
H. E. Ward, Sanford
C. W. Watson, Brunswick
G. W. Wescott, Portland

Glanders in Horses.

Glanders seem to be very well under control both in Maine and in other states. Three thousand six hundred and forty-two horses have been brought into the State the past year and health certificates filed with this office without finding a single case of this disease. Numerous cases within the State have been investigated but only seven animals have been condemned. These have been killed, buried and the stables carefully disinfected.

Hog Cholera.

Veterinarians have reported twenty-one outbreaks of hog cholera during the year. In every case hog cholera serum has been rushed to the spot and all animals on the place inoculated. In eighteen of the above cases three hundred and forty-eight hogs have been treated and sixty-one deaths reported. Reports have not been received on the other three outbreaks. The cause for so many deaths was on account of allowing the disease to get to an advanced stage before a veterinary was called. The largest herd was that of Edward Gagne of Lewiston. This was a garbage fed herd and numbered one hundred and eleven head. A close watch was being kept over them, however, and a veterinary was called when the disease first appeared. When the herd was treated with the serum four of the shoats were very sick and a large per cent of the apparently healthy ones were carrying a temperature of from 103 to 105 degrees and were beginning to show skin blotches. Only two of the four that were seriously sick died. All the others made a good recovery. This shows the importance of calling a doctor immediately if any suspicious symptoms are noticed.

In closing I wish to express my grafteful appreciation for the financial assistance given this division by the Governor and Council, which has made possible the carrying on of this work without disappointing hundreds of farmers who were anxious for the test and thousands of consumers who were asking that their milk supply be guaranteed free from tuberculosis germs. Also, this timely assistance has prevented the severing of our cooperative understanding with the Federal bureau, which means so much in carrying out this great work.

I also wish to express my sincere thanks to the Maine Veterinary Medical Association and to the individual members of the profession for their loyal support and cooperation. And, last, but not least, I am grateful for the assistance and backing that you have given me, Mr. Commissioner, and for the very pleasant relations that have at all times existed.

Respectfully submitted,

HERBERT M. TUCKER,

Chief, Division of Animal Industry.

REPORT OF DAIRY INSPECTOR.

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

Owing to the resignation of Mr. Brooks Brown, who for nearly six years has been State dairy inspector, I am submitting to you the annual report of this bureau.

During Mr. Brown's regime in the capacity of dairy inspector, I have acted as his assistant for quite a period, and it is with no small degree of satisfaction to be able to sincerely say that a great improvement has been made under Mr. Brown's term of office in the handling of the milk and cream supply of the State as well as the conditions under which the commodity is now handled.

Collecting of Samples

During the past year, five hundred and thirty-five milk and cream samples have been collected throughout the State. In every possible case where a dealer uses bottles exclusively our mode of procedure has been to take the milk in the original bottle giving an empty one in exchange. This enables us to forward to the station for analysis the product as it is bottled by the producer.

I regret, however, that in some localities dealers still persist in supplying their customers from cans. This is an unsatisfactory as well as an antiquated way to handle milk. It is unfair to the customer as well as unsanitary, as it is almost impossible to supply milk in this manner and get an even and standard quality. Some cities now have an ordinance against the use of cans and it is to be hoped more will fall in line.

Dairy Inspection.

Nearly five hundred dairies were inspected during the past year. With the exception of a comparatively few instances, improvement both in cleanliness and equipment was found.

The value of dairy commodities is being more appreciated every year by both the producer and consumer and it is my opinion that a vast majority of users of milk products are convinced that paying a fair price and getting in exchange a clean product is far more satisfactory and economical than buying a cut-priced article produced under unhealthful conditions.

Violations.

Three prosecutions have been made and convictions in each case obtained, for producing and selling milk under unsanitary conditions. In each of these cases due warning was given and suggestions made, but were not heeded. Two were convicted for selling watered milk and nine for selling below standard.

Displaying License Number on Vehicle.

There is a tendency among dealers in some parts of the State to disregard the necessity of displaying their license number on the vehicle from which they deliver their milk.

It should be realized by all dealers that this is a necessary precaution as a protection to them as well as a mode of identification. Chapter 37, section 5, of the revised statutes carries a penalty for violation of this act.

Milk in Restaurants.

One of the sources of distribution of milk to which this bureau has given considerable attention during the past year, is the restaurant. It is to be regretted that I have found several instances where restaurant proprietors buy their milk supply in cans of one and two gallon capacity, let it stand for a time then remove a portion of the cream, sell what remains (a very low grade of milk) to the customer for from five to ten cents a glass. This not only disgusts the customer so that he will not thereafter buy

milk with his meals, but it is a direct violation of chapter 30, section 3, of the revised statutes. We have made several prosecutions for this violation the past year.

But it is pleasing to report that many restaurants are now serving from individual jars, bottled at the dairy. Those interviewed who are serving milk in this manner, report an increased sale and a perfectly satisfied customer.

Local Milk Inspectors.

The work being done by the local milk inspectors is fast becoming a factor that will be a big aid to this division, and in many instances splendid cooperation is being worked out between them and the producers.

Respectfully submitted,

M. R. UMBERHIND,

Acting State Dairy Inspector.

REPORT OF SHEEP SPECIALIST.

To H. M. Tucker, Chief of Division of Animal Industry:

I herewith submit my report for eighteen months, ending June 30, 1922.

As sheep specialist I have continued the program of the past two or three years by exerting every effort to eliminate the various diseases to which sheep are subject in this State, believing that the industry can be a perfect success only as a result of sound, healthy breeding stock, capable of a high production both in wool and lambs. This work has been done principally by encouraging better breeding and the careful selection of ewe lambs to replace the old ewes culled, and the use of better sires for breeding purposes. This has brought about a keener interest and a desire for a better quality of sheep.

Due to the large amount of publicity in giving demonstrations at the farms and lectures at various public meetings, and in publishing all information pertaining to the various diseases, the farmers have become familiar with both the symptoms of the diseases and the treatments, and this has resulted in a decrease in the demand for personal services along these lines.

It is to be regretted that conditions generally have caused the farmers to reduce the size of their flocks during the fall of 1921, which was brought about principally by the low price of wool, and an extremely short crop of hay. Realizing that a reduction in stock must be made and that the price of beef was unsatisfactory, also the price of dairy cows very low, and that the percentage of the same fitted for the market was so very small, the farmers felt that selling the sheep was the only possible chance to get by, as the dairy cattle or beef when forced onto the market always brings an extremely low price. As it is much more difficult to build up a dairy than it is to acquire a flock of sheep, many farmers accepted the inevitable

and disposed of either a part or the entire flock, which caused a decrease in the number of sheep from one hundred four thousand seven hundred and thirty-four in 1920 to eighty-six thousand nine hundred and seventy-seven in 1921, or a decrease of seventeen thousand seven hundred and fifty-seven.

It is very gratifying at this time to report that the conditions pertaining to the sheep industry are very much brighter as indicated by a growing demand for breeding ewes, and it is anticipated that within a comparatively short time the sheep population in our State will assume the proportion in numbers, and quality, exceeding the past few years. Every resident of Maine fully realizes the importance and the necessity of maintaining the sheep industry, and something should be done to assist in advertising and creating more of a demand for both wool and lambs in our own State. At the present time we produce only about one-eighth of the wool consumed, and a large percentage of all lambs grown are shipped to foreign markets. If the various farm organizations and farmers' clubs and all interested would advocate an increased use of native products it would be a great assistance in stimulating the industry. Already there is a growing demand for good breeding stock for the fall of 1922, and plans are being made to render every assistance possible by compiling a complete record of all breeding stock offered for sale, and of those desiring to purchase.

As secretary of the Maine Sheep and Wool Growers' Association I am very glad to report that the work has progressed satisfactorily. Finding it impossible to market the 1920 clip either as grease or scoured wool at a price that would pay the cost of production we were compelled to cause the same to be manufactured, and sell the manufactured products to the consumer. The success of this plan of marketing is beyond question as evidenced by the increased demand for the products, and while a percentage of the members were compelled to wait a considerable time for their money, so far as reported all were much pleased with the final results. At the time of receiving and bagging, the market was completely demoralized, and the wool could not have been sold for over fifteen cents per pound. The manufacturing, while expensive as all projects are in the beginning, resulted in a price of thirty-five cents per pound to the growers, or one hundred thirty-three and one-third per cent on the money involved.

During the season of 1921 the members of the association pooled fifty-three thousand two hundred and forty-seven pounds of wool. As the market for grease wool had not recovered it was deemed inadvisable to sell at any price obtainable, and many of the members being keenly interested in the manufacturing project, advised continuing it. About one-third of the 1921 clip was manufactured. The balance was sold, either as scoured wool or in the grease at a gross price of thirty-eight and one-half cents per pound, f. o. b. cars, and will be shipped very soon, and settlement made with the farmers. The price received, less the necessary expenses such as freight, office expenses, salaries, etc., will net the farmers considerably more than they could possibly obtain through local buyers, although in some localities where there are local branches of this association, some of the larger wool buyers are offering thirty-five cents per pound to our members. This, however, is in only a very few localities. The same companies were offering thirty cents in unorganized territory, which is plainly evident that an effort is being put forth to break up the association. All wool producers in the State should take this into consideration as without doubt the price of wool throughout the State is considerably higher than would have been the case if it were not for the Maine Sheep and Wool Growers' Association. We are passing through the same experience as is the history of all farm organizations, organized capital attempting to break down the Maine Sheep and Wool Growers' Association by offering prices which are above the market with the evident purpose of convincing the members that the association is not really doing much for them. If these companies would offer the same price in all territory in which they buy it would indicate at least a desire for a square deal on their part.

Wool Grading Demonstrations.

Unfortunately, it was impossible to secure an expert wool grader for a sufficient time to grade the wool for all the members. Due to lack of funds the Federal Bureau of Markets, who have cooperated with the bureau of markets in the State department of agriculture and the Maine Sheep and Wool Growers' Association, were able to furnish an expert grader

for only a limited time, and it was found necessary to give these demonstrations in newly organized territory, making it impossible to carry out the original plan of the association, which is to sell the wool of its members according to grade. The results of these grading demonstrations are apparent in a much better quality of wool being received for the season of 1922, and carrying a less percentage of shrinkage. The producers, realizing that they were creating an excessive shrinkage, have provided feeding racks and bettered conditions generally, thus eliminating a large percentage of hay, straw, chaff and other foreign matter from the fleeces, and creating a keen interest in building up the grades of wool.

The association has pooled and assembled approximately sixty-five thousand pounds of wool for its members for 1922 up to the present time, and it is expected that a large quantity will be received later from scattering members.

The question of an expert grader was taken up with the Federal Bureau of Markets, and through the influence of Mr. C. M. White, chief of the division of markets, in cooperation with the association, Mr. Geo. E. Hunt of Pawtucket, R. I., an expert grader, was secured for the month of June and has demonstrated wool grading in the various localities organized during the past year.

Demonstrations have been given in Aroostook, Franklin and Piscataquis counties. Mr. Hunt has proven very popular among the farmers. He has taken great pains to explain the various grades of wool, and the effects of the same on the market, and we hope that it will be possible to secure his valuable services in the future. The work of the association in Aroostook county was started in March and April of the present year, and the farmers in that county have displayed a keen interest in the association and its work, and were very much pleased with the results of the grading. The inquiries for the best methods of improving the quality and quantity of wool indicated plainly a desire for maintaining the high standard of quality for which their county is noted. Present indications are that their membership will be largely increased during the coming year, and that the demand for the finished product will be highly satisfactory.

As the wool market at present is very satisfactory the association is contemplating disposing of nearly all of the better grades, feeling that in this way they can render their members better service than by holding the wool for a possible increase in price at a later date. It is the plan of the association to try and sell this year's clip entirely on its grade and to pay the farmers for the same accordingly.

Due principally to the fact that many dealers and farmers have felt that the quality of Maine grown wool in the past was unsuitable for the manufacture of products that could be consumed at home, it was decided to put on exhibits at the various large State fairs and also at the Eastern States Exposition at Springfield, Mass., during the season of 1921. The popularity and success of this movement was demonstrated by the thousands of people who very carefully inspected the finished products. These exhibits created a great demand for the goods, as many business and professional men were much pleased with an opportunity to wear garments from native grown wools that have proven highly satisfactory from both appearance and long service.

In connection with the department of agriculture an exhibit was made at the Eastern States Exposition in Springfield, Massachusetts, which proved very popular. These exhibits consisted principally of bed blankets, suitings, yarn, cloth and ready-to-wear pants, and attracted the attention of people from many states in the west and central west, as well as from the New England States, resulting in many orders being received for future delivery.

The high quality and appearance of these goods are manifested by the rapidly increasing demand for the same. It is anticipated that this system of marketing will eventually take care of a larger part of the wool produced in the State at a price to the producer that will stabilize and build up the sheep industry and place it on a permanent basis, and also assist the citizens of Maine by making it possible for them to get virgin wool products of high quality and finish at prices within reach of

C. H. CRAWFORD, *State Sheep Specialist,*

Secretary, Maine Sheep and Wool Growers' Ass'n.

REPORT OF THE SECRETARY OF THE MAINE SWEET CORN GROWERS' ASSOCIATION.

The result of the efforts of the Maine Sweet Corn Growers' Association was somewhat disappointing for the season of 1921. The packers show no inclination to cooperate or even meet with the executive committee of this association for the consideration of our mutual interests.

During the winter and spring of 1920-1921, the executive committee tried at various times to arrange a conference with the packers, but not until April were we able to get this opportunity. A special committee was then appointed by the canners' association to confer with the committee of sweet corn growers on the questions of price, acreage, etc., and after much discussion the canners' committee informed us that due to the hard conditions under which they were laboring they could not, nor would not, pay the growers over three cents per pound for the season of 1921. At meetings held by the locals throughout the sweet corn growing territory, the executive committee had been instructed not to accept less than five cents, this price being based on the cost of production for the season of 1920, which proved to be 4.26 cents per pound. The executive committee, realizing that the entire country was passing through a period of readjustment, felt justified in asking the growers to accept a reduction in price, and that four cents per pound was as little as the packers could reasonably ask us to accept for the season of 1921, this being an actual sacrifice of .26 cents per pound less than actual cost of growing for 1920.

Finding it to be impossible for the two committees to agree, it was decided to close the conference. At this time the canners' committee decided that they could compromise and a conditional offer was made that if the executive committee would go back to their members and advise them to supply the required acre-

age, using all their influence to secure the same, the packers would pay three and one-half cents per pound. This really being a request for us to bind the sweet corn growers to accept an actual loss of more than three-fourths of a cent per pound, the proposition was promptly refused by the executive committee. The conference was adjourned after the announcement by the packers that they could easily secure the desired acreage at three cents per pound, and would proceed to do so and break up the growers' association.

Immediately activities in field work among the packers was started. Due to the firm stand of the growers it was soon found impossible to get their acreage at the price offered of three cents except in a very few localities, after which a flat price of three and one-half cents was offered the farmers. One company submitted a profit sharing proposition to their growers in which they agreed as follows:

"1. We will pay three cents per pound for corn at the regular time as heretofore.

"2. We will pay all profit over cost at three cents per pound, and not exceeding four cents per pound, and disburse this additional payment, if any, to the planters on or before February 1, 1922.

"3. We will have our cost figures verified by a certified public accountant and have his finding announced over his signature.

The above proposition is made with sincerity after a careful investigation of actual conditions existing today in the trade."

This seemed a fair proposition to many of the growers who believed that this company would carry out their agreement. However, so far as we are able to ascertain, not a single grower has ever received any report or even a suggestion from this company, which proves beyond a doubt the "sincerity" of their proposition.

The growers felt that it would be impossible under ordinary conditions to grow corn at the price offered and a large majority refused to plant. As a result many of the factories remained closed during the season and a large percentage of those operating obtained but a small acreage. It would doubtless have been

much better for both packers and growers if a limited acreage had been accepted at the price of four cents per pound, as this would have made it possible in all cases for the production to have equalled the over-head in operating the factories.

The executive committee made various efforts during the winter and spring of 1921-1922 to get a conference with the packers for the adjustment of conditions for the 1922 production. While they did not absolutely refuse to meet the executive committee, excuses were offered as to why a conference could not be arranged for, and their correspondence plainly indicated that they neither desired nor intended to give us a hearing.

Realizing the great importance of the sweet corn industry to the State generally, Commissioner Washburn felt that something should be done to bring about a satisfactory adjustment and on February 25th proposed a conference of the canners' and growers' associations which was accepted by the growers but not by the canners. They suggested, however, that they would be willing to meet him personally, and on February 28th a conference between Commissioner Washburn and the president of the canners' association, Mr. Elwell, was held in Portland in which the situation was fully gone over with no definite results. President Elwell indicated that his association did not care to meet the executive committee under any condition.

Commissioner Washburn being unwilling to give up the attempt, submitted to the Maine Canners' Association on March 15th another plan of conference, asking for a meeting on March 23rd between the representatives of the Maine Canners' Association, the Maine Sweet Corn Growers' Association, the Department of Agriculture and the extension service of the College of Agriculture. It was to be understood that the meeting was not to be in the interests of any particular group, either of canners or producers, but to discuss the entire situation of the sweet corn industry and to try to bring about an understanding which would be beneficial to all interests. President Elwell replied requesting reasons for excluding non-members of the association, and stated that such a meeting as suggested by Commissioner Washburn would decidedly further the interests of a particular group. Upon receipt of this letter, Mr. Washburn suggested that non-member growers be invited to attend the conference, and that President Elwell select the representatives.

A wire was received in reply stating that the time was too short to arrange for a conference on the date suggested and that a meeting of the canners' association would be called before the end of March at which time the question would receive consideration. After receiving this communication the entire question of adjustment seemed to be closed and the representatives of the growers felt that everything possible had been done to bring about a satisfactory arrangement.

A meeting of the executive committee was called to consider what could be done to best protect and advance the interests of the members, at which time the entire outlook for the farmers was very carefully considered. The broken potato market, unsatisfactory dairy conditions, and extremely low prices for beef, all seemed to indicate that the farmers were facing a hard situation. While it could not be reasonably expected that the production of sweet corn per acre would equal that of the past three seasons, the committee decided it would be better to grant permission to those who desired, to grow at three and one-half cents per pound, the price offered by the packers for the season of 1922. Members of the growers' association, realizing the benefits derived from the organization and that the packers were exerting their influence at this critical time to destroy the same, indicated a determination to stand firm and to cooperate fully with the various farm organizations to increase membership.

After assembling plans and figures relating to the cost of equipment and operation, the farmers at Farmington and Dexter decided that the only solution to the situation would be to either buy, or build and equip, canning plants to be owned cooperatively. In many other localities the same movement is being seriously contemplated and if the above mentioned plants prove the success expected, many cooperative plants will be built in the near future.

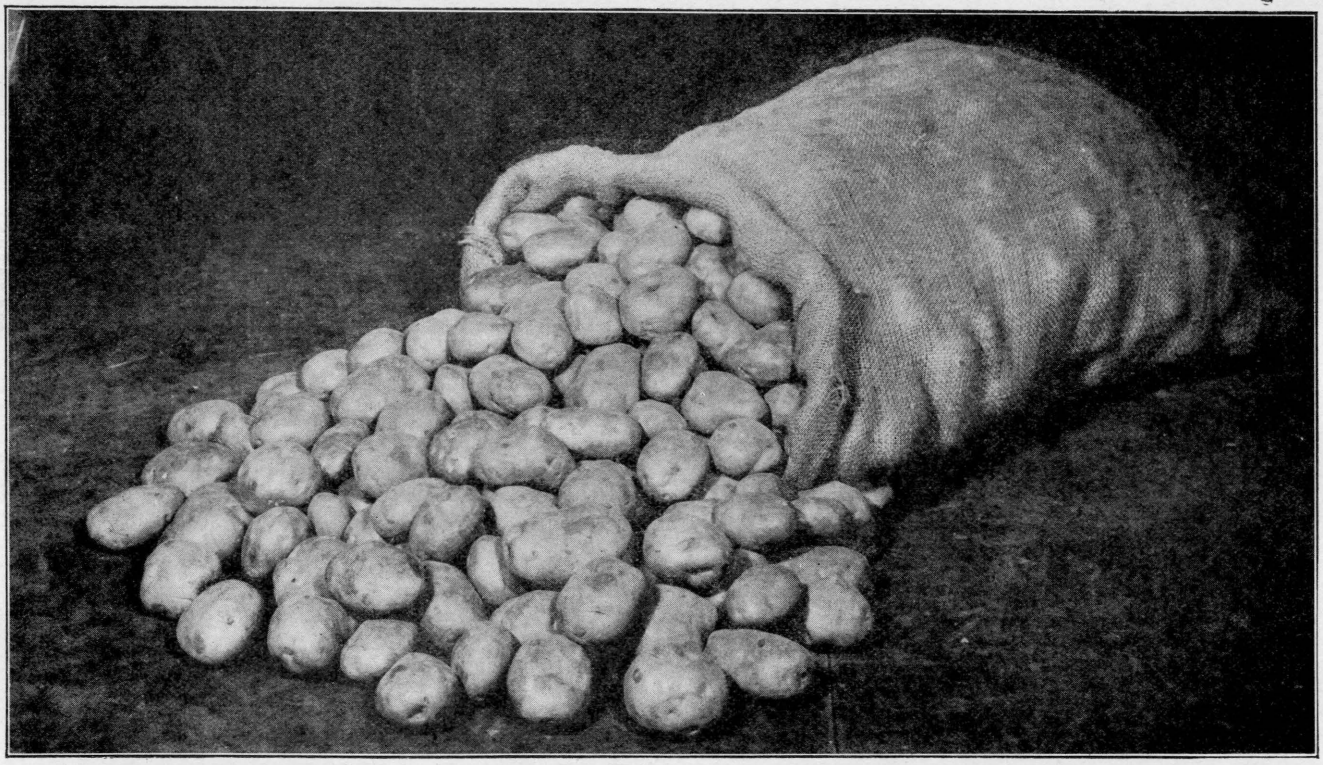
Upon investigation it is found that only a small percentage of the canned corn consumed in the State of Maine is grown and packed here, a condition which is certainly to be regretted. It is not fully understood why the Maine Canners' Association has not put forth more effort to advertise and to create a demand for native grown corn. It is admitted by all that the quality of Maine corn is superior to that grown in any other State and it is not easily understood why markets in other states should

be sought and developed for a product that should be consumed here. The Maine Sweet Corn Growers' Association is doing everything possible to build up markets in our own State, and if the canners' association would cooperate with us, there is little doubt that a much larger percentage of native grown corn would be consumed locally.

Respectfully submitted,

C. H. CRAWFORD,

Secretary, Maine Sweet Corn Growers' Association.



No question about winning new and keeping old markets with stock graded this way.

REPORT OF CHIEF OF THE DIVISION OF MARKETS.

To Hon. F. P. Washburn, Commissioner of Agriculture:

I herewith submit a general report of the work of the division of markets for the eighteen months ending June 30, 1922. There is also appended the special report of the field agent. It is a pleasure to note that marketing work has been and still continues to be carried on with the hearty cooperation and support of other members of the department. Much assistance has also been received from the extension service of the University of Maine, and state-wide cooperative organizations. An example of this spirit of mutual endeavor to solve our marketing problems was shown early in the spring of 1921. At this time the State Farm Bureau Federation requested the chief of the division of markets to act as their representative on a committee from the New England Council of Farm Bureaus to investigate and, if deemed advisable, to plan for a New England purchasing organization for the various local buying groups throughout the New England States. In carrying out this work between February 25th and November 14th, 1921, ten conferences, committee and general meetings were held. Nine involved a trip to Massachusetts, and the committee as a whole labored diligently in developing a complete plan of organization including by-laws. This plan was submitted to various cooperative associations, and up to date the interest has been earnest enough, until it came to the proposition of adequate finances. This seems to be the stumbling block, and at the present time no progress is being made.

Milk Powder Plants.

During October and November, 1921, an effort was made in several sections of the State to promote a milk powder plant.

On account of the unsettled condition of all dairy markets, the farmers were ready to turn to most any outlet for their product, and at the request of two different communities, an investigation was made of the profits coming from the already existing plants which powdered milk. Questionnaires were sent to sixty-two milk powdering plants throughout the United States, and the results are summed up in the following extract from a letter written a resident of the locality where one of these plants was contemplated:

"We find that the average price paid farmers for 4% milk is $1.664, for 3% milk is $1.54, while the average price for skim milk is 22.5 cents per cwt. Two of the plants are in financial difficulties, eight are not operating, and fifteen powder skim milk only as a means of disposing of the surplus. Only eight powder whole milk. Where the investment in building and equipment are separated, the average cost of buildings is around forty thousand dollars, while the cost of equipment is approximately one hundred thousand dollars. Where the returns included building and equipment as a lump sum the average cost was one hundred and twenty-nine thousand dollars.

I think that the value of this project according to these returns is very questionable, as the following quotations are from some of the letters: "No large profits." "Selling price of powdered skim is 6½c which is less than the cost of manufacture." "Not considered good investment." "Better feed skim on farm." "No dividends." "The market for milk solids is such that products made from skim milk cannot be disposed of profitably. This condition will, no doubt, correct itself in time, but we would not advise anyone to start building a plant until these conditions are corrected. At present we doubt if anyone operating a milk plant is making powdered milk on a profitable basis." "

Thus if the farmers who received the results of this investigation did not make any money, they were at least saved from the chance of losing considerable.

Crop Reporting.

An agreement between the United States Bureau of Markets and Crop Estimates and the several New England States came into operation July 1, 1921. The general plan was to have one combined crop reporting service for the New England

States with headquarters at Wakefield, Massachusetts. This arrangement has proven exceptionally satisfactory. Already the potato estimates for Maine are received as the very best figures available. Check of the 1921 estimate shows it to have been within three per cent of the actual figures. This is significant from the fact that severe criticism was leveled at the service during the winter on the ground that the estimate was much too high. The final shipping figures show the actual crop to have been three per cent larger than the opinion indicated. An equally accurate system for reporting the apple crop is to be developed. So long as the present efficiency continues the financial backing of the Maine department will be behind the project.

It is hoped that an equally reliable service may be created in some other potato producing sections. Grave errors in estimates in North Dakota and Minnesota made it impossible to market the crop in an orderly manner. In one state the crop was underrated about eight thousand cars.

Organization work commenced early in 1921 resulted in the formation of the Maine Farmers' Exchange, a central purchasing agency for local cooperative buying groups. The most notable saving after the exchange began business was in the fertilizer deal which in the spring of 1922 amounted to approximately twenty-five hundred tons. Immediately after the exchange price was put out the large fertilizer companies dropped their prices to a level with that of the cooperatives, which has resulted in a saving to the farmers of between five and eight dollars per ton as a conservative estimate. Thus figured on the total consumption of the State, which is between one hundred and seventy-five thousand and two hundred thousand tons, it is easy to determine what a tremendous saving the existence of these cooperatives has meant to agriculture in the State. The exchange has handled grain, seeds and some poisons constantly since it opened for business in December, 1921. It is expected that a steady growth and increase in financial strength will continue from now on.

The two cooperative blueberry canning factories organized in the winter of 1921 in cooperation with county agent Tomlinson of Washington County have far exceeded the results expected, as the price paid the growers for the 1921 pack was eleven cents per quart as against seven cents paid by the stock

canning companies. Thus the Machias factory alone has returned to the farmers of that locality more than four thousand dollars in excess of what would have otherwise been received. So successful were these cooperative plants that without assistance a new cooperative company has been organized and the factory is being built at Harrington to take care of the 1922 pack of that locality.

Owing to a disagreement with the sweet corn packing companies of the State and the Maine Sweet Corn Growers' Association, this industry was cut in half during the 1921 season, and much feeling was aroused in many localities. The advice given has been to go slow and let a few communities try out the experiment of cooperative corn canning factories, as the investment required is a large one. Farmers in the vicinity of Farmington organized a cooperative apple canning factory and did a large packing business in apples during 1921, and have enlarged their plant this year to care for 100 acres of corn grown by its members. Further enlargement will depend on the outcome of the present season's pack. The farmers in the vicinity of Dexter have formed the Pine Tree Canning Company, Incorporated, and purchased the plant of the Portland Packing Company in that town at a cost of twelve thousand dollars. This will be operated as a strictly cooperative concern and only the product of its members will be canned.

The sweet corn growers' association, a collective bargaining organization, existing for two years as a voluntary organization, was incorporated in the fall of 1921, and is now a legally recognized corporation conducted on cooperative lines. It has performed a notable service for the sweet corn growers of the State.

The deflation in prices during 1920-1921 and other extraordinary conditions placed heavy burdens on many of the farmers' unions, and it seemed highly desirable to strengthen those already in existence rather than to promote new ones when the general trade conditions were so unsatisfactory. However, at the insistent demand of a small community in Woolwich known as Montsweag, a local farmers' union was perfected which will serve the community with groceries, grain, fertilizer, feeds, etc. This was a particularly pleasant task as the locality was ready and willing to adopt suitable cooperative bylaws, system of bookkeeping and other well tried ideas.

Demonstrations and Extension.

During the period covered by this report one hundred and thirteen lectures were given before granges and other local organizations with an average attendance of sixty at each meeting. The subjects used were as follows: Central Purchasing Organization, Marketing Milk by the Cream Plan, Various Phases of Grades and Standards, and Freight Rates. In addition to these lectures, formal reports were prepared for the Maine Farm Bureau Federation, covering the New England purchasing organization, and also to the Maine State Grange at its annual session in December on cooperation. At this latter meeting over four hundred granges were represented by delegates. The total membership of the organization in this State amounts to fifty-seven thousand.

The Eastern States Exposition at Springfield, Massachusetts, occurred September 19-25, 1921. Some three weeks were used preparing the Maine Department of Agriculture section of the exhibit. This occupied a 48 x 16 foot space and advertised Maine agriculture. Especial emphasis was placed on the diversified crops which are characteristic of the farm management plan adopted by the larger part of the State. Products of the orchard, forage crops and grain were shown. The attendance at the exposition was upwards of two hundred and fifty thousand persons, and constant throngs of people were passing by the exhibit from ten o'clock in the morning until nine-thirty at night, so that the story of Maine was told to thousands of people daily.

Perhaps no phase of the cooperative work carried on by the Maine Department of Agriculture has come into such intimate touch with the actual farmer as the wool grading demonstrations. The work on the 1921 clip, owing to difficu'ty in obtaining a grader was not done until August of the present fiscal year, when Mr. Samuel T. Greenwood spent two weeks in giving demonstrations in cooperation with the Maine Sheep and Wool Growers' Association, C. H. Crawford, secretary. The work was performed in communities where the organization was new and the producers had never been given any idea of the differences of grades or the factors which determine the general classifications. Mr. Greenwood's work was highly satisfactory and has tended to improved care in handling clips.

The wool grading demonstrations for the 1922 season have just been completed, June 30th. Mr. George E. Hunt from the Federal bureau conducted these demonstrations in an exceptionally able manner. His tactful and sympathetic way of meeting the farmers won their confidence, and questions and answers passed freely. The educational value of this work is shown from the fact that at the new places visited this year, word had been received from various communities where the demonstrations had been conducted during the previous year, so that many of the wool growers were inquiring what differences in prices might be expected on the various grades. The cooperation and interest shown in this work by the Federal Bureau of Markets and Crop Estimates is deeply appreciated. To their willingness to provide an expert classifier each year is due the success of the venture. All salary and expenses of the grader were borne by the Federal government.

Bookkeeping Demonstrations.

The work commenced some two years ago of service and demonstrational work in bookkeeping among cooperative organizations has been continued, and the system recommended by the division of markets was installed in whole or in part in fifteen local cooperative buying organizations. It is a gratifying particular of this work to discover a slow but steady improvement in the method of handling the finances and general conduct of the business since these systems were installed. Many of the local cooperative groups suffered severely in the 1920 and 1921 deflation of prices, but at the present time a constant improvement is being noted in a large majority. Practically all of the financial reports obtained when doing bookkeeping work have shown a surplus over the preceding financial report.

Following our suggestions received from a conference with bureau of market officials in December, 1920, in Washington, and at the request of several potato shippers, an amendment to the law creating the department of agriculture was framed. This authorized the commissioner "to investigate and furnish statements to shippers and other interested parties as to the quality and condition of fruits, vegetables, dairy and other perishable farm products when received within the State for intrastate or interstate commerce, under such rules and regu-

lations as he may prescribe, including payment of such fees as will be reasonable and as nearly as may be to cover the cost for the service rendered. Provided, that statements so issued by the authorized agents of the department shall be received in all courts of the State of Maine as prima facie evidence of the truth of the statements therein contained." This is known as chapter 81, public laws of 1921, State of Maine. The law being passed during March, 1921, and becoming effective July 1st of the same year, it was impossible to do anything until November 1, 1921, when inspectors were placed at Houlton and Presque Isle and the service commenced. Inasmuch as it was an entirely new idea in the State, and only limited funds available to popularize the plan with the shippers, the growth was exceedingly slow. The inspector at Houlton was kept at work for two and one-half months, but owing to the small number of cars offered for inspection, he was then taken off. The inspector at Presque Isle was continued until May 1st, and the total number of cars inspected was one hundred and fifty-six.

Two points stand out with particular emphasis. First, not a single car was turned down which had been inspected, while many shippers claimed that they had difficulty with one out of every five cars which were not inspected. Secondly, evidently while the work was conducted in a very modest way, it has convinced the shippers of its paramount importance to their business, and thanks to the hearty cooperation of the Federal bureau, through its division of fruit and vegetable inspection, plans for a cooperative State and Federal service have been developed.

During the week of May 22, 1922, in company with Mr. Stilwell of the Federal bureau, and Mr. Frank Coombs, manager of the Aroostook Potato Growers' Association, meetings were held and shippers interviewed in eight large shipping centers and twenty-one hundred and twenty-five cars were pledged for inspection the coming winter. Mr. Coombs is continuing along this line, and expects to get pledges for a minimum of five thousand cars.

The work has been consistently developed to coincide with the service rendered by the Federal vegetable and food products inspections, as it is felt that to conduct this work along another line would bring confusion to both shipper and receiver and

discredit both the State and Federal departments. It is hoped by the new cooperative plan of a combined State and Federal certificate to develop standardized forms and methods of carrying on the work. Certainly the shippers with whom the chief of the division of markets has talked express their keen appreciation of being able to obtain the coming year a certificate which will be prima facie evidence in all United States courts as well as in Maine courts. They consider that honest conduct of this service will tend to better grading and the sending out of standardized products.

In conclusion, your attention is especially called to the very material help given to marketing activities in Maine by the United States Bureau of Markets and Crop Estimates. For two and one-half years a direct share of the salary of the present chief of the division has been paid by the bureau. Four speakers have been sent into the State during the past eighteen months at our request. Wool grading experts have been furnished. A cooperative crop-reporting service is being carried on, and it is hoped to inaugurate a shipping point inspection service for fruits and vegetables July 1st of the present year. All this assistance has been valuable and is appreciated.

Respectfully submitted,

C. M. WHITE,

Chief, Division of Markets.

REPORT OF FIELD AGENT OF THE DIVISION OF MARKETS.

To C. M. White, Chief, Division of Markets:

I herewith submit my first annual report as field agent of the division of markets.

At the time I assumed the duties of field agent the organization of the Maine Farmers' Exchange was being carried on, and I immediately entered upon that work. In company with A. B. Clement, who at that time was connected with the division of markets as a special agent, ten farmers' unions and three granges were visited.

After the work of organizing a central farmers' exchange was completed, the next project undertaken was wool grading. During the seasons of 1921-1922 twenty-nine wool grading demonstrations were attended.

At your request I helped E. L. Newdick the latter part of July and first week in August on seed improvement work. The particular branch covered was field inspection of potatoes for certified seed.

During the period beginning August 20th and ending October 15th, I attended fourteen fairs in the capacity of agent, or inspector, and at three of these fairs, namely, Caribou, Houlton and Presque Isle, I had charge of a department exhibit showing different products made from Maine wool.

In response to many requests from farmers' unions throughout the State, the bookkeeping project was next on our program of work. During the winter months help was given eight unions in taking stock and commencing new systems of bookkeeping, and others were given assistance in taking stock and making out their yearly statements. In all, sixty-nine official visits were made. The information gained from personal contact with the different farmers' organizations has enabled me to send out circular letters which have been of much assistance to the different local unions.

It may be of interest to you that most of the unions are slowly but surely recovering from the disastrous results of the tremendous drop in grain prices during the latter part of 1920 and 1921. One very encouraging feature to be noted is the fact that only four farmers' unions have been forced to liquidate during the year, and most of these could have been prevented by more hearty cooperation and efficient management.

In response to appeals from the N. E. M. P. A. for assistance during the milk controversy in February, I spent one week in the territory covered by dealers involved. The value of cooperation has never been better illustrated than in the successful termination of that dispute.

In addition to the above activities mentioned, from time to time I have been engaged in the promotion of shipping point inspection. I covered the central part of the State and found most of the shippers very much in favor of such work being done. They fully realize the value of shipping point inspection, and the only objection at the present time is the cost of the service. Some effort was made to have cars from the Dover-Foxcroft and Belfast branches of the Maine Central Railroad inspected at Waterville, but objections from the railway officials prevented this idea being carried through. Perhaps some way of solving this problem will be worked out before the shipping season of 1922 begins.

The work done as your field agent has brought me in close contact with the men connected with the department of agriculture in other divisions, and to them and Commissioner Washburn, as well as to you, I want to extend my thanks for the good advice and hearty cooperation at all times.

Respectfully submitted,

J. THOMAS DIONNE,

Field Agent, Division of Markets.

DEPARTMENT OF AGRICULTURE.

FINANCIAL STATEMENT

For the Period from January 1, 1921, to June 30, 1921.

Appropriation	*Appropriated*	*Expended*
Salary and Clerk Hire	$13,000 00	$13,104 11
Balance from 1920	243 56	
General Office Expenses	6,000 00	5,964 44
Division of Plant industry	14,500 00	14,609 71
Income from nursery license fees	160 00	
Division of Markets	2,612 50	2,409 71
Division of Inspection	4,500 00	13,688 82
Credits	11,485 26	
Division of Animal Industry	2,250 00	2,233 75
Including Livestock Sanitary Commission	25,000 00	47,318 76
(Deficit covered by Council Orders)		
Aid to Agricultural Societies and Fairs	15,860 28	15,859 94
Farmers' Institutes and Dairymen's Conference, including Poultry Industry	1,500 00	1,490 52

DEPARTMENT OF AGRICULTURE.

FINANCIAL STATEMENT

For the Period from July 1, 1921, to June 30, 1922.

Appropriation	*Appropriated*	*Expended*
Salary and Clerk Hire	$27,000 00	$28,563 32
Credit from Dairy Division	2,000 00	
General Office Expenses	12,000 00	10,887 78
Division of Plant Industry	32,500 00	33,822 96
Credit from Nursery License Fees	400 00	
Division of Markets	5,225 00	6,059 36
Credit from Crop Inspection Service	836 73	
Division of Inspection	9,000 00	22,076 29
Credit from registration fees and fines	17,029 54	
Division of Animal Industry	55,000 00	80,015 29
(Deficit covered by Council Orders)		
Aid to Agricultural Societies and Fairs	24,830 28	23,350 30
Maine Seed Improvement Association	1,000 00	1,000 00

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	1,270	1,347	145	278	35	205	20	79	8	6	10	2	8	-	-	16	4
Aroostook	897	1,604	52	216	77	194	-	52	24	4	3	2	12	-	-	-	-
Cumberland	3,583	3,977	519	861	214	484	527	233	18	15	14	1	42	2	-	-	-
Franklin	401	812	24	261	21	116	247	7	-	-	-	-	1	-	-	-	-
Hancock	704	1,321	140	689	63	251	632	15	25	8	9	4	6	-	-	-	-
Kennebec	824	902	34	299	18	210	-	15	-	-	6	-	3	-	2	-	-
Knox	736	1,349	110	526	67	125	505	22	294	14	10	-	5	10	-	-	270
Lincoln	266	511	36	107	18	50	-	2	-	1	2	-	-	-	-	-	-
Oxford	753	399	39	238	54	240	875	11	1	2	1	2	2	-	-	-	-
Penobscot	1,327	2,024	96	725	193	390	114	14	11	5	3	34	9	-	4	5	4
Piscataquis	305	422	24	83	9	95	-	3	-	-	-	-	-	-	-	-	-
Sagadahoc	652	691	142	180	60	143	942	2	1	-	3	-	-	-	-	-	-
Somerset	737	950	84	350	82	199	-	21	19	-	12	6	13	-	9	-	-
Waldo	509	627	23	291	33	199	-	3	-	-	-	-	-	-	-	-	2
Washington	565	1,602	165	431	83	216	200	3	-	-	5	2	1	-	-	25	-
York	2,480	3,176	319	845	202	514	3,054	21	1	-	7	1	5	16	1	13	-
	16,009	21,714	1,952	7,180	1,229	3,631	7,116	503	402	55	85	54	107	28	16	59	280

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	Dr. A. M. Garcelon	Lewiston	J. S. Butler	Lewiston	A. W. P. Cobb	Auburn
Eastern Maine State Fair	George L. Coffin	Bangor	A. B. Peckham	Bangor	Edward E. Piper	Bangor
Central Maine Fair	Frank. E. Haines	Waterville	Ralph 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	W. H. Whipple	Portland	F. H. Jordan	So. Portland
Androscoggin County	John Look	North Jay	Charles D. Dyke	Livermore Falls	Geo. W. Dyke	Livermore Falls
Androscoggin, Greene Town Fair Association	B. P. Rackley	Greene	E. B. Sanderson	Greene	J. C. Wood	Greene
Androscoggin, Leeds Agricultural Association	L. G. Parker	South Leeds	H. W. Lincoln	Leeds Center	W. B. House	Leeds Center
Androscoggin Valley	J. C. Bowles	Livermore Falls	Geo. B. Barrows	Canton	Geo. B. Barrows	Canton
Aroostook County	Edgar W. Russ	Caribou	Frank Riley	Caribou	Frank Riley	Caribou
Aroostook, Houlton	Geo. H. Benn	Hodgdon	Ernest B. Leighton	Houlton	Alton C. Carter	Houlton
Aroostook, Northern Maine Fair Ass'n	J. Frank Guiou	Presque Isle	E. T. McGlauflin	Presque Isle	M. S. W. Dingwall	Presque Isle
Cumberland, Bridgton	C. H. Cook	Bridgton	Fred S. Hanson	Bridgton	Howard E. Burnham	Bridgton
Cumberland County	M. I. Collins	Gorham	F. E. Moulton	Cumberland Center	H. C. Palmer	Gorham
Cumberland Farmers' Club	F. L. Haskell	South Windham	Willard Wilson	Cumberland Center	Willard Wilson	Cumberland Center
Cumberland, Freeport Poultry Ass'n	C. I. Davis	Waterville	L. G. Cushing	Freeport	L. E. Curtis	Freeport
Cumberland, New Gloucester and Danville	Fred M. Furbush	Auburn	A. M. Thurlow	Poland	Charles Nelson	Upper Gloucester
Franklin County	B. H. Farrington	Dryden	G. M. Hatch	New Vineyard	C. H. Pierce	Farmington
Franklin, North	Bion Wing	Phillips	H. W. Worthley	Phillips	F. E. Parker	Phillips
Hancock County	M. R. Hinckley	Bluehill	H. A. Saunders	Bluehill	M. R. Hinckley	Bluehill
Hancock, Eden	J. L. Fogg	West Eden	Julien Emery	Salisbury Cove	C. F. King	Salisbury Cove
Hancock, North Ellsworth	John McNamara	Ellsworth	Harold Maddocks	Ellsworth	Wm. Richardson	Ellsworth
Kennebec, Cochnewagen	H. H. Witherell	Monmouth	W. E. Reynolds	Monmouth	C. H. Berry	Monmouth
Kennebec County	Ellsworth E. Peacock	Readfield	Ellsworth E. Peacock	Readfield	Fred A. Walker	Readfield
Kennebec, Litchfield Farmer's Club	B. R. Small	Litchfield	E. M. Lapham	Litchfield	C. E. Walker	Litchfield
Kennebec, South	Leslie B. Hisler	Coopers Mills	Arthur N. Douglas	Gardiner	Jasper S. Gray	Windsorville
Knox, North	W. E. Perry	Union	H. L. Grinnell	Union	R. B. Lewis	Union
Lincoln, Bristol	Geo. A. Huston	Damariscotta	J. W. Hunter	Damariscotta	Chas. B. Woodward	Damariscotta
Lincoln County	Geo. D. Pastorius	Newcastle	J. A. Perkins	Nobleboro	E. R. Castner	Damariscotta
Oxford County	L. E. McIntire	East Waterford	W. O. Frothingham	South Paris	W. O. Frothingham	South Paris
Oxford, North	John F. Talbot	Andover	Roger L. Thurston	Andover	F. A. Miller	Andover
Oxford, West	Chas. W. Farrington	Fryeburg	E. C. Buzzell	Fryeburg	A. D. Merrill	Fryeburg

Oxford, Western Maine Poultry Ass'n	H. E. Lovejoy	Norway	E. P. Crockett	South Paris	D. H. Bean	South Paris
Penobscot, Bangor Poultry Ass'n	W. H. Northrup	Bangor	T. V. Campbell	Bangor	H. I. Bolton	Bangor
Penobscot, North	C. M. Lombard	Springfield	I. R. Averill	Prentiss	O. C. Abbott	Springfield
Penobscot, West	A. M. Atkins	Dexter	E. E. Colbath	Dexter	F. C. Barker	Exeter
Sagadahoc, Agric. and Horti. Society	H. E. Peterson	Brunswick	E. O. Patten	Topsham	I. R. Morrell	Brunswick
Sagadahoc, Richmond Farmers' Club	H. W. Douglass	Richmond	N. H. Skelton	Richmond	E. H. Stewart	Richmond
Somerset Central	Elmer E. Harris	Skowhegan	Geo. H. Plummer	Skowhegan	John W. Fogler	Skowhegan
Somerset, East	A. K. Libby	Hartland	H. H. Coston	Pittsfield	H. H. Coston	Pittsfield
Somerset, Embden	Harlon Boyington	Solon	G. G. Palmer	North Anson	Fred C. Ward	Solon
Somerset, Four Country Fair Ass'n	A. H. Burse	Pittsfield	J. E. McMichael	Pittsfield	James Halliday	Pittsfield
Somerset, Madison	Mark Gray	Anson	J. Frank Withee	Madison	Edgar H. Athearn	Anson
Somerset, Solon	A. C. Heald	Solon	Joseph Matson	Solon	John McCollor	Solon
Somerset, Wesserunsett Valley Fair Ass'n	Harvey D. Eaton	Waterville	Howard E. Chapman	Athens	James E. Chapman	Athens
South Berwich Poultry Ass'n	Charles N. Harvey	South Berwick	Ralph E. Foss	South Berwick	A. R. McIntire	South Berwick
Waldo and Penobscot	J. W. Nickerson	Swanville	F. W. Curtis	Belfast	F. M. Nickerson	Frankfort
Waldo, New Belfast Fair	Miles S. Jellison	Belfast	H. C. Buzzell	Belfast	L. E. Thornton	Belfast
Waldo, Tranquility Grange Ass'n	Parker Young	Lincolnville	J. O. Eugley	Lincolnville	H. A. Miller	Lincolnville
Waldo, Unity Park Association	C. A. Plummer	Unity	J. H. Farwell	Unity	J. H. Farwell	Unity
Washington, Machias Valley	Wm. G. Means	Machias	Wm. G. Means	Machias	Wm. G. Means	Machias
Washington, West	Wm. G. Means	Machias	Wm. G. Means	Machias	Wm. G. Means	Machias
York, Agricultural Social Aid Society	Benj. A. Goodwin	Biddeford	L. E. Kimball	Biddeford	Walter C. Smith	Alfred
York, Cornish	William R. Copp	Cornish	Leon M. Ayer	Cornish	Samuel G. Sawyer	Cornish
York, Shapleigh and Acton	Edwin S. Lary	South Acton	Fred K. Bodwell	Acton	Lawrence E. Staples	Shapleigh

Name of Society	Amount received from State.	Receipts for membership.	Receipts from loans.	Entry fees for poultry.	Receipts from entry fees for trotting purses.	Receipts from all other sources.	Total receipts.
Maine State Agricu tural Society	$2,500.00	$280.00	—	—	1,545.00	39,600.74	43,925.74
Eastern Maine State Fair	1,750.00	110.00	—	—	1,620.00	39,152.31	42,632.31
Central Maine Fair	2,500.00	—	3,200.00	—	1,287.75	32,520.12	39,507.87
Maine State Pomological Society	2,002.12	51.00	400.00	—	—	178.45	2,631.57
Maine State Poultry Association	1,018.42	133.00	—	—	—	2,007.00	3,158.42
Andros oggin County	199.88	75.00	—	—	610.00	2,371.26	3,256.14
Androscoggin, Greene Town Fair Association	38.61	no report received		—	—	—	38.61
Androscoggin, Leeds Agricultural Association	61.15	—	—	—	—	538.85	600.00
Androscoggin Valley	201.52	2.00	—	—	127.50	2,020.26	2,351.28
Aroostook County	375.38	—	—	—	195.00	10,708.42	11,278.80
Aroostook, Houlton	1,040.48	25.00	1,500.00	—	342.00	21,459.17	24,366.65
Aroostook, Northern Maine Fair Association	1,868.26	46.00	4,500.00	—	3,150.00	35,967.97	45,532.23
Cumberland, Bridgton	229.85	—	2,000.00	—	2,050.00	5,133.10	9,412.95
Cumberland County	766.80	520.00	—	—	2,193.00	15,352.15	18,831.95
Cumberland Farmers' Club	no report received			—	—	—	—
Cumberland, Freeport Poultry Association	443.96	31.50	500.00	335.00	—	263.50	1,573.96
Cumberland, New Gloucester and Danville	182.11	45.00	—	—	186.50	2,409.63	2,823.24
Franklin County	789.39	1,288.50	—	—	1,080.00	14,091.98	17,249.87
Franklin, North	100.37	337.50	550.00	—	397.50	1,082.23	2,467.60
Hancock County	184.42	—	—	—	36.00	3,883.01	4,103.43
Hancock, Eden	63.60	1,920.31	—	—	120.00	—	2,103.91
Hancock, North Ellsworth	74.23	1.50	—	—	—	786.83	862.56
Kennebec, Cochnewagen	149.29	—	—	—	—	421.11	570.40
Kennebec County	312.92	25.00	—	—	215.00	1,750.00	2,302.92
Kennebec, Litchfield Farmers' Club	no report received			—	—	—	—
Kennebec, South	104.22	20.00	—	—	18.25	2,032.50	2,174.97
Knox, North	209.17	—	—	—	20.00	4,900.21	5,129.38
Lincoln, Bristol	23.84	.25	—	—	—	130.93	155.02
Li coln County	64.61	6.00	—	—	87.50	3,385.20	3,543.31
Oxford County	1,119.52	106.00	300.00	—	930.00	12,147.12	14,602.64
Oxford, North	239.37	4.00	100.00	—	220.00	1,819.87	2,383.24

Oxford, West	669.74	—	—	—	—	6,509.85	7,179.59
Oxford, Western Maine Poultry Association	—	7.50	9.72	629.50	—	—	646.72
Penobscot, Bangor Poultry Association	839.36	32.00	600.00	487.50	—	145.00	2,103.86
Penobscot, North	92.84	—	—	—	560.00	1,048.46	1,701.30
Penobscot, West	591.70	60.00	—	—	520.00	5,664.44	6,836.14
Sagadahoc Agricultural and Horticultural Society	1,102.11	90.00	—	—	1,510.00	12,129.29	14,831.40
Sagadahoc, Richmond Farmers' Club	45.03	1.00	100.00	—	—	363.98	510.01
Somerset Central	540.73	130.00	2,000.00	—	296.00	10,534.99	13,501.72
Somerset, East	216.93	—	625.00	—	34.00	2,745.73	3,621.66
Somerset, Embden	26.18	—	—	—	—	166.91	193.09
Somerset, Four County Fair Associtaion	419.76	—	—	—	975.00	4,075.96	5,470.72
Somerset, Madison	67.54	10.00	—	—	280.00	1,090.98	1,448.52
Somerset, Solon	108.43	—	—	—	—	339.20	447.63
Somerset, Wesserunsett Valley Fair Association	66.70	7.00	—	—	—	1,757.83	1,831.53
South Berwick Poultry Association	136.67	12.00	—	293.25	—	152.45	594.37
Waldo and Penobscot	563.07	—	938.84	—	277.50	2,712.83	4,492.24
Waldo, New Belfast Fair	149.79	20.00	—	—	810.00	5,122.42	6,102.21
Waldo, Tranquility Grange Association	39.37	—	—	—	—	117.25	156.62
Waldo, Unity Park Association	179.17	—	—	—	440.00	1,291.30	1,910.47
Washington, Machias Valley	211.03	no report received		—	—	—	211.03
Washington, West		no report received		—	—	—	—
York, Agricultural Social Aid Society		15.00	—	—	261.43	651.12	927.55
York, Cornish	309.73	—	—	—	1,776.00	6,437.15	8,522.88
York, Shapleigh and Acton	123.03	256.50	60.00	—	—	103.80	543.33
	$25,112.40	$5,668.56	$17,383.56	$1,745.25	$24,170 93	$319,274.86	$393,355.56

FINANCES, 1921—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	729.18	5,190.00	24,394.15	3,273.65	39,023.28	$82,525.00	$26,300.00
Eastern Maine State Fair	5,267.90	5,760.00	5,181.64	23,522.62	44,342.06	33,455.44	21,400.00
Central Maine Fair	5,701.49	4,385.00	19,751.88	7,903.57	43,970.94	—	15,945.00
Maine State Pomolical Society	—	—	—	1,666.71	2,770.1	2,400.00	—
Maine State Poultry Association	49.67	—	1,399.53	—	3,730.87	1,620.00	1,569.49
Androscoggin County	420.00	1,800.00	380.00	—	3,088.55	—	—
Androscoggin, Greene Town Fair Association	—	—	—	—	—	—	—
Androscoggin, Leeds Agricultural Association	—	—	180.81	—	345.51	—	—
Androscoggin Valley	785.50	1,300.00	296.46	400.00	3,472.51	4,000.00	2,627.74
Aroostook County	313.07	3,393.00	11,425.07	—	16,062.29	—	—
Aroostook, Houlton	1,531.01	7,263.80	2,123.78	13,750.01	27,413.31	25,000.00	8,700.00
Aroostook, Northern Maine Fair Association	2,927.91	7,300.00	13,724.48	3,965.80	34,056.14	75,000.00	13,500.00
Cumberland, Bridgton	3,500.00	3,600.00	972.39	560.00	9,008.64	7,600.00	2,500.00
Cumberland County	5,348.07	4,753.00	4,169.99	4,095.96	20,556.22	10,000.00	—
Cumberland Farmers' Club	—	—	—	—	—	—	—
Cumberland, Freeport Poultry Association	—	—	259.92	19.05	937.47	—	—
Cumberland, New Gloucester and Danville	634.25	711.00	513.62	211.00	2,729.12	2,500.00	—
Franklin County	—	2,700.00	11,911.00	—	17,537.70	25,000.00	—
Franklin, North	25.00	1,275.00	400.00	291.81	2,407.60	1,950.00	2,350.00
Hancock County	227.35	778.32	2,018.80	140.00	3,719.22	3,000.00	—
Hancock, Eden	379.36	420.00	588.52	220.00	1,791.63	2,500.00	115.00
Hancock, North Ellsworth	409.02	90.00	424.14	73.43	1,133.04	2,500.00	—
Kennebec, Cochnewagen	9.67	—	52.61	3.55	471.99	—	—
Kennebec County	200.00	700.00	44.00	104.00	1,700.00	1,000.00	—
Kennebec, Litchfield Farmers' Club	—	—	—	—	—	—	—
Kennebec, South	130.70	535.00	486.70	578.89	2,087.39	1,500.00	—
Knox, North	950.00	725.00	950.00	676.32	3,872.67	2,000.00	—
Lincoln, Bristol	28.65	—	22.90	54.50	137.05	1,200.00	—
Lincoln County	—	598.25	1,282.45	378.62	2,656.22	4,000.00	2,500.00
Oxford County	1,853.47	2,400.00	2,610.02	2,687.72	12,573.16	25,000.00	1,500.00
Oxford, North	846.28	650.00	157.08	—	2,301.33	2,000.00	—

Oxford, West	—	—	—	4,808.19	6,248.69	—	—
Oxford, Western Maine Poultry Association	12.00	—	108.91	230.61	1,070.92	500.00	—
Penobscot, Bangor Poultry Association	100.00	—	506.00	340.00	1,871.00	1,100.00	700.00
Penobscot, North	525.00	1,400.00	1,150.00	—	3,348.70	7,000.00	—
Penobscot, West	1,740.16	1,300.00	918.65	482.00	6,077.04	5,500.00	2,735.00
Sagadahoc Agricultural and Horticultural Society	2,000.00	3,100.00	1,820.00	1,264.19	11,127.50	15,000.00	—
Sagadahoc, Richmond Farmers' Club	—	—	130.00	—	502.45	—	—
Somerset Central	3,944.48	2,036.00	2,100.00	5,581.60	15,143.98	12,000.00	3,500.00
Somerset, East	250.00	1,064.00	2,307.66	—	4,141.66	2,500.00	2,225.00
Somerset, Embden	—	—	—	33.94	130.94	—	—
Somerset, Four County Fair Association	—	2,800.00	2,219.29	210.00	5,342.79	7,000.00	5,000.00
Somerset, Madison	69.86	700.00	112.95	—	1,046.71	1,200.00	580.00
Somerset, Solon	—	—	—	50.12	409.12	—	—
Somerset, Wesserunsett Valley Fair Association	300.00	—	400.75	2.50	1,094.75	700.00	500.00
South Berwick Poultry Association	—	—	37.51	35.36	419.62	100.00	90.00
Waldo and Penobscot	246.21	2,200.00	486.67	767.20	4,370.03	4,000.00	905.05
Waldo, New Belfast Fair	1,693.65	1,817.50	775.00	1,728.05	6,646.20	4,588.01	—
Waldo, Tranquility Grange Agricultural Society	—	—	5.94	—	96.69	—	—
Waldo, Unity Park Association	25.00	1,170.00	370.00	73.95	1,900.35	.15	—
Washington, Machias Valley	—	—	—				
Washington, West	—	—	—				
York, Agricultural Social Aid Society	340.00	—	282.16	—	905.21	300.00	600.00
York, Cornish	510.00	3,850.00	1,800.00	2,275.14	9,381.14	4,500.00	—
York, Shapleigh and Acton	—	—	47.50	41.65	427.65	2,000.00	—
	$44,023.91	$77,764.87	$121,301.65	$82,501.71	$385,599.76	$383,738.60	$115,842.28

ANNUAL REPORT

OF THE

State Pomological Society

1921

MAINE STATE POMOLOGICAL SOCIETY.

OFFICERS FOR 1921.

PRESIDENT.

A. C. MACOMBER.....Dryden

VICE-PRESIDENTS.

N. 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,

W. C. ROBINSON .....North Anson
F. H. DUDLEY .....Augusta
E. W. DOLLOFF .....Standish

TRUSTEES FOR 1921.

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

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
Bickford, 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 Henry... .Wiscasset
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 Sta.
Conant, W. H..... Buckfield
Conant, W. G..... Hebron
Corbett, Herman ..... Farmington
Cottle, A. S..... R. 37, Waterville
Crowell, John H..... Farmington
Cummings, Marion L..... Hebron
Dana, Woodbury S..... Westbrook
Dawes, S. H..... Harrison
Dearborn, Hall C.,
Hampden Highlands
DeCoster, Virgil P..... Buckfield
Dennison, Mrs. Cora M.... Harrison
DeRocher, Peter... Bradentown, Fla.
Dirwanger, Joseph A..... Portland
Dodge, Mrs. Lucy T..... Orono
Dolloff, E. W..... Standish
Douglass, C. S..... Douglass Hill
Dunham, W. W..... North Paris
Emerson, Charles L.. South Turner
Emery, Ralph B..... Springvale
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
Higgins, Forrest L..... Standish
Hinds, W. C..... Winthrop
Hitchings, E. F..... Orono
Hoyt, C. E..... New Portland
Hoyt, Mrs. Frances ..... Winthrop
Jones, Elwyn ..... Dryden
Jackson, F. A..... Winthrop
Jewett, Glen A..... Head Tide
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
Nason, E. A..... Mechanic Falls
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...W. Farmington
Pope, Charles S..... Manchester
Pulsifer, D. W..... Poland
Ramsdell, E. H..... Ripley
Rich, N. H..... Charleston
Richards, John T..... Gardiner
Richardson, Herbert A.,
82 Best St., Woodfords
Ricker, A. S..... Turner
Ricker, Fred P..... Turner
Roak, George M..... Auburn
Robinson, W. C..... North Anson
Rogers, Mrs. Jeanette,
North Newburg
Sawyer, Andrew S...Cape Elizabeth
Sawyer, Charles F..... Hebron
Saunders, Ernest ..... Lewiston
Seavey, Mrs. G. M..... Auburn
Sewall, W. F..... Bowdoinham
Skillings, C. W..... North Auburn
Smith, Frederick O... New Vineyard
Smith, V. N..... Buckfield
Stanley, H. O..... Winthrop

Stanley, N. D..... Pittsfield
Staples, George W.,
904 Main St., Hartford, Conn.
Stilphen, Asbury C..... Gardiner
Strout, Charles S..... Biddeford
Supt. Maine Sanatorium Farm,
Hebron
Sweetser, F. R. Cumberland Center
Taylor, Miss L. L. (Lakeside)
Belgrade
Taylor, Frank H..... Winthrop
Thomas, William W..... Portland
Thomas, D. S..... North Auburn
Thurston, Edwin...West Farmington
Townsend, Mrs. B. T..... Freeport
True, John W..... New Gloucester
Twitchell, George M..... Auburn
Verrill, H. E..... Hebron
Verrill, Harry M..... Portland
Vickery, James ..... Portland
Walker, Charles S..... Peru
Walker, Elmer V..... Oxford
Waterman, Willard H., East Auburn
Waugh, F. A..... Amherst, Mass.
Wentworth, H. G..... Skowhegan
Weston, Joseph ..... Gardiner
Wheeler, Charles E..... Chesterville
White, Charles M..... Bowdoinham
White, Mrs. Annie .... Bowdoinham
White, Edward L..... Bowdoinham
Whitman, L. E..... Hebron
Woods, Charles D..... Orono
Wright, Frederick ..... Augusta
Yeaton, George A..... Augusta
Yeaton, Samuel F., West Farmington

ANNUAL MEMBERS, 1921.

Clements, Norris ..... Winterport
Graves, Blanche M.... Bowdoinham
Longfellow, Lester M.... Hallowell
Mason, F. L..... Mechanic Falls
Merrill, L. S..... Orono
Page, E. D..... Bangor
Smith, C. M..... Amherst
Smith, Geo. S..... Monmouth
Walker, E. E..... Augusta

MAINE STATE POMOLOGICAL SOCIETY.

BANGOR, MAINE, NOVEMBER 15-18, 1921.

Annual meeting, held in connection with the annual meetings of the other State agricultural societies.

Annual business meeting November 15, 1921.

Meeting called to order by President Macomber.

The President appointed as a Committee on Resolutions, the following gentlemen: George A. Yeaton, C. C. Clement, T. E. Chase.

The President real his annual address, as follows:

In presenting this my second annual report, let me first thank the Bangor Chamber of Commerce and the citizens of Bangor who have so generously contributed to make this meeting a success; and I wish to thank every exhibitor for doing his bit to make this show possible.

We orchardists of this State were very fortunate in having a bumper crop of apples this year, when there is such a short crop of fruit over the country.

What the Pomological Society would like to see is a live fruit-growers' association in every orchard section of the State. This would eliminate much of the present trouble in marketing the fruit and would give the growers what rightfully belongs to them.

The Maine Fruit Growers' Exchange is an organization which came into existence primarily to assist the fruit growers' associations in the better distribution of their products and to bring about a better spirit of cooperation in the different sections of the State.

The cooperation which has been brought about has saved the fruit growers thousands of dollars in buying spray materials, fertilizers, spray and dusting outfits, etc., and through this agency the fruit has sold for better prices, which in turn makes orcharding more profitable.

This Society is anxious to see our apple packing law better enforced. There are many barrels of apples going out of the

State marked No. 1 that would hardly come up to No. 2. But if this Society can keep up its good work with field meetings and demonstrations it will certainly decrease the quantity of No. 2 apples raised in the State.

The real thing which we must work for is better marketing methods and a better system of distribution, also advertising our fruit to bring it to the attention of more consumers.

We have held field meetings in different sections of the State, that we might disseminate the truths which have been worked out in our own orchards under conditions similar to those which exist in these localities, thus giving them the benefit of practical experience.

At some of these meetngs we have given demonstrations in dusting, pruning and other orchard practices. From our observations in the communities where these demonstrations have been held, the orchards are producing better quality and a larger quantity of fruit.

The Society will gladly arrange to hold community meetings where the interest will warrant doing so; in fact, the Society stands ready to assist any man who is growing fruit whether it is in a small way simply for home use, or the man who is specializing in orcharding.

E. L. White presented his report as Secretary, as follows:

The Executive Committee have held three meetings since January 1st.

The first meeting was held in Auburn, February 15th. The resignation of Major Philbrook as our Vice-President of the New England Fruit Show was accepted and Mr. F. P. Washburn, our Commissioner of Agriculture, was elected to fill the vacancy.

Arrangements were made to hold our annual meeting in November with the other State-wide organizations, the same as last year, the time and place to be fixed later.

The second meeting was held in Augusta, June 30. The premium list was revised and the programs for the summer field meetings were arranged.

The third meeting was called in Portland. Matters relating to annual meeting were gone over.

We have held four field meetings since January 1.

The first meeting was held in June in the orchards of W. G. Conant at Hebron, with an attendance of two hundred people who were interested in bettering the orchards of Maine.

The speakers from outside the State were Mrs. Eva M. Winslow of the Marshall Orchards at Fitchburg, and Professor Potter of the Durham, N. H., Agricultural College. Mr. W. L. Warren gave an address on work in his own orchards. Mr. C. L. Pierce spoke on marketing Maine fruit. The meeting proved to be of much profit to those who attended.

The series of August meetings began in the orchards of W. C. Robinson in New Portland. About four hundred people were in attendance during the day, gathering from all over Maine. This orchard plainly demonstrated what can be done with many of the hills of Maine, an acre on this hill top at one time practically worthless now netting the owner from $800 to $1,000 profit.

The field meeting held in Mr. Stanley's orchards at Pittsfield met with unfavorable local conditions and the attendance was not large. This is another hill top of Maine which has been made to produce fine apples, demonstrating the many possibilities in Maine for producing fine apples.

The third August meeting was held in Lincolnville, the forenoon exercises being held in the Grange Hall and the afternoon program in the orchards of Mr. Knight. There were in attendance at this meeting two hundred people who were interested along the lines of better fruit for Maine.

The field meetings during the year of 1921 have been more largely attended and with more interest manifested than has been the case for many years.

The Society wishes to express their sincere thanks to the people who have held the meetings in their orchards and have entertained us so royally in their homes.

Our Society had the usual interesting program at Orono, Farmers' Week. This course of lectures should be more largely attended by the farmers of Maine. The many who did attend last March carried home with them many thoughts to help them in their every day work.

The year 1921 can truly be said to have been a profitable one for Maine orchardists.

Voted, That the report of the Secretary be accepted.

T. E. Chase presented his report as Treasurer, as follows:

REPORT OF TREASURER OF POMOLOGICAL SOCIETY FOR YEAR 1921.

REPORT OF TREASURER OF POMOLOGICAL SOCIETY FOR YEAR 1921.

RECEIPTS.

1921			
Jan. 25.	Cash on hand in Nat'l Shoe & Leather Bank		9 28
Jan. 29.	Rec'd Dividend on Bank Stock		20 00
Feb. 5.	" from State Treasurer (1920 stipend)		1,502 46
Mar. 25.	" from sale apples		18 90
July 23.	" from State Treasurer (special stipend)		499 66
"	" Dividend on Bank stock		20 00
"	" Apples at Orono		19 05
Nov.	" Three life membership fees		30 00
Dec.	" Interest on Liberty bond (1 yr.)		42 50
"	" Interest on other bonds (1 yr.)		45 00
"	" loan from Nat'l Shoe & Leather Bank		499 98
1922			
Jan. 4.	" Dividend on bank stock		14 00
"	" Interest on savings deposits		21 89
" 30.	" Interest on bonds		22 50
			$2,765 22
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			270 00
Due for transfer from working funds			30 00
	Total		$2,670 00

DISBURSEMENTS.

Order No.		
1.	Portland Chamber of Commerce, dues	$25 00
2.	W. C. Robinson, executive committee expenses	12 32
3.	H. P. Sweetser, representative to American Pomo. Soc.	113 91
4.	National Shoe & Leather Bank, note	300 00
6.	C. L. Pierce, speaker	22 46
7.	W. H. Conant, speaker	19 66
8.	Howard F. Maxim, speaker	28 34
9.	E. W. Dolloff, executive committee	8 37
10.	Walter Dolley, speaker	24 46
11.	Geo. A. Yeaton, speaker	12 88
12.	T. E. Chase, executive committee	7 06
13.	J. P. Hutchinson & Co., treasurer's bond	5 00
14.	Charles E. Nash & Son, printing	16 58
15.	White & Horne, printing	3 75
16.	A. C. Macomber, expenses	54 62
17.	A. L. T. Cummings, federation dues	6 00
18.	W. C. Robinson, executive committee expenses	18 40
19.	E. W. Dolloff, executive committee expenses	8 40
20.	T. E. Chase, six months' salary	13 50
21.	E. L. White, six months' salary and expenses	75 00
22.	E. L. White, expenses	69 41

23.	Mrs. E. M. Winslow, speaker	50 68
24.	W. L. Warren, speaker	15 74
26.	A. C. Macomber, expenses	7 62
27.	N. D. Stanley, executive committee expenses	31 24
28.	A. C. Macomber, expenses	11 25
29.	E. W. Dolloff, executive committee expenses	8 94
30.	T. E. Chase, executive committee expenses	10 40
31.	E. L. White, executive committee expenses	4 10
32.	Mrs. E. M. Winslow, speaker field meetings	76 32
33.	Geo. F. Potter, speaker field meetings	66 77
34.	Bastian Bros., badges annual meeting	23 96
35.	F. L. Mason, speaker annual meeting	20 27
36.	H. W. Matthews, labor annual meeting	9 40
37.	F. H. Morse, speaker annual meeting	14 96
38.	A. C. Macomber, expenses	18 58
39.	F. H. Morse, speaker	2 25
40.	W. C. Robinson, executive committee	6 82
41.	T. E. Chase, executive committee	21 12
42.	E. F. Hitchings, judge	25 00
43.	Geo. A. Yeaton, speaker and judge	78 19
44.	National Shoe & Leather Bank, box rent	3 00
45.	H. C. Chapman Hotel Co., speakers, judges, executive committee	231 43
51.	Premiums	535 50
52.	Premiums, boxes and barrels	569 00
53.	The Maine Farmer Co., printing	20 00
	Total	$2,707 66
	Cash on hand Feb. 1, 1922	57 56
		$2,765 22

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, and the report was accepted.

The President appointed the following as a committee to receive, sort and count ballots: H. P. Sweetser, A. K. Gardner, Frank Morse.

Election of Officers for Ensuing Year.

The following officers were elected:

President: William C. Robinson of North Anson.

First Vice-President: N. D. Stanley of Pittsfield.

Second Vice-President: W. G. Conant of Hebron.

Secretary: E. L. White of Bowdoinham.

Treasurer: T. E. Chase of Buckfield.

Member of Executive Committee for three years: F. H. Dudley of Augusta.

Member of Experiment Station Council: Wilson H. Conant of Buckfield.

State Vice-President of American Pomological Society: George A. Yeaton of Augusta.

Vice-President of New England Fruit Show: Frank P. Washburn of Augusta.

Three delegates to the Federation of Agricultural Associations of this State: W. C. Robinson, W. H. Conant, E. L. White.

The PRESIDENT: Have we anything under new business?

Mr. W. H. CONANT: Mr. President, ladies and gentlemen, members of the Pomological Society: As a member of the Station Council representing this organization, in addition to what report I made I would like to say that I have given over a whole lot of time and considerable money in the interests of the Maine Station and what it is doing for Maine's agriculture. The Experiment Stations throughout the whole country are, as a result of the war conditions, finding themselves in rather hard circumstances financially. Our director, Mr. Morse, has just returned from a conference of Directors of Experiment Stations throughout the country. It develops that eighty per cent of the efficient men who were engaged in investigation work previous to the war have resigned and gone into other lines of work. When you stop to think of it—80%—you can imagine what that means. It also develops that many of the states in the United States, in addition to the Federal aid received, are putting up from one hundred to three hundrd thousand dollars to carry on the work in the various states.

Many of the Experiment Stations felt that the scope of their work should be broadened somewhat and that they should receive larger Federal aid, and a bill is now before Congress, upon which a hearing will be held in the near future, to broaden the scope of this work and to increase the Federal aid to these Stations.

Doubtless many of you know the result of the work here in the State in our own much respected Experiment Station, that we are without finances to carry on the work properly and that at the Legislature last winter we got turned down, and that the Station is very much handicapped in its work. Should this bill be passed, even in a new draft, it would doubtless give this Station a bigger field of activity and increase its financial aid.

Now the best part of this bill—I am not going to take time to read it—is that it does not demand a fifty-fifty proposition

from the State. It is an out and out Federal aid. The State is not asked to pay a cent. You know what I mean by the fifty-fifty plan. There has been a great deal of work done by the Federal Government; provided the State will pay a certain amount they will match it. This does not come under that head at all. Personally I have read the bill and looked over the situation and it seems to me this bill should be passed, at least in a new draft, even if the sums are cut down. I have a resolution here that I want to submit for your rejection or adoption as you see fit:

Whereas: We believe that the Agricultural Experiment Stations, established in the several states by the Hatch and Adams Acts, have in a large degree contributed to the agricultural progress and to the prosperity of the country in general during the thirty or more years of their existence, and

Whereas: We believe that the time has now come when it is imperative that the Stations receive additional support from the Federal Government in order that they may continue to effectually solve the various problems that confront the American farmer under present-day conditions,

Be it Resolved: That the Maine State Pomological Society requests the Maine Delegation in Congress to use their best efforts to secure the passage of the so-called Purnell bill (H. R. 2243), "To authorize the more complete endowment of agricultural experiment stations, and for other purposes."

One of the good features in this bill is that it so broadens the scope of experimental and investigation work that the Station will be enabled, should this bill pass, to go out here and get a little nearer the farmer's problems than they can under the Hatch and Adams bills, which specifically state how the money shall be spent, so that it is only in a limited way that they can use that money.

I submit this resolution to you and I hope you will discuss it, and I feel as your council member it should merit the support and endorsement of this Society.

Mr. GARDINER: Mr. President, I would make a motion that it be referred to the Committee on Resolutions with the suggestion that it be incorporated in their report.

The motion was seconded and it was so voted.

Professor HITCHINGS: I am wondering if we, as members

of this Association, appreciate the work done by our Experiment Station Council, and especially by the member elected by us. In listening to the report, although to many of us it does seem rather theoretical, yet to my mind I feel there is a chance for the orchardists of Maine to learn a whole lot that they can apply to their own orchards. We have been discussing up stairs the question of varieties. In his report he spoke of the influence of the stock on scion and bud. Our orchardists as a rule cannot do the work of the nurserymen. The nurserymen, as a rule, are not particular enough in regard to their selection of buds for their stock. Most of the stock is French stock as indicated. They have not in the past discarded the weaklings as such, and in many cases they have not selected their buds from the best bearing stock. What they are doing now, I don't know, but I hope they are mending along that line. But as orchardists we can use the scientific method and select our scions from bearing trees that have a record. That is being don by some of our orchardists, but a majority of them are taking any scions they can get. I feel that this Association ought to take some action, and make a special effort at their field meetings to bring out these points in regard to varieties and the use of the scions in propagating these trees.

Then there are so many varieties. I believe the Association ought to take into consideration some of the work being done by the community orchard plan that is recommending eight or ten standard commercial varieties along these lines and do away with this large number of varieties.

The College of Agriculture, the Extension Service, Department of Agriculture, the State Federation of Farm Bureaus and the Maine Exchange, whereby it is proposed to encourage community planting throughout the State, and we are limiting the number of varieties in this community plan proposition to strictly known, hardy, commercial, money-making varieties. Personally I feel that the Society here could do no better than to endorse this community plan proposition in limiting this thing down to eight commercial varieties. Now I understand that in fixing those eight varieties, every inch of land in the State of Maine that can grow apples was considered, and the varieties which they are able to bring to the nearest perfection, and I think there is no hardship worked on any one and I think they

will all stand by that variety list, and that in twenty years there will be wonders accomplished by standing by that list submitted by this cooperative community plan.

QUESTION: Won't you state those varieties?

Mr. CONANT: Mr. Gardner can perhaps give them more quickly than I can.

Mr. GARDNER: Williams Early, Wealthy, Gravenstein, McIntosh, Spy, Wolf River, Baldwin and R. I. Greenings.

Adjourned until afternoon session.

AFTERNOON SESSION.

Mr. CHASE: Mr. President, your Resolutions Committee is ready to report.

The first resolve that we have to bring up is the one that Mr. Conant presented to the meeting this morning to endorse the Purnell bill.

There is also a resolution that we want to put before the Society this year in regard to the apple packing law. It seems there has been—as there is with every good thing—there are always some knockers, and there seems to be an effort being made over the State to have the bars let down a little on the apple packing law, and as the Pomological Society had quite a good deal to do with the making of the law and have always stood behind it, we want to go on record and have it put into our resolutions as one of the resolves of this meeting that the Pomological Society use every effort to uphold the State of Maine packing law as it is today, or even better, under no circumstances to let the bars down at all on this law. And these are the resolutions as adopted and signed by your Resolutions Committee and hereby submitted:

(1) Whereas: We believe that the Agricultural Experiment Stations, established in the several states by the Hatch and Adams Acts, have in a large degree contributed to the agricultural progress and to the prosperity of the country in general during the thirty or more years of their existence, and

Whereas: We believe that the time has now come when it is imperative that the Stations receive additional support from the Federal Government in order that they may continue to effectually solve the various problems that confront the American farmer under present-day conditions,

Be it Resolved: That the Maine State Pomological Society requests the Maine delegation in Congress to use their best efforts to secure the passage of the so-called Purnell bill (H. R. 2243), "To authorize the more complete endowment of agricultural experiment stations, and for other purposes."

(2) Whereas the Maine State Pomological Society believes that the apple packing law as it now stands is for the best interests of the fruit industry of Maine, therefore

Be it Resolved: That the officers of the Society use every effort to maintain the law as it now stands and for its strict enforcement.

Voted, to accept the report of the Committee on Resolutions.

Mr. CHASE: One more matter brought up two years ago I think it was. You remember the Society voted to allow no flats in our exhibitions. Now we think that perhaps—it has taken away some fruit from the show—that perhaps it would be well to allow a certain amount of flats to come in; perhaps not allow a man to have an exhibit of all flats,—but we know what our Experiment Station exhibit looks like and how it appeals to every one who comes into the hall because it does make a good show. I would like to put the matter in this way, that it be left to the discretion of the Executive Committee to go into this matter thoroughly, and perhaps take it up with some of the growers if need be, and decide what we ought to do, and I would like to have it left finally with them. If they want to bring it to a vote, why we can go into it now or we can refer it to the next meeting, but I think it would be better if the Executive Committee were allowed to thrash this matter out and come to their decision, and that the Society vote to stand by them; and to bring the matter to a head, I will make a motion to that effect that this matter of flats in this exhibit be left to the Executive Committee to investigate thoroughly, and that their decision be accepted in place of the vote recorded at the meeting two years ago. I make that as a motion.

It was so voted.

Mr. CONANT: Now Mr. President, in regard to this resolution affecting the Purnell bill, I would like to make a motion that the Secretary be instructed to carry out the will of the resolution and notify our delegation in Congress to that effect.

It was so voted.

Mr. LEE: Mr. President, before we adjourn, I think most of us members present would like an opportunity of expressing our appreciation of the retiring president and of the other officers who do so much work when all the rest of us are asleep or having a good time, and I move that we express our appreciation by a rising vote of thanks since it is all we can do.

A rising vote of thanks was given.

Mr. W. H. CONANT: I do not wish to prolong these matters, I realize you have a program to carry out this afternoon and you are going to require every minute, but just a word before the program starts. I was sorry to be called out of the meeting this morning in answer to a telegram and didn't have the opportunity to say to the Society this word. As your representative on the Station Council, it seems to me that the exhibit by the Experiment Station from Highmoor and Aroostook farms is a tremendously important feature in the meetings of this Society. It should be the business of this Society to urge and demand from the Experiment Station that there be some replanting of commercial orchards at Highmoor Farm, and there will not be perhaps until you demand something of that sort or make your wants known. With the seedling, cross-breeding work that they are doing there, there is an opportunity to top work a lot of those into commercial varieties. At least five hundred standard trees of commercial varieties should be planted there next spring.

The motion was made and seconded to this effect and it was so voted.

SPRAYING AND DUSTING.

Assistant in Insecticide Investigations, A. KELSALL, Dominion Entomological Laboratory, Annapolis Royal, N. S.

Mr. Chairman, Ladies and Gentlemen:

It gives me a very great deal of pleasure to be able to address you this afternoon. It is always a pleasure for me to meet persons interested in orcharding, for I am myself keenly interested in fruit growing, and I only hope that any small amount of information which you may extract from me will to a certain extent balance the knowledge which I know I myself will receive as a result of your deliberations.

For many years now our Entomological Laboratory at Annapolis Royal, Nova Scotia, has been engaged almost exclusively

in a study of insecticides and fungicides. Now of course, most of you are well acquainted with the curious way in which materials act in a somewhat different way in different localities, due mostly to variable temperature, moisture, and sunlight conditions. So you will understand that what I speak about this afternoon are results as we have found them in Nova Scotia, and you will understand that these results may not be necessarily universally applicable.

I presume that speaking to this audience, I do not have to speak about the necessity of either spraying or dusting to grow good clean apples in a commercial orchard. I think everybody in the orchard business has found it necessary to either spray or dust to obtain apples free from apple scab, and free from the marks of insect injury. For many years past, most of our experiments with sprays and dusts have given at least seventy-five per cent of clean apples, and most of our check plots have given at least seventy-five per cent of blemished fruit.

But during the past three years, we have obtained results showing benefits from the application of insecticides and fungicides which we had not previously known to exist. In some of our experimental orchards, particularly two years ago, the size of the apples was noticeably larger on the treated than on the untreated portions of the orchards. This was due to the fact that the untreated trees, and particularly the leaves, were so infested with various pests that they were unable to function to the best advantage, and consequently produced under-sized fruit. In 1919, the increased size of the apples on treated orchards, alone paid for the cost of treatment even had the apples on the untreated orchards been clean.

Another thing which we have repeatedly noticed, is the fact that treated orchards retain their leaves much later in the fall than untreated orchards, this of course, being due to the fact that the leaves of untreated orchards have more fungi on them and consequently they tend to drop sooner. The significance of this was apparent when we found that almost invariably the trees which retained their leaves late in the fall tended to set a much bigger crop the following year. But this was not all; we had the opportunity of noting the effects of winter injury on various acres of orchard, and found that where the leaves were retained late in the fall, there was less winter injury than where

the leaves fell early. (I am not now speaking of cases where trees made a late growth in the fall, for in that case it would probably be different.) Where the leaves stay on the tree late, there is a higher concentration of sugar and other soluble matter in the sap of the tree. This lowers the freezing point of the sap and consequently there is less winter injury.

Undoubtedly, the main benefit from spraying and dusting are directly derived from the control of insect and fungous diseases, but I just mention these "side-line" benefits which we have obtained in Nova Scotia, namely, a larger sized apple, prospects of a better set the following year, and less liability to winter injury. We have been fortunate in Nova Scotia in having three large apple crops in succession and we consider that these would not have been possible but for the large amount of spraying and dusting which is now being practiced.

To come to an actual consideration of the various materials which are used as sprays and dusts we will deal first with sprays and with the fungicides. Lime-sulphur is probably the best known apple fungicide, although we use it but very little in Nova Scotia. Commencing in 1910, we used lime-sulphur to a considerable extent, and at first we considered it very satisfactory. But later we had a succession of damp seasons with a rather low amount of sunlight, and in addition the spray gun was introduced. These two factors together caused lime-sulphur to give a considerable amount of injury and produced a low set of fruit, so that we had to abandon lime-sulphur. Experiments continued every year since, have shown us quite definitely that in a damp season with a small amount of sunlight we get serious injury from the use of lime-sulphur in the usual recommended strengths on certain varieties of apples. In a dry, bright season such as the past one we do not get this injury nor do we get it if the lime-sulphur is used sparingly as a mist spray. Taking everything into consideration we do not consider it advisable to recommend lime-sulphur in Nova Scotia, and at the present time very little is used.

The main fungicide with us is Bordeaux Mixture. Comp'aints have several times been made that Bordeaux Mixture is a messy material and inconvenient to make, but following the procedure which we use, these difficulties are overcome.

A very finely divided crystal copper sulphate is used of about the same consistency as ordinary granular sugar. This material dissolves very easily, in this respect being quite unlike the large blue crystals generally seen. This copper sulphate is added to the spray tank at the time of the commencement of filling the tank. While the tank is filling, the agitator is kept going and by the time the tank is two-thirds full, the copper sulphate is all dissolved. The necessary amount of hydrated lime is then added, and finally the poison. By this time, the tank will be full and the Bordeaux Mixture ready to apply.

Now regarding the formula to be used in making Bordeaux Mixture for use on the apple, I want to emphasize that the formula used for potatoes and other crops will not do for the apple. Perhaps I may describe how we came to use Bordeaux on the apple.

As I said before many growers became dissatisfied with lime-sulphur, and among these was a Mr. Thomson of Berwick who tried by experiment to find other materials which would be satisfactory. An ordinary lime whitewash mixture was used but this did not control scab. So Mr. Thomson started adding small amounts of copper sulphate to this lime whitewash. The results were excellent giving clean apples, no foliage injury, and very little russetting.

Following the work of Mr. Thomson we, in a series of experiments, demonstrated quite conclusively that to control fungous diseases the copper sulphate need not be present in greater quantity than from four to seven pounds per one hundred gallons of mixture. And further it was definitely shown that to entirely prevent yellow leaf and copper injury on the foliage, there must be present a very great excess of lime. So that the Bordeaux mixture which we are using on the apple is composed of approximately the following materials: five pounds of copper sulphate, twenty pounds of hydrated lime, to one hundred gallons of water. To this we add two pounds of calcium arsenate to every one hundred gallons for the purpose of controlling the biting insects.

Complaints have been made that Bordeaux mixture russets the fruit. The type of Bordeaux mixture which I have described russets the fruit far less than the ordinary type made with equal parts of copper sulphate and lime. Russetting of

the fruit occurs only at one stage in the development of the fruit. You will remember that when the apples are first formed, they are green and hairy, and when in this stage they also possess stomates, or breathing pores, in the same way as a leaf. It is very probable that the injury known as Bordeaux russetting is associated with either one of these and probably with the apple hairs. Before the apples get much larger than marbles, the hairs drop off, and a corky layer forms under the breathing pores and closes them. After this stage it is impossible to russet an apple with Bordeaux mixture.

If the apples are sprayed immediately after the fall of the blossoms they will be russetted to a certain extent. So we in Nova Scotia, use at this stage a spray composed of three pounds of soluble sulphur, ten pounds hydrated lime and two pounds of calcium arsenate per one hundred gallons. This spray is not a very strong fungicide, but it is sufficient to carry over and provide protection through the period when Bordeaux is liable to russet.

To come to the common orchard insecticides, namely, lead arsenate and calcium arsenate. When for some reason it is considered advisable to use an insecticide without any fungicide, lead arsenate is undoubtedly the best one to use. It is not generally realized that lead arsenate besides being an insecticide, does possess a certain low fungicidal value. If insects are very numerous in an ordchard, a person may very profitably use a large excess of lead arsenate, say about ten pounds of dry lead arsenate to one hundred gallons, about three times the usual amount, for one or two sprays and it will be found that besides cleaning off the insects the material in this strength will do very fair as a fungicide.

Lead arsenate is perfectly safe to use in Bordeaux mixture. Lead arsenate is also perfectly safe to use in lime-sulphur provided the mixture is applied immediately after being made. If lime-su'phur and lead arsenate are allowed to stand say for an hour or so the result is disastrous, for the foliage will be burnt. In this case, a reaction occurs which results in the formation of a lot of water soluble arsenic. Where lime-sulphur and lead arsenate are mixed and immediately applied, the lime-sulphur is oxidized and no detrimental reactions will then take place.

Lead arsenate cannot be mixed with soluble sulphur. This mixture results in the formation of soluble sodium arsenate and the result is scorched foliage.

As stated before, for use alone lead arsenate is the best of insecticides. But here again certain precautions are necessary for cases of burning have been known. There are certain impure waters with which lead arsenate cannot be mixed. Lead arsenate used alone should not be mixed with a hard water for here again water soluble arsenic is formed. Nor can lead arsenate be mixed with a water which contains sa't.

Calcium arsenate is much cheaper per unit of arsenic, than is lead arsenate. Consequently, the orchardist should use calcium arsenate where it is safe to do so. Calcium arsenate is perfectly safe in any mixture which contains an excess of free lime. Consequently, calcium arsenate is perfectly safe in Bordeaux mixture. Calcium arsenate is also satisfactory in lime-sulphur and in solub'e sulphur but with both these it is advisable to add a small amount of hydrated lime. For use alone, calcium arsenate is unsatisfactory for it is acted upon by the carbon di-oxide of the air, a soluble form of calcium arsenate results, and there follows foliage injury.

In view of all the above considerations, the spray calendar as used in Nova Scotia is as follows, expressed in Imperial gallons:

1st spray: Time: When leaves are about one-quarter of an inch in diameter.
Material: 3-10-40 Bordeaux, 1 lb. arsenate of lime to 40 gals. (3 lbs. bluestone, 10 lbs. hydrated lime, 40 gals. water).
Application: Drench thoroughly at 225 lbs. pressure.
Pests Destroyed: Apple scab, budmoth, browntail moth, cankerworm, tent caterpillars.

2nd spray: When the blossom buds are showing pink at the tip. For green apple bug apply the substituted spray when blossoms are beginning to open.
Materials: 3-10-40 Bordeaux, 1 lb. arsenate of lime to 40 gals.
Application: Use 225 lbs. pressure but be careful and do not keep nozzle too close to the trees.

Pests Destroyed: Apple scab, budmoth, canker-worm, fruit worms, green apple bug, browntail moth.

3rd spray: Time: When the blossom petals have fallen.
Material: 1 lb. soluble sulphur, ½ lb. arsenate of lime, 5 lbs. hydrated lime to 40 gallons of water.
Application: Apply under 200 to 225 lbs. pressure as a fine mist holding the nozzle well away from the trees.
Pests Destroyed: Apple scab, budmoth, green apple bug, codling moth, fruit worms, tussock moth, fruit spot.

4th spray: Time: Two weeks after the third or calyx spray.
Material: 3-10-40 Bordeaux, 1 lb. arsenate of lime to 40 gals.
Application: Drench thoroughly but hold nozzle away from trees as on 3rd spray.
Pests Destroyed: Apple scab, tussock moth, fall webworm, red-humped caterpillar, yellow necked caterpillar, fruit spot, inky spot, storage rots.

Modifications for Special Insects.

Green apple bug: Where this pest is present substitute for the second spray 2 lbs. soluble sulphur, 1 pint of nicotine sulphate to 100 gals. of water, omitting the arsenical poison. The addition of 4 pounds of fish oil soap to each 100 gallons improves this spray. If green apple bug is serious, use this formula for the third spray instead of the regular one, drenching thoroughly.

Large biting insects: When cankerworm, tussock moth, tent caterpillars, fall webworm, etc., are present in large numbers apply instead of the regular spray, 3 lbs. of dry lead arsenate or 6 lbs. of paste lead arsenate to 40 gallons of water as soon as the young caterpillars can be detected.

Aphids: Add three-quarters of a pint of nicotine sulphate to each one hundred gallons of the mixture recommended for the first spray when leaves are showing green at tops. If aphids appear in summer use nicotine sulphate 1 pint, soap (shaved fine and dissolved in water) 4 lbs. to each 100 gals. of water.

The Third or Calyx Spray.

Where a better fungicide than soluble sulphur is desired and a moderate amount of russetting is not an objection, 2-10-40 Bordeaux with arsenate of lime 1 lb. to 40 gallons may be applied for a calyx spray. Ben Davis, Baldwin, Greening and Gravenstein russet easily. Northern Spy, King and Gano are not so easily russetted.

A Quickly Made Bordeaux Mixture.

To make Bordeaux rapidly put the required amount of powdered or dissolved copper sulphate into the spray tank. Start the engine, and with the agitator running, fill the tank. While the agitator is still running add the hydrated lime and finally the insecticide. The Bordeaux is then ready to apply.

Warnings.

Do not use arsenate of lime alone on apple foliage.

Do not use arsenate of lead with soluble sulphur.

In making Bordeaux for apple spraying do not use less than three parts of lime to one of copper sulphate.

Do not leave soluble sulphur exposed to the air; keep it in a closed container.

Be sure to add the lime to the soluble sulphur-arsenate of lime combination.

Most of the common insecticides are safe when used with Bordeaux.

Measure the capacity of your spray tank.

Note:—If the weather conditions and the prevalence of pests make it desirable, fifth spray may be applied two weeks after the fourth and may be similar to the fourth in materials and application.

So far we have been discussing the materials used in spraying. But lately there has been great developments in the use of dust instead of spray. I think all orcharding communities have been scratching their heads over the problem, spray versus dust. In Nova Scotia, we have developed into quite dust enthusiasts. More orchards in the Annapolis Valley are now being dusted than sprayed and you may infer the scale on which dusting is being carried on when I say that nearly one thousand tons of

dust were applied to the Annapolis Valley orchards this past season.

There are several definite advantages of dusting over spraying, and you have probably heard them so often that I will not troub'e you by emphasizing them. These advantages expressed briefly are:

1. Greater speed in application.

A dusting outfit is capable of treating from five to ten times as much orchard as a spraying outfit in a given time.

2. More suitable timing of applications.

Owing to the rapidity of application the grower can time his applications to suit the weather and the stage of the fruit.

3. Less waste time.

Dusting operations should be done during weather unfit for most agricultural field operations, such as immediately after a rain or very early in the morning, while spraying operations require the best of weather.

4. Lower cost of machinery.

The initial cost of a dusting outfit is one-half that of a sprayer, the cost of upkeep is less, the gasoline used is less, and the duster is a longer-lived machine.

5. Lighter weight of dusting apparatus.

A dusting outfit with dust and operators does not weigh more than a third of the weight of a sprayer ready for operation, so that in spring it can be taken over hills or over wet ground upon which a sprayer would mire.

6. Less liability to trouble and breakdown.

A dusting outfit in practice is a reliable machine and is not responsible for delays due to leaky valves, blowouts, etc., which always occur with a high pressure sprayer.

7. The simplicity and speed of a duster makes a greater appeal to the grower.

More growers will dust than will spray, even if the total cost is the same, because it is less trouble. This is highly important, particularly in an orcharding community, where it is desirable in the interest of every individual to improve the standard of product of the entire community.

You will probably think that you realize these advantages, but the thing must be determined by the total cost. We have kept careful records during the past two years taking into

account all the factors involved. With us it has cost a trifle more to dust with 90-10 sulphur lead arsenate dust than to spray, and it has cost us a trifle less to dust with the copper arsenic dust, which I will describe, than to spray. You can sum it up by saying that as far as actual cost goes, there is not much difference between dusting and spraying.

But to my mind there is a very great advantage in dusting over spraying for a certain class of orchardists. Most orchards are on a one family farm. That is to say, the orchard is managed by the owner with the possible help of a son or two, and additional hired he'p at rush times. A man situated in this position is limited in the amount of orchard he can handle by the amount he can spray. A person with one pair of work horses and say, twenty acres of orchard, has no sooner finished one spray than it is time to begin over again leaving very little time for cultivation and other farm work. Now when dusting is practiced, this process is not the limiting factor in the acreage of orchard which can be successfully operated on a one family farm. The limiting factor is then cultivation, and consequently, a one family farm is capable of much greater production.

For the man who has a small orchard, it is very well for him to continue spraying. I would not advise him differently. For the large specialized orchardist and the person who is increasing his acreage, dusting appears to me to be his salvation.

And now to the results of dusting. I may sum it up briefly; during our several years of dusting we have had quite equally good results as spraying in the control of fungous diseases and in the control of biting insects. In the control of aphis and such sucking insects, it is another matter for while these can be controlled by dust impregnated with nicotine it is an expensive matter. But in Nova Scotia, it is not very often that we are troubled with sucking insects, and we hope to have cheap dusts which will control them, by and by.

As in the case of sprays there are two different forms of dust, one with sulphur as its main active ingredient and one with copper as its main active ingredient.

You will all be acquainted with what is known as 90-10 dust. This dust is composed of ninety parts of superfine sulphur and ten parts of lead arsenate. This dust is fairly satisfactory and gives very smooth apples. But in this connection I would like

to issue a word of warning in regard to the use of dilutents, such as hydrated lime. With us, the use of these materials has considerably lessened the value of the dust. Many of these so-called inert dusts are by no means inert and it is just as well to avoid them until more is understood about their action.

The main dust we are using in Nova Scotia, is what we call the copper-arsenic dust, a dust devised by Mr. Sanders who addressed you here some years ago. This dust is composed of dehydrated copper sulphate, calcium arsenate, and hydrated lime. You are all familiar with the blue copper sulphate crystal. This material contains a certain amount of water and when this water is driven off by heat or by other means, a fine white powder resembling flour in appearance remains. It is this material which is used as a source of copper. The other materials, calcium arsenate and hydrated lime, will be perfectly familiar to you.

We have used these materials in the following proportions: ten parts of dehydrated copper sulphate, five parts of calcium arsenate and eighty-five parts of hydrated lime. These proportions may be varied, and it may be advisable to somewhat increase the arsenic content and possibly the copper also in regions where scab is particularly troublesome. The materials may be purchased already mixed or they may be mixed by the grower, using his dust outfit engine and an ordinary flour mixer similar to the ones used in the large bakeries.

This dust, which is essentially the same as a Bordeaux spray, causes a certain amount of russetting similar to, but not as great as that of Bordeaux spray, at the same period. For this reason where small amounts of russetting are not desired, the 90-10 sulphur lead arsenate dust should be used for the application following the blossoms.

This past season the 90-10 sulphur lead arsenate dust, cost seven dollars ($7.00) per one hundred pounds and the copper-arsenic dust six dollars ($6.00) per hundred pounds. The copper-arsenic dust is thus somewhat cheaper, but there is another difference in the spreading power which makes it cheaper again. Assuming that it takes seventy-five pounds of 90-10 sulphur lead arsenate dust to cover an acre satisfactorily, then fifty pounds of the copper arsenate dust will have the same covering power.

The failures from dusting come from either a poor application of material, the use of too small an amount of material, or failure to keep the tree covered during the infection periods. Let me conclude by giving a few directions regarding dusting.

1. For old orchards, use at least seventy-five pounds of sulphur lead arsenate dust or fifty pounds of copper arsenic dust per acre per application.

2. Do not follow a fixed schedule as with spraying. The dust has not as strong powers of adhesion as spray, and therefore it pays to start with the dust at the beginning of the season and to dust thereafter, not more infrequently than every fortnight, but at any time that hard rains or infection periods intervene to dust more frequently, sometimes only a few days apart.

3. Apply the dust when the air is calm, and preferably when the trees are wet. These conditions are generally not met with during the ordinary working day. The best time is about sunrise when there is often both calm air and a dew. The evening commencing about 7 or 8 P. M., often gives good conditions. Some are using acetylene flare lights and dusting at night.

The following is the Dust Calendar as used in Nova Scotia:

Before the blossoms: Apply copper arsenic dust two or three times, making the intervals shorter if the weather is damp and cool. Apply dust at the rate of 50 lbs. per acre per application. Apply when the air is still and the trees damp from either dew or fog or after a rain. This usually means applying the dust between 3 A. M. and 8 A. M. although occasionally a foggy day can be utilized.

The Calyx application: Immediately after the blossoms on varieties liable to russetting use 75 lbs. of 90-10 sulphur lead arsenate dust. Ben Davis, Gravenstein, Baldwin and Greening russet easily. On such varieties as Northern Spy, King, Gano, etc., copper arsenic dust may be used as on the pre-blossom applications.

Early and Midsummer applications: A week or ten days after the calyx application and at equal intervals thereafter, make two to three applications of copper arsenic dust in the same manner as before the blossoms.

NOTES.

Apply copper arsenic dust at the rate of 50 lbs. per acre and 90-10 sulphur lead arsenate dust at the rate of 75 lbs. per acre to 20 year old trees. Vary the amount from this with the age of the trees.

Dusting in the early morning when the air is still and the trees damp gives the best result in scab control. One duster can only give the best results on about 15 acres each morning or around 60 acres each season.

Copper arsenic dust is made up of 10 lbs. of dehydrated copper sulphate, 5 lbs. arsenate of lime and 85 lbs. of hydrated lime.

90-10 sulphur lead arsenate dust is made up of 90 lbs. superfine dusting sulphur and 10 lbs. of dry lead arsenate.

Dilutents such as hydrated lime and talc are not recommended in sulphur dust.

QUESTION: Is there any difference between arsenate of lead and arsenate of zinc? in the use of it?

Prof. KELSALL: Oh, yes, there is a considerable difference. We practically do not use arsenate of zinc at all and I have had very little experience with it. Arsenate of zinc can be used a little in Bordeaux and can be used in lime on a foliage like potatoes alone. Whether it can be used on apples I don's know, and whether it can be used with lime sulphur I don't know.

Mr. CLEMENT: I would like to ask if they have used tobacco in connection with their other materials?

Professor KELSALL: Yes, we have used tobacco dust; in some cases we have got control of sucking insects, in some we have got no control of them. Its only value is a filler and for control of sucking insects.

Mr. CONANT: How fine do you grind your Bordeaux dust in order to cover so large an area with fifty pounds?

Professor KELSALL: We buy copper sulphate with a specification that it will pass a screen of 200 meshes to the inch and that it contains 35% metallic copper. The calcium arsenate is the ordinary calcium arsenate, 40%; the hydrate of lime is the ordinary hydrate of lime.

You will find the high calcium hydrated lime is very much fluffier than dolomite lime.

Mr. CHASE: Can you buy this copper sulphate with the water taken out or do you have to do that yourself?

Professor KELSALL: In our first experimental work we did it ourselves but since it has been bought that way.

Mr. CHASE: Will it keep over that way?

Professor KELSALL: It has to be in reasonably tight containers. The mixed dust is all right, although it should be mixed fresh every year.

Mr. DUDLEY: Have you tried the nicotine sulphate in kaolin and unslaked lime?

Professor KELSALL: Professor Britton of Nova Scotia has done most of that work and he has had quite a lot of success with aphids, the green apple bug, and also with the apple psylla which we have in Nova Scotia and which you do not have here, but it is very expensive that way.

QUESTION: You use about 2% of nicotine sulphate?

Professor KELSALL: Yes. Dr. Britton has also been using it in sulphur dust and he has obtained good results. I might say we have been experimenting with nicotine shot out in the form of fumes from the duster and have obtained very good results, and I should not wonder if that is the way we shall eventually come to do.

Mr. CONANT: This may be on a side line, but I would like to know if Professor Britton has got control of the railroad trypeta with the dusting method?

Professor KELSALL: I don't think any work has been with dust on the railroad worm. In the Annapolis Valley itself there are practically no railroad worms. There are some in the outskirts, you might say. He did a lot of work with the spray, but I don't think he has done any since.

Mr. CHASE: You speak about 75 lbs. .90-10 to the acre. That figures out about two pounds to the tree does it not?

Professor KELSALL: Well, our orchards have run between forty and fifty to the acre.

BEE CULTURE.

F. L. MASON, Secretary State Beekeepers' Association.

I have been asked to speak to you on some slides that Mr. Dudley had in his possession, and I find that they were evidently designed for a lecture to amateur beekeepers. There is no doubt that a technical discussion of some phases of bee-keeping would be more interesting to the limited few here. However, I shall speak on these simply as a subject which I know and enthuse over to those who know nothing about bees.

First, I wish that I might dispel from your minds that particular idea of mystery that seems to have surrounded bees and bee-keeping. There is nothing more mysterious about a colony of bees than there is about the fact that a little brown seed placed in the ground is sure to produce a tree of a certain type and that that tree shall bear fruit of a certain size, a certain flavor, a certain shape. All the works of nature are beyond the comprehension of the human mind, and therefore they are to some degree mysterious; but I assure you that bees are no more mysterious than any other one of the works of nature. If you are one of those persons who have the idea that nature has designed a certain few human beings—that these few are so constructed that they can understand the essentials of bee culture, and that nature has made it a perfect blank to all others, it is because this impression has been handed down to you by tradition and by stories from a superstitious and an ignorant class. You have not acquired this from the well enlightened. This subject is absolutely just as approachable to you as it is to any other person of ordinary intelligence, and if there are any fruit producers here who have been instructed and have learned that they ought to have bees in or near their orchard, and who are hesitating because they have the idea that they couldn't acquire the knowledge to tend bees, I wish that you would overcome that in some way.

This first illustration shows the bees at the entrance of a hive. The fact that bees sting and the fact that this sting is rather painful is the reason why very few people have gone beyond this casual observation of a colony of bees, and that is the reason why this picture illustrates the general conception of a colony of bees. But tonight by the use of these pictures we shall be

allowed without any danger of stings to enter the hive and see some of the things that are going on there.

This is an illustration of the queen, the drone and the worker bee. Those of us who have observed only casually may have assumed that all the bees in the hive were of the same type, that they were identical. As a matter of fact we find that they are not identical, but that there are three types of bees. This is the queen bee (indicating), this is the drone and this is the worker bee. First, we will consider the queen bee. We will consider her first because she is of the most importance, and perhaps the most fascinating to study. Physically you will notice that she is longer than either of the others, and in proportion she is much slimmer built. I say she—I use the singular—because there is but one queen in a colony of bees. She is the true female. She is the mother of the colony. She is the mother of every other one of the individuals. Now and then when I tell you that in a single colony of bees there are from seventy-five to a hundred thousand individuals, and that this is the mother of them all, that she lays the eggs that produce them all, you will realize that her duty is not a trivial one, and when I tell you that a single queen is capable of producing from three to five thousand eggs daily, you will realize she is not lax in her duty. That is her life work and she consumes the three or four years of her life in egg laying. The other bees of the colony recognize the importance of the queen. If we opened the hive we should find them attending her, preening her body and her wings, offering her food, while they are ready at any time to defend her with their lives. They appreciate her importance. To show some of the extent to which bees will go to protect a queen, I would relate an incident in regard to mailing queens through the mail. We supply queens by taking a queen and placing her in a small mailing cage with a wire cover and from five to fifteen bees of this type—the workers bees—as nurse bees. Candy is placed in that cage for their food during the journey. Now if they are delayed on the journey and the feed runs short as it does sometimes—I have received them in what we call bad condition, that is, a majority of the inmates of this cage are dead from starvation. If that is the case, if there is but one individual left, it is almost invariably the queen. The instinct is so strong that the worker bees sacrifice their lives even in order that the queen

may exist. This (indicating) is the drone bee. He is a lazy and indolent fellow and is a consumer and not a producer. I say *he* because this is the male bee of the colony. In the late spring we notice the appearance of drones. There will be several hundred in a colony. In the early fall they disappear. We shall have to dwell on his activities later and we will leave him without further mention and go on to the worker bee. There is one queen in the colony, at certain seasons of the year several hundred drones, and from seventy-five to a hundred thousand of these individuals. This is the individual that has given the usual conception of bees. She is the worker bee. I say *she* because she is a female, an undeveloped female. She does not function sexually, but as a matter of fact physically is an undeveloped female, as actually neuter. It is she who brings the honey from the field. It is she who brings the pol'en to feed the young bees. She cleans the house, she produces the wax for the comb and builds the comb; she repairs the comb when it is broken. She defends the hive from robbers. She is busy from the time she emerges from the cell, from the time she is born until her death. She is nearly perpetual motion and well exemplifies the phrase that she has put into our language "as busy as a bee." If any of you are inclined to dwell upon the greater prob'ems of nature, there is nothing that can be more interesting than the tracing of the life of a worker bee. The worker bee emerges from the cell, starts in with nurse work and as soon as she is able to goes to gathering honey. In the summer time, during the busy season, she often literally wears herself out in six weeks gathering a store of honey, when there is fifty or a hundred pounds of honey in that colony still storing more honey, rushing honey and pollen into that hive, and rushing in a store of honey that there is no possible chance that she will ever partake of herself. Now what is the force that drives that bee on to that incessant labor, that makes her absolutely wear herself out, leaving the hive in her young life a beautiful golden color caused by the hairs on her body, and in a few short weeks you will see her entering the hive, her body b'ack and seared, the end of her wings frayed, and in a few weeks more crawling off and dying, absolutely worn out storing that honey which she will never touch? If you will tell me what force

compels her and drives her on, I will answer many questions about the beginning and the end of the force, whatever it is which directs this universe. It is a very interesting study.

The next picture shows the queen with the attendant bees. This is the queen here (indicating). These are the attendant bees. Now I am afraid this illustration would be, not educational but misleading. I have said myself, and it is a fact, that while I have found bees attending the queen, preening her body, had some experience with all that, I have never found any such uniform circle as this, and I should say that this was a work of art in photography and a work of great good fortune to find that attendance. I have not observed that attendance and I think it is misleading from the fact that an amateur looking in a co'ony of bees for the queen might, after seeing this picture, look for this arrangement of bees instead of the queen and that would not be the right thing to do. Fix your mind on the queen and look for her. She is easily distinguished from the others. Look for the queen and not for any arrangement of the bees.

This illustration shows the brood in the various stages of development. From the point of view of a bee-keeper this is the most instructive film that will be shown. It is the most valuable because from an understanding of this and the conditions there depicted he carries on his bee operations. To explain, the egg of a bee is white, slightly translucent, is the shape of a banana, and is about as long or a little longer than the diameter of the head of a pin. It is 6-100 of an inch long. It is deposited on the bottom of the cell at about the center and projects into the cell, deposited on the small end. Now then, if you watch that carefully, to the naked eye there will be no perceptible change in appearance for two days. During the third day the egg will not change itself but you will not notice a change, that is, you will see surrounding this egg a white milky substance. If you are watching, you will see the bees continually sticking their heads down in the cell. They are depositing food, and the third day you will see that the food is deposited in profusion. In three days or slightly more this egg will hatch into a grub or larva, as we term it. This larva will grow very rapidly. If you should observe a larva at night and the same one the next morning it very likely would have doubled in size. The food that is fed it must be of a very rich, concentrated

nature. It grows very rapidly until at the end of the sixth day when it completely fills the cell. At the end of the sixth day you will notice that the bees have put in a profusion of this white milky substance, and then that they have sealed the cell over apparently tight. That capping is not tight. It is made of shreds of wax and it is porous so the larva can develop. Now then it was in the egg stage for three days, a larva for six days, and it remains sealed for twelve days, making a total of twenty-one days. Now why this is so important and why every amateur should fix this in his mind, is that, should he open a colony and find that there are no eggs present he will know that there is something the trouble. If his hive is populous it is quite a job to find the queen; if he found her he would know she was there but if he didn't find her he would think he might have overlooked her; but if there are no eggs present it shows the queen is missing. And if the experienced bee-keeper could not find any eggs but a larva two days old, he would know his queen had disappeared from that colony five days before and would govern his operations accordingly. This is a very important thing for the amateur bee-keeper to understand, the development of the worker. The drone brood develops very similar to the worker brood with the exception that it takes a little longer developing, takes twenty-three days instead of twenty-one days to come to maturity.

This is a frame with sealed brood. This is the brood that is sealed here. As it happens there are no emerging bees discernible here, but ordinarily you would see bees emerging from it.

These are queen cells on the comb. Now we have observed this worker brood and gone into it to quite an extent. There are two great laws of nature. The first is the law of self-preservation and the second is the law of the perpetuation of the race. We have observed the bees. We have spoken of them as bringing in stores, defending the hives, doing all those things that show that they have responded fully to the law of self-preservation. They have laid eggs that would produce worker bees that would carry on the work of these hives; but as far as all that went that hive would continue on from year to year as one colony of bees. We have nowhere seen them responding to the idea of perpetuation of the race. Now the first response that we might see would be the occurrence of drone brood. I think perhaps

I can explain this to you better if you have in mind a colony of bees during the quiescent period of winter. They are not one of the seven s'eepers. They are not dormant during the cold weather of winter. They do approach a condition where the food consumption is at a minimum, the quantity at a minimum, no brood is being raised, no eggs are being laid and the colony is practically inactive. Now then as the warm days of spring come on, the alders and the willows and the red maples begin to put forth their buds which yield pollen and nectar. Warm days come and the bees fly out. They find this pollen and nectar and they rush back to the hives with their loads. The queen realizes and the bees realize that the active season is on, that it is the season for intense activity, and the queen immediately begins to lay eggs in great profusion. As a matter of fact nature has provided that soon after this she is laying eggs at her maximum of from three to five thousand eggs a day. What is the result? In a very short time young worker bees are hatching so rapidly that they are much more than taking care of the death rate of the colony from the old bees dying off, and that colony becomes very crowded. They lack room; they are overrunning the hive. When this begins to be apparent the queen will deposit drone eggs in drone cells. The drone cell is a little larger than the worker cell. She will begin to lay eggs in those drone cells and they will produce drones in preparation for the fertilization of the young queen that is to come. When the hive becomes very populous and the prosperity of the colony seems assured, the bees will take this in hand and they will take one of the worker eggs that has been laid, one of the eggs that under normal conditions would produce an undeveloped worker bee, one of the seventy-five or a hundred thousand—they will take several of those eggs—I mean by several, eight or ten of them, and you will notice that they begin to feed them unusually profusely—you will see an immense amount of this white food. That egg will remain in the egg state for about three days, as it did in the case of the worker bee, but in about five and one-half days—a half a day less than in the case of the worker egg—it will be ready to seal. Before that egg is ready to seal you will notice that even to the destruction of the surrounding cells they have increased the size of that cell—they have begun to draw it out and they have drawn it out into this shape (indi-

cating). This would be about the size of the end of my little finger and look very much like a peanut. At the end of five and a half days this will be loaded with this white food and will be sealed over.

Now a few days after this is sealed over, if you are observing the hive continually and very carefully, you will notice, provided the hive is very populous, a rushing of bees over the comb, apparently aimlessly, going hither and thither over the comb, rushing to the entrance, rushing back to the combs again, and finally but at some signal unexplained to you, there is a rush through the entrance and out comes what seems to be that entire colony of bees which swarms around in the air near the hive for a little while, then goes to a neighboring tree and clusters there.

These are the queen cells torn open. We will pass over that.

This is the condition that we find in this tree. Now with the single exception of telling you that among this great mass of bees somewhere in the center is the queen from that colony, I am going to leave them hanging there and go back with you to the hive that they left. You remember that we had those eggs fed very profusely, that they had remained three days in the egg state, then developed into larvæ, then these large cells had been drawn out and they had been sealed. That had happened a day or two before. Now in about seven days from the time that this was sealed over, if we are watching carefully, one of these, the most mature of them, will be seen to have been gnawed from the inside round in a circle, and if you are watching you will notice this cap pushed out, and out of that comes a bee. It is not a worker bee, it is not a drone, but it is a young queen. She will go over the comb, take a sip of honey, take food, crawl around until she finds another queen cell such as this one, then she will attack it, tear it down and kill the inmate. She will go over the hive and do that in each case. Then we have one queen remaining in the hive as we had before. Now in from five to eight days from the time that she was born you will notice the queen go to the entrance, fly out a little way, hover in front of the hive, come back, evidently marking her location, and finally she will take wing and disappear. She is gone for some time and returns to the hive and you will find attached to her a foreign substance, a white substance. Now what has happened? This is what is called the marriage or nuptial flight of the queen.

She has flown into the air and has met one of the drones that I told you were emerging about this time. Nature has provided an abundance of them at this season of the year when the young queens are coming out. She has mated with a drone in the air and the organ of the drone is still attached to her body. She has mated for life, and she returns to the hive, never to leave it again until the following season she leads out a swarm of bees, as her mother whom we left hanging in the tree there a while ago, has done.

Now then we will come to this swarm of bees in the tree. As I have told you, there is a queen among them. It is rather mysterious to see them hanging in the tree, in the bright sunlight perhaps, with no shelter and apparently perfectly content. This apparent contentedness is deceiving for us because we do not know what is going on. As a matter of fact there are several scouts that are scouting the surrounding country looking for a new home, and when they return, it may be an hour, it may be twenty-four hours, they evidently give the signal that a home is found, and all at once this colony of bees will break into the air in a swarming mass and take a bee line to that new home. They will enter it, the bees will feverishly set to building combs and bringing in honey, the queen will feverishly set to laying eggs. Thus the bees respond to that second law of nature, the perpetuation of the race.

I have tried to tell you something of the bees' life in these pictures. Now what I have told you as a matter of fact might be much like a man who had never seen an automobile—a man drives up with an automobile, gets out and says, when you want to go why you pull on this and step on that and push that forward and go ahead. The amateur will find there is a great deal to learn, after what I have told him. There are many variations from that routine of the colony. But I have gone over this, not so much with the hope of instructing you in the care of bees, as to try to emphasize the one point, that should you be so inclined, that is, if you are orcharding and you feel your orchard demands bees and you cannot persuade some bee-keeping neighbor to locate near you, there is no reason why you should hesitate to attempt it yourself, because you can do it just as a man can learn by attempts and by trial to drive an automobile.

There are some more films that we will go over rapidly.

These are pollen baskets filled—just simply represents the hind leg of a bee and the baskets filled.

These are pellets of pollen as they come from a bee, as they are torn off from a bee's legs. They are shown in comparison with an ordinary size thimble, showing you the amount of pollen that a bee will bring into a hive at a time, that is he will come in with two, one attached to each leg. So you see the amount of pollen brought in at a single load is not insignificant, and the orchardist should recognize from this picture that the bee has been pretty busy to take the fine dust—all of you know how fine it is—and bring in two of these pellets at a single load. Now as to the scientific part of the bee gathering this pollen, going from flower to flower and picking up the pollen in his mouth, moistening it with nectar from the flower, and the method that he has of transferring this back to his hind leg and from there back into the pollen basket, and going into the hive and prying it loose, I do not think would be particularly interesting to the orchardist. But the collecting of pollen suggests one thing that may arise in the mind of the orchardist. The orchardist may ask how near bees should be to his orchard in order to become effective. He asks the bee-keeper how near they should be, and the bee-keeper will tell him that bees will fly from one to three miles in search of pollen and nectar, and he may conclude that bees that are three miles from his orchard, or two miles from his orchard, or one mile from his orchard are sufficiently near. Although I will not state this on absolute authority, I am quite convinced in my own mind that this is not the case. About two miles from our own home yard in a bee line from us there has been for a number of years a gentleman who has quite an orchard, and is a gentleman who looks into matters rather thoroughly. A few years ago we kept practically the only Italian bees that were in the neighborhood and he recognized the difference between our bees and the ordinary black bees. In talking over the matter he said that he felt quite confident that he could tell when our bees were visiting his orchard, and said that in the ordinary season the bees would visit his orchard and would pollenate his fruit sufficiently. He said, however, that there were years when it was rainy and dull and there was not much sunshine when he suffered from the lack of bees to pollenate his flowers, and that those same years an acquaintance of his who

lived about on a line from his place to ours but instead of being two miles distant was about an eighth of a mile distant from us, would secure an excellent crop and he explained it in this way: that on the days when the bees fly for only an hour or so after dinner that the sun would come out bright enough so they could fly an hour or so that they would go far enough to visit this orchard of his neighbor, whereas they would not go over to his place the two miles and visit his orchard. I am inclined to think he was right, and I would suggest that it would be better in the long run to have bees within a few hundred yards of the trees. In a great many years it would not be necessary, but there would be the one exception perhaps in five or six years when you would need them and when your crop would pay for the trouble of keeping them.

This is a bee tree cut open. If any one gets the idea of hunting bees for profit he better get over it as soon as possible. It is a good deal like partridge hunting, I reckon they cost me probably ten dollars a piece. And the bees will cost you much more. But if you like to go out in the sunshine and out in the woods, the hunting of bees is a very fascinating pastime. In general the hunting of bees, roughly outlined, is to take two boxes, and it is well to have a close cover; in one of them is some sweetened syrup. The old hunter will tell you that about the time you see the bees begin to work on the cucumber vines is the time to hunt bees. The flow of nectar is not abundant and the bees will attack any accumulated sweet. But you could set a bowl of honey in your bee yard when flowers were in full bloom and nectar was abundant and it would not be touched. When the nectar shuts off the bees become very eager to secure any accumulated sweet. The operator takes these boxes and goes out into the woods until he notices bees on the flowers. He catches several in this empty box and when he has several caught he will take his box with honey or syrup and invert the other box bottom side up so the opening is clear and the bees will go down and fill up. He will remove this box carefully, they will come out and circle around to mark their location and then strike in a bee line for their home. When they come back they will probably bring other bees with them and in time a line of bees is established going and coming in a certain direction. Then the operator will take his box when it is fairly full of bees and move

along this line. He will probably do that until the bees begin to fly back. That shows he has gone by the tree. When he finds he has gone by the tree, then he will probably set off at right angles and get a line there, and the intersection of those lines will be the approximate location of the tree, when he will go in and examine the trees in that locality that seem likely to have cavities where the bees could be found. If any of you should attempt this, I would say one of the things in finding a colony is not to find the place where the bees are going in and out the trunk of the tree, but if you suspect bees in a tree, go out where you can look into the openings of the outside branches and walk around the tree and observe these openings carefully, and in the bright sun you will easily see them darting back and forth across these openings, and if you go on the other side of the tree and find none it shows they stop there. It is difficult to see bees going in and out of a tree, but it is not so difficult to see them in among the branches.

In this picture a queen is being placed in a cage for mailing. It is interesting probably to you, from the fact that the ordinary bee in the State of Maine is a hybrid or black bee. It is of a nervous disposition, is inclined to be cross, and a great many do not like to handle them. They prefer the Italian strain of bees. And gentlemen in the West and South have chosen isolated localities where there are no other kinds of drones flying but their own and there they breed queens. This queen when she is once mated is mated for life. They take these queens and place them in small cages of this style, which is simply a wooden block with three holes bored down into it, nearly through it, and on each end is a hole. The further opening from us is filled with queen cage candy. A piece of pasteboard is tacked on the back edge and a wire cloth on top. The queen and several attendant bees are placed inside and a wire cloth is tacked over here. They are mailed through the mail. When the queen arrives the purchaser will be sure that the old queen is killed in the hive, and will then place this queen in here underneath, so that the bees may become acquainted with her and she may absorb the odor of the colony before being liberated. Since she is mated for life her eggs will produce only Italian bees, so that in three weeks you will notice the Italian bees emerging on your combs, and finally the old black bees die off and your colony is a pure Italian colony.

This is extracting equipment in a honey house. I do not think this would be as interesting to the amateur only in the way of knowing how the science has developed. Here we have the power extractor that runs by a gasoline engine. This is a centrifugal machine, a separating machine in a way. We take the combs and with a sharp, heated knife cut off the cappings, set the combs in a basket in this machine so and set it to revolving and by centrifugal force the honey is thrown out on to the sides of the extractor. It runs down and is drained off here and is pumped by a tunnel running up here through this pump and down into the long tank where it is strained before going into this tank. Here it is drained off into the cans for sale or storage. Then the combs are placed in this device here, and the cappings are placed here, when by heat the wax and the honey are separated.

This is what is called a beginner's outfit by one of the supply houses. If I dwell on this much it will take on the nature of advertising, so I will skip over this with simply a mention of some of the articles here. The book is simply a book on bees and need not be mentioned, magazine on bees, gloves, the hive stand, combs and the wire, the hive body itself and the super. The general idea being that the bees raise their brood in a frame of this size and that they store their surplus honey in a super of this style—this is a convenient tool box, and the hive tool and the smoker. Perhaps I might dwell somewhat on the function of the smoker. It does not stupify the bees; that is not the intention. When smoke is blown into a hive the bees seem to have the natural instinct that they may be driven from their home, and if they are driven from their home it is perfectly natural whether they go as a swarm or for any other reason that they go filled with honey. They fill their honey sacs in order that they may live for several days until the new home is located and the comb built and housekeeping started again.

It is a fact that bees when filled with honey are docile and easy to handle. The operator simply takes advantage of this instinct. The smoker has a bellows and a firebox where oil or waste or burlap or punk wood or something of the kind is set burning and the smoke is blown into the entrance of the hive, causing the bees to think their home may be disturbed and to fill themselves with honey and therefore to be more easily handled.

This is an extracting outfit. There is nothing to be explained other than it gives perhaps a little better view of what the extractor is. Here are the comb baskets. The operator turns it by hand, throwing the honey out on to the side and it is drawn off.

This is a colony of bees packed for shipment. The principal thing to remember in shipping bees is not to ship them when they are not very strong and to give them plenty of ventilation. You will notice that the bottom of the hive is attached to the brood chamber and that a screen is p'aced over the entrance. Then there is a full size screen over the top of the hive, and end blocks nailed here and a cover placed over that to protect them from the sun, this space being open here to give top ventilation. Should any of you purchase bees that come packed in this style, I think perhaps one of the best things to do is to set them on their permanent stand where you intend them to be, and unless it is cold or rainy it is well to take the cover which came with the hive and press it right on top here, and then especially if you are a little timid, to take pincers or something of that kind and reach across to the entrance of the hive and quickly tear away the screen for its whole length or a part of it to leave an opening, and go away and leave the bees for a few hours. You can come back then, when they have quieted down and have marked their location, and can smoke them and remove this temporary cover and place on the permanent top.

This is a picture of bees swarming on the body of a person. I am not going to dwell a great deal on this. I should doubt from things that I see here that this had any such purpose in it, but I am afraid some operators of bees foster the idea of mystery in bee-keeping, they rather enjoy having the unitiated look up to them as being people favored in a particular way. Now that is not the idea in this picture at all. It is simply for the purpose of telling the attitude of the bee. Now this same gentleman here who has bees clustered over his arms and on his bare hands today in this picture would not do any such thing at another time. It is true you can handle bees at some times in this way. If you want to get into your bees, do not do it at night when you think they will be quiet; do not do it in the early morning before they begin moving; do not do it when it is raining. Those are the worst times you can pick out. But go at your bees on a sunshiny, bright day, in the middle of the day, when the bees

are darting out and coming in loaded with honey, so you will see them drop in front of the hive, then dart out after another load. When honey is coming in profusely then the operator can handle bees much in this way without much danger of stings. However, the amateur should always wear gloves and a veil. They give him confidence; nervous, flighty motions about bees are not desirable.

This shows the face of an observation hive, which is simply a frame of bees and brood placed in an observation hive, with sections of honey placed over it. Now some of you may have in mind that you would like to study bees and that you would like to observe the inside workings of a hive, and some of you may see advertised by the various supply houses what you will see listed as a one frame observation hive, or a five frame, or an eight frame observation hive, and the five or eight frame observation hive will cost a great deal more, and therefore you might assume is a great deal better, but a five or an eight frame observation hive absolutely does not accomplish its purpose. The trade demands them and certain houses put them out. But the idea is that if you have more than one frame in the hive, with the exception of one or two very elaborate arrangements, the queen which you observe will naturally go between the combs and you cannot observe her. If you wish to study the inside workings of a hive, the observation hive for you to purchase is the one frame observation hive.

I hope I have made this interesting to some who do not know bees, and if there are any questions you would like to bring up at this time I shall be glad to do what I can to answer them.

QUESTION: I have heard some talk about the changing temperature, the heat and cold, killing bees, and say that it is hard to raise bees in Maine on account of the changeable climate, sudden changes.

Mr. MASON: Well, if you mean your expression in a technical way, that is, as a beekeeper, it might be possibly. The South is the place to raise the bees themselves. We consider that the place to raise bees themselvs—for the business of selling bees, you understand. But as to the bee keeping possibilities, the bee keeping possibilities in the North are really better than they are in the South. In the South they have a continued flow of honey during the whole year. That continued flow of honey

stimulates the queen to immense activities, a large amount of brood is raised, and they are all the time consuming an immense amount of honey; whereas in the North our bees are dormant during a long period and then brood-rearing starts intensively, and the honey flow comes along with a rush and the Northern beekeeper may get his surplus in ten, twelve, or twenty days, and he will get more surplus honey. If I am to interpret your question to mean the raising of bees for sale to the market, the South is more desirable. But if you mean it is difficult to take a colony of bees and make them live year after year, in the North, it is not.