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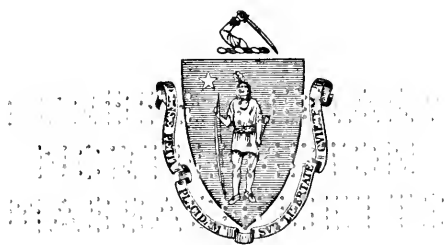
ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR THE

YEAR ENDING NOVEMBER 30, 1922



PUBLICATION OF THIS DOCUMENT

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DEPARTMENT OF AGRICULTURE, 1922.

Commissioner of Agriculture.

DR. ARTHUR W. GILBERT OF BELMONT.

Advisory Board appointed by the Governor and Council.

	Term expires Nov. 30.
HERBERT N. SHEPARD OF WARREN	1922
EDWIN H. PRIEST OF LITTLETON	1922
JOHN BURSLEY OF BARNSTABLE	1923
STUART L. LITTLE OF NEWBURY	1923
LESLIE R. SMITH OF HADLEY	1924
EVAN F. RICHARDSON OF MILLIS	1924

Organization of the Department.

DIVISION OF DAIRYING AND ANIMAL HUSBANDRY

O. M. CAMBURN OF ARLINGTON, *Director*.

DIVISION OF INFORMATION

DR. CHARLES D. WOODS OF BOSTON, *Director*.

DIVISION OF MARKETS

WILLARD A. MUISEN OF WATFORD, *Director*.

DIVISION OF ORNITHOLOGY

ELWARD HOWE TORRUSH OF WESTBOROUGH, *Director*.

DIVISION OF PLANT PEST CONTROL

R. HAROLD ALLEN OF MANSFIELD, *Director*.

DIVISION OF RECLAMATION, SOIL SURVEY AND FAIRS

LESLIE R. SMITH OF HADLEY, *Director*.

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The Commonwealth of Massachusetts

REPORT OF THE COMMISSIONER.

The business of farming in Massachusetts has made very distinct progress in the last few years. This is a result of activities of the various educational and other agencies which have done admirable work in the encouragement and assistance to agriculture during many years past. It is also due to an increased freight rate which has given the farmers of New England a better competitive advantage with the farmers from the West and the South.

Very noticeable changes are taking place in Massachusetts agriculture. Instead of old-fashioned generalized farming the recent tendency has been toward specialization and the adaptation of a system of farming to our condition of land and markets which is best fitted to bring about maximum returns and produce, in many instances, a fair profit. The future of farming in Massachusetts lies in the raising of high-quality products. In considerable measure the expensive hand operations are being replaced by the use of modern machinery. This specialization calls for greater skill on the part of the farmer in production and marketing. Through educational agencies he is acquiring this skill in greater degree, particularly during the last few years. Farmers' meetings no longer deal with the fundamental, and, in many instances, elementary farming problems which have now become well known, but are concerned with technical problems of a high order. Meetings of farmers for the discussion of these problems compare very favorably with groups of other business men for the discussion of their problems.

RELATIONS WITH OTHER AGRICULTURAL AGENCIES.

There are many agencies at work for assistance to the farmer. The most effective of these are made up of farmers themselves. There has been a growing tendency for greater harmony among various organizations which deal with farm problems. These

agencies hold an annual convention each year, the program and organization of which is largely directed and controlled by a committee made up of representatives of these farm organizations. This is the Winter Meeting of the Union Agricultural Organizations.

WORK OF THE STAFF.

I again wish to record the enthusiasm and vigor with which all members of the staff have carried on their work during the past year. There has been no regard for hours of labor, but each has worked to the best of his or her ability to bring about best results in our field.

CHANGES IN THE STAFF.

The Department of Agriculture has been most fortunate in securing the services of Dr. Charles D. Woods as Director of the Division of Information. Dr. Woods for many years has been director of the Maine Agricultural Experiment Station, where he gained an enviable reputation as one of the best known and highly respected experiment station directors in the country. He brings to this Department and to the State a wealth of knowledge and information which is a great asset to the work which this Department is attempting to perform.

Mr. John W. Plaisted, the former Director of the Division of Information, has been assigned to duties in connection with regulatory law enforcement and the carrying out of the provisions of other laws entrusted to this Department that require the technical knowledge for which, by his legal training, he is especially fitted.

RECOMMENDATIONS.

1. *To change Administration of Laws regulating Sale of Fertilizers and Feedingstuffs.* — The police laws of the Commonwealth are, for the most part, handled, as they undoubtedly should be, by the executive branch of the government. The laws concerning dairy products, plant and orchard and forest pests, grading and packing of agricultural products, and the like, are entrusted to the Department of Agriculture for their enforcement. The laws regulating the sale of commercial fertilizers and commercial feeding stuffs were enacted prior to the establishment of the Department of Agriculture. These laws are now entrusted to the Director of the Experiment Station, a department of the Massachusetts Agricultural College. In like manner the old

Board of Agriculture antedated the establishment of the college and teaching agriculture was carried on by the Board as a part of its work. Recognizing the overlapping and duplication of effort some time since, the Massachusetts Agricultural College and the Massachusetts Department of Agriculture entered into a memorandum of agreement whereby the regulatory and administrative agricultural work of the State is to be done by this Department and the educational work by the college. The Department of Agriculture has entirely withdrawn from the educational field. Looking toward greater efficiency and the proper correlation of efforts, I recommend that the administration of the laws regulating the sale of commercial fertilizers and commercial feeding stuffs be transferred from the Director of the Experiment Station to the Commissioner of Agriculture. I also recommend that the analytical work which is of a scientific nature, and the publication of the results of the analysis which are educational, be left, as they now are, with the Experiment Station. This recommendation is in line with a movement in the State Departments of Agriculture in all of the other States in the Union. A few years ago the National Association of Commissioners, Secretaries and Departments of Agriculture outlined a plan for the differentiation of these lines of work. I quote two paragraphs from a resolution adopted by this association in 1920. Since that time most of the States have swung into line and are following this plan, which has been found to be of the greatest degree of efficiency and economy.

The beginning of this work was at the New York meeting in 1916, and culminated in a careful and detailed discussion and unanimous adoption of the plan now in force under this association at the meeting at Baltimore in January, 1919. The plan was first outlined at a meeting of the executive committee and officers of the association in Washington in November, 1918. A committee appointed at the time of this meeting presented the plan to the Secretary of Agriculture, Mr. D. F. Houston, and later to the Executive Committee of the National Association of Land Grant Colleges and Universities. It was adopted by both agencies and by the entire body of representatives of Land Grant Colleges at their national meeting at Washington in November, 1918. With this adoption by our own association it became the national policy as a thorough and detailed discussion by each of the three important agencies concerned.

The plan places all regulatory control and administrative work relating to agriculture, and extension work concerning the same, with the State departments, and locates the purely experimental and educational work with the stations and college.

2. *To regulate Advertising of Substitutes for Butter.* — Through the inspection work of this Department certain oleomargarine advertisements have been detected which are misleading, since they use dairy terms and names of dairy animals, a use which is not fair to the dairy industry or to the consumer. To correct this practice legislation is recommended to prohibit such advertising.

3. *To prohibit Adulteration of Milk in Certain Forms.* — The dairy inspectors of this Department, during the past year, have observed on the shelves of retailers compounds which consist of evaporated skimmed milk, with an amount, substantially, of cocoanut oil substituted for the butter fat which has been extracted from the whole milk. These compounds resemble condensed milk, and, despite the fact that they are carefully labeled and the manufacturers contend that they are not sold as a substitute for condensed milk, investigations show that they are placed on the shelves of retailers beside the condensed milk, and in some instances the term "milk" is added, so that they are being offered to consumers as a substitute for condensed milk. Legislation to protect the consumer from these products is therefore recommended.

4 and 5. *Concerning the Suppression of the European Corn Borer.* — In view of the seriousness of the present situation we are making two recommendations. The first of these provides a system under which the work to suppress the corn borer can be successfully conducted. The second requires landowners to take certain measures which ought to be of great assistance in reducing the infestation. Since a great many of the borers live through the winter in corn stubble, they can most readily be destroyed by plowing the stubble under so that the borers cannot get to the surface, or by destroying the stubble in some way.

6. *Further Amendment of the Drainage Law.* — The last two years' experience with the drainage law brings two points forcibly to the front, — first, an additional method for financing these projects is necessary; and second, the assessment maps and rolls defining project areas and notifying each owner of his proportional share of the expense need to be made before the projects are carried to the county for financing. Regarding the first point, the present law makes it obligatory for the proj-

ects to be financed by the county. The legal machinery provided for this purpose is very cumbersome, and does not operate smoothly. Provision should be made in the law to permit the districts, with the approval of the Board, to sell their bonds in the open market without involving the counties or the towns. On the second point we believe that the State should provide the funds for these surveys, as this is in accordance with the provisions of the law as it now stands, and as there is no other source from which the funds can be made available for that purpose.

CO-OPERATION WITH OTHER STATE DEPARTMENTS.

There has been a noticeable harmonious working together of State departments during the past year. The Departments of Correction, Public Welfare, Public Health and Agriculture have a working agreement for the improvement of farming operations on the State farms. These contain many thousands of acres of good land which are receiving expert guidance along scientific lines.

The Departments of Public Safety and Agriculture are working closely together to make the newly created State constabulary of greatest benefit in rural districts.

The Departments of Conservation and Agriculture are in closest harmony in the eradication of bovine tuberculosis among domestic animals and in working out problems of farm forestry.

The Department of Agriculture and the Massachusetts Agricultural College have working agreements which prevent duplication of work and bring about closer co-operation.

DAYLIGHT SAVING.

The régime of daylight saving has again been injurious to the farmers of the State. I again recommend the repeal of this law, or at least, local option in which the various communities of the State may vote for themselves as to whether they wish to be under daylight saving or standard time.

POULTRY THIEVING.

The ease of travel by automobile has brought about a greater amount of thieving in the country than ever before, particularly that of poultry. I urge greater vigilance on the part of

local and State police authorities and others, and the infliction of maximum penalties upon such persons as have been caught at such thieving.

PAYMENT FOR MILK.

Last year the Legislature passed a resolve requiring this Department to make an investigation of payments for milk by the milk dealers of the State. It has been known for some time that farmers lose a great deal of money each year from the sale of milk to persons who are financially irresponsible. At the present time farmers have no way of obtaining the financial standing of any but the largest milk dealers. The latter usually are rated by well-known rating companies, and their financial status can be obtained. I recommend that the Department of Agriculture be given authority to obtain accurate information concerning the financial standing of such of those milk dealers who are not rated by well-known national agencies or who are not properly bonded, this information to be kept confidential but to be made known to any one asking for it in the form of a rating guide, so that all milk producers, and others, may be able to decide for themselves as to the financial standing and responsibility of those milk dealers with whom they are doing business.

FUTURE OF FARMING IN MASSACHUSETTS.

The farming industry in Massachusetts has a bright future. Now that farmers have begun to specialize and adapt their modes of farming to our conditions of soil, climate and market, and are getting away from generalized farming, I believe that there will be found a greater prosperity among them than has been seen for many years. The work of the boys' and girls' agricultural clubs, the encouraging number of students and farmers who are trained at the Agricultural College, and the activities of the farm bureaus and other agencies point toward a greater number of trained men and women in agriculture who will bring about its rejuvenation. In most country districts there are now leaders who have had some specialized agricultural training. This will increase.

Our Division of Markets is performing notable assistance in the development of better markets for farmers, which also means lower prices to consumers.

The Division of Fairs is bringing about a much greater efficiency in the conduct of agricultural fairs and greater encouragement to agriculture as a result of it.

The Division of Animal Husbandry is assisting in many ways to improve the large number of pure-bred dairy animals, of which the State has many outstanding herds.

EUROPEAN CORN BORER.

The European corn borer has increased in numbers and damage in the State to an alarming extent. It appears to become a menace to our farming, which may result in enormous financial loss. The presence of this insect in great numbers on the eastern border of the United States also presents a possible national menace. If this dangerous insect should spread from this State to the great corn and cotton belts it will be difficult for one's imagination to estimate the amount of damage which will result. This is a serious State and National problem. I recommend legislation which will assist to keep it down by means of requiring all corn growers in the quarantine area to plow their fields properly in the fall or to rake and burn the corn stubble. It is expected that this will help materially in keeping this pest in check. I do not believe that we can expect to eradicate it—at least, not until its parasites have been developed in sufficient quantities to do this. It may be necessary for the Commonwealth to make large appropriations to assist in cleaning up areas badly infested, to save the market-garden and farming industry from very serious damage. We are aware, also, of its national danger, and have called attention to the members of Congress, Governors and commissioners of agriculture in other States, with the urgent request that Federal appropriations and assistance be made available to keep this insect in what is now a relatively small territory.

Respectfully submitted,

A. W. GILBERT,
Commissioner.

REPORT OF THE DIVISION OF DAIRYING AND ANIMAL HUSBANDRY.

INSPECTION WORK.

The dairy inspectors of the Division have made 8,928 inspections during the past year. One hundred and thirty-seven samples were taken, most of them purchased. There were 7 court cases prosecuted during the year, violations of the oleo-margarine laws, all resulting in convictions.

It has been our policy during the year to prosecute only major cases where manifestly violation of the law has been either willful or persistent, or both. In minor cases where technical violations have occurred, whether through ignorance or carelessness, such conditions have been remedied through helpful inspection and advice. We find such violators glad and willing to comply with the statutes when once the matter has been clearly pointed out to them. This policy saves persons from unnecessary criminal records and courts from unnecessary cases. It works well.

Inspections during the Twelve Months ending November 30, 1922.

MONTH.	Inspections without Samples.	Inspections with Samples.	Total.
1921.			
December	950	27	977
1922.			
January	859	14	873
February	848	26	874
March	949	9	958
April	319	3	322
May	512	—	512
June	368	—	368
July	1,260	1	1,261
August	667	—	667
September	116	8	124
October	780	11	791
November	1,185	16	1,201
Total	8,813	115 ¹	8,928

¹ Twenty-two additional samples were taken during inspections, making total samples taken or purchased, 137.

Summary of Inspections.

Total number of inspections	8,928
Number of inspections where no samples were taken	8,813
Number of samples, mostly purchased	115
Number of additional samples taken during inspections	22

COURT CASES PROSECUTED.

The charges in the several cases prosecuted in court during the year were as follows:—

Selling oleomargarine colored in imitation of yellow butter	5
Selling oleomargarine without signs on vehicle	2

Summary of Court Cases prosecuted during the Twelve Months ending November 30, 1922.

CITY OR TOWN.	Where tried.	Month.	Number of Cases.	Law violated.	Convictions.
Fall River	Fall River	April	4	Oleomargarine	4
New Bedford	New Bedford	September	2	Oleomargarine	2
Fall River	Fall River	October	1	Oleomargarine	1
Totals	—	—	7	—	7

DAIRY SITUATION.

That Massachusetts farmers are interested in dairying is manifest by the increase in the number of cows as of April 1, 1922. The assessors' report for 1922 shows 167,181 cows, which is an increase of 8,976 animals, or 5.6 per cent, over the 1921 report. During the past fifty years the smallest number of cows was reported in 1915, since which time there has been a steady increase, so that the number in 1922 is 15 per cent greater than that of 1915.

The dairy farmers are constantly working to improve their herds, as is indicated by the data taken from the 1922 supplementary list to the breeders and owners of pure-bred dairy cattle, issued in 1920. The 1922 list shows 605 persons owning 4,343 pure-bred animals who were not listed in the earlier bulletin.

There are now 8 producers' co-operative milk-distributing plants operating in the State. The number of farmers shipping

to them is increasing. Some of these plants are making ice cream, thus handling profitably the product offered above fluid milk sales. The motto of "Essex County milk for Essex County people" has increased sales and also caused other milk distributors to seek a supply of near-by milk. This purchase of near-by milk is on the increase generally in the eastern part of the State.

The use of milk is increasing in the various cities of the State. Reports of Boston's rail supply of milk and cream show an increase of 8,000,000 quarts over last year. Massachusetts farmers shipped to Boston 12,569,772 quarts of milk during the first ten months of 1922, which is an increase of 1,627,000 quarts, or 14.8 per cent, over the same period in 1921. The serving of milk in the schools of the State is increasing remarkably. Several factories also have bottled milk available for their employees during working hours.

The demand for certified milk is increasing in the State. Twelve farms, with approximately 1,285 cows, are supplying 17 cities with certified milk. This is an increase of 5 farms and 510 cows supplying 5 additional cities over last year's report. Certified milk is offered at from 20 to 30 cents per quart, and in one instance at 35 cents per quart.

Special milks of various brands usually sell at from 1 to 8 cents above the regular price for bottled market milk. Their use is on the increase. This demand for special high-quality milk is even greater than last year, and Massachusetts dairy-men are eager to supply the demand.

DEMONSTRATION SHEEP FARMS.

The demonstration sheep farms have been of increased service to the sheep raisers of the State. During the year the 6 farms have had over 900 visitors, and have given to groups of interested farmers 17 demonstrations at the farms and 22 demonstrations at other farms. These have been on the copper sulphate treatment for parasites, docking, castrating and machine shearing. The farm managers have made official visits to 474 farms to give assistance and advice concerning sheep husbandry.

The shearing machines have been frequently called for, shearing almost 1,500 sheep. One of the farms extended a special

invitation to 3 schools. The children on visiting the farm were given an instructive talk on sheep, and saw the power-shearing machines in operation. Last spring 4 of the sheep farms gave extra attention to the special dressing of early lambs to supply a special market. Sheep raisers near those farms, who had early lambs, were instructed in the best way to dress lambs, and obtained satisfactory prices.

The demonstration farm managers have also been of great service in encouraging the use of paper twine for tying fleeces; advice on feeding the farm flock; planning sheep pens; assisting in selection of pure-bred rams; in treatment for parasites; and in the assembling of small pools of wool.

This year most of the farmers asked for a plan to sell their wool in the grease. Therefore the several demonstration farms served as points of assembly, and small pools of wool were made in these communities. A total of 37,681 pounds of wool was sold through these local pools. The country buyers were offering about 25 cents per pound early in the season; later, in one community, 30 cents per pound was offered. The growers by pooling received from 36 cents early in the season to 45 cents later. With the larger lots of wool to bid on, buyers offered the more satisfactory prices, and the growers received, net, from 34 to 42 cents, which averaged almost 9 cents per pound, on all the wool sold, above what the country buyers were paying.

Inquiries were received from time to time to have small lots of wool made into virgin wool blankets, as last year. The total amount of wool offered for manufacturing into blankets was too small to justify making a pool this year.

The managers of these farms state that the sheep raisers are asking more and more for advice on sheep husbandry and for the service offered by these demonstration sheep farms.

EXHIBITS AND MEETINGS.

In April a special dairy exhibit was put on at the Home Beautiful Exposition. This exhibit was made up of a herd of 10 dairy animals, 3 beef animals, and dairy house equipment in operation. Various breeders of pure-bred dairy cattle supplied noted dairy animals, representatives of their respective breeds. The dairy herd was made up of 2 Holstein cows, 2

Jersey cows, 2 Ayrshire cows and one bull calf, and 3 Guernsey cows. The beef animals were excellent representatives of the Hereford breed and the Aberdeen-Angus breed. A number of schools took advantage of this opportunity and a great many classes visited this exhibit to study the different breed characteristics. The milk produced at three milkings each day was handled at a model dairy house. Here the milk was strained, cooled, bottled and capped in full view of the visitors, who were eager to secure a drink of freshly produced milk. A fully equipped dairy-testing laboratory was of considerable interest to a great many people.

Much interest was manifest in the beef animals. People returned time after time to ask questions about them.

At the Eastern States Exposition a three-room dairy plant was in full operation daily during the week. A herd of 15 dairy cows was stabled in a tent supplied with modern dairy barn equipment, swinging stanchions, individual drinking cups, cork brick floor and concrete gutter. This herd was milked three times daily. The milk was taken to the dairy plant in the Massachusetts Building, where it was again strained, cooled, bottled, capped and made available to visitors, who were eager to drink freshly produced milk.

At the Union Agricultural Meeting in January, and at the Sturbridge and Barre Fairs in the fall, a special exhibit was put on with maps showing the number of pure-bred animals, of each of the five dairy breeds, shipped from Massachusetts, and the States to which they went. Over 5,000 animals were shipped to 46 States.

During the year twenty-three meetings were attended, — grange, county breeders' clubs, dairymen's meetings, — at which addresses were made on Massachusetts pure-bred dairy cattle, cow-testing association work, co-operative milk marketing, and purpose of county breeders' clubs. The classes of dairy cattle were placed at one agricultural fair.

BOVINE TUBERCULOSIS SITUATION.

The live-stock owners of Massachusetts were eager to avail themselves of the provisions of chapter 353, "Relative to compensation by the Commonwealth in certain cases where animals affected with bovine tuberculosis are killed," which became

operative August 1, 1922. Immediately a great many cattle owners voluntarily made application to have their herds tested. The number of herds and animals submitted on the applications was in excess of the funds available. Nineteen herds with 414 cattle were on the waiting list November 30, 1922. There are now 322 herds with 9,463 cattle under supervision, which is greater than last year by 148 herds with 2,998 cattle. The November, 1921, report shows 55 herds with 1,807 cattle once tested free, and 41 herds with 1,436 cattle fully accredited. The November, 1922, report shows 101 herds with 2,371 cattle once tested free, and 65 herds with 2,379 cattle fully accredited. A comparison of these two reports shows a marked advance, and indicates the interest of cattle owners in this important work.

LEGISLATION.

Through the inspection work of this Division certain oleomargarine advertisements have been detected which are misleading, since they use dairy terms and names of dairy animals, a use which is not fair to the dairy industry or to the consumer. To correct this practice legislation is recommended to prohibit such advertising.¹

The dairy inspectors of this Department, during the past year, have observed on the shelves of retailers compounds which consist of evaporated skimmed milk, with an amount, substantially, of cocoanut oil substituted for the butter fat which has been extracted from the whole milk. These compounds resemble condensed milk, and, despite the fact that they are carefully labeled and the manufacturers contend that they are not sold as a substitute for condensed milk, investigations show that they are placed on the shelves of retailers beside the condensed milk, and in some instances the term "milk" is added, so that they are being offered to consumers as a substitute for condensed milk. Legislation to protect the consumer from these products is therefore recommended.²

Chapter 36 of the Resolves of 1922, entitled "A resolve providing for an investigation as to the expediency of licensing contractors and dealers in milk and cream and related matters," stated:

¹ Introduced as House Bill No. 2.

² Introduced as House Bill No. 3.

That the department of agriculture is hereby directed to investigate the purchase, collection and shipment at wholesale of milk and cream by contractors or dealers, and such other related matters as are contained in house bill number six hundred and thirty-nine of the current year, with special reference to the feasibility and expediency of licensing such contractors and dealers, and to report its recommendations, together with drafts of bills embodying the same, to the general court, not later than the second Wednesday in January, nineteen hundred and twenty-three.

In furtherance of this resolve, public hearings were held in nine cities and towns, — Nantucket, New Bedford, Brockton, West Brookfield, Hardwick, Greenfield, Pittsfield, Grafton, and Sterling. In announcing these hearings notices were given to the newspaper circulating in the various territories; 12 farmers' clubs, 46 granges, 22 milk associations, 314 milk dealers, 9 milk inspectors and 8 county agricultural agents were notified of the date, time and place of meeting in their respective territories. In addition to these meetings investigations were carried on in 21 cities and towns, — New Bedford, Fall River, Taunton, Brockton, Lynn, Salem, Beverly, Gloucester, Ipswich, Newburyport, Amesbury, Lowell, Lawrence, Haverhill, Waltham, Framingham, Fitchburg, Hardwick, Gilbertville, Gardner, Pittsfield. The losses entailed by dairy farmers, due to certain milk dealers failing to pay for milk, amount to tens of thousands of dollars, and is a condition not limited to any one part of the Commonwealth, but is prevalent in general, varying only in degree of loss.

To meet this condition suggestions are offered for legislation in a more detailed report.¹

¹ Reported in House Bill No. 396.

REPORT OF THE DIVISION OF INFORMATION.

The Division of Information collects and compiles agricultural information and statistics; prepares, edits and distributes the publications of the Department; has charge of the Department library; furnishes publicity material to the press; answers inquiries on agricultural matters; maintains an employment bureau for farm labor; acts as an advertising and sale agency of farms; and co-operates in an advisory capacity with the State departments having charge of institutions which maintain farms.

Other than the development of the co-operative work with other departments of the Commonwealth having agricultural activities, the work of the Division has progressed along the lines that have characterized its activities in other years. The change in directors when the year was a third past was in one sense not abrupt. Both persons had been working in association for months. The change was in reality a transition worked out in harmony with mutual understanding and in agreement.

DISTRIBUTION OF AGRICULTURAL INFORMATION.

The Massachusetts Department of Agriculture continues, as in the past, to answer as fully as it can the inquiries sent to it by correspondents. The large numbers of inquiries by mail and in person, while time-consuming, are apparently helpful and appreciated. The inquiries are varied in their nature, and come from people within and without the Commonwealth. The Department confines its publications to the general problems of production, marketing, statistics, fairs, drainage, reclamation and similar problems of conservation and promotion.

The chief program of the Extension Service of the Massachusetts Agricultural College is the teaching of crop growing and animal production. In accord with this, the publications of the Extension Service aim to instruct in methods of growing and production. The United States Department of Agriculture embraces all three functions of administration, research, and teaching, and issues a series of Farmers' Bulletins that are almost

handbooks on special subjects. While prepared for the country as a whole, a large percentage of them apply to Massachusetts conditions almost as well as though they had been written for the State. Through the courtesy of the Massachusetts Agricultural College and the Massachusetts delegation in Congress, the Massachusetts Department of Agriculture can, in addition to its own publications, furnish its correspondents with both college and Federal publications.

The available bulletins, circulars and leaflets of the Massachusetts Department of Agriculture, of the Massachusetts Agricultural College and of the United States Department of Agriculture are listed in Publication 106 of this Department, and are sent on request to any citizen of the State. This publication is also sent on request to any resident of Massachusetts. Requests for publications are filled the day they are received, and a postal card is sent at the same time, informing the person making the request that the publication has been sent, or, in case for any reason the publication is temporarily unavailable, that fact is stated on the card.

THE LIBRARY.

During the many years of the existence of the State Board of Agriculture there seems to have been at different times attempts to establish a library independent of the State Library, that should contain the State and Federal publications on agriculture, standard manuals, handbooks and textbooks bearing on agriculture and allied subjects. When the Department of Agriculture was established as a part of the executive government of the State, it was speedily found that because of lack of room for storage these books could not be properly shelved. Two or more years ago all of these books, other than a few hundred that were needed for frequent reference by the officers of the Department, were temporarily stored with the State Library. But books thus stored were not catalogued, and while they were accessible they were not arranged so as to be at all readily used.

In June last the Commissioner of Agriculture formally placed the charge of the library of the Department of Agriculture with the Division of Information. After informal conferences with the State Librarian the Commissioner of Agriculture formally wrote him:—

In order to avoid duplication it is my desire to combine our agricultural library with the State Library. I am therefore placing at your disposal as a permanent repository all of the books of our library, with the exceptions noted below. These are to be entered, listed and catalogued as an integral part of the State Library.

After further conference the State Librarian wrote formally, accepting the books and outlining in full memorandum the mutual responsibilities. The following memorandum, given to the Commissioner and the Directors of divisions by the Director of the Division of Information, outlines the plan arrived at and which is being put into operation as rapidly as the cataloguing and card indexing can be handled.

With a desire for co-operation between the Massachusetts Department of Agriculture and the Massachusetts State Library, that greater convenience in the use of the books may result and that unnecessary duplication of cost and work may be eliminated, the following plans have been decided upon: —

1. We will retain in our library one copy each of —

Manuals and other reference books.

Farmers' Bulletins of the United States Department of Agriculture.

Department Bulletins of the United States Department of Agriculture.

Experiment Station Record of the United States Department of Agriculture.

The Agriculture of Massachusetts.

2. Other books and pamphlets now in our library and variously stored will be turned over to the State Library. These will be shelved and catalogued so far as they add to the strength of the State Library in new series or in filling gaps in files.

3. The State Library will at once catalogue the above and books that were stored with it two or more years ago.

4. Duplicate author and subject cards of all publications now in and hereafter added to the State Library, on the topics named below, will be filed in our library so that one can tell at a glance what is available on any given subject.

General Collection on Agriculture.

History of Agriculture.

Federal Publications on Agriculture. (All. The State Library is an official repository of all Federal publications.)

State Department of Agriculture Reports.

State Experiment Station Reports.

Horticulture.

Grains.

Fruits.

Farm and Fencing.

Gardens and Gardening.

Marketing, Co-operative, etc.

Domestic Animals.

Birds.

Bees.

Insects Beneficial and Injurious to Agriculture.

Animal Pests.

Fertilizers.

Agricultural Chemistry and Physics.

Rural Sociology.

Agricultural Education.

Agricultural Conservation.

Forestry.

5. New books, as they are needed, will be purchased by the State Library, so far as its means will permit.

6. The newspaper files will not be changed under this plan.

7. Current publications which come to the Department will be looked over by the Director of Information, and attention of directors will be called to any publication that seems to bear on their work.

SUBJECT-MATTER OF DEPARTMENT PUBLICATIONS.

The precursors of the Department of Agriculture date from the early days of the last century, and outdate the Agricultural College, with its intramural and extramural teaching, and the Agricultural Experiment Station. Partly historically and partly from agricultural needs it came about that the Department publications covered the whole field of agriculture.

The law establishing the Massachusetts Department of Agriculture is very comprehensive. Under it the Department is authorized to do almost anything for the promotion of agriculture within the Commonwealth. The acts establishing the Massachusetts Agricultural College and Agricultural Experiment Station make teaching the function of the one, and the investigation of problems bearing upon the agriculture of the State the function of the other. It is the purpose of the Department of Agriculture to work in thorough co-operation with all other State agencies, and to avoid duplication of effort. It functions chiefly along the broad lines of constructive administration and the execution of the laws pertaining to agriculture.

As a historical survival, as a war measure, and because of the demand for and appreciation of publications telling how to grow crops, and the like, the Department had up to May last published instructional books that come within the field of the Extension Service of the Agricultural College, and also the Agricultural College published some books that entered

the field of the Department. In order to avoid duplication of effort and to make the publications of the Department and the college harmonize, the following agreement was entered into in the early summer of 1922.

It is agreed between the Massachusetts Department of Agriculture and the Massachusetts Agricultural College that, in the field of publications, such subjects as are primarily promotional of agricultural interest, or which are intended primarily to present the opportunities for agricultural enterprise in this State, shall be considered to be within the province of the Department of Agriculture, and that publications which are primarily instructional shall be considered to be within the province of the college.

That in general the college shall confine its publications to the furnishing of definite subject-matter information on agricultural and home-making subjects; and that the Department shall restrict the scope of its publication activities to the promotion of agricultural interest, and to presenting the opportunities for farming in Massachusetts.

This agreement shall in no way be understood to limit the scope of the research publications of the Massachusetts Agricultural Experiment Station.

Whenever either the Department or the college feels it necessary to publish a subject that is obviously outside its province as herein defined, whichever party is responsible for the publication shall propose that it be jointly issued, bearing the names of both the Department and the college on the title-page. No joint publication shall be issued without the full consent of both parties to the implied co-operative responsibility.

This agreement is entered into for the sake of closer co-operation between the Department and the College, and in order that duplication of effort may be reduced to the smallest possible minimum. It is intended to clarify and define fields of work, not at all to hamper or embarrass either party in its work. It is realized that there may frequently be border-line publications on subjects difficult to limit by precise definition, but it is expected that the spirit of the understanding here indicated will assist in satisfactorily placing all such subjects.

PUBLICATIONS IN THE YEARS 1920 TO 1922.

With the exigencies of the war the secretary of the then Board of Agriculture published more than a half dozen different types of publications, most of them having to do with teaching how to grow crops, how to obtain maximum animal production, and how to market. The "Agriculture of Massachusetts" lists these publications.

The change from the Board of Agriculture to the present Department, with the administration vested in a Commissioner, occupied about two years of time, and necessitated legislation

by two sessions of the General Court. But during these years of reconstruction it was necessary for the Department to continue to function. It has issued many new publications and reprinted with more or less of revision many of the earlier publications of the Board of Agriculture. Part of the time there seems to have been no plan for listing publications, and later a system was devised that is somewhat confusing.

Since May, 1922, a uniform system of numbering has been adopted without regard to size of the publication. As the highest numeral used to designate any publication issued either by the present Department or the former Board was below 100, the first publication in the new series is numbered Department Publication No. 101. It is proposed to adhere to a uniform numbering, with everything in one series, and to assign the numbers in the order that copy is sent to the printer.

Report.

The report of the Commissioner for the fiscal year 1921 includes reports from all six divisions of the Department, containing 145 pages, 3 plates and 5 illustrations.

Department Bulletins.

Department Bulletin No. 31. Insect Enemies of Vegetable Garden Crops. 1922. 27 pages.

Department Bulletin No. 32. Not published.

Department Bulletin No. 33. Not published.

Department Bulletin No. 34. Not published.

Department Bulletin No. 35. Directory of Agricultural Organizations.

This was for 1921. The Directory for 1922 is published as Department Publication No. 101. 1922. 21 pages.

Department Bulletin No. 36. The Organization and Work of the Department. 1921. 11 pages, 1 page of plates.

Department Bulletin No. 37. Digest of Laws of the United States and different States concerning Shipments of Nursery Stock. 28 pages.

Department Bulletin No. 38. Dairy Laws of Massachusetts. 34 pages.

Department Bulletin No. 39. List of Useful Books on Agriculture. 1921. 12 pages.

Department Bulletin No. 40. List of Farms for Sale in Massachusetts. 1921. 60 pages.

Department Bulletin No. 40. Massachusetts Farms for Sale in 1922. 1921. 57 pages.

Department Bulletin No. 41. Agricultural Statistics of Massachusetts and New England. 1921. 86 pages.

Department Bulletin No. 42. Agricultural Legislation in 1921. 16 pages.

Department Bulletin No. 43. Dairy Statistics of Massachusetts. 1921. 15 pages.

Department Publications since May, 1922.

Department Publication No. 101. Massachusetts Department of Agriculture and Directory of Agricultural Organizations. 36 pages.

Department Publication No. 102. Onion Growing in the Connecticut Valley. 20 pages. 2 full-page plates.

Department Publication No. 103. Score Cards for Agricultural Fairs and Societies. On card. 2 pages.

Department Publication No. 104. Agricultural Legislation, 1922. 24 pages.

Department Publication No. 105. The Drainage Law with an Explanation. 12 pages.

Department Publication No. 106. Publications on Agricultural Topics. Distributed by the Massachusetts Department of Agriculture. 16 pages.

Department Publication No. 107. 1922 Supplement to Breeders and Owners of Registered Pure-Bred Dairy Cattle in Massachusetts. 24 pages.

Department Publication No. 108. Dairy Statistics 1922. 20 pages.

Department Publication No. 109. Card for sending out with letters on Destruction of Corn Borer. 1 page.

Department Publication No. 110. Methods of Controlling the European Corn Borer. 2 pages.

Department Publication No. 111. Digest of Laws Regarding Shipments of Nursery Stock. 28 pages.

Department Publication No. 112. Bird Houses and Nesting Boxes. 28 pages. 8 pages of plates. 30 illustrations.

Department Publication No. 113. Two Years with the Birds on a Farm. 42 pages. 3 pages of plates. 8 illustrations.

Department Publication No. 114. The English Sparrow. 20 pages. 9 illustrations.

Department publication No. 115. Outdoor Bird Study. 52 pages. 26 illustrations.

Department Publication No. 116. Food, Feeding and Drinking Appliances and Nesting Material to Attract Birds. 40 pages. 30 illustrations.

Department Publication No. 117. Plants that Attract and Shelter Birds and Some that Protect Cultivated Fruits. 32 pages. 6 illustrations.

Department Publication No. 118. Some Facts about Farming in Massachusetts. 28 pages. 1 page plate.

Department Publication No. 119. European Corn Borer. Illustrated card. 2 pages. 1 page colored plate.

FARM LABOR — EMPLOYMENT SERVICE.

The unemployment situation which marked the season of 1921 was still keenly felt in 1922. Many skilled and hundreds of unskilled men were seeking work. It is true that industry was gradually picking up in various lines of production and that unemployment was just as gradually being relieved. The process was so gradual, however, that labor was seeking employment of any kind during the transitional period.

This state of affairs made it possible for the farmers to obtain sufficient help for the work of the farms. The difficulty, however, was to find efficient and permanent help from the ranks of labor both available and cheap. Local labor, while available, was frequently unskilled and more frequently undependable.

The majority of calls coming to this office were for experienced farm workers, — men who could milk and handle a plow and who accepted the hours and wage of the farm without protest. There were also a number of calls for young men with little or no experience, to do the necessary but less important chores at a low wage. Depending upon conditions, such calls were frequently interesting to students, high school boys or to young men without a trade, who felt the attraction of out-of-door work and life.

Owing to the general economic situation, there were few opportunities this season for the highly trained and experienced men in agricultural work. Superintendents, foremen and specialists were not in demand. Employers continued to keep expenses at the lowest possible mark by engaging only the labor necessary to carry on the work. Such foremen and managers as already held positions kept them, and there was consequently little change and few vacancies created. There were no calls for women to assist in garden or farm work. While women have proved their adaptibility and skill in agricultural work, and while their services are frequently obtained cheaper than those of men, employers have found such labor more difficult to accommodate and therefore dispensed with it this season.

The scale of wages offered by farmers in 1922 was much the same as in 1921. There was a tendency downward, but farmers were usually willing to pay an adequate rather than a cut

wage to efficient and satisfactory workers. Single men experienced in farm work received from \$30 to \$50 a month, including board and room, and married men received from \$60 to \$75 with cottage and such perquisites as fuel, milk and garden. Good milkers were always in demand and could command the highest wage offered in general farm work.

During the past season co-operation with other agencies has been continued and broadened. Men have been referred to us by the American Legion, the Veterans' Bureau, Department of Public Welfare and Immigration, the Y. M. C. A. and social agencies. Wherever possible openings have been found for the men so referred. There has been continued co-operation with the Massachusetts Agricultural College, with Breck's Registry and the Public Employment Bureau, and even with commercial agencies when there has been a surplus of men or jobs and no outlet through the ordinary channels. Through the co-operation of the agricultural instructor at the Roxbury High School we have found places for a few of the high school boys specializing in agricultural training.

Applications from 325 farm hands have been received for work on farms. It is safe to assume that many others have found positions indirectly through this office, namely, through co-operating agencies and through answers to appropriate advertisements. No record has been kept of such placements. One hundred and ninety-one applications for farm help have been received and the majority of them filled.

The season of 1922 has been marked by an adequate supply of help at a wage the farmer could afford to pay.

LISTING AND ADVERTISING MASSACHUSETTS FARMS FOR SALE.

The second annual bulletin of "Massachusetts Farms for Sale" was issued in March, 1922. This book contained descriptions of 110 farms. During the early spring and summer 40 more descriptions were received and kept on file.

There is a great deal of interest in farm prospects and property in the Commonwealth of Massachusetts. Much of this interest is manifested by farmers of other, especially western, States. These farmers are seeking locations on or near State highways with near-by markets, thus eliminating the problem

of high freight rates and long-distance hauls. Massachusetts offers these opportunities.

A large number of city people, located in or near Boston, have been seeking small tracts of farm land for the purpose of raising poultry. The majority of such inquiries have come from families of limited means who prefer to raise their present standard of living by more independent activities outside of the city limits. A previous experience in farm life and a present knowledge of retail prices in city markets encourage this class to enter farming on a small scale and to feel sure of success in this field.

Thirty farms have been reported as sold. Several other sales are pending. Fifteen farmers, whose farms have not yet been sold, have notified us of the assistance given them through advertising in the bulletin. The supply of bulletins was exhausted the last of August, and information relative to farm properties was given by mail, and, wherever possible, by office appointment. Photographs of farms are not published in the bulletin, but are kept in the office files for reference.

MASSACHUSETTS STATE INSTITUTION FARMS.

As stated in the last report of the Commissioner of Agriculture, late in October, 1921, the Commissioners of Correction, of Public Health and of Public Welfare asked the assistance of this Department in studying the 13 farms connected with institutions in their departments. This study, begun by the writer November 1, 1921, continued to occupy his full time until he was appointed Director of the Division, March 15, 1922. Immediately upon his appointment the Commissioner of Agriculture directed him to "continue the co-operative and advisory work which you have begun with the Department of Correction, of Public Health and Public Welfare as fully as they may desire and your other duties will permit."

The Commissioners of these departments, the superintendents of the institutions and the head farmers have given hearty co-operation. It has been a pleasure to work with them, and much in the way of unifying the work and systematizing the management has been and is being accomplished. With the sympathetic co-operation of the division chief of the State Auditor's office, who audits the institution accounts, a system of

keeping the farm accounts has been installed which, wherever they are fully carried out, makes certain daily or weekly reports of all matters of farm business being reported to the institution office. And at the office these reports can be readily and speedily transferred to the special farm ledger so that at any time it is possible to know the financial side of any farm operation in progress, and at the end of the year to fill in the excellent form for farm reports that, for a number of years, has been prescribed by the Auditor. It was the study of these reports early in the year that disclosed the fact that frequently adequate returns were not made to the institution office, and that in consequence the reports did not give an accurate measure of farm operations. It is expected that a study of the farm reports for 1922 will clearly picture the farm operations for the year, and that from their study further suggestions will present themselves.

Twelve of these institution farms carry dairy herds totaling about 1,000 head, and the 12 farms connected with the Mental Disease institutions have herds totaling about 1,500, so that at these 24 farms the State owns and carries about 2,500 head of dairy stock. With the exception of one small herd these are black and whites. All of the males are pure-blood, registered animals, and with one exception they are registered in the Holstein-Friesian Cattle Club. Some of the females are also registered stock; others are known to be pure bred, but either have not been or cannot now be registered. The larger number of the cows are grade cattle, but many of these are so nearly straight Holstein-Friesian that even an expert could not by their appearance distinguish them from pure-breds. In a report, among others, the following constructive suggestion was made to the Commissioners of these institutions in early November, 1922:—

Another matter I want to call to your attention at this time is a much larger, and, in my opinion, an important constructive, measure, and one that needs careful consideration before it is adopted or rejected.

With one exception all of the farms carry dairy animals for milk production, and this is the most important farm project, no matter from what angle it be viewed.

The State has by legislative action approved the stamping out of bovine tuberculosis. Therefore it behooves every institution to have a herd free of tuberculosis at the earliest possible moment. Most of the farms have

taken steps to eradicate this menace to profitable dairying, and are well along toward having clean herds. The others should clean up. Every dairy animal should be tested and all reactors slaughtered or segregated. By the so-called Bang method it is possible to save the progeny from infected but otherwise desirable cows, and from them rear healthy stock. This is obvious, and does not seem to require discussion other than as to method of handling, and that will differ with the facilities at each institution.

At 11 of the farms in our groups, and at a like number of farms at the Mental Disease institutions, the dairy animals are black and whites with some of them pure bred and registered. Many of these unregistered animals are valuable for breeding purposes, as some of them are giving 10,000, 11,000, 12,000 and up to or beyond 15,000 pounds a year.

Without discontinuing the pure-bred registry, I would advise the establishment of a State Institution Farm Herd Book which should combine the advantages of a herd book, of a cow-testing association, and the so-called advanced registry features of the cattle clubs.

This would mean —

The entry of each individual, with a complete description and as much of her ancestry as may be had.

The assignment of a herd book number.

The keeping of complete daily milk records.

The determination of milk fat in the milk of each animal as often as once a month.

The monthly reporting and handling of these records at a central office, preferably at the State House.

The registry of each animal added to the herd by birth or purchase.

This matter was considered by the Commissioners of the departments named above and by the Commissioner of Mental Diseases. The following letter to the Commissioner of Agriculture resulted: —

At a meeting of the Commissioners of Correction, Public Health, Mental Diseases and Public Welfare on Wednesday (November 29, 1922) it was voted to approve Dr. Woods' recommendation that the Department of Agriculture establish a State Institution Farm Herd Book.

It was voted further that Dr. Woods be asked to talk with Mr. Forristall in the Department of Mental Diseases regarding a definite plan for handling the records of milk production and the testing for butter fat in the institutions under the four departments, and then submit definite recommendations to the four departments.

The making of the Herd Book has been commenced, and the definite recommendations asked for have been presented to the Commissioners.

REPORT OF THE DIVISION OF MARKETS.

The Division of Markets has continued to develop the services which are proving valuable in bringing about better methods of marketing. Requests from farmers, middlemen and consumers have been made for additional and more complete services. It is hoped that we may be able to increase our facilities to meet their demands. To meet the exacting requirements of those using the Division's facilities, an efficient and accurate service is necessary to hold the confidence which is now evident. The regulatory activities have been administered with a view to helping those whom they affect to do their marketing according to the requirements of the laws, and bringing about a more general understanding of the purpose for which they were enacted.

The Division's market news service, its standardization, inspection and certification program, and the beginning made in studying the practices and margins in the distribution of farm products, have met the approval of all those directly affected.

The efficient production and distribution of farm products will come about more rapidly when the necessary operations in correct marketing are thoroughly understood. In order to give all sections of the Commonwealth a service of much importance it will be necessary to have permanent representatives in several of the larger cities. Up to the present time two cities have been the centers for temporary services through part-time employees. Carrying on under this plan has given an opportunity for those using the services to decide upon their value. This decision has come in the affirmative, with a request for permanent year-round service.

Keeping pace with the rapid progress in standardization will be a problem for a long period of time. The advantages to be derived by growers, the trade and the consumer, through the standardization of grades for farm products and the packages in which they are marketed, are little realized. This problem has been handled in a limited way by the Division, but to

attain the greatest results in the shortest possible time much more effort must be applied by the employment of a person who can give undivided attention to the problem.

The facts brought out in the studies of the practices and margins in the marketing of farm products which have been made and are under progress have been so enlightening that it is our belief that future advancement in the solution of many marketing problems will become much simplified through the continuation of these studies by those thoroughly competent to make them and able to deduct the correct conclusions.

A well-developed marketing service cannot be attained without giving full consideration to the consumer in the marketing problem. This fact is fully appreciated, and in all the services that have been organized there are many benefits to the retail buyer. The Division is desirous of extending its efforts so that its services to the consumer may continue to be of increasing value.

A very condensed report on the details of the work of the Division of Markets follows.

WHOLESALE MARKET NEWS.

Since the farmers' educational agencies have been engaged in promoting better production methods there has been a continually growing problem of how to market the extra production brought about through the improved methods which they have advocated. The answer to this question lies largely in the farmer's interest and observation of influences and conditions which govern his market. Unlike most producers, the farmer is not in close communication with his market. The grower is the last to receive word of market changes, and this has been increasingly true as production has moved farther from the large growing consuming centers. Although there have been tremendous advancements in the development of communication, it was not until the introduction of radio communication that the grower has been brought into close contact with his market.

The common complaint of the farmer is that market news is past history by the time he receives it. He is continually demanding news at the time it is happening. Broadcasting by radio has this possibility. Through its use there is no

reason why producers should not know the latest weather prospects, the selling price of his product in the morning's market, as well as the general condition of the market, such as price trends, the supply, and the movement of the product.

With the complete development of radio communication, sufficient facts will be available to the grower, who is now shipping without timely knowledge of market conditions, to determine within reasonable limits what are to be his returns.

The radio broadcasting of weather, crop and market information has constituted the outstanding development during the past year in market news dissemination in Massachusetts. Timeliness has always been emphasized as one of the essentials to an efficient market reporting system. The utilization of the mailing system often delays the information to the farmer thirty-six to forty-eight hours. The employment of the daily press has been hailed as a real improvement, especially when the reports on morning markets have been carried by evening editions. However, radio offers the greatest opportunity to lessen the time between the hour when the market has been determined and the time it is now reported to the producer. The benefits to be derived by radio are unlimited, but like every new discovery, patience must be exercised until perfection can be attained. The first broadcast of market information in Massachusetts was made by the Westinghouse Electric and Manufacturing Corporation on April 24, 1922, and was made possible through the courtesy of the "New England Homestead," which paid the cost of transmitting a telegram from Boston to Springfield. This service has operated continuously until November 11, when it was discontinued.

The radio schedule for Massachusetts now includes a 10.30 A.M. broadcast of the weather forecast from the American Radio and Research Corporations at Medford Hillside; at 1.30 P.M., daily, except Saturday, the Boston Farmers' Produce Market is announced by this station, together with the weather forecast; and on Mondays and Thursdays of each week the United States Department of Agriculture "Agriograms" are announced by this station. At 6 P.M. the Boston Wholesale Fruit and Vegetable Market, the Boston Butter, Cheese and Egg Market, and the Boston Dressed Meat Market are announced daily except Saturday. The Brighton Livestock Market is broadcasted on Wednesday at this hour, and the

Boston Farmers' Produce Market is repeated daily, except Saturday, at this time.

The Worcester Farmers' Produce Market is broadcasted daily except Saturday by Station W. C. N. at Clark University at 5.30 p.m. The United States Department of Agriculture "Agriograms" are also broadcasted from this station, and the weather forecast is broadcasted at 5.15 p.m.

The Westinghouse Electric and Manufacturing Company announce their agricultural market reports at 7.45 p.m. The Springfield Farmers' Produce Market, which is broadcasted daily except Saturdays, is furnished by a representative of this office at Springfield. The Boston portion of the broadcast, which includes the Boston Wholesale Fruit and Vegetable Market, the Boston Butter, Cheese and Egg Prices, the Brighton Livestock Market, and the Boston Farmers' Produce Market Report, is furnished this station through the courtesy of the "New England Homestead," as noted above.

The New England Weekly Crop Report, issued by V. A. Sanders, crop statistician for New England, is broadcasted from four stations in New England, — from Amrad, W. G. I., at 6 p.m.; from Worcester at 5.30 p.m.; from Springfield at 7.45 p.m.; and from Hartford at 7.50 p.m., Saturday only.

As in former years, the Boston Farmers' Produce Market Report, a bulletin giving the wholesale prices on fruits and vegetables received by farmers on the Boston Farmers' Market, has been mimeographed daily, except Saturday, and sent to a mailing list of about 400 farmers, the recipients furnishing postage. On Thursdays the Brighton Livestock Market Report is included, as well as hay and grain prices furnished by the Boston Chamber of Commerce. This information is also sent out daily by the Associated Press. The "Manchester Union," the "Lowell Courier Citizen," and the "Morning Mercury," New Bedford, also carry our Boston market news.

The market reporting service in Boston is maintained throughout the year, while the Worcester and Springfield wholesale produce markets are reported only from July 1 to December 1. Mimeographed sheets are prepared from both of these cities and sent to a mailing list in a similar manner to the custom prevailing in the Boston office. This information is also published in newspapers of both these cities. It is the practice of all of our reporters to summarize the week's market

on Friday. The Worcester and Springfield summaries are carried in the newspapers of these respective cities, and the Boston summary is forwarded to the mailing list. Request has been received this year for special information on the apple market of Boston, New York, Philadelphia and Liverpool. Through the courtesy of the United States Bureau of Agricultural Economics, we have been able to meet the request of the Massachusetts Fruit Growers' Association, and the "Springfield Republican" publishes this information.

MARKET-NEWS SERVICE FOR HOUSEWIVES.

A new type of market-news service is being furnished to housewives by the Division of Markets. A list showing the range of retail prices for foodstuffs charged by representative retail markets of metropolitan Boston is published weekly. This report includes prices of fruits, vegetables, butter, eggs, cheese, lard, meat and fish. Thus at all times the housewife may know approximately how much should be paid for any particular article. By keeping in close touch with the market, she is informed of the best time to can or to store certain fruits and vegetables. The report also includes a paragraph devoted to market news, ending with a seasonal recipe, or a practical, economical household suggestion.

By means of radiophone the retail market forecast, indicating weekly demand for certain commodities, and what is new on the market, is broadcasted Wednesday mornings at 9.30 A.M. and Fridays at 2 P.M.

MASSACHUSETTS CROPS.

The winter of 1921-22, for the most part, was favorable to meadows, pastures, fall-sown grains and fruits, so that they began spring growth in good condition. Heavy rains came early in April and water courses were high, but no considerable damage resulted. Temperatures were unseasonably low during April and May, but June brought warmer weather, and farm work and plant growth became normal.

Some deficiency of moisture prevailed for a time in May, but June brought plentiful and frequent rains which continued above crop requirements until late summer. To some crops, notably Connecticut Valley onions and tobacco, the rains did great damage.

Apparently the fruit crops this year were damaged somewhat less by the ice storm of late November, 1921, than had been expected. Chilling temperatures, frosts and freezes in late April and May killed a considerable part of the apple fruit buds, and early predictions were for a very short apple crop. However, the prospect for the crop gradually improved.

Since July 1, 1921, the crop-reporting service for Massachusetts has been conducted co-operatively with the other New England States and the Federal Department of Agriculture. The work is conducted from one central office located within this State. This form of service is now effective in most of the United States and the results have been very satisfactory. Duplication and contradiction in the crop reports are prevented, a superior service is built up, closer contacts within the State are assured and the costs are kept at a minimum. Besides general improvement in all parts of the service here, much wider dissemination of the information and crop reports has been obtained through the daily press and many agricultural, financial and trade papers.

A new feature this season was the Weekly Crop Notes which gave current information on leading crops, live stock and related subjects of public interest. These notes were sent out by radio, Saturday evenings, from stations at Medford, Worcester and Springfield, and were furnished the press. One of the most valuable parts of this service consists of special surveys of cash crops. These furnish, in convenient form, an inventory of exact information regarding such crops. Such surveys have been finished for the acreage of Connecticut Valley onions and tobacco, and one is under way for the cranberry crop. The program of work for the coming two years includes surveys of the commercial apple and peach crops and a livestock reporting service suited to New England's needs. A great deal more use is being made of crop information by all people concerned with agriculture, and every effort is made to obtain the highest possible accuracy. Frequent reports were issued covering truck crops outside New England but shipped to markets here.

The entire crop of apples was somewhat larger than the ten-year average, being estimated at 3,010,000 bushels against the short crop last year of 1,125,000 bushels and 3,575,000 in 1920. The crop of commercial apples estimated at 461,000 barrels

also ran substantially above the six year average of 284,500 barrels, and compared with 172,000 last year and 375,000 in 1920. Summer and fall varieties were relatively better than winter varieties. Excessive rains and cloudiness prevented effective spraying and caused much of the crop to be of low quality. While much high-grade fruit sold well the price for winter fruit was discouragingly low, due to a large United States crop.

Peaches turned out relatively better than apples, the crop being estimated at 182,000 bushels against 185,000 last year and 4,000 in 1920. The crop sold well, mostly. Pears were estimated at 84,000 bushels against 45,000 last year and 83,000 in 1920. Cranberries showed steady improvement during the season, and the production was put at 290,000 barrels against 189,000 in 1921 and 280,000 in 1920.

The area of corn for grain was put at 29,000 acres, about the same as the past two years, while silage corn, with 25,000 acres, showed a small increase. The excess rains prevented much cultivation, and the average yield of 40 bushels is considerably below last year and the usual yield; production, estimated at 1,160,000 bushels; silage production, 250,000 tons against 288,000 tons in 1921.

Tame hay area, 431,000 acres, about the same as the past two years; average yield, 1.35 tons per acre, and production 581,800 tons against 529,000 last year and 567,000 in 1920.

Area of oats for grain, 10,000 acres, which was slightly more than the past two years. Average yield, 34 bushels; production, 340,000 bushels against 279,000 last year and 306,000 in 1920. Berkshire County produces over 50 per cent of this crop.

The area of Connecticut Valley onions up to June 20 was 4,559 acres, but some further abandonment was caused later by heavy rains and lack of labor. Average yield per acre was close to 300 bushels, and total production around 2,700 cars of 500 bushels each. Shipments are likely to be considerably below this figure, because of rot, shrinkage, and low prices. The United States onion crop was large and quality good.

Area of potatoes, 29,000 acres, about the same as in 1921, but unfavorable weather reduced the average yield to 90 bushels per acre; production, 2,610,000 bushels against 3,335,000 last year and 4,000,000 in 1920. The yields and superior

quality obtained from certified seed potatoes this year bring out strongly the advantages of using it. Such seed gave yields ranging from 150 to 300 bushels and averaging around 175 bushels compared with only about half as much on home-grown, unselected potatoes.

Tobacco area shrunk from 10,180 acres last year to 9,379 this year, due mainly to low prices for Broadleaf. Average yield, 1,325 pounds per acre; production, 13,250,000 pounds against 13,700,000 pounds last year.

ONION GRADING LAW.

For many years it was believed that if onions were graded there would be a decided favorable reaction on the part of the trade toward Connecticut Valley onions. As a result of this feeling men interested in the growing and marketing of onions were instrumental in having passed an act (chapter 438, Acts of 1922) providing for a grading and inspection service for onions. Hearings held in Northampton and South Deerfield indicated that it was advisable for the Commissioner to establish standard grades for onions. The Massachusetts Commissioner of Agriculture has, therefore, established and promulgated as the official Massachusetts grades for onions the United States recommended grades for northern grown onions, as the representative attendance and interest seemed to warrant the establishment of standard grades and the inauguration of the service.

Certification and inspection of Connecticut Valley onions, provided for by the Massachusetts Division of Markets co-operating with the United States Bureau of Agricultural Economics, went into effect September 5, 1922. This service establishes a standard basis for intelligent dealing, enabling onion receivers to deal directly with growers, thus reducing distribution costs, inasmuch as a certification service gives onions of the same quality a uniform standing. The receiver is thus placed in a position to know the quality of goods he shall have for resale. Sales made on grade facilitate trade, prevent waste by reducing the shipment of unmarketable products, and save expense of sorting at market centers. Furthermore, the establishment of those grades and the accompanying service enlarge the marketing possibilities of the Connecticut Valley,

while the resultant effect of shipping merchandise of standard quality should react to the betterment of its trade reputation.

Furthermore, this service will establish a basis for adjustment with transportation companies or others in case of damage from frosts, heat or other cause, or in case of rejection by the receiver. The receiver is enabled to obtain the quality of goods which he desires, thus reducing expensive readjustment at market centers.

A few weeks previous to the inauguration of this service the United States Bureau of Agricultural Economics furnished a supervising inspector for the purpose of assisting in the inauguration of the service and acquainting our inspection force with the Federal system of carlot shipping point inspection. In so far as a portion of our onion crop is marketed beyond the State borders, it was emphasized that the advantage of the Federal co-operative certificate should be obtained, if possible. We were therefore pleased to become a part of a system which is uniform throughout the United States and well known among the trade.

Valuable assistance was rendered by the Massachusetts Agricultural College Extension Service and farm bureaus of Franklin and Hampshire counties in effecting the organization of grading demonstration meetings which were held in the principal onion-growing towns in the valley. The supervising inspector of the Bureau of Agricultural Economics, together with the onion inspector of the Division of Markets, and the county agent, attending these meetings, demonstrated the grade classifications and discussed with the individuals the details of the operation of the certification and inspection service.

Exhibits intending to show the standard grade for onions and the operation of the certification and inspection service were held at the Greenfield and Northampton agricultural fairs. A portion of the display space of the Division of Markets exhibit at the Eastern States Exposition at Springfield was also devoted to this purpose. The meetings gave the Division an opportunity to demonstrate and discuss the service to many interested persons.

The inspectors give each applicant for inspection a certificate and duplicate which contain a true statement of the grade and condition of the lot inspected. Duplicates of these are filed in

the offices of the United States Bureau of Agricultural Economics and the Massachusetts Division of Markets; extra copies, not to exceed three, may be obtained at \$1 per copy. An inspection report accompanies each car inspected, copies of which are forwarded to interested parties. These reports are useful in that they give an advance notice of the findings of the inspector, the complete details of which will be found on the formal typewritten certificate, which is prepared a few hours later.

A fee of \$3.50 is charged for inspection and certification of carlots; \$2.50 of this fee is paid to the Commonwealth and \$1 to the United States Department of Agriculture. The money received in this manner is returned to the State and National treasuries and applied to the expenses of operation of this service. Our co-operative agreement requires all inspectors to be bonded for the collection of fees. This fee may be lessened, if the number of inspections requested gives a return sufficient to warrant the reduction.

Certificates issued under this agreement will be honored in all markets and accepted in all courts of the Commonwealth and of the United States as prima facie evidence of the truth of the statements contained therein.

Our onion-growing area suffered severely this year on account of a small local crop of less than average quality, which came into competition with a nationally large crop of good quality. The carlot movement has been very small this year, yet we have certified to date 72 cars.

The system is new in Massachusetts, and its fair trial for a few years will determine its adaptability to our conditions. Favorable comment and the general use made of it under adverse conditions, however, argue well for its continued usage.

It must be remembered that the inspection and certification service for Massachusetts onions is a voluntary service furnished upon request to those interested in the commercial marketing of onions. Its object is to furnish interested parties with an exact statement of the quality and condition of the contents of the shipment, according to standard grades. The full co-operation of all interested in the Connecticut Valley onion crop has been urgently requested in order that the certification and inspection service now available may gain for

Massachusetts onions the best markets and highest returns. Suggestions for the improvement of the service will be cordially received at any time.

TOBACCO GRADES.

The Legislature in 1922 directed the Department of Agriculture to investigate present grading and marketing practices among growers of leaf tobacco, with a view to recommending a system of grading whereby the tobacco-growing industry of this Commonwealth may be benefited through the adoption of more economic and scientific marketing methods. The sum of \$1,000 has been appropriated for this purpose. Arrangements with the Bureau of Agricultural Economics of the United States Department of Agriculture have been entered into for the employment of a man to carry on the work on a co-operative basis. A competent man has been employed and the investigation is now in progress. Close co-operation is being maintained with the Connecticut Valley Tobacco Association and with the United States Department of Agriculture, in order that the results of this investigation may be as accurate and comprehensive as possible.

APPLE GRADING LAW.

Because of the short crop and consequently limited shipping season of last year, additional funds became available for work on the apple grading law this fall. The shipping season began early because of an abnormally large early fall crop, and shipments have continued heavy through the season.

Realizing the added advantages to be had in shipping point and farm-packing inspection, the principal growing areas in the Commonwealth, especially in Franklin, Middlesex and Worcester counties were frequently visited. This method of inspection has certain advantages, not the least among them being the opportunity to visit the grower himself and talk with him while he is conducting his packing operations, and thereby rendering him assistance as well as advice on the ways in which he may improve his practices. Shipping point inspection has the added advantage of preventing improperly packed apples from circulating in the channels of distribution, whereas in terminal inspection much damage may be done before the goods are seen

by the inspector. It is hoped to continue this practice in the future.

Opened-packed apples which are often put up in a deceptive manner are attracting the attention of packers. To the growers of Massachusetts apples this practice offers a real problem, as closed package goods come into direct competition with apples in open packages, and the closed package is often discredited because of the presence in the market of improperly open-packed goods. But the greatest detriment comes in an indirect way through the general market depression and dissatisfaction caused by the presence of these open packages which are so often deceptively packed.

The practice of closing packages, common among merchants, and made necessary by the rulings of transit companies, has necessitated our close observation, as boxes closed in this manner come within the jurisdiction of our grading law. Our work at Boston has included daily observation of the wholesale market and the examination of Massachusetts packed apples for export, as well as periodical visits to the packing area in Middlesex County. We have been able to assist in instructing and inspecting in several large transactions, one involving 35,000 boxes. Compliance with Massachusetts grade requirements is gradually improving.

From the standpoint of the producer the apple situation in Franklin County for the present season has been very unsatisfactory. The quality of fruit has been much below normal, a condition which was brought about by unfavorable weather conditions during the growing season. Scab, sooty fungus and Baldwin spot have been very prevalent. In addition to this a very severe September hail storm in the Colrain section, and an unprecedented early October freeze throughout the county, have been factors in cutting down the total barreled apple output.

Prices have been lower than those that have prevailed during the last few years. The general orchard-run price has ranged from \$1.60 to \$2.50, mostly \$2 per barrel. The price on A's and B's has been \$3 per barrel quite generally, with a few lots that graded out a very high percentage of A's selling at \$3.50. All prices include barrel, which cost the grower about 55 cents. The cider price has been 50 cents per hundredweight during the entire season.

It has been a buyer's market throughout the season. Very few sales were made until picking time. Dealers and peddlers from near-by cities have taken out some early fruit and the poorer grades of winter apples. The motor truck is becoming an important factor in the marketing of the county's apple crops. One buyer has shipped several thousand barrels to Providence, Rhode Island, in this manner, trucks taking as many as 100 barrels per load. Speed in getting to market, the shorter time required between picking and placing in cold storage at terminal points, and the difficulty in obtaining cars when needed are three factors which are encouraging the use of trucks.

Distribution of carload shipments has been mostly to the same points that have received the bulk of the county's crops for the last five years. The largest buyer has shipped to Ballston Spa, New York, for storage. Many of these apples are orchard-run and will probably be repacked before being marketed. Another large buyer has shipped to Providence, Rhode Island, for storage and immediate market. Buyers of smaller lots have shipped to Boston, Worcester, Springfield, Holyoke, Hartford and New Haven. About 2,000 barrels have been shipped to Boston docks for export. Comparatively few lots have been graded, due largely to the poor quality of the apples. Many lots have been sold orchard-run with the heads put in the barrels just as they come from the orchard. With such conditions existing it is a surprising fact that there have been a greater number of violations of the grading law than have occurred in either of the past two years. This is due to the fact that several new buyers, who have professed unfamiliarity with the grading law and inspection service, have been operating in the county. Violations have been mostly because of overfacing or because of the presence of apples in barrels smaller than the designated minimum size. Up to the present time 5 cars have been remarked in order to conform to the law, 1 car has been repacked, and 3 cars are in the process of repacking.

STANDARD CONTAINERS.

Standard containers for marketing fruits and vegetables are of more interest to the average citizen than he generally realizes. Not only is he defrauded frequently by the substitution of short-measure packages at full-measure price, which is

unavoidable if the difference in the size of packages is not easily detected, but also the cost of marketing is increased by the greater expense of manufacturing a large number of unnecessary styles and sizes and by breakage in transit, sometimes attributable to the difficulty of loading odd-sized containers. These losses constitute a wholly unnecessary tax on the fruit and vegetable industry.¹

A move to standardize hampers, round-staved baskets and other containers, which is now taking the form of national legislation, has been endorsed by this Division. Passage of an act standardizing boxes and half boxes for farm produce, passed by the legislation of 1921, constitutes a local move directly in line with the national standard container program. As an outcome of this legislation a commission, composed of the Commissioner of Agriculture, the Director of the Division of Markets, the Commissioner of Labor and Industries and the Director of Standards, was directed by chapter 8 of the Resolves of 1921 to investigate the expediency of revising the schedule of bushel weights prescribed for fruits, vegetables and other commodities by section 173 of chapter 94 of the General Laws, and to make such recommendations for legislation in relation thereto as may appear necessary, together with any other recommendations for legislation that would tend to establish a more satisfactory basis for retail sale of said commodities.

In order to determine as many facts as possible in regard to expediency of the then present weight per measure system, a number of weights were made of all varieties of fruits and vegetables for which there was a legal weight per measure. The relationship of such factors as variety, size, condition and shrinkage in storage were considered and analyzed in these investigations. A total of 532 weights were taken by the investigators of this Division. The complete report of the facts of this commission appeared in House Document No. 1021. However, we quote here briefly the conclusion and recommendations arrived at by this commission: —

The fallacy of attempting to remedy the conditions outlined . . . by any changes in the established bushel weights is apparent, as any weight adopted must necessarily be arbitrary and cannot reasonably be expected

¹ Farmers' Bulletin 1196, U. S. D. A.

to represent the actual weight of a bushel of any commodity at the time of sale. Experience teaches that a standard unit of measure must be definite and constant, having a fixed and uniform value at all times and under all conditions and circumstances. The avoirdupois pound meets with all these requirements, and there appears to be a substantial unanimity of opinion on the part of all concerned in favor of requiring all retail sales of fruits, vegetables and grains to be made on the basis of avoirdupois weight, exception being made in regard to certain fruits or vegetables which have been carefully graded as to size, in which case the sale may be made upon the basis of numerical count, and provided, also, that retail sales may be made in any original unbroken standard container in which the goods were received by the retailer.

The legislation which was finally passed abolished the weight per measure system, substituting therefor retail sales by weight or count, and brought about a situation where sales will be made at either wholesale or retail in the original standard containers without weighing and counting at the time of sale, the term "standard container" as used in this connection including only barrels, boxes, baskets, hampers or similar containers the dimensions or capacity of which was established by law of this Commonwealth and by act of Congress, the contents of which had not been removed or repacked by the retailer and upon which is plainly and conspicuously marked the net quantity of contents thereof in terms of weight, measure or numerical count.

The results of this legislation are far-reaching when it is understood that this law brings about the adoption of national standard containers for use in the Commonwealth.

ROADSIDE MARKETS.

Massachusetts already has many roadside markets which have been most successful in providing a means of marketing farm products, enabling both the grower and the consumer to profit from the elimination of transportation and distribution charges. Early attempts on the part of farmers to sell by sign advertising did not produce the results that the roadside stand has accomplished. The fact that such stands are being appreciated by the buying public which frequents the automobile highways is indicated by the great number of these markets to the mile in some sections of the State.

Over 2,000 baskets of peaches last season is only a part of

what was sold across two barrels and a board, while some of the larger roadside stands did from \$8,000 to \$15,000 worth of business.

Comparatively new is the community roadside market with near-by farmers supplying fresh vegetables, thus assuring a large variety at all times. Home-made ice cream, candy, doughnuts and cookies are an added feature.

Perhaps the most unique farmers' market is the moving community market, where all the farmers in a community get together and hire a man to go from house to house selling a wagonload of fresh fruits and vegetables direct from the farm.

In profit sharing lies the secret of the success of these markets, for the failure to offer an advantage in prices and quality are the principal causes of unsuccessful attempts at roadside selling.

PRODUCE MARKET RESEARCH STUDIES.

In the spring of 1921 the Legislature of Massachusetts designated the Division of Markets to make analysis of costs entering into the marketing of Massachusetts farm products. After a preliminary survey of the situation, the Division of Markets, in co-operation with the Bureau of Agricultural Economics, United States Department of Agriculture, decided to start with a study of the margins in the marketing costs of Connecticut Valley onions, inasmuch as this is one of the most important cash crops of interstate market importance produced in Massachusetts.

The growing and marketing of Connecticut Valley onions carries with it a high degree of financial risk. These can be overcome to a large extent by the adoption of methods that have already proved profitable. A means of establishing trade confidence and eliminating some of the marketing hazards became effective this year with the adoption of an inspection and certification service on the basis of United States standard grades.

Since the system of marketing potatoes is typical of that employed in the distribution of other staple farm products, it was thought that such an analysis would be valuable for comparison with other market studies. A survey was made of the methods and costs entering into the distribution of Maine potatoes in Massachusetts. The system of marketing potatoes from the time they leave the grower until they reach the con-

sumer was analyzed; the charges exacted by the various agencies were ascertained; and actual margins, as far as possible, were determined.

As a result of the study of traffic congestion in the Faneuil Hall Market district, as it affects cost of food distribution, opinions were given for reducing traffic congestion. Boston dealers have become convinced that a terminal market is necessary.

The question, Is it more profitable to ship the apple crop of Franklin County, Massachusetts, to market by rail or truck, was answered in the study made of the transportation of the Franklin County apple crop to market.

As the work of determining marketing costs of agricultural products progressed, it was considered advisable to make a study of the retail margins of certain farm products, and to make a brief analysis of the retail buying practices of metropolitan Boston. Charts and maps have been made to illustrate many phases of the market research work.

A project of interest to people connected with the milk business, as well as to those interested in the advertising and selling of other farm products, was also carried on in Boston. This was a study of the various factors influencing demand for milk. Especial emphasis was placed upon the analysis of advertising and publicity and their importance in the marketing scheme. While the study was only a preliminary step in the investigation of farm products publicity, it is of interest because it marks the beginning of research in a field where advertising may prove a great benefit to consumer, producer and distributor alike.

Among the studies to be pursued this coming year is that of retail and jobbing practices and the marketing of Massachusetts apples. Already a study of the influence of the push-cart vendor on the relief of glutted markets, as well as the influence on other methods of retailing, is in progress.

Realizing that New England should be considered as an economic unit, a counsel, designated as the New England Research Counsel on Marketing and Food Supply, has been created by State and Federal agencies for the purpose of stimulating interest in problems relating to the distribution of agricultural products, co-ordinating the work so far as possible to eliminate all duplication.

CO-OPERATIVE RELATIONS.

The Division of Markets has continued to maintain the same cordial co-operative relations with the agencies who are conducting similar lines of work. Increased unity of effort has been brought about with the United States Bureau of Agricultural Economics through the extension of the research studies which were started a year ago.

The program for 1922 includes a study of the market costs of Connecticut Valley onions; a survey of the methods entered into for the distribution of Maine potatoes in Massachusetts; a study of traffic congestion in Faneuil Hall Market districts; a study including various factors influencing the demand for milk; further studies on the marketing of Massachusetts apples; also a study of the influence of the push-cart vendor on the relief of flooded markets; as well as margin studies on several principal commodities sold in the Boston markets.

The Division is co-operating with the United States Department of Agriculture, Bureau of Agricultural Economics, in conducting an investigation of the grading and practices in the marketing of leaf tobacco. Co-operative relations with this Bureau are also maintained in the operation of a shipping point inspection service for onions. In market-news work we rely on this Bureau for the furnishing of that portion of our Boston farmers' produce market report which quotes supplies and prices on shipped-in fruits and vegetables and for the price on butter and eggs. We are also co-operating with the local office of the Bureau of Agricultural Economics in furnishing to radio broadcasting stations a complete program of Massachusetts agricultural market news. The Division is the authorized representative of the Department in maintaining co-operative relations with the Bureau of Agricultural Economics Crop Reporting Service, New England States co-operating.

As in previous years we are co-operating with the Boston Market Garden Association in issuing our Boston Price report, with the Worcester County Extension Service, and with the Hampden County Improvement League in the issuance of reports from Worcester and Springfield. The Boston Chamber of Commerce has made available price figures on hay and grain which we disseminate through our Boston Produce Market Report.

The continued co-operation with the press in Springfield, Worcester, Northampton, Greenfield, New Bedford and Lowell, together with the Associated Press of Boston, has added greatly in making available market news to our people. A mention of co-operative agencies is incomplete without the names of the radio broadcasting stations which have this year, for the first time, disseminated market news to our agricultural population. Our news is broadcasted from the American Radio and Research Corporation at Medford Hillside, from the Clark University at Worcester, and from the Westinghouse Electric and Manufacturing Company at Springfield. Co-operative relations are maintained with the departments of the Agricultural College, which are conducting lines of work similar to our own.

INFORMATION ON MARKETING.

In the State of Massachusetts are approximately 4,000,000 people. Provided each person consumed 10 cents' worth of vegetables a day, the total value of vegetables eaten in Massachusetts each year would amount to \$146,000,000. The census credits us with a production in Massachusetts of about \$15,000,000 worth of vegetables, including the estimated products of home gardens.

It has been estimated that a sale from 150,000 to 250,000 bushels of produce a year from a single Massachusetts farm is not unusual. The volume of crops varies from year to year, but the steady sale is from the large greenhouse growers who sell from 150 to 200 bushels of lettuce every day during the winter season, following with their crops of cucumbers in early spring, and outdoor crops in summer. The gross volume of business of many of the market gardeners runs from \$50,000 to \$150,000 a year. The offsetting expense items, however, must be taken into consideration. Without much question the net profits have been much lower than for other types of business of equal volume, with a turnover of only about twice a year, as compared with a good many other lines of business, where the turnover is from ten to twenty times a year.

The Boston market distributes from 3,500 to 6,000 carloads of foodstuffs per month, depending upon the month. These are in the form of fruits, vegetables, dairy products, meat and poultry. Sound economic development, low-cost produc-

tion, high-quality products, efficient marketing, a proper stimulation of popular interest and appreciation — all are essential, and the advance must come step by step, built on a secure foundation of service to the public.

The Division of Markets aims to assist individuals, and to co-operate with organizations wherever possible, in the promotion of the more efficient marketing of farm products.

Each week an article, covering the subject of marketing problems and conditions, is written for publication, reaching 10,000 subscribers. Reprints are sent to agricultural leaders and educators of the State, as well as to the county agents throughout New England.

The Division has been represented at approximately 75 meetings during the year, at which the subject of better marketing has been discussed.

The exhibit work conducted at the Eastern States Exposition, Springfield, Massachusetts, included a model market window, displaying Massachusetts farm products in a unique, different and interesting manner, in order to catch and hold the attention of passersby. Through the courtesy of S. S. Pierce Company, Boston grocers and importers, a map display, indicating Massachusetts dependence upon the other States and foreign ports for her food supply, furnished data concerning the origin and carlot receipts of foodstuffs shipped into the Boston market. The total production of food products in Massachusetts is only about one-sixth of the consumption. The recently established grades for onions were demonstrated and the certification and inspection service explained. Through the co-operation of the New England crop statistician maps, charts and educational material were arranged to show the importance of crop market information.

REPORT OF THE DIVISION OF ORNITHOLOGY.

PUBLICATIONS OF THE YEAR.

The following publications have been issued from this Division in 1922: —

Report of the Division of Ornithology for 1922. 41 pages. 4 illustrations.
Department Bulletin No. 9. The Utility of Birds. (Reprint.) 84 pages.
34 illustrations.

Department Bulletin No. 8. Some Under-water Activities of Certain
Water Fowl. 50 pages. 15 illustrations.

Department Publication No. 112. Bird Houses and Nesting Boxes. A
reprint. 28 pages. 41 illustrations.

Department Publication No. 113. Two Years with the Birds on a Farm.
A reprint. 42 pages. 9 illustrations.

Department Publication No. 114. The English Sparrow. A reprint.
20 pages. 9 illustrations.

Department Publication No. 115. Outdoor Bird Study. A reprint.
52 pages. 26 illustrations.

Department Publication No. 116. Food, Feed and Drinking Appliances
and Nesting Material to attract Birds. A reprint. 38 pages. 30
illustrations.

Department Publication No. 117. Plants that attract and shelter Birds
and some that protect Cultivated Fruits. A reprint. 31 pages. 3
illustrations.

No leaflet for the use of the schools on Arbor and Bird Day was published, as the Department could not supply a sum sufficient to print and distribute it. It is improbable that this publication will be continued unless the Legislature provides adequate means for the purpose.

MATERIAL IN PREPARATION FOR PUBLICATION.

Work authorized by the Legislature on the first volume of the publication on the Birds of Massachusetts has been continued, but has not advanced beyond the Anatidæ. Six of the colored drawings for illustration have been completed thus far by the artist, Mr. Louis Agassiz Fuertes. The Director hopes

that persons who have notes on the habits, nests, migrations, moults, etc., of New England birds will correspond with him. Any new information for the work will be gladly received and credit will be duly given the contributors.

INVESTIGATIONS.

Investigations regarding the nesting habits of tree-nesting wild fowl and the underwater activities of diving birds were continued during the year. The Director visited Nahant, Nantucket and Marthas Vineyard for the purpose of observing some of the habits of the latter birds. Space will not permit the inclusion of the results of this investigation in this report. A continued study of the migration, habits and distribution of Massachusetts birds was conducted. Inquiries also were made regarding the present status of the Heath Hen, and of the breeding gulls and terns along the Massachusetts coast, while much was learned regarding the food of birds by observers acting for the Division of Ornithology. Mr. John A. Farley spent parts of the months of June and July in an ornithological reconnaissance in the hill country of western Massachusetts.

THE HEATH HEN.

During the period in April most advantageous for taking a census of the Heath Hen on Marthas Vineyard, the Director could not spare time for a visit to the Island, and Mr. Farley took the census. He could locate only "117 birds as present or accounted for" as against 314 birds found there by the Director in three days of April, 1921. His report seems to indicate that within a year the birds decreased at least one-half in number. This diminution may be accounted for in part by the fact that very few young were reared in 1921, as recorded in the last annual report of this Division; but this fact, together with deaths from other natural causes, would hardly explain this apparent excessive and alarming decrease. The birds on the reservation are well guarded against man and their natural enemies, but it seems probable that the law protecting them is not respected by some of the people in other parts of the island. Heavy rains occurred during the breeding season of 1922, and possibly further decrease will have to be recorded in 1923.

On one farm where formerly these birds were common several cats were acquired and naturally there the Heath Hens disappeared. Although roaming vagrant cats are continually destroyed by the superintendent on the reservation, they are abundant in many parts of the island, and are without doubt the worst single menace to the welfare of the Heath Hen. If general diminution continues, the Heath Hen will soon be extinct.

CONDITION OF THE GULLS AND TERNS ON THE MASSACHUSETTS COAST.

The larger colonies of mingled Common, Roseate and Arctic Terns in Massachusetts no longer show an annual increase in the number of individuals. On the other hand, gulls continue to multiply. The increasing gulls seem to be inimical to the terns. On Skiffs Island, where many Common Terns formerly bred, this species has been much reduced in numbers since the Herring Gulls began to breed there. Similar conditions have been reported from Maine islands formerly occupied by terns which have disappeared following the invasion and nesting of Herring Gulls. The great multiplication of Laughing Gulls on Muskeget Island has been accompanied by more or less diminution in the numbers of the terns which have always summered on the island. Herring Gulls also are now nesting on Muskeget. Owing to the excessive increase of Herring Gulls on Maine islands, and because of the complaints regarding their depredations, the National Association of Audubon Societies has discontinued its warden service on several of the larger breeding places of the species. The protection of these gulls became necessary at a time when their extinction was threatened by the millinery trade, but it seems that now they have recovered their normal numbers. These gulls are useful as scavengers. If they become too numerous, however, they may attack grain in the fields, as they did in the British Islands, where they increased unduly under protection.

During the past summer the terns breeding at Chatham suffered much from heavy rains at hatching time, and later, when the young were nearly fledged, many died from lack of sufficient food. This greatly restricted the annual increase. At Monomoy the birds seemed to find an adequate supply of food,

while they were protected from their natural enemies by Mr. Charles Ives, employed by the Department of Conservation, who killed cats and skunks which in recent years had greatly reduced the colony. The terns had little success on the Wepecket Islands, where it is said that storms and rats destroyed the eggs and young. At Wellfleet and Truro, also, very few young were reared. We have no definite report from Penikese. On the other hand, Least Terns which recently have been decreasing seem now to be increasing. At Monomoy many were reared, probably owing to the protection from their enemies afforded by Mr. Ives. The species now seems to be scattering along the beaches in the breeding season, like the Piping Plover. This expedient has been successful this year, but the birds will have to move from time to time as their enemies discover their breeding places. Having long had a precarious existence in New England this species has begun to increase now not only in Massachusetts but also locally all along the Atlantic coast. It may be that under protection the species is coming in from the south; at any rate, it is now extending its range northward. Conditions here, however, will become more and more inimical to its safety as the summer population increases, with its accompanying multiplication of house cats and dogs. Unless special protection from man and other enemies can be provided, it will become increasingly difficult for this species to maintain itself in Massachusetts.

BIRD BANDING.

Trapping and banding of birds is by far the most important method in ornithology that has been developed in many years. During the past year the Division of Ornithology has co-operated with the Biological Survey of the United States Department of Agriculture in encouraging the tagging of birds by means of numbered bands. Most of the official observers of the Division have taken up bird banding.

A meeting to form a bird banding association for this section of the country, to co-operate with the Biological Survey, was held January 17, 1922, in the lecture room of the Boston Society of Natural History. The meeting was attended by many New England people and resulted in the formation of the New England Bird Banding Association. This body now includes

in its membership naturalists in the eastern Canadian provinces, New York and New Jersey, as well as many from all parts of New England. The following officers were elected:—

President, Edward H. Forbush.

Vice-Presidents, Dr. Charles W. Townsend and James Mackaye.

Secretary and Treasurer, Laurence B. Fletcher.

Recording Secretary, Mrs. Alice B. Harrington.

Councilors, John E. Thayer, A. C. Bent, Dr. John C. Phillips, Charles L. Whittle, William P. Wharton and Aaron C. Bagg.

Within a few months the New England Bird Banding Association numbered over 300 members. Great interest was shown in banding, but unfortunately early in the summer the supply of bands gave out, and thus many were deprived of further opportunity to band birds. Now, however, a machine has been perfected which turns out bands at a rapid rate, and these can be supplied in any number by the United States Biological Survey at Washington.

Notwithstanding this lack of bands, the members of the association have banded to date about 4,000 birds, of over 100 species. Some of the birds banded have been heard from several months after banding. Young Night Herons banded on Cape Cod were picked up later, one at Kennebunkport, Maine, another at Fryeburg, Maine, and still another at Marblehead, Massachusetts. A Night Heron banded at Ipswich, Massachusetts, was found at North Andover, Massachusetts. A Junco banded in March at Sandwich, Massachusetts, was captured in April by a cat at Buckland, Massachusetts, nearly 100 miles to the westward. A Song Sparrow banded in 1921 at Cohasset, Massachusetts, returned and was taken in a trap in the spring of 1922. In November and December some winter birds which had been banded in Massachusetts last winter or spring, and had gone north to breed, came back to the same localities where they had been banded. Mr. Aaron C. Bagg of Holyoke, one of the councilors of the association, had a flock of about 40 Tree Sparrows last spring on his place, all of which he succeeded in banding. Some of those banded disappeared in February, and the last one left late in March. Early in December two banded Tree Sparrows returned and one went into the trap. It was one of those banded in the

spring; since then three more of these banded birds have been taken.

In October, during the session of the American Ornithologists' Union in Chicago, the Inland Bird Banding Association was formed, which will include in its field of operations the great area included in the Mississippi River Valley, from Canada to the Gulf of Mexico.

With an adequate supply of bands assured, the officers of the New England Bird Banding Association plan to direct the activities of the members toward the solution of certain definite problems in field ornithology, particularly that greatest puzzle of all — the immemorial mystery of migration.

BIRD MIGRATION AND DISTRIBUTION DURING THE YEAR.

(Summary compiled from reports of divisional observers and office records.)

This report begins December 1, 1921, as this date is the first day of the fiscal year covered by all Massachusetts reports.

December, 1921.

In 1921 there were about three hundred and fifty days in which the temperature averaged much above normal; therefore the year on the whole was perhaps the warmest on record in southern New England. But the last half of December brought a change, with temperature lower than normal and with severe weather in the North.

Numbers of Wild Fowl and Sea Birds. — Large numbers of wild fowl and sea birds appeared on the New England coast during the month. Brants were abundant early. Canada Geese continued to pass, and many remained along the coast.

Numerous Dovekies, Razor-billed Auks, Black Guillemots and Brunnich's Murres were reported in the coastal waters, and later a few Puffins began to come south.

Many Owls. — In the coastal region there was a great flight of Long-eared and Short-eared Owls, while a flight of Barred Owls reached its height in the interior. Storms which prevailed on the North Atlantic drove ashore many ducks, Dovekies and other sea fowl. Some of these birds were exhausted, dead or dying because of the rough seas, while others were dead or disabled from contact with waste oil pumped out of oil-burning steamships.

Canada Jays. — In Maine and Ontario a southward movement of Canada Jays was indicated in November, and during November and December five of these birds were reported in Massachusetts.

A Wood Pewee was reported December 1 in Plymouth County, Massachusetts. A great flight of Redpolls worked down through Maine and many appeared in western Massachusetts. Goldfinches and Siskins migrated in increasing numbers. Late in the month Evening Grosbeaks were very widely distributed, but there were fewer Pine Grosbeaks and very few Crossbills. The number of Northern Shrikes was almost unprecedented. Along the coast some White-throated Sparrows, Mockingbirds and Catbirds remained, and on Cape Cod there were many Mourning Doves, Red-winged Blackbirds, Cowbirds and Myrtle Warblers. On the 8th a Bohemian Waxwing was seen and taken in Norfolk County, Massachusetts.

January, 1922.

January, 1922, was more nearly normal than January, 1921, though in many places in southern New England the thermometer did not reach the zero mark during the first half of the month. From the 23d to the 27th, however, the temperature in northern New England reached the low mark of 30 to 40 degrees below zero, while in southern New England zero temperatures were quite general. In the coastal region there was little snow, but more fell among the hills of the interior. The month was notable for fair weather on land, storms at sea, and an extreme scarcity of small land birds.

Sea Birds Driven Ashore. — Easterly storms in the North Atlantic continued to drive sea birds upon the coast. Gales with a velocity of 95 miles an hour were reported. Dovekies, Razor-billed Auks, Black Guillemots and Brunnich's Murres were seen all along the Massachusetts coast. The Puffin was recorded as far south as Block Island, Rhode Island. Many Geese were reported wintering along shore. Many Mourning Doves wintered on Cape Cod.

Snowy Owls. — A flight of Snowy Owls was the vanguard of a greater number in February. Many were reported from Maine to Long Island. A flight of Pine Grosbeaks, Redpolls, Siskins and Crossbills, which left the North in December, passed

in January through southern New England. A few of these remained in Massachusetts. Evening Grosbeaks were common, though not so abundant as in the winter of 1920-21. On the coast a few Fox Sparrows and Swamp Sparrows remained, while a very few Chipping Sparrows were reported on Cape Cod. During the last week of January the number of Goldfinches, Purple Finches and Siskins seemed to increase along the coast of southern New England. A few Catbirds, Bluebirds and Hermit Thrushes were noted. A Prairie Horned Lark was singing on January 20 at Block Island, and Meadowlarks also sang there on mild days.

February, 1922.

February temperatures averaged above normal in southern New England, with less than the usual amount of snow. There were only two cold waves, but in northern New England there was much snow, and low temperatures prevailed. The southerly seaboard of southern New England was without snow most of the month, and during the last half small land birds increased in numbers there and some began mating and singing.

A Northward Movement. — On the eastern seaboard of Massachusetts and on Long Island, New York, a slight northward spring movement of land and water birds began during the last ten days of the month, while both along the coast and in the interior boreal land birds began to work toward the North. Along the coast Canada Geese began to move. Storms at sea again drove many sea birds ashore during the month, but no Puffins were reported during the last half.

Many Species Wintered. — A Hooded Merganser wintered in or near Boston and Baldpates passed the winter on Marthas Vineyard. Apparently more Night Herons than usual wintered in the coastal region of southern New England, and at least one Great Blue Heron seemed to survive the winter in eastern Massachusetts, another in New York, and still another in Maine. Several Killdeers wintered in Connecticut. Mourning Doves stayed through the season on Cape Cod and Marthas Vineyard. Short-eared Owls were reported all winter in southern New England, and at least one Long-eared Owl. Cowbirds, Red-winged Blackbirds, some Field Sparrows and Swamp Sparrows, Song Sparrows (but fewer of these than usual),

some Catbirds and one Virginia Rail apparently came through the winter in the Cape Cod region. There were two reports of Bohemian Waxwings in northern New England, but no sign of an early northward movement of Cedar Waxwings. On February 24 on Long Island, New York, there were some returning Song Sparrows, and on the 26th there was an increase of Meadowlarks.

March, 1922.

It was said of March that "it came in like a lion and went out like a lamb." March weather was practically normal with storms, winds, sunshine, a little of spring and a taste of summer. On the 7th, with mild weather, a "bird wave" was noted in southern New England, and during the 8th this increased somewhat in numbers. It consisted largely of Red-winged Blackbirds, Song Sparrows, Robins, Bronzed Grackles and Meadowlarks. On March 12, in Middlesex County, Massachusetts, Crows were observed migrating by moonlight until 9 P.M. After that date the numbers of birds increased, particularly Red-winged Blackbirds and Grackles which were seen in immense flocks. Juncos and Brown Creepers passed north early in the month. On March 4 Fox Sparrows were noted in southern Connecticut, while singing Snow Buntings in nearly perfect spring plumage were seen on the same day in northern Vermont.

Winter with much snow prevailed until the 22d in the northern parts of northern New England. In northern Vermont there had been one hundred and twenty-one days of sleighing up to March 11, and 88.06 inches of snow had fallen. The weather was very severe in the Maine woods. Squirrels which were plentiful in the autumn in northern Aroostook County, Maine, almost disappeared during the winter. On March 25 and 26 a warm wave quickly melted the snow and broke up the ice in many northern streams. During this time a flood of bird life swept northward.

A Flood of Migrants. — Canada Geese were moving all along the coast. The great wintering flocks in Nova Scotia moved on to Prince Edward Island. A large flight of Brants appeared at Nantucket and Muskeget Island, Massachusetts. Gannets were seen from Long Island to Cape Cod and a few Ospreys were heard from along the coast of New England. White-

winged Scoters and Holboell's Grebes were moving during the latter half of the month. The bird wave on the 26th included many land birds; Robins, Phœbes, Fox, Song, Vesper, and Savannah Sparrows, and a few Field Sparrows. Most of the boreal winter birds had moved on into the North by April first. Tree Swallows, which usually arrive very early at Plymouth, Massachusetts, were there by the 19th in large flocks. But it was not until the 26th that this species was widely reported in Massachusetts. Cowbirds had wintered locally in large numbers on Cape Cod. Some appeared in migration March 1 on Block Island. One was reported on the 8th from Maine. An immense flock of Bronzed Grackles moved along the Massachusetts coast. Mockingbirds had been noted all winter in unusual numbers along the seashore. A Canada Jay passed the winter near Boston. On the 28th a Murre was picked up dead on the Massachusetts coast, the second recent authentic record for the State.

April, 1922.

In southern New England April was cool and backward with excessive rains and floods caused by rain and melting snow. There were but few warm days. During the warm periods bird migration moved rapidly; in cool weather these movements were less noticeable.

A Retrograde Movement. — During the cold wave and snow-storm which began on the last of March, Canada Geese were seen flying southward in New York State, along the Connecticut Valley and in Middlesex County, Massachusetts. In this county, also, large numbers of small birds flew south during the storm, and many returned after it had passed. In the Connecticut Valley region birds from the hills seemed to concentrate in the valleys, while swarms of birds apparently retreated to the coast of Connecticut. A foot of snow with a severe drop in temperature proved too much for many birds. All over southern New England flocks of Fox Sparrows, Juncos and Song Sparrows, checked or turned back in migration, gathered wherever food could be found. Thousands of birds sought shelter in barns, cellars and open sheds.

Birds Die of Starvation and Cold. — Many died of starvation. Others, fully fed and apparently in good condition, were found dead. A farmer reported 25 dead birds about his buildings.

Others found such victims later when removing piles of brush under which stormbound birds had sought shelter. Bluebirds, Juncos, Tree Sparrows, Fox Sparrows and Robins were picked up, some dead, others in a weakened condition. Many were caught by cats, some were eaten by hungry crows and others were killed by flying against buildings in the storm; but the great majority came through alive. Gradually with warmer weather the chill produced by melting snows passed away and by the 5th migrants were again moving northward.

Birds Rush Northward. — On the 9th there was a touch of summer in the air, and on the 10th this terminated in Massachusetts with a mid-day temperature of from 80 to 88 degrees. During that week the birds rushed northward. Barn Swallows were reported April 9 on Long Island, and after that date became common there. From the 9th to the 12th they were recorded in Maine and Ontario. On the 8th Chipping Sparrows in small numbers began to appear on Long Island and in southern Massachusetts. On the 9th this species was seen on Prince Edward Island. From the 14th to the 19th a few Brown Thrashers and House Wrens were heard from in southern Connecticut. A few Thrashers and Catbirds were reported here and there throughout the month. Probably some of these had wintered in southern New England. A cold wave beginning on the 19th reached its climax on the morning of the 21st. Many severe frosts occurred throughout New England following a "blizzard," which reached northern New York on the 20th, and brought a little snow to most of New England. On the 24th and 25th another brief warm wave started migration again, but the month closed with cold northerly winds and night frosts. No early northward flight of Cedar Waxwings was reported. This species had been very rare in Massachusetts throughout the winter. There was an unusual flight of Winter Wrens which at one time were reported throughout the Atlantic coast region from South Carolina to northern Ontario. Broods of Black Ducks were hatched in Massachusetts by or before May 1.

May, 1922.

May was a disappointing month to the student of birds. During the first half of the month there was much cool weather and migration seemed to be somewhat delayed. Although most of the species due at that time appeared, they were in

smaller numbers than usual. The month was notable, particularly in the coastal region, for the small number of individuals of migrating warblers, and several species were unusually rare. The scarcity of birds was not so noticeable, however, in extreme western and northern New England. There was an immense flight of shore birds along the New England coast. Hawks also were more numerous than usual.

Bird Waves.—On the 2d there was a warm wind which brought a flight of early warblers in Maine. On the 10th, with warm weather and south winds, the northward movement was again accelerated, and a considerable migration of Sharp-shinned Hawks occurred. At this time a large flight of Knots appeared on Nantucket. On the 12th one of the greatest flights of shore birds seen within the last forty years was reported on the coast of Essex County, Massachusetts. For several days sandpipers and other shore birds continued in abundance along the coast. The flight of land birds also increased, and between the 12th and 17th the main migration of northern warblers passed through southern New England. The crest of this northbound wave apparently reached Ontario on the 14th and 15th and northern Vermont and Northern Maine on the 18th and 19th. A few Canada Geese and Brants lingered along the coast of southern New England until the 20th, which was a warm day. After the 20th Cedar Waxwings began to appear in abundance. In western Massachusetts and northern New England a flight of land birds was noticed on the 21st. On the 23d there appeared a great arrival of Greater Yellow-legs and Turnstones at Nantucket and on Cape Cod. Black-breasted Plovers came in numbers until the 30th. Some Loons, Scoters, Mergansers and Brunnich's Murres remained throughout the month. Probably some of these delayed water birds were more or less disabled by oil and were too weak to go north. The 26th was cold with north winds, followed in the night by sharp frosts. The month closed, however, with high temperatures. Although a large flight of Red-breasted Nuthatches went south early in the autumn of 1921, but few were reported in southern New England on their return in the spring. Two Blue Grosbeaks were reported in Massachusetts during the month, and there were reported a few Blue-gray Gnatcatchers. A considerable increase in nesting Killdeer Plovers was noted in many parts of New England.

June, 1922.

The deficit in precipitation during the twelve months prior to June, 1922, must have been made up during this month. Tempestuous electric storms and torrential rains prevailed over a large part of New England.

Storms destroy Young Birds. — Destructive hailstorms also occurred. These elemental disturbances were fatal to many eggs; some young birds were destroyed by rain and wind, others were drowned by floods. The continuous rains in some sections made it difficult for the parent birds to obtain food for their young, which in consequence starved.

Quite a number of Loons were noted on the coast, and in at least two cases young birds were seen with them. Many Red-breasted Mergansers and a few Old-squaws and Holboell's Grebes were reported from Cape Cod, and a few Bonaparte's Gulls along the New England coast. Black-breasted Plovers, both species of Yellow-legs, Knots and Least and Semipalmated Sandpipers were noted locally throughout most of the month in New England. Four Brown Pelicans were reported June 7 in Essex County, Massachusetts. A male Gallinule was seen from May 30 to June 10 in Connecticut. On the latter date a Blue Grosbeak was recorded in Norfolk County, Massachusetts. On June 12 a Lark Sparrow was seen on Long Island. On the 13th a Cerulean Warbler was seen in Franklin County, Massachusetts. A nest of this species was found in New York State. Two pairs of Slate-colored Juncos were reported breeding in Connecticut. Notwithstanding the fact that the latter part of May was favorable to migration, some land birds were not reported from some localities until from the 1st to the 20th of June.

July, 1922.

There was less precipitation in July than in June, but the rainfall still was excessive. Along the seacoast of eastern Maine and in Nova Scotia and New Brunswick the rains of the first part of the month were even heavier and more continuous than in June. Fogs prevailed there for many days. The storms and cold in that region caused practically a total loss of young terns in some places and local Chimney Swifts disappeared.

Early Migration. — Southward migration began early. On

the 4th a Nashville Warbler was seen well out on Cape Cod, and on the 6th a Bay-breasted Warbler. In the stormy weather beginning July 10 a great migration of shore birds of many species landed at various points on the New England coast. On the 10th and 11th warblers were reported moving down the Maine coast. Several species of northern warblers were seen on the 13th in Brooklyn, New York. Bobolinks and Tree Swallows began moving after the first week in the month. Red-breasted Nuthatches appeared in localities in Maine, from which they had been absent in the breeding season. There was other evidence of movement among land birds. On July 26 at Mingan on the St. Lawrence River, in the Province of Quebec, Tree Swallows were observed bound west along the coast. Crossbills were moving in the same direction. A few days later reports from Maine indicated an accession of Crossbills of both species there. Immediately afterward both species appeared in New Hampshire and Vermont.

The rains caused a terrible destruction of Chimney Swifts in Maine. In one locality it was reported that two wheelbarrow loads of these birds were found dead at the bottom of a great unused chimney. (A similar occurrence happened in 1904 in Massachusetts, but from that time until 1922 nothing like it has been reported.) Considerable mortality among young terns occurred at this time in Massachusetts. Meanwhile in northern Vermont dry weather prevailed.

August, 1922.

August was not an excessively hot month in southern New England, but as with the other summer months there was an excessive rainfall. Fog and rain prevailed along the coastal region of southern New England for nearly all the first part of the month, and interfered with the observation of bird migration. Winds from the South and Southwest prevailed. The greatest rainfall of the month came on the 27th, with high winds, thunderstorms and floods which did great damage to roadbeds and bridges. During the prevailing southwest winds and fine weather of the previous week many shore birds passing south were keeping well out to sea, but with the long storm which began on the 26th the wind changed to southeast and a great flight swung in over the coast.

A Great Flight of Shore Birds. — Thousands of shore birds representing nearly all species that migrate along our shores passed over Cape Cod and Nantucket and later many appeared on the shores of Buzzards Bay. All day on the 27th and all night the birds were passing. This flight was notable for the large number of Golden Plovers; more were observed than have been seen in Massachusetts for many years. On the 28th the greatest flight of shore birds seen for years passed over Block Island. Loons were scattered all along the coast. On the 5th and 9th of August a few Crossbills were recorded in Massachusetts. During the first week in August large flocks of Killdeers were reported in New York, Massachusetts and Connecticut. Rather unusual numbers of Black Terns were seen on the Massachusetts coast. Northern Ducks began to arrive. A few ducks, including Mallards and Pintails, appeared as early as August 17 on Long Island, New York. On the 17th, also, Blue-winged Teals were observed on Block Island, and a Green-winged Teal was recorded in Nova Scotia. A number of Little Blue Herons were reported in the Middle States and a few in Massachusetts, but only a very few Egrets were noted this year in New England. The August migration was not so early or so general as in 1921. Many small birds having lost their early broods by storms bred later than usual.

Immense Flocks of Martins. — Immense flocks of Martins were noted during the first week of August in Nova Scotia, Virginia and South Carolina. This furnished abundant evidence of their migration. Several northern warblers appeared August 6 on Long Island. After August 12 the reports of southward movements in New England increased. Kingbirds and Night-hawks were migrating in considerable numbers from the 16th in Maine to the 28th in Massachusetts. There was a large flight of Kingbirds on Long Island. Many small birds were heard passing on many of the cooler nights in northern New England. By the 19th northern warblers were more commonly reported from Long Island.

Among the birds noted migrating southward were the Veery, Bluebird, Chebec, Great Crested Flycatcher, House Wren, Brown Thrasher, Chimney Swift, Pigeon Hawk and Duck Hawk. Two Marbled Godwits were taken August 19 on the coast of Virginia. Hudsonian Godwits appeared in Massachu-

setts. A large flock of Wilson's Petrels, appearing "like a low black cloud about a mile in length" was seen on August 3 off the Long Island coast.

September, 1922.

The month of September brought a change in the weather. In the first half of the month there were many rainstorms, but the last two weeks were dry. There were few frosts and the winds were mostly southerly and southwesterly.

A General Movement. — Notwithstanding contrary winds birds were heard migrating every night, but until the 25th and 26th comparatively few migrants were reported during the day. A severe frost on the night of the 26th in northern New England, following strong northwest winds, started a great migration of land birds, many of which alighted the next morning in southern New England. At the same time a flight of water birds and shore birds appeared along the coast and in the river valleys. The latter half of the month brought a considerable migration of Wood Ducks. The first Mergansers and Scoters at Block Island were reported on September 18. On the 28th there was an immense flight of waterfowl on the Massachusetts coast. They were mostly Ducks and included all three species of Scoters. The local game birds bred well for the most part, but floods interfered with the breeding of Snipes and Woodcocks. Very few Snipes were reported until the frost of the night of the 25th, when a considerable flight appeared. The high water in early September made conditions inimical for them in their usual haunts in the meadows, and many of them went to uplands and to the higher parts of salt marshes. During the great mid-September flight Black-throated, Green, Blackpoll and Myrtle Warblers were reported in great numbers, while Pipits, Winter Wrens, Brown Creepers and Kinglets appeared in abundance during the latter part of the month.

Crossbills Abundant in Maine. — Following the wet summer a great crop of fruit and seeds developed in the woods of northern New England, providing abundant food there for winter birds. Crossbills were abundant in these woods as the month ended, but few had appeared in southern New England.

October, 1922.

The warm weather and southerly winds of the last days of September seemed to delay migration somewhat. October in southern New England was mainly bright and clear with no long storms. The first fifteen days were principally mild or warm. The latter half of the month was cool or cold and windy, with some northerly or northwesterly gales. On the night of October 19 a snowstorm occurred over a large part of Maine. On several nights small ponds in northern New England and some in southern New England were skimmed with ice, thawing again in the sunlight of succeeding days. During the mild weather of the first half of the month there was much bird song, late strawberries ripened in the sun, and here and there a fruit tree began to put forth a few leaves and blossoms.

Many Cormorants, Kittiwakes and Horned Grebes appeared during the month off the Massachusetts coast. Brants and Geese were rather slow in coming. They appeared in small numbers compared with those of 1921, and few young of either species were seen or taken. This led to the belief that the breeding season in the north was disastrous. Northerly gales during the last part of the month sent along some ducks, among them great flights of the three species of Scoters. A few Barred Owls and Horned Owls appeared from the north. About October 1 a large flight of White-throated Sparrows was reported from western Massachusetts and eastern Middlesex County, and many Juncos invaded Berkshire County.

Tremendous Flocks of Crows. — On October 3 tremendous flocks of Crows were seen going south, and about this time large flights of land birds appeared passing through eastern Maine. Many sparrows of various kinds appeared. Two Three-toed Woodpeckers were reported from western New York. Great flights of land birds passed through eastern Maine in the fine weather following October 2. They left that region on the 5th before a storm which threatened on that day and burst on Massachusetts on the 7th and 8th, with a terrific downpour of rain accompanied by thunder and lightning. During this storm great numbers of birds appeared in Massachusetts. There were hundreds of Cedar Waxwings, Myrtle, Parula and Blackpoll Warblers, Kinglets, Creepers and Tree

Swallows, and many sparrows and blackbirds. A drop in temperature following the snowfall of the 18th and 19th in Maine sent along a considerable flight of northern species, such as Siskins, Fox Sparrows, White-throated Sparrows, Juncos, Kinglets and Hermit Thrushes.

A Great Movement of Woodcocks. — During this cold wave, which was general over New England, there was a great flight of Woodcocks. On the 20th and several subsequent days many of these birds were seen and shot, from the coast well to the westward of the Connecticut Valley in Massachusetts. At the same time, Woodcocks were reported as few in southern Connecticut, where, however, many appeared a few days later. During the month there were unusual numbers of Golden-crowned Kinglets that appeared from Maine to Pennsylvania. A migration of Arctic Horned Owls was reported in northern Ontario and an influx of Woodpeckers in Maine. There was a great flight of Wilson's Snipes on October 5 at Block Island, and on October 6 a small flight of Crossbills.

November, 1922.

November was generally pleasant, rather cool in southern New England with frosty nights, which occasionally were quite cold in northern New England, but there was little snow. Zero was reached on the 27th in northern Vermont. The winds were mainly northwesterly or westerly, with only a few warm "southerly" days. During the first week a great flight of northern water birds appeared along the coast of southern New England. There were many Loons and Red-breasted Loons, Kittiwakes, Black-backed Gulls, Eider Ducks, Red-breasted Mergansers and Oldsquaws.

Birds Blown out to Sea. — Fresh northwest winds in northern New England blew many migrating wild fowl out to sea. Comparatively few Canada Geese appeared during the month except off shore, where fishermen and sailors saw many migrating southward over the sea. It was only on our farthest seaward outpost, Nantucket, that many Geese were seen.

The still, cold nights of the last half of the month closed most of the ponds and small lakes, and sent many wild fowl southward or to the coast. In the last days of October Snowy Owls appeared in the Maritime Provinces and a few reached

New England, where in November many were seen. On November 9 a large flight of Red-tailed Hawks and some Rough-legged Hawks passed through southern New England. The flight of Owls continued and many Great Horned Owls and Barred Owls were reported. A number of Acadian Owls and a few Hawk Owls and Richardson's Owls were recorded in Maine. Among the Horned Owls taken was one very dark bird and one of an extremely light phase, probably an Arctic Horned Owl. This southward movement of northern Owls, both great and small, seemed to indicate a scarcity of mice and rabbits somewhere in the North.

During the first two weeks of the month land birds passed in large numbers. These gradually grew fewer until by the last of the month most of them had disappeared. The immense flight of Siskins and Crossbills in Maine began to move westward. Large numbers of Siskins appeared in southern New England, but few Crossbills were reported. The number of Pileated Woodpeckers recorded in New England exceeded that of all reports for the previous few years. Immense flocks of Grackles and Crows were seen in Massachusetts, and a flock of about 100 Great Blue Herons was seen November 16 in Middlesex County, Massachusetts. Apparently this was a part of the great November flight that passes annually but rarely is observed in New England.

OUTSTANDING EVENTS OF THE YEAR.

Among the outstanding events of the year was the abundance of Great Northern Shrikes in the winter of 1921-22 in New England. No equal abundance of these birds has been reported from the western United States. Apparently there was a slight southward movement of Canada Jays. We have no previous report of such a migration. Reports from New England reveal almost no northward movement of Egrets during the late summer, although some Little Blue Herons appeared. Albinos or partial albino birds which were recorded in very unusual numbers during 1921 appear to have decreased greatly in 1922. Only a few were reported, not more than the normal number. Albinos are marked birds; they are attacked by many enemies and probably are short-lived. There was a great increase in the numbers of Golden-crowned Kinglets in New

England in the breeding season. There has been an apparent increase during the year in the number of Northern Pileated Woodpeckers. This may indicate a southward migration. The autumnal flight of Geese and Brants showed a great falling off from that of 1921. Apparently this was partly due to the fact that few young were raised, and in part to off-shore winds that drifted the coastal flight out to sea.

A COMPARISON OF THE WORK OF THE DOWNY WOODPECKER WITH THAT OF THE SAPSUCKER.

A careful comparison has been made of perforations in the bark of two apple-tree limbs cut from the trees by Mr. A. A. Cross of Huntington, Massachusetts. One of these shows holes which the Sapsucker itself was seen to make. The other shows somewhat similar perforations which were made by a Downy Woodpecker while under observation. The examination of these two specimens was made to see if any difference could be observed by which the work of each species could be recognized. Unfortunately the bark on the limb perforated by the Woodpecker was more than twice as thick as that on the Sapsucker limb. Therefore the holes made by the Woodpecker averaged about twice as deep as those made by the Sapsucker. They are arranged irregularly in horizontal rows, but rather more regularly than those of the Sapsucker. These perforations look much alike, but close examination shows a recognizable difference. The holes made by the Downy, although deeper, are no larger; in fact, they average smaller, and are more uniform in size than those made by the Sapsucker. Their external diameter varies somewhat in accordance with the thickness of the bark. These perforations are more or less conical in section, being smaller at the end and larger at the beginning. The sides of the perforations are roughened by projecting fibers of the bark, and are not as clean-cut as those made by the Sapsucker. In no case do these perforations penetrate through the bark into the wood, and many of them apparently do not reach the cambium; also, some of them seem to slant a little upward. The perforations of the Sapsucker, on the other hand, vary in size from a small hole, much like that made by the Downy, to one more than half an inch in diameter. The sides of the perforations are nearly rectangular to the surface of the

bark, and in some cases the edges even overhang. Thus the hole is larger inside next the wood than outside, and gives evidence that the Sapsucker sought the inner bark, for in every case the perforations go down to the sapwood.

With only two specimens of the work of these two species at hand, and these varying considerably in the thickness of the bark, no generalizations can be made, but the differences between the two are evident to the naked eye and more so when examined under a lens. However, the roughness shown on the sides of the perforations made by the Downy may be due in part to the greater age and more fibrous quality of the bark.

If the Downy Woodpecker was taking cambium, it must have secured very little in comparison with that taken by the Sapsucker, which evidently ate or pecked out much more by enlarging the perforations as they neared the wood. Most of the holes made by the Downy either ended or tapered to a mere point before the wood was reached.

Dr. Joseph Grinnell of the University of California, Berkeley, California, sends some manuscript describing his experience with a pair of Willow Woodpeckers (*Dryobates pubescens turati*). Dr. Grinnell and Mr. Tracy I. Storer watched a Willow Woodpecker at work. They shot one bird, and found bits of inner bark fibers adhering to the bristles about the bill, but do not report that they have examined the contents of the stomach. Their comparison of the work of the Willow Woodpecker and that of the Sapsucker follows:—

A pair of Willow Woodpeckers proved to be regular tenants of Curry's apple orchard on the floor of the Yosemite Valley. They or their ancestors had evidently worked there for some years, with the result that most of the 150 trees in the orchard showed marks of their attention, and many of the trunks were fairly riddled with the somewhat Sapsucker-like drillings. On November 8, 1915, two of us made a study of the site, with findings as follows:—

A measured area 6 inches (15 cm.) square, 4 feet (130 cm.) above ground on a trunk 12 inches (32 cm.) in diameter contained 17 fresh pits and 30 old ones, of last year's digging or older. These pits were horizontally elliptical, each about 2.5 by 4 mm. in surface extent, thus distinctly different in size and shape from true Sapsucker drillings. They were arranged in irregular horizontal rows, with spaces of 6 to 14 mm. between individual pits and 3 to 8 cm. between rows. On this particular trunk the pits occurred over a vertical distance of 41 inches (105 cm.) so that there were about 2,100 pits in all on this one tree. Limbs less than 4 inches (10 cm.)

in diameter were not usually found to have been worked upon. However destructive this drilling would seem to be, it does not seriously affect the vitality of the trees; the pits are but 4 to 5 mm. deep, penetrating only the outer layers of the bark, which after a time scale off. We would judge that all evidence of this woodpecker's work is thus removed in natural process within about three years. The heartwood (sapwood?) seems to be not damaged at all, as is the case with most true Sapsucker work. Our inference is that the Willow Woodpecker feeds on the inner layers of bark, which the bird exposes through the perforations above described.

REPORT OF THE DIVISION OF PLANT PEST CONTROL.

The Division of Plant Pest Control has devoted the greater part of its time during the past year to the inspection of nurseries, European corn borer, white pine blister rust and apiary inspection. The nursery inspection has been carried on chiefly along the lines that have been followed during the past few years, 180 certificates having been issued to nurserymen, and 250 licenses to agents. The European corn borer is proving a more serious problem each year, and the white pine blister rust is also consuming more time and much greater attention from this Department.

NURSERY INSPECTION.

Early in the spring a large number of interstate shipments were inspected and the bulk of them were found to be in excellent condition. Probably the practice we have pursued in past seasons, of refusing to accept inferior shipments, has become so well known to out-of-state dealers, that only first-class stock is in most cases consigned to this State. Several inspections of the nurseries, especially the larger ones, have been made for various insects and diseases even though these pests have not in previous years been found in them, it being our policy to keep a careful check on the nurseries rather than to intensify the inspection after an infestation of some serious pest becomes well established.

The European pine shoot moth, a few years ago quite prevalent, has apparently been eradicated from our nursery stock. The San José scale, which was one of the first pests and probably the most serious that we had to contend with fifteen years ago, is very seldom found in any large amount, it being very unusual for us now to find a block of stock infested. When this insect is found we usually, with the permission of the nurseryman, destroy the stock, as it is ordinarily present on

too few trees to warrant spraying. Probably this practice has aided greatly in keeping this insect in check. A small amount of oyster-shell scale has been found for the last few years, but the amount has decreased each season. This insect is more difficult to control than San José scale, in that it passes the winter in the egg stage under the scale, making it very difficult to use an effective spray during the dormant season.

The satin moth, which is the latest imported insect to be of serious consequence in the nurseries, was found in a few instances this season. This pest may be controlled easily by spraying with arsenate of lead at the time the young caterpillars start feeding. It passes the winter as a small larvæ in the crevices of the bark, and in that stage there is danger of its being shipped on nursery stock either during the fall or spring shipments. For that reason the Federal government placed an absolute quarantine on willows and poplars, prohibiting them from being shipped out of the infested area. After a special hearing before this Department, it was decided, with the advice of some of the nurserymen, to place a State quarantine on willows and poplars, with the exception that they might be shipped from the infested area to other points within Massachusetts under permit, said permits, however, to be void after May 1. This plan seemed to work out very well, and the same practice will be invoked next season.

The gypsy moth inspection was very gratifying, and it was necessary to withhold fewer certificates on account of this pest this fall than any season for the past ten years. The egg masses were not present to any great extent in any of the nurseries, and where they were at all numerous the nurserymen were very prompt in taking care of them. The absence of these egg masses was due probably to several factors, one of which was the partial winterkilling of the eggs; and another, the death of large numbers of small caterpillars caused by the cold damp weather which prevailed at the time of hatching. The damp summer, too, caused considerable disease to develop in the caterpillars, which, with the results of spraying, largely account for the smaller number of egg masses found this fall. It is hoped that as the nurseries are now apparently free from this pest, careful control methods will be practiced.

EUROPEAN CORN BORER.

The European corn borer work in Massachusetts has been curtailed because of the lack of Federal funds. This Department realizes the seriousness of this problem, but we feel that the State of Massachusetts cannot afford to handle it alone; neither do we believe that it is entirely a State problem. It is the consensus of opinion of those concerned with this insect, that it is largely a Federal problem and should be handled by the Federal government. When the insect was first discovered in Massachusetts, the State Legislature immediately made available \$100,000. Following that the Federal government appropriated additional funds, and considerable clean-up work was done in the badly infested area. However, in the past two years this clean-up work has been abolished and the small appropriation at our disposal has been used for quarantine and scouting work. Partially because the clean-up work has been neglected, we find the situation that confronts us to-day much more serious than at any time. The conditions in Arlington, Medford, and some of the other points where the infestation has been present for several years is at this time very serious. Fields of corn, spinach, beets, celery and several other vegetables were in some instances so badly infested that the crop was not marketable. The weed areas throughout some of these towns are in no small measure responsible for the above conditions, and we hope that sufficient funds may be made available whereby they may be remedied.

In view of the seriousness of the present situation we have submitted to the Legislature two bills, one recommending the policy by which this work could be carried on most efficiently, the other applying to field methods which might assist in greatly reducing the infestation. This latter would make it compulsory that all corn stubble be plowed under by December 1.

The Federal government is well aware of the damages of which this pest is capable, it being much more serious because of the fact that it is two-brooded here. While the European corn borer has been found in New York, Ohio, Michigan and Canada, it is in these localities single-brooded, and it is our belief that if the two-brooded corn borer is allowed to enter the corn belt unchecked, it will cause incalculable loss. It is

for this reason that we are strongly urging the Federal government to assist to their utmost at this time in fighting the corn borer we have in New England. We have had a large force of men inspecting in the Boston produce market and also in the flower market. These inspections at all times are made in co-operation with the Federal Horticultural Board. The quarantines are operated from June 1 to January 1, as it is only during this period that the stock grown within the infested area is marketable. It was found that it was very expensive to make field inspections, as at that time we could not determine how much of the material would be shipped out of the area, while by following the plan now in practice, that is, inspecting the produce in the Boston market, we are called upon to inspect only that going out of the area. It seems at the present time that this inspection will soon be uncalled for, as the area infested by the corn borer is rapidly increasing, and it will soon be so large as to include most of the markets where Boston produce is shipped.

The inspection of cut flowers, such as chrysanthemums, dahlias and gladioli, is by no means a small task, as large quantities of these flowers are shipped daily out of the infested area. The inspection for corn coming into Massachusetts from New York, where the single-brooded corn borer is present, is one more precaution to be taken. It is sincerely hoped that some drastic action may be taken that will assist in checking this pest.

Each year finds a larger number of insects and plant diseases sent into the office for identification. Usually these are the more common household and garden pests, but occasionally an unusual species is sent in for determination. A year ago we received hundreds of complaints in regard to the common stalk borer. Most of the specimens received were sent by persons who thought it was the European corn borer. This season there have been very few such cases called to our attention. This is probably due to weather conditions, as this insect is more of a southern pest, and it may have been that it was unable to withstand the winter weather. However, this insect is found in small numbers in this State most every year.

During 1922 there has been an abundance of oriental moths, doing considerable damage to fruit and shade trees in greater Boston. Several cases were called to our attention in Boston,

Dorchester, Squantum and Quincy. We are very glad at all times to receive specimens for identification, and to do all we can toward recommending or even supervising control measures.

WHITE PINE BLISTER RUST.

The present status of the white pine blister rust in this country presents a situation which is both discouraging and encouraging. It is discouraging because the disease has become generally distributed in New England, northeastern New York State, and in sections of Wisconsin and Minnesota, and has just been reported for the first time in the Pacific Northwest in the State of Washington. Even the most skeptical are willing to admit that the disease has proven particularly fatal to young white pines, — the type which is of prime importance in any consideration of the production of the pine crop of the future. The encouraging phase of the situation, however, is that intensive experimental work has demonstrated that the further spread of the disease can be prevented effectively and at a reasonable cost by the systematic destruction of the currant and gooseberry bushes that may be growing on or within 900 feet of pine-producing lands.

The real problem in the situation, however, is one of education. In other words, the average pine owner has no knowledge of the nature and characteristics of the disease, the damage it may do, and the comparatively simple methods by which its further spread can be prevented. In appreciation of this fact, a new policy, effective May 1, 1922, was formulated for the conduct of blister rust control work. In accordance with this plan, the United States Department of Agriculture, through the Office of Blister Rust Control, agreed to conduct an intensive educational campaign by the assignments of Federal agents to the more important pine-producing counties throughout the State. The State Department, in carrying out its obligation, agreed to aid pine owners in the performance of control work by furnishing a number of men to assist the educational agents in the work of inspecting pine lands.

For purposes of administration the State has been divided into 9 districts, and 8 Federal agents have been assigned this year. These men have been assisted by 21 temporary employees of this Division, acting in the capacity of scouts, crew foremen or supervisors of control work. Through the courtesy

of the Director of Extension Service, the local farm bureaus, and other similar organizations the educational agents have been provided quarters in the office of the county agricultural agents. The co-operation of the county agents has been a help in conducting the work.

Although there were many delays incident to the organization of the new plan of work, active control work has been in progress in five districts in the State, namely, District I in Essex, III in Plymouth, IV in Bristol, V in Worcester and VIII in Hampden. In conducting this work the general plan followed has been to first examine the land of a co-operating pine owner without charge. If the examination disclosed the presence of Ribes (currants and gooseberries) in any numbers, a report has been made to the owner and he has been requested to furnish additional men to perform the eradication work under the supervision of a State foreman or scout. In some instances Ribes have been so abundant that crew work has been essential, in which cases the owners have borne the expense of the crew members, the State Department paying for the services of the foreman. In most cases the owner has not only paid for the work on his own lands, but has also borne the expense involved in the establishment of a necessary protection zone outside his holdings. In northern Worcester County, however, Ribes have been found in such abundance that the State Department has guaranteed a protection zone without cost to the owner. This practice cannot be continued in the future. In Plymouth and Bristol counties, on the other hand, Ribes have been so scattering that the few bushes found have been pulled by the State scouts without expense to the owners.

During the field season, approximately 61,600 acres of land have been examined at an average cost per acre of 18 cents. In this work 1,565,662 Ribes (1,563,294 wild and 2,368 cultivated) have been destroyed. Nearly 200 pine owners have actually performed control work on their holdings, and have expended the sum of \$3,222.67 in protecting their pines.

The most important accomplishment of the year, however, has been the successful dissemination of the facts concerning blister rust to pine owners and other interested parties, and although many delays were experienced in building up an entirely new organization, 1,185 personal interviews were made

during the short season. It is also interesting to note that for the first time in Massachusetts the active interest of lumbermen has been obtained, and plans for another year already call for the practice of control work on the holdings of a number of concerns interested in the lumber industry.

In connection with the educational program, a very special effort has been made to have a complete blister rust exhibit at the more important community fairs throughout the State. At each fair, pine owners have been urged to have their lands inspected, and as a result, the names of prospective co-operators have been obtained from nearly every town in the State. Exhibits have been shown at 39 fairs. The county agricultural agents have been of great assistance in connection with this phase of the season's work.

A new illustrated circular has been published during the year to replace the original 2-page leaflet. A small, inexpensive card has also been prepared for general distribution at fairs, the larger circular being reserved for distribution direct to pine owners.

At the beginning of the year blister rust as previously reported within the State seemed to be confined particularly to several rather well-defined areas, in which the condition might be described as local-general-infection, meaning that the disease can be found quite extensively within a township or any large portion thereof. Such areas are found in sections of Berkshire, Essex, Hampden and Plymouth counties. In addition to these areas there are scattered spot infections consisting of an isolated tree or groups of trees.

On January 1, 1922, the records indicated that the disease, in at least one of its stages of development, had been found in 269 towns out of the total of 353 cities and towns in the State, in 92 of which it had been reported on pine. Since that time, however, although no extensive scouting has been in progress, the disease as it appears on pine, has been found in 32 additional towns. In Essex County infection on pine has been found in every pine lot examined this year, and has been reported in all but 7 of the cities and towns in the county. In Plymouth County the disease has been reported in every township. In northern Worcester County infection has been so abundant on *Ribes* for the last two years that there must be a serious pine infection area somewhere in that section of

the State, although its location is not apparent as yet. In western Hampden County an infection area has just been found in the town of Chester, in which the pines show a high percentage of young cankers. This seems to indicate a recent spread of the disease in this part of the State, where practically no control work has ever been performed.

The blister rust work in Massachusetts has been conducted under the direction of Mr. C. C. Perry of the Federal Office of Blister Rust Control, in co-operation with the Director of this Division.

APIARY INSPECTION.

The apiary inspection has been carried on under the supervision of Dr. Burton N. Gates, and the following report has been submitted by him.

The inspection of apiaries in 1922 has encountered no unusual problems. Besides the writer, who has directed the work, former Deputy Inspectors Edwards Thorne of Worcester and Ivan Rawson of Pittsfield have served. Mr. O. F. Fuller was employed as usual on a temporary basis to cover important points in southern Worcester County, east and southeastern part. Mr. Fred Challet of Northampton was employed for the first time. Each of these have given efficient service.

Berkshire County was thoroughly covered by Mr. Rawson, who found no unusual outbreaks of disease. The type most frequently encountered in his territory is European foul brood. There are a few local spots of infection in Berkshire County which ought to be followed up closely in 1923.

For the first time in several years it was possible to cover a large part of Franklin, Hampshire and Hampden counties. This was accomplished by Mr. Challet. European foul brood is the type most frequently encountered in this section, although late in the season our attention was called to a localized infection of American foul brood. This has been dealt with as fully as the late season would allow, and we believe is controlled, although an early inspection of the apiaries in the locality in 1923 is imperative. On the whole, the Connecticut Valley was found in a satisfactory condition.

Worcester County was covered as thoroughly as possible, selecting towns most in need of assistance, by Messrs. Thorne and Fuller. Mr. Thorne also worked in Middlesex County, as

did Mr. Fuller in the three southeastern counties. Diseases have always caused more concern in Worcester County and eastward, possibly because of a more dense and urban population who buy and sell bees freely. Avocational beekeepers live largely in the eastern part of the State, who we find are not infrequently in trouble with bee disease before they realize it. It was not possible to work in Essex County nor on Cape Cod.

There is always considerable work in this eastern half of the State — too much to be accomplished by one inspector, even though he is assisted by part time of another. The field is large enough for full service of two men, even with the help of a part-time man. For this reason it has seemed necessary to request the apportionment of additional funds.

Formerly the annual fund available was \$2,000. This was reduced some years ago to \$1,500, since which time expenses of travel and all other items have increased. It is evident to anyone that to-day \$1,500 cannot possibly be made to do the work that \$2,000 did before the rise in expenses. Moreover, the former appropriation was never adequate to cover the State in any given year. It has been respectfully urged that the appropriation be increased to \$2,500, which sum it has been explained can be made to supply regular service in the Connecticut Valley (heretofore only partial and periodic); will enable more extended work in Worcester County (much needed); and make possible the appointment of an inspector, resident in eastern Massachusetts either north or south of Boston, to cover territory now reached but occasionally, or in case of an outbreak, as well as support the service as a whole more adequately.

In the report of 1922 it was mentioned that in two localities, at least, there were persistent infections. These we are glad to report are wiped out and the localities relatively clean.

One exhibit of honey was made for the Department at the Union Meeting in January. The writer has also prepared and presented a general bulletin on beekeeping for publication by the Department. In directing the work the writer has given part time as needed.

REPORT OF THE DIVISION OF RECLAMATION, SOIL SURVEY, AND FAIRS.

RECLAMATION.

The work of the Division of Reclamation has been this year combined with that of the State Drainage Board, the Director of the Division being also secretary of the Board. The report of the Board follows:—

REPORT OF STATE DRAINAGE BOARD.

The personnel of the Board for 1922 has been the same as for 1921, Mr. Warren C. Jewett of Worcester, chairman, representing the Department of Health, and Mr. Leslie R. Smith of Hadley, secretary, representing the Department of Agriculture.

The work of the Board has increased rapidly during 1922. Six new petitions to form drainage districts have been received since the last report, and all but one of those projects have been examined. Inquiries leading toward the formation of six additional districts have also been received and answered. Three new district organizations have been completed and constructive work on two projects started. The Board has also prepared for the guidance of districts, standard forms for district articles of association, for district by-laws, for petitions to county commissioners and for meeting calls. Two hundred copies of the amended law with accompanying explanations were printed and have been nearly all distributed to interested persons. The Board has held 7 public hearings and made 8 engineer examinations on projects this year. The Board has furnished advice to the districts on organization and on design of proposed structures, and has conferred with the officers of various departments of the United States, the State, the counties and of some railroads in the interests of these districts.

Projects on which petitions have been received are noted below. The organization of five of these has been authorized by the State Secretary.

Salisbury Drainage Project.

Progress in this project was delayed by the necessity for obtaining legislative authority to purchase land in New Hampshire needed for the proposed dike. This authority was granted by the last Legislature and the formation of the district proceeded with, and designs have been prepared for the necessary structures. The roadbed of an abandoned street railway company, now a highway, just inside the New Hampshire State line, will be used as the dike. Tide gates and a weir will be constructed for regulating the water in the marsh. It is expected that construction work on the project will be completed next spring.

Green Harbor Drainage Project.

The project originated in 1872, when the owners of the marsh lands built a dike about a mile above the mouth of Green Harbor River. The sluices there provided partial drainage for this land but friction with the users of the harbor below prevented the success of the project. The first sluice, becoming defective, was abandoned and a new sluice of smaller capacity was installed. This being unsuccessful, a district was formed under the present drainage laws. During the fall of 1921 a new sluice of about 100 square feet area was designed and plans for laterals outlined. The district drainage commissioners presented the project to the Plymouth County commissioners for financing according to law, but up to the present time the county commissioners have refused to approve the project. Proposals of various compromises have been offered, but none as yet agreed upon.

Weweantic River Drainage District.

Weweantic River Drainage District, as noted in the last annual report, is located in the town of Carver, and is the first to actually reach the constructive stage. A large, concentrated area of cranberry bogs, lying at the headwaters of the Weweantic River, had been badly damaged through lack of drainage because the river channel below had become clogged. The first work undertaken was the clearing and digging out by hand of the half mile of channel just below these bogs. The expense was less than \$250, but the results were very satisfactory. The water level at the bogs after draining was lowered about $1\frac{1}{2}$ feet, which fulfilled all the requirements at this point. It is planned to extend this work down stream, also to construct some small

reservoirs for holding water to flood the bogs in case of frost, and to improve the waterways of certain highway bridges. The Board feels highly gratified at the results obtained so far on this project.

North Marblehead Drainage District.

The original petition for this project received late in December, 1921, called for the drainage of 100 acres of land in the "Lower Division Pasture and Tillage." Examination revealed that the small creek valley concerned consisted of a succession of small wet pockets; that only a small portion of these wet lands were required for agricultural purposes; and that drainage for building purposes and to abate an alleged nuisance were the principal needs involved. As the petition did not appear entirely to cover the needs of the situation, the Board at a hearing advised the preparation of a new petition broad enough to cover the entire valley of this creek and its tributaries. This new petition has been received, and at a meeting held on November 10 the new project was reported upon favorably and district drainage commissioners appointed.

Assabet River Drainage District.

Owners of the Assabet River marshes in Westborough and Northborough petitioned in February, 1922, for the formation of a district to drain about 500 acres of land. Examination showed that for the main portion of the land involved, straightening, deepening and widening of the channel and the rebuilding of one highway bridge would relieve the main difficulties. Extension of the project to Northborough as first proposed would involve expensive changes in the culvert under the New York, New Haven & Hartford Railroad and the lowering of two dams at Northborough. This extension has therefore been omitted for the present. District drainage commissioners were appointed, the district formed, and the Worcester County commissioners petitioned to finance the project to the extent of \$40,000. The county commissioners have not as yet passed on this petition. The project will drain a marsh adjacent to the upland of the petitioners which is now in productive cultivation. The drained land will be used principally for raising hay and for pasturage.

Shelburne Drainage District.

A petition received in April, 1922, for the draining of about 30 acres in Shinglebrooks Meadows, Shelburne, could not be acted upon as the land involved had but two owners. The Attorney

General ruled that the provision of the drainage law, stating that "several proprietors may petition," requires three or more owners to make the law applicable.

Cherry Rum Brook Drainage District.

The owners of about 600 acres of wet lands lying along Cherry Rum Brook at the northern limits of Greenfield petitioned for a drainage district in April, 1922.

The lower portion of this valley is controlled during the winter months by the ice pond dam of the Greenfield Ice and Trucking Company. This portion of the project will eventually be converted into house lots, but for the next few years will be used for agricultural purposes with which the dam will not interfere. The upper portion of the project is controlled by a concrete culvert through the State highway to Bernardston. This culvert is of ample size, but sets about 3 feet too high to permit of fully draining the wet land above. In addition, the brook itself is narrow, shallow, crooked and not of sufficient size to carry the water from this area. The Board approved the project to the extent of \$7,000, appointed district drainage commissioners and organized the district. The county commissioners have financed the project and construction is partially complete. By agreement with the Greenfield Ice Company work ceased by November 4 to let that company raise its crop of ice for the coming season. Work will be resumed after March 1, 1923, and probably be completed in the early spring.

Wessagussett Drainage District.

At North Weymouth and bordering on Fore River is a small valley of about 13 acres surrounded by high knolls. The valley floor is below the height of extreme high tide. A highway along the beach acts as a dike, and a poorly constructed culvert through it provides very poor drainage for this valley. The surrounding land is developed as a summer colony, and it is desired to also build cottages in this valley. Mosquitoes from the wet valley lands also constitute a nuisance. The owners therefore petitioned the Board in May, 1922, to form a drainage district. The Board held hearings on the petition, have approved the project to the extent of \$1,500, and appointed district drainage commissioners. The district has not yet been formed. A new and lower culvert with a tide gate is required, and the present ditch should be enlarged and deepened to accomplish the objects desired by the petitioners.

Malagasco Drainage District.

Just south of Boylston Center and east of the Wachusett Reservoir is a marsh of about 90 acres at the headwater of Malagasco Brook, a tributary of the Reservoir. The marsh owners in September, 1922, petitioned to have this marsh drained, as it comprises the most valuable portion of their farms. This area is known on the Metropolitan Water Board records as swamp No. 1, and in 1889 that Board planned to drain the land, but the inability to arrange for rights across the outlet of the marsh resulted in the work being held up, and only a portion of the ditches then planned were constructed. The formation of a district clears away the legal obstructions to its drainage. The Metropolitan Water Board decided not to proceed with their previous plans. Organization under the petition has therefore been carried out along customary lines, the hearing held, and the district drainage commissioners have been appointed.

Summary of Expenditures for Year.

Appropriation	\$2,200 00
Cost of work of Drainage Board for year	1,975 12
	<hr/>
Balance unexpended	\$224 88

LESLIE R. SMITH,

Secretary, Drainage Board.

SOIL SURVEY.

The field work on the soil survey of Worcester County was completed in October. This year the northern part of the county was surveyed. The official report, to be prepared and published by the Bureau of Soils of the United States Department of Agriculture, will not be ready for some time, but some of the general results can be stated.

The county was found to have a large variety of soils, at least fifteen classes, each appearing in one to five or six types. One or more of these may be different from any soil class yet found in any other part of the country. In the valleys they are largely gravels, sands and gravelly or sandy loams, with occasional areas of swamp, meadow, muck and peat. The tops and slopes of the hills are largely covered with loams and stony loams, and in some localities the hills are so steep or rocky as

to be wholly unsuitable to any kind of tillage, although they may be valuable for pastures or forestry. The sandy loams in the valleys are often of types suitable for market gardening, especially if irrigation can be provided. The most extensive areas of these soils are in the eastern towns of the county. Several classes of the loams on the uplands are of the best quality for tree fruits, especially apples, and some for potatoes, while others of heavier texture are more desirable for corn, forage crops and pasturage. The best fruit soils extend across the country in a wide belt, from the south central part to the northeastern corner. The heavier soils, suited to corn and forage crops, lie west of this belt, largely in the central and southeastern parts of the county. The soils of various classes will, of course, often produce good crops of other things than those for which their use is particularly recommended. The predominantly rocky areas are most extensive in the southern and northwestern parts of the county. The land surface is so broken and irregular that no one type or class of soils tends to dominate in any given locality. A considerable proportion of the good soils in the county are not in use, and many areas are unoccupied. Altogether, the soils found are ample in quality to serve as the foundation of a much greater farming industry.

As last year, the soil survey field party consisted of two persons, a specialist assigned by the Bureau of Soils and an assistant employed by this Division. The total expense charged to the Department appropriation was \$1,207.90.

Since the soil survey work was begun in 1919 the field work has been finished in four counties, — Barnstable, Bristol, Norfolk and Worcester. Plymouth County was surveyed in 1911 and the Connecticut Valley in 1903, but it is possible that the latter survey will be revised because of changes in soil survey methods and classifications since it was made.

FAIRS AND EXHIBITS.

Agricultural prize money was allotted to 109 agricultural, horticultural, grange and community fairs and poultry associations.

The special exhibitions of the Department were carried out on a much larger scale than ever before. At the Union Agricultural Meeting, Horticultural Hall, Boston, January 17 to

20, inclusive, exhibits of honey and bee products, dairy statistics and corn were made, and the sum of \$375 cash and eight special ribbons were offered as corn show prizes.

At the Home Beautiful Exposition, Mechanics' Building, Boston, April 15 to 29, a comprehensive exhibit of Massachusetts agriculture was made. A 12-cow dairy in operation, with complete milk and wash room equipment and a milk laboratory for the chemical, physical and bacteriological analysis of all milk produced and handled, was shown. Two beef breeds of cattle were shown, — Aberdeen Angus and Hereford. Colony poultry houses showing 4 utility breeds, — Leghorns, Plymouth Rocks, Wyandottes and Rhode Island Reds. — baby chicks with electric brooders, and a bank display of Massachusetts eggs completed the poultry exhibit. Food and fur rabbits and hares were also shown. Floriculture and horticulture had a prominent place, and a model greenhouse showing indoor vegetable growing attracted much attention. A model garden laid out with walks, green plots, flowering plants and shrubs completed the exhibit. The model dairy and milk plant were of great value in showing the consumer how to produce clean, pure milk.

In the State Building at the Eastern States Exposition, Springfield, September 17 to 23, inclusive, each Division of the Department put up a much larger exhibit than ever before, and as a result it became necessary to go outside the State grounds. Through the courtesy of the Eastern States management space was furnished and a dairy barn, with tie-ups for 15 cows, and 4 poultry houses were installed. The grounds about the building have been beautified to a great extent, and the setting is a very beautiful one.

At the Brockton Fair, October 3 to 7, a general agricultural information booth was established, and the Department assisted in the arranging, staging and installing of all the exhibits in the horticultural department of the fair.

The Department allotted the sum of \$100 to the Essex County Corn Show at Hathorne March 16.

Sixteen poultry associations and one rabbit club received prize money allotments. Department medals were offered at 23 fairs and 3 poultry shows, and the Boys' and Girls' Club Camp at the Massachusetts Agricultural College was financed by the Department.

The 109 fairs mentioned as receiving allotments of State

prize money may be classified as follows: major fairs, 27; community fairs, 12; grange fairs, 51; poultry shows, 16; rabbit and cavy exhibit, 1; junior exhibits, 2. The major fairs are held by societies owning their own grounds, building and equipment. The community fairs are those held under the auspices of a local organization and frequently take in several towns. The grange fairs are conducted by the subordinate granges with competition open to the public.

All fairs have been inspected by a representative of the Department and a detail record sheet filled out. A great improvement has been noted in the character of the midway concessions and the cleanliness of eating places. The attendance figures have been large this year and the quality of exhibits high. Lantern slides have been made from photographs taken of outstanding exhibits and live stock, and an illustrated lecture on fairs prepared. The demand for this talk has been good, and it has been given many times in different parts of the State.

A demand for an improvement in the judging at some fairs has brought out the suggestion that the Department carry on each year a judge's school and thereby help establish a more efficient judging system. We are getting more closely in touch with the fairs each year, and the result should be of great benefit to both the fair and to the Department, and consequently to the agriculture of the State.

Agricultural Prize Money awarded to Societies and Fairs.

NAME.	Award.
Acton Agricultural Association	\$300 00
Anawan Grange (Rehoboth)	24 00
Ashburnham Grange	25 00
Athol Grange	25 00
Barnstable Agricultural Society	603 00
Becket Grange	30 00
Bedford Grange	40 00
Blackstone Valley Agricultural Society	400 00
Bournedale Agricultural Society	45 50
Braintree Grange	35 00
Brimfield Grange	27 50
Bristol County Farmers' Association	100 00
Brookville Grange	22 00

Agricultural Prize Money awarded to Societies and Fairs — Continued.

NAME.	Award.
Cheshire Grange	\$20 00
Chesterfield Grange	18 50
Concord Grange	20 00
Dedham Grange	38 50
Deerfield Valley Agricultural Society	700 00
Essex Agricultural Society (Topsfield)	501 00
East Bridgewater Grange	25 00
Falmouth Agricultural and Horticultural Society	45 00
Franklin County Agricultural Society	1,000 00
Franklin Grange	25 00
Flintstone Grange (Dalton)	10 00
Garden City Grange (Newton)	25 00
Gardner Riding and Driving Association	160 00
Garfield Grange (North Dana)	30 00
Gill Grange	29 00
Greater Lynn Fair	403 00
Groton Farmers' and Mechanics' Club	450 00
Hampshire, Franklin and Hampden Agricultural Society	1,000 00
Harwich Agricultural Society	36 50
Heath Agricultural Society	83 50
Highland Agricultural Society	700 00
Hillside Agricultural Society	700 00
Hingham Agricultural and Horticultural Society	98 50
Hinsdale Grange	25 00
Holliston Grange	28 00
Hoosac Valley Agricultural Society	400 00
Housatonic Agricultural Society	999 50
Lanesboro Fair (Newton)	18 00
Lawrence Horticultural Society	36 00
Lee Grange	35 00
Leverett Grange	25 00
Lunenburg Farmers' Club	51 00
Marshfield Agricultural Society	550 00
Marthas Vineyard Agricultural Society	500 00
Maynard Grange	20 00
Monomoy Grange (Chatham)	20 00
Millers River Grange (Orange)	-
Merrimac Grange	25 00
Nantucket Agricultural Society	341 00

Agricultural Prize Money awarded to Societies and Fairs — Concluded.

NAME.	Award.
Needham Grange	\$35 00
New Salem Grange	25 00
Northfield Grange	40 00
Norton Grange	30 00
Norwood Grange	25 00
Otis Grange	29 50
Oxford Agricultural Society	500 00
Pembroke Grange	32 00
Plymouth County Agricultural Society	380 00
Ponkapoag Grange	25 50
Randolph Grange	30 00
Raynham Center	25 00
Reading Grange	25 00
Riverdale Grange (Gloucester)	-
Rockland Grange	25 00
Sandwich Agricultural Society	50 00
Southboro Grange	-
Stockbridge Grange	38 00
Southboro Cattle Club	173 00
Stoneham Grange	-
Stoughton Grange	-
Templeton Grange	35 00
Union Agricultural Society	700 00
Wachusett Grange (Leominster)	25 00
Ware Agricultural Society	82 25
Warren Grange	31 50
Wendell Grange	30 50
Westminster Farmers' and Mechanics' Club	36 50
West Newbury Grange — "Laurel"	31 00
Westport Agricultural Society	500 00
West Stockbridge Grange	25 00
Weymouth Agricultural Society	250 00
Williamsburg Grange	38 00
Worcester Agricultural Society	999 50
Worcester County West Agricultural Society	699 00
Worcester North Agricultural and Driving Association	650 00
Worcester Northwest Agricultural and Mechanical Association	701 00
Worcester South Agricultural Society	650 00
Total	\$17,841 25

Medals.

Through a number of fairs, State medals were offered for special meritorious exhibits, and in certain cases a limited number of medals were placed in the hands of the fair inspectors to be awarded by them for individual accomplishment.

At the Eastern States Exposition and Brockton Fair, medals were offered for the champion dairy cow of each of the five dairy breeds, bred and owned in Massachusetts. One gold medal was offered for the grand champion dairy cow at the Worcester Fair. Medals were awarded as follows:—

Acton Agricultural Society	{ 1 silver medal 1 bronze medal
Brockton Agricultural Society	4 gold medals
Eastern States Exposition	5 gold medals
Essex Agricultural Society	3 silver medals
Franklin County Agricultural Society	5 silver medals
Groton Farmers' and Mechanics' Club	{ 1 silver medal 1 bronze medal
Hampshire, Franklin and Hampden Agricultural Society	3 silver medals
Highland Agricultural Society	2 bronze medals
Hillside Agricultural Society	1 silver medal
Hoosac Valley Agricultural Society	2 silver medals
Housatonic Agricultural Society	1 silver medal
Marshfield Agricultural Society	5 silver medals
Marthas Vineyard Agricultural Society	1 silver medal
Union Agricultural Society	1 bronze medal
Westport Agricultural Society	1 silver medal
Worcester Agricultural Society	{ 1 gold medal 5 silver medals 2 bronze medals
Worcester County West Agricultural Society	1 silver medal
Worcester South Agricultural Society	1 silver medal
Eastern Massachusetts Pigeon and Pet Stock Association	2 bronze medals
Boston Poultry Association	2 silver medals
United Rabbit and Cavy Club	1 bronze medal

Boys' and Girls' Club Work.

Camp Gilbert at the Massachusetts Agricultural College was conducted this year and the expense of same paid by this Department.

Camp Gilbert and boys' and girls' club work expense	\$1,731 10
Framingham Boys' and Girls' Club	51 75
Junior exhibits at Eastern States Exposition	93 00
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	\$1,875 85

Expenses of Special Exhibits.

Special exhibit at Union Agricultural Meeting	\$942 39
Special exhibit at Home Beautiful Exposition	3,010 87
Special exhibit at Eastern States Exposition	2,302 76
Essex Corn Show	72 50
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	\$6,328 52

Poultry Shows.

This Department offered prizes at 16 poultry shows and 1 rabbit and cavy exhibit during 1922. Each of these shows is inspected by a representative of the Department, and the report is on file. The prize money was awarded as follows:—

NAME.	Award.
Boston Poultry Association (rabbits)	\$40 00
Eastern Massachusetts Poultry and Pigeon Association	225 00
Gardner Poultry Association	75 00
Great Barrington Poultry Association	117 50
Holyoke Poultry and Pet Stock Association	168 00
Holyoke Poultry and Pet Stock Association	- 1
Hub Poultry Association, Incorporated	122 00
Lenox Poultry Association	111 00
Milford Poultry Association	75 00
Needham Poultry Association	34 00
Needham Poultry Association	- 1
New England Poultry Association, Incorporated	175 00
New England Poultry Association, Incorporated	- 1
Northampton Poultry Association, Incorporated	155 00
Springfield Poultry Club, Incorporated	174 00
Stoughton Poultry and Pigeon Association	- 1
United Rabbit and Cavy Club	60 00
Southeastern Massachusetts Rabbit Breeders Association	42 00
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	\$1,573 50

¹ Show held, but no award made up to December 1.

SUMMARY OF EXPENDITURES.

Appropriation	\$29,374 05
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Paid:

Prizes at fairs	\$17,841 25	
Special exhibits	6,328 52	
Boys' and Girls' Club (camp)	1,875 85	
Poultry and rabbit shows	1,573 50	
Inspection of shows	25 05	
Badges, medals and banner	870 82	
Postage	302 31	
	<hr/>	28,817 30
Balance		<hr/> \$556 75

CONTROL WORK.

In March a change was made in the organization of the Department whereby the handling of all cases arising under the laws which the Department administers was assigned to a single official. Previously these cases had been handled by the several divisions which make inspections of apples, dairy products, nursery stock, etc. The attorney appointed for this purpose and to render other legal service to the Department was assigned to this Division.

Appearances have been made in 5 cases, all in Fall River and New Bedford, and all for violations of the oleomargarine laws. Three of these were original complaints and 2 were before the Superior Court on appeal. The defendants in the first 3 cases pleaded guilty and were fined in the district courts; 2 paid their fines and 1 appealed. In the appealed cases the findings in the district court were sustained. In one of these the sentence of the lower court was affirmed; in the other the fine was somewhat reduced.

During the session of the General Court the counsel prepared various bills, and followed the progress of legislation on agricultural subjects and that concerning the powers and duties of the Department.

Advice has been given on several legal questions, including suggestions on the apple-grading regulations, the operation of the drainage law and other departmental problems. In some instances assistance has been rendered to agricultural organizations and to individual farmers.

Material for two publications has been prepared, one on agricultural legislation of the year in Massachusetts, the other on the drainage law, presenting the complete text of the law and a brief explanation. Further work has been done on a manual of agricultural laws, but this cannot be finished until a complete index of the recent compilation of the General Laws is available.

During the year investigations were made of two doubtful promotion schemes which seemed likely to result in loss to Massachusetts farmers. The information secured warranted action against both these enterprises. One of them had been represented here by a salesman who left New England before we were notified of his activities. A general warning against his concern was sent out to agricultural authorities in all the New England States. The second had an office in Boston. An informal complaint against it was sent to the Commission on Public Utilities, which was soon after notified that the concern would not attempt to sell more stock in Massachusetts. Warnings against this second concern were also sent to agricultural authorities throughout this section. The detailed investigation of this enterprise was conducted by the Division of Dairying and Animal Husbandry.

The counsel has continued the collection of information about the vegetable growing industry which was begun in another division. This is not yet completed.



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