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The Commonwealth of Massachusetts

ANNUAL REPORT

OF THE

DIRECTOR OF ANIMAL INDUSTRY

FOR THE

YEAR ENDING NOVEMBER 30, 1920

DEPARTMENT OF CONSERVATION



BOSTON

WRIGHT & POTTER PRINTING CO., STATE PRINTERS  
32 DERNE STREET

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*July 18 1921*

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*Vol. Cont June 29, 1926.*

WARREN G. GIBSON  
ATTORNEY GENERAL  
NOTED BY THE

# The Commonwealth of Massachusetts

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## DEPARTMENT OF CONSERVATION.

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DIVISION OF ANIMAL INDUSTRY,  
BOSTON, Nov. 30, 1920.

*To the Commissioner of Conservation.*

By the provisions of chapter 350, General Acts of 1919, the Department of Animal Industry, organized and existing under authority of chapter 608, Acts of 1912, was placed in the Department of Conservation to serve therein as the Division of Animal Industry. This act went into effect Dec. 1, 1919, and I have the honor to present the following report of the work of this Division for the year ending Nov. 30, 1920.

The functions of the Division of Animal Industry and the duties of its officials may be described as follows: Inspection and examination of horses, cattle, sheep and swine within the Commonwealth, and of the conditions under which they are kept; the execution of measures in prevention, control or cure of contagious disease among them; the slaughter when necessary of such as are affected with, or which have been exposed to, contagious disease, followed by the burial or other disposal of their carcasses; the cleansing and disinfection of districts, buildings or places where contagion exists or has existed. Another duty under the law is the regulation of the shipment of horses, cattle, sheep and swine from other States to Massachusetts, in order that the prevalence of contagious disease may not be further increased by diseased animals from other communities. This regulation necessitates the mallein testing of many horses, and the tuberculin testing of all cattle over six months of age that are not intended for immediate slaughter or are not accompanied by a satisfactory record of test made by a veterinarian approved by the live-stock official of

the State from which they are shipped, and by officials of the United States Bureau of Animal Industry.

Successful dairying, as the production of milk, butter and cheese, the conservation of all kinds of animal food used for human consumption as meat, the commercial business of propagating, feeding and marketing cattle, sheep and swine, and of their by-products, such as leather, wool, fats, fertilizers, and many other articles of commerce, all depend in great degree upon the maintenance of health of those species. Preservation of the health of the people is also dependent in no small degree upon it, as is also fertilization of the soil necessary to successful agriculture.

Healthy live stock being recognized as so indispensable to all of these projects, the prevention, control and eradication of contagious disease among animals is an important public work, far-reaching in its influences, and affecting more or less directly the welfare and material prosperity of all the people.

The work of this Division directly in preservation of the public health lies in the suppression of such animal diseases as are communicable to the human subject, namely, glanders, bovine tuberculosis, rabies, anthrax, actinomycosis, etc. Some of these diseases are rapidly fatal to the human subject, and their transmission readily occurs if circumstances are favorable for it. It is very important, therefore, that this class of diseases be prevented, controlled or, if possible, eradicated from the animal kingdom.

Fertility of the soil is so dependent upon the keeping of live stock that the ratio of general crop production to the number of animals produced, raised and maintained upon our farms is an intimate one. Numbers are largely increased if contagious disease is effectively controlled; therefore, the intimate relation that effective work of this Division bears to successful agriculture may be readily seen.

There is no question as to the greater economy of raising and maintaining only such live stock as can be kept free from contagious disease, for the reason that healthy animals return to their owners a far greater revenue on the investment of time, labor and capital than do those among which disease prevails in any form or in any degree of intensity.

Each succeeding year there is an increased dependence of the public for food material upon domestic animals, as represented not only by dairy products but by meat value of the carcasses of cattle, sheep and swine. That these carcasses may be found fit for human food, it is necessary that the animals shall have been raised under proper sanitary conditions, and maintained free of contagious disease up to the time of slaughter. The carcasses of thousands of animals are yearly condemned on account of lesions of contagious disease being found at time of slaughter. It is an economic necessity of the State and Nation that this great waste be reduced to a lower point than has yet been reached. Although progress in this direction is yearly increasing through the active co-operation of Federal, State and municipal authorities, the Division of Animal Industry recognizes that its work of elimination of animal diseases has a broad field for expansion, and that its duty in relation to increased food supply for the people is well defined.

In accordance with the provisions of chapter 189, General Acts of 1918, this report will consist of a brief summary of the year's work of this Division, illustrated by charts showing the control work of recent years of some of the principal contagious diseases of animals. These charts will probably be of considerable interest to those who have been familiar with the workings of our organization during a period of years. They show the number of cases we have had to deal with, and the working out of policies that have been pursued, with such occasional variations as seemed advisable, for a considerable length of time.

Following is a gross summary of the work of the Division for the year ending Nov. 30, 1920:—

#### CATTLE.

15,546 Massachusetts cattle were physically examined by Division agents.

1,924 Massachusetts cattle were tuberculin tested by Division veterinarians.

2,855 interstate cattle were tuberculin tested by Division veterinarians.

9,736 tested interstate cattle were examined at Brighton and their test records viséed.

5,247 tested interstate cattle were inspected and identified at other points.

989 animals on 143 farms in 47 towns were given preventive treatment against blackleg.

263 animals on 12 farms in 6 towns were given preventive treatment against anthrax.

43 animals were given preventive treatment against hemorrhagic septicemia.

968 visits to unsanitary premises were made by district veterinarians.

#### HORSES.

530 tests for glanders were made by Division veterinarians.

4,063 interstate horses were examined by Division veterinarians.

23 tests of whole stables were made by Division veterinarians.

11 animals were given preventive treatment against anthrax.

#### DOGS.

623 cases of possible rabies in dogs were investigated.

#### SHEEP AND GOATS.

38 sheep were given preventive treatment against anthrax.

85 goats were given preventive treatment against hemorrhagic septicemia.

#### SWINE.

51,505 head of swine were treated in prevention or cure of hog cholera.

15,965 head of swine were treated in prevention or cure of hemorrhagic septicemia.

#### MISCELLANEOUS DISEASES.

685 cases of miscellaneous diseases were investigated by Division veterinarians.

#### BOVINE TUBERCULOSIS.

The control and eradication of bovine tuberculosis in Massachusetts has for many years been a problem for serious consideration. Cattle owners, whether engaged in dairying alone, the production and marketing of animals for food purposes, or the propagation and sale of pure-bred animals as foundation stock, are all pecuniarily affected by the ravages of this disease, and suffer serious loss in consequence of its continued prevalence.

The dire significance of its possible transmissibility to the human subject may also be referred to as an additional reason for a continuous study of any and all methods of control that promise any degree of success.

The records of the Federal meat inspection service at the many different points in the country furnish the best indication of the prevalence of this disease, the control of which is a nation-wide problem and in no sense a local one. In the country as a whole, thousands of animal carcasses and parts of carcasses are annually condemned at time of slaughter on account of the lesions of this disease being extensive enough to render the meat unfit for human food. While accurate statistics of the number of carcasses of Massachusetts cattle so condemned are not available as a separate unit, no doubt they are of practically the same significance as are those of the country as a whole.

While the number of carcasses condemned at Federal-inspected abattoirs on account of this disease has gradually increased from year to year until recently, it is gratifying to know that for the past three years the number so condemned has shown a considerable decrease. This decrease has been largely due to the more active control work inaugurated by State authorities, and the active movement inaugurated in 1917 by the Federal government looking to eradication as a possibility in the course of time. These activities have been stimulated and seconded by the live-stock industry of the country, all branches of which finally realize the great economic losses caused by tuberculosis of live stock, and the alarming significance of its steady increase from year to year.

In Massachusetts for thirty years its regulatory live-stock officials have been engaged in carrying out such measures in the control of bovine tuberculosis as seemed to promise relief to such conditions of its prevalence as from time to time arose or were apparent. These measures have resulted in more or less success as far as limiting the spread of the disease is concerned. It has been felt, however, that its eradication or complete control, if ever such can be accomplished, will be brought about by nothing less than a nation-wide movement to that end, instituted by Federal authorities co-operating with State officials, and both organizations supported by the live-stock industry in all its branches, and by an aroused public sentiment on the subject of animal food from healthy animals only.

The general policy which has been pursued by the Division

in this work for the past three years is still in operation. This policy briefly stated is as follows: Tuberculin testing of all cattle arriving in Massachusetts from other States not accompanied by approved records of test, followed by slaughter of the reacting animals; annual examination by local inspectors of animals of all Massachusetts cattle and the premises on which they are kept, with a detailed report as to the health of the animals and the sanitary condition of the premises; quarantine of all animals suspected of being diseased, followed by an examination by a Division inspector not only of the suspected animal but of all other members of the herd in which it is found, with the slaughter of such as are found diseased; disinfection of the premises where diseased animals are found and a "follow-up" examination of the herd three months later; the same process of disinfection and re-examination of herd again carried out if additional cases are found; tuberculin testing of herds at request of the owners, under an agreement as to the disposal of the reacting animals.

In our opinion the present Massachusetts plan of searching out and disposing of clinical cases of tuberculosis, thereby removing the most active spreaders of the disease, is one of the most effective methods by which progress in its actual control is accomplished. The diagnostic value of the tuberculin test, carefully applied by competent men, is very generally recognized; it should be taken advantage of at every opportunity for the purpose of disclosing the non-clinical cases. Although not infallible even in the hands of most competent and careful veterinarians, satisfactory control of the prevalence of tuberculosis among our neat cattle is not possible without its aid.

The Division is giving its support to the Federal movement in eradication of bovine tuberculosis, and co-operating with national authorities in this work to the fullest extent possible under existing law.

The most prominent feature of the Federal movement is the "tuberculosis-free accredited herd" plan, upon which plan the movement largely depends for its indorsement by the cattle-owning public. Under this plan certain indemnity is paid for reacting cattle which are slaughtered, the owners of which have submitted their herds for official tests applied under Federal and State

supervision. This payment of indemnity, however, is contingent upon a like indemnity being paid by the State wherein the cattle are owned. Under existing Massachusetts law, indemnity can be paid by the Commonwealth only for cattle which are condemned by Division officials, such condemnation to occur as a result of physical examination, the use of tuberculin as a diagnostic agent being in most cases prohibited. As the majority of cattle reacting to a tuberculin test are not cases that can be readily condemned by physical examination, indemnity for such reactors cannot be paid by the State, and for that reason alone no Federal indemnity is available. The Massachusetts cattle owner, therefore, who desires to eradicate tuberculosis from his herd by slaughter of the reactors to an official test, finds himself denied both State and Federal indemnity as partial reimbursement for his losses, and consequently the work of eradication by the "tuberculosis-free accredited herd" plan has not progressed in this State to the extent it has in most other States of the Union, or to the extent it would if our laws were more favorable to its progress.

Believing that advantage should be taken of every factor which promises to be of any assistance in the eradication of this great scourge of live stock, the undersigned, as a member of a commission created by the Legislature of 1920 to study the situation regarding the prevalence of bovine tuberculosis in Massachusetts, will favor a recommendation for legislation providing for such amendment to our laws as will permit the payment of indemnity, under proper regulation, to owners of cattle whose animals are destroyed on account of having reacted to tuberculin tests applied under official supervision.

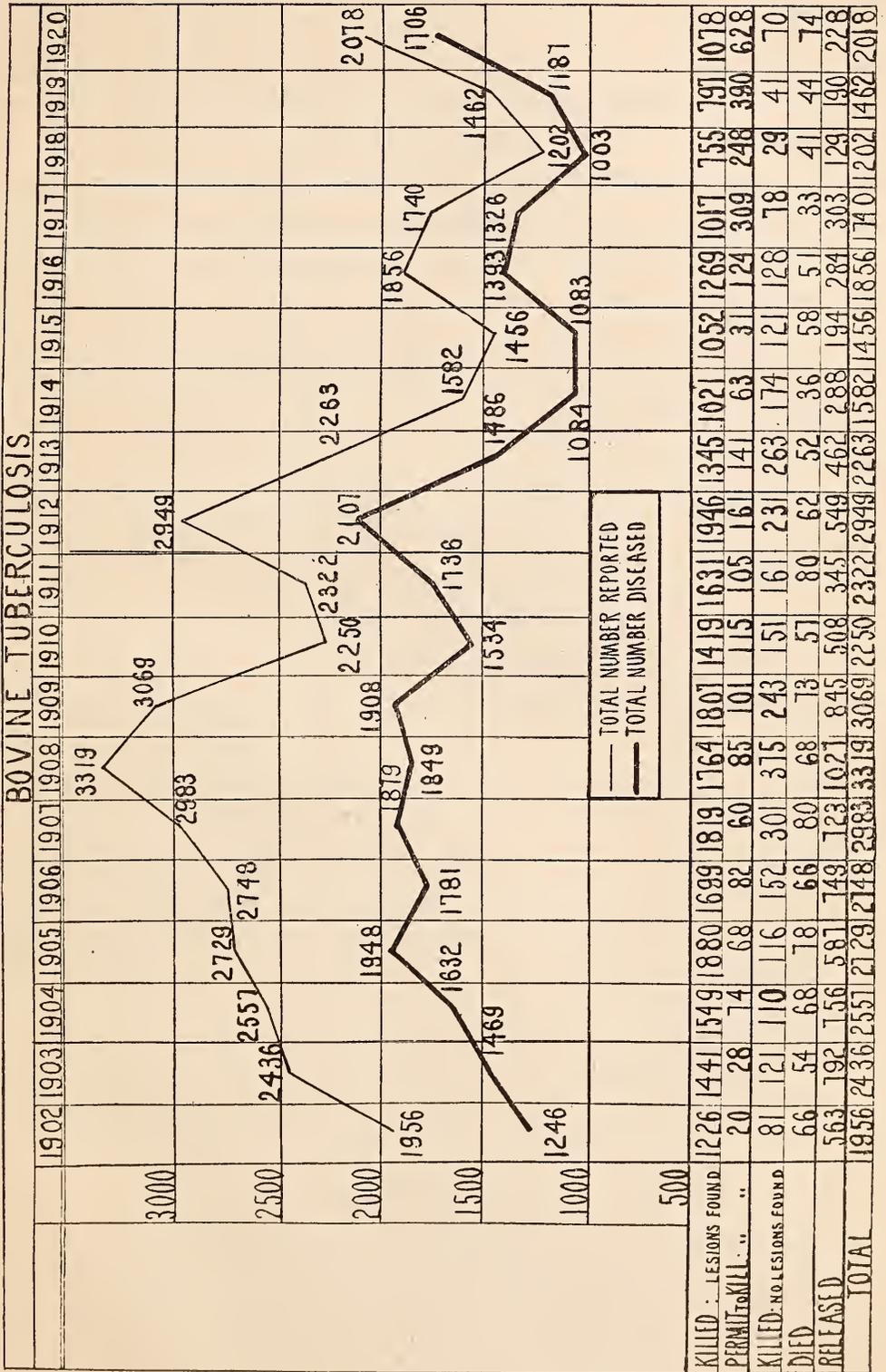
Such legislation will presume, for its proper execution, the expenditure of a considerable amount of money on the part of the Commonwealth. However, considering that such expenditure commands the award of an indemnity by the national government, and that the combined indemnities will be a great inducement to cattle owners to submit their herds for test, the ultimate effect will probably be to so reduce the prevalence of the disease in this State that the large annual appropriations to this Division now necessary for its control will be very much reduced, and ultimately by an amount large

enough to more than offset any appropriations for the execution of a law such as recommended.

Chapter 470, Acts of 1920, entitled "An Act relative to the Indemnity to be paid for Animals because afflicted with Tuberculosis," went into effect Aug. 18, 1920. By the provisions of this act, which is amendatory to section 6 of chapter 90 of the Revised Laws, the maximum amount which the Commonwealth may pay for a tuberculous animal is raised from \$40 to \$60. The immediate effect of this act has been to largely increase the number of cattle reported to this Division as suspected of being affected with tuberculosis. Under the former maximum payment of \$40 it was often to the pecuniary advantage of an owner to send a suspected animal to slaughter without official condemnation, the salvage, in case the carcass was passed as fit for food, being greater than the maximum award by the State. We find now, however, that in many cases the situation is reversed, and, under the amended law, the money returns to the owner from the Commonwealth are greater than they would be from direct slaughter without official condemnation. The record of positive cases of bovine tuberculosis taken care of by this Division will for this reason show a very large increase in numbers this year. We do not believe that this indicates an increased prevalence of the disease, but rather that the amended law and the increasing popularity of the tuberculin test operate to bring more cases to our attention for disposal. We feel that we can in consequence more correctly estimate actual existing conditions of prevalence of this disease than was formerly possible.

Following is a chart showing for a period of nineteen years the number of cases reported to this Division and the number actually found diseased as proved by post-mortem examination, with marginal notes stating the methods of disposal.

This year's tabulation, as shown in the opposite chart, probably more nearly approaches a correct record of the prevalence of tuberculosis in our herds than that of any other one year. In addition to a diligent search for clinical cases as formerly, and the bringing to our attention of many more cases by the operation of the amended law increasing the indemnity payable by the Commonwealth, the tuberculin test reactors appear this



year as a greater factor than ever before in our statistics, constituting a much larger portion of the total number of animals killed.

Comparing the last three years' records, we find the percentage of reactors to total number killed, as follows: 1918, 23.5 per cent; 1919, 28.1 per cent; 1920, 33.4 per cent. In other words, one-third of all the tuberculous cattle killed under our supervision this year were reactors to a tuberculin test and killed for that reason. Practically none of these cases could have been detected by physical examination.

Following are various tables showing the extent of the work of the Division in connection with the control of bovine tuberculosis in Massachusetts for the year ending Nov. 30, 1920:—

*Massachusetts Cattle.*

Cattle reported as diseased in 1919 disposed of in 1920, . . . . .	33
Cattle reported as diseased during the year, . . . . .	2,069
	————— 2,102

*Disposal of Above Animals.*

	Killed, Lesions found.	Killed, No Lesions found.	Permit to kill, Lesions found.	Permit to kill, No Lesions found.	Died.	Released.	Forwarded to 1921.	Totals.
Reported by inspectors, owners, etc., . . . . .	1,070	10	65	30	74	228	17	1,494
Reacted to Division tests, . . . . .	-	-	245	14	-	-	-	259
Reacted to private tests, . . . . .	8	-	272	12	-	-	7	299
Reacted to United States tests, . . . . .	-	-	46	4	-	-	-	50
Totals, . . . . .	1,078	10	628	60	74	228	24	2,102

The above table shows the disposal of Massachusetts cattle suspected of tuberculosis and reported from all different sources.

Following is a tabulation of tuberculin tests only, made by Division inspectors and reported by private veterinarians, showing also the disposal of such reactors as came under the jurisdiction of the Division and such as could be arranged for by consultation with owners:—

## DEPARTMENT TESTS.

Premises on which tests were made, . . . . .	37
Number of animals tested, . . . . .	1,924
Number of reactors, . . . . .	496

*Disposal of Reactors.*

Killed, lesions found, . . . . .	203
Killed, no lesions found, . . . . .	10
Killed by owner, no killing order issued, . . . . .	3
Awaiting action, . . . . .	280

NOTE. — In addition to above, 46 animals which reacted in 1919 were killed, in 4 of which no lesions were found.

## TESTS REPORTED BY PRIVATE VETERINARIANS.

Number of herds in which animals were reported, . . . . .	153
Number of animals tested, . . . . .	3,631
Number of reactors, . . . . .	758

*Disposal of Reactors.*

Slaughtered by owner, no record of post-mortem findings, . . . . .	136
Condemned on physical examination, . . . . .	8
Killed, lesions found, . . . . .	247
Killed, no lesions found, . . . . .	12
Showing no physical symptoms of tuberculosis, no record of disposal, . . . . .	315
Awaiting action, . . . . .	40

NOTE. — In addition, 25 animals reacting to test made in 1919 were killed and lesions found.

During the year Division inspectors physically examined 1,310 herds of Massachusetts cattle comprising 15,546 head, of which number 1,380 were killed and found diseased.

*Interstate Cattle.*

In accordance with present regulations of the Federal government, all dairy or breeding cattle shipped interstate, if over six months of age, must have passed a tuberculin test applied by veterinarians approved by the live-stock officials of the State where tested and by the chief of the Bureau of Animal Industry, United States Department of Agriculture.

A modification of this regulation has, however, been made applicable to cattle shipped to so-called "public stockyards" which are under the supervision of Bureau officials and where the animals can be tested upon arrival. On July 1, 1919, the Brighton cattle market was designated as "public stockyards," and such of the dairy or breeding cattle in the weekly shipments to that point as have not been tested before shipment are tested by inspectors of the Bureau of Animal Industry and of this Division working in co-operation. Check tests are also made from time to time on interstate cattle supposed to have been properly tested before shipment, in order that the quality of this work done in other States may be determined.

Additional quarantine stations for receipt of animals for Brighton market are maintained at Watertown and Somerville, at which points many of the cattle destined for that market are unloaded. The protection of Massachusetts cattle interests at these points is carefully attended to by our force of inspectors, and we feel sure that no cattle which can be suspected of tuberculosis are released for any purpose except for immediate slaughter.

Brighton stockyards being the only point in the State to which untested cattle may be shipped, in strict compliance with Federal regulations, our former work of testing at other points is reduced to a minimum and consists only of testing such animals as may arrive not accompanied by a record of tuberculin test. A few violations of the regulations occur, some of them through ignorance of Federal and State requirements, and others in willful disregard of them. These latter cases are investigated when reported and prosecution in the courts is instituted if deemed advisable.

Following are tabulations showing in detail the interstate cattle work of the Division at Brighton and other points:—

AT BRIGHTON QUARANTINE STATION FROM DEC. 1, 1919, TO NOV. 30, 1920.

Number accepted on approved records of test, . . . . .	9,736	
Number received and tuberculin tested, . . . . .	2,758	
		————— 12,494

*Disposal of Above Animals.*

Number released on accepted records of test, . . . . .	9,736
Number released on first test, . . . . .	2,460
Number released on second test, . . . . .	85

Number released on third test, . . . . .	5	
Number died awaiting second test, . . . . .	1	
Number released for slaughter on first test, . . . . .	28	
Number released for slaughter on second test, . . . . .	4	
Number condemned on physical symptoms, . . . . .	1	
Number slaughtered on first test, lesions of tuberculosis found, . . . . .	103	
Number slaughtered on second test, lesions of tuberculosis found, . . . . .	37	
Number slaughtered on first test, lesions of tuberculosis not found, . . . . .	23	
Number slaughtered on second test, lesions of tuberculosis not found, . . . . .	8	
Number slaughtered on third test, lesions of tuberculosis not found, . . . . .	1	
Number held awaiting disposal, . . . . .	2	
		————— 12,494

AT OTHER POINTS FROM DEC. 1, 1919, TO NOV. 30, 1920.

Number condemned in 1919 awaiting slaughter in 1920, . . . . .	2	
Number held from 1919 awaiting test or other disposal in 1920, . . . . .	37	
Number held from 1919 for retest or other disposal in 1920, . . . . .	8	
Number received during the year, . . . . .	5,342	
		————— 5,389

*Disposal of Above Animals.*

Number released on accepted records of test, . . . . .	5,247	
Number released on test made after arrival, . . . . .	89	
Number reacted and held till 1921 for disposal, . . . . .	2	
Number condemned in 1919, slaughtered in 1920, lesions of tuberculosis found, . . . . .	2	
Number condemned, lesions of tuberculosis found, . . . . .	4	
Number condemned, lesions of tuberculosis not found, . . . . .	1	
Number slaughtered on "permit to kill" warrant, lesions of tuberculosis found, . . . . .	1	
Number slaughtered by owner under Federal supervision, lesions of tuberculosis found, . . . . .	4	
Number slaughtered by owner under Federal supervision, lesions of tuberculosis not found, . . . . .	3	
Number remaining in State temporarily, no test required, . . . . .	23	
Number held awaiting release or test, . . . . .	13	
		————— 5,389

## SUMMARY.

Total interstate dairy cattle received at Brighton station,	12,494	
Total interstate dairy cattle received at other points,	5,389	
		17,883

*Origin of the Above Interstate Cattle.*

Vermont, . . . . .	5,254	
Maine, . . . . .	6,207	
New Hampshire, . . . . .	4,729	
New York, . . . . .	1,040	
Connecticut, . . . . .	173	
Rhode Island, . . . . .	42	
Other States and Canada, . . . . .	438	
		17,883

Animals other than dairy cattle requiring tuberculin test received at other points than the quarantine stations may be classified as below:—

*Cattle not requiring Tuberculin Test.*

Cattle for immediate slaughter, . . . . .	1,916	
Calves for immediate slaughter, . . . . .	2,510	
Dairy calves under six months old, . . . . .	215	
Cattle returned from out-of-State pastures, . . . . .	377	
Cattle pastured in the State during the season, . . . . .	77	
Feeder cattle, . . . . .	72	
Lost in mountains, . . . . .	1	
Unloaded for short stay on route through State, . . . . .	29	
Returned from temporary stay in other States for breeding purposes, etc., . . . . .	9	
Remaining in State for brief periods only, for breeding purposes, etc., . . . . .	8	
For temporary stay at sales or exhibitions, . . . . .	843	
		6,057
Total, . . . . .		6,057

There are large slaughtering establishments at Haverhill, West Newbury and Springfield where Federal inspection of slaughtered animals is maintained, to which points cattle and calves for immediate slaughter may be shipped without special permit, record of which is not kept by this Division. There are on an average several thousand animals shipped to these points annually, and it is estimated that at least 90 to 95 per cent of them come into Massachusetts from other States.

Fourteen permits allowing shipment of cattle into the State were brought over from the previous year, report on them not having been received before the close of that year. There were 1,171 permits issued during the year; on 29 of these no report has yet been received. It was found that cattle were brought in without permits in 146 instances, comprising 996 animals; 571 of these were accompanied by approved records of test; 48 were tested by Division veterinarians; 122 were Massachusetts cattle returned from pastures in other States; 26 were dairy calves under six months old; 28 were feeder cattle; 1 had been out of the State only temporarily; 1 was lost track of; 29 remained in the State temporarily; and 170 head were for immediate slaughter. These figures are all included in the statistical tables.

During the past year Massachusetts cattle owners were not allowed to send their cattle into the State of New Hampshire for pasturage upon certificate of physical examination only, that State requiring that such cattle be tuberculin tested before entering the State in accordance with the regular rules governing the interstate movement of cattle. The State of Vermont has not required the tuberculin test, but has allowed cattle to enter for pasturage only under rigid restrictions, requiring inspection and tagging before entering, and a strict accounting for before leaving the pastures in the fall. The State of New Hampshire takes the larger number of pasture cattle, a few going into Vermont and Maine. The records of this Division show that 99 head of cattle were tagged only, and 595 head were tuberculin tested by Massachusetts veterinarians, to be sent to pasture in other States. When returned to this State such cattle are accepted without further test, provided they can be checked up by their tag numbers.

At a sale of Ayrshire cattle held in Springfield in June, 45 animals came from other States, 17 of them being sold to remain in Massachusetts. At a sale of Hereford cattle in Worcester, which took place in May, 27 head came from out of the State, 15 being sold to remain. At the national Ayrshire sale occurring in Springfield in June, 34 head came from other States, 13 being sold to remain in Massachusetts.

At the Eastern States Exposition held in Springfield in the latter part of September, and a sale of Aberdeen-Angus cattle

held in connection therewith, 667 head were brought from other States, of which number 3 dairy cattle were sold to remain in Massachusetts, and 2 head were sold for immediate slaughter. At this exposition there were 74 exhibitors of cattle, 23 exhibitors of sheep, and 18 exhibitors of swine. There were 896 head of cattle exhibited; there were 39 head of baby beef and Junior Extension Department calves (calves previously given to boys for fattening with the intention of having them exhibited at the exposition), and there were 70 head of nurse cows on the grounds, making a total of 1,005 cattle at the exhibition. There were 395 sheep, 304 head of swine, and 293 horses on the grounds.

In point of numbers this exposition was the largest since the Eastern States began to hold these exhibitions, and the average grade of animals exhibited was the highest.

The Division keeps records of all animals received at the several quarantine stations, also the States from which neat cattle are shipped, as shown by the following figures:—

*Receipts of Stock at the Watertown Stockyards for the Year ending Nov. 30, 1920.*

New Hampshire cattle, . . . . .	3,559
Vermont cattle, . . . . .	5,968
Calves, . . . . .	24,860
Sheep and lambs, . . . . .	2,106
Swine, . . . . .	3,353

*Receipts of Stock at the New England Dressed Meat and Wool Company's Yards at Somerville for the Year ending Nov. 30, 1920.*

Maine cattle, . . . . .	2,374
New Hampshire cattle, . . . . .	2,302
Vermont cattle, . . . . .	7,150
Massachusetts cattle, . . . . .	1,944
Western cattle, . . . . .	3,555
Canada cattle, . . . . .	514
Calves, . . . . .	90,324
Sheep and lambs, . . . . .	246,504
Swine, . . . . .	927,100

*Receipts of Stock at Brighton for the Year ending Nov. 30, 1920.*

Maine cattle, . . . . .	8,777
New Hampshire cattle, . . . . .	8,441
Vermont cattle, . . . . .	3,091

Massachusetts cattle, . . . . .	13,168
New York cattle, . . . . .	11,335
Western cattle, . . . . .	36,138
Canada cattle, . . . . .	356
Calves, . . . . .	80,988
Sheep and lambs, . . . . .	11,360
Swine, . . . . .	42,407

#### GLANDERS.

The prevalence of this disease among the equine species has been satisfactorily controlled during the past year and the number of positive cases found is at nearly the same low figure as during the year 1919. The record for that year was so low that much doubt has since existed as to our ability to maintain it at anywhere near the same point. However, on account of this low record for two successive years we feel still more confident that we are on the way toward total extermination of this disease.

We realize the importance of complete control not only on account of the great economic loss which it causes to owners of the different types of horses used for farm work, general business purposes, exhibition, breeding, and as a means of recreation and pleasure, but also on account of the danger of its communicability to the human subject, nearly always causing death of the person infected.

Although the horse, as an aid to business and as a means of pleasure, has been to a great extent supplanted, he has been shown to be a really indispensable factor in the performance of the world's work, whether in times of peace or in war, and, what is of equally great importance, he is now of priceless value in the field of preventive medicine; that is, in the manufacture of the various sera now used in the prevention and cure of disease, especially in the human subject. He is, therefore, an animal which must still be produced in large numbers, and be maintained free from contagious disease if possible. Consequently we are actively engaged at all times in the suppression of glanders as the one principal disease of a contagious nature that affects horses, mules and asses.

The successful methods by which the number of cases of glanders has been rapidly reduced in the past few years, and which have apparently solved what was formerly a difficult

problem of disease control, may be briefly referred to as follows:—

Immediate quarantine of all reported cases; prompt killing of all clinical cases, followed by disinfection of the premises where kept, of the blacksmith shops where shod, and of watering troughs where they were in the habit of drinking; examination and re-examination of all contact animals, together with application of the several diagnostic tests when necessary; extension of the plan of testing whole stables; closing of public watering troughs in sections where an outbreak of the disease occurs; testing of all horses and mules shipped interstate from New York, New Jersey, Connecticut and Rhode Island, unless accompanied by satisfactory records of recent tests.

The records of the Division for the year ending Nov. 30, 1920, show the following facts:—

At the end of 1919, 8 horses were under observation. Of this number, 1 died and 7 have been released as free from the disease.

During the past year 124 suspected animals, in addition to the 8 mentioned above, have been examined. Of this number, 27 animals proved to be positive cases and were destroyed in accordance with the requirements of the law; 1 was killed by its owner, autopsy proving it to have been a case of glanders; 3 horses were killed at request of owners, post-mortem examination failing to show lesions of glanders; 1 State and 2 interstate horses were condemned and killed, no lesions of glanders being found on post-mortem examination, their full appraised value amounting to \$225; 1 horse died before final diagnosis was made; 87 were released as free from the disease; and 2 were still held under observation at the end of the year.

In the so-called "stable tests," or tests of all animals in stables where glanders has been found, 243 horses have been tested in 23 stables; among them 1 case of glanders was found and 1 horse is still held under observation.

The above figures are all included in the tabulations which follow:—

## HORSES REPORTED AS SUSPECTED.

Brought forward from the year 1919, . . . . .	8	
Reported by renderer, . . . . .	3	
Reported by inspectors, Division agents, veterinarians, owners, etc., . . . . .	122	
Interstate, reported by inspectors, . . . . .	2	
Contact animals examined in stable tests, . . . . .	243	
		— 378

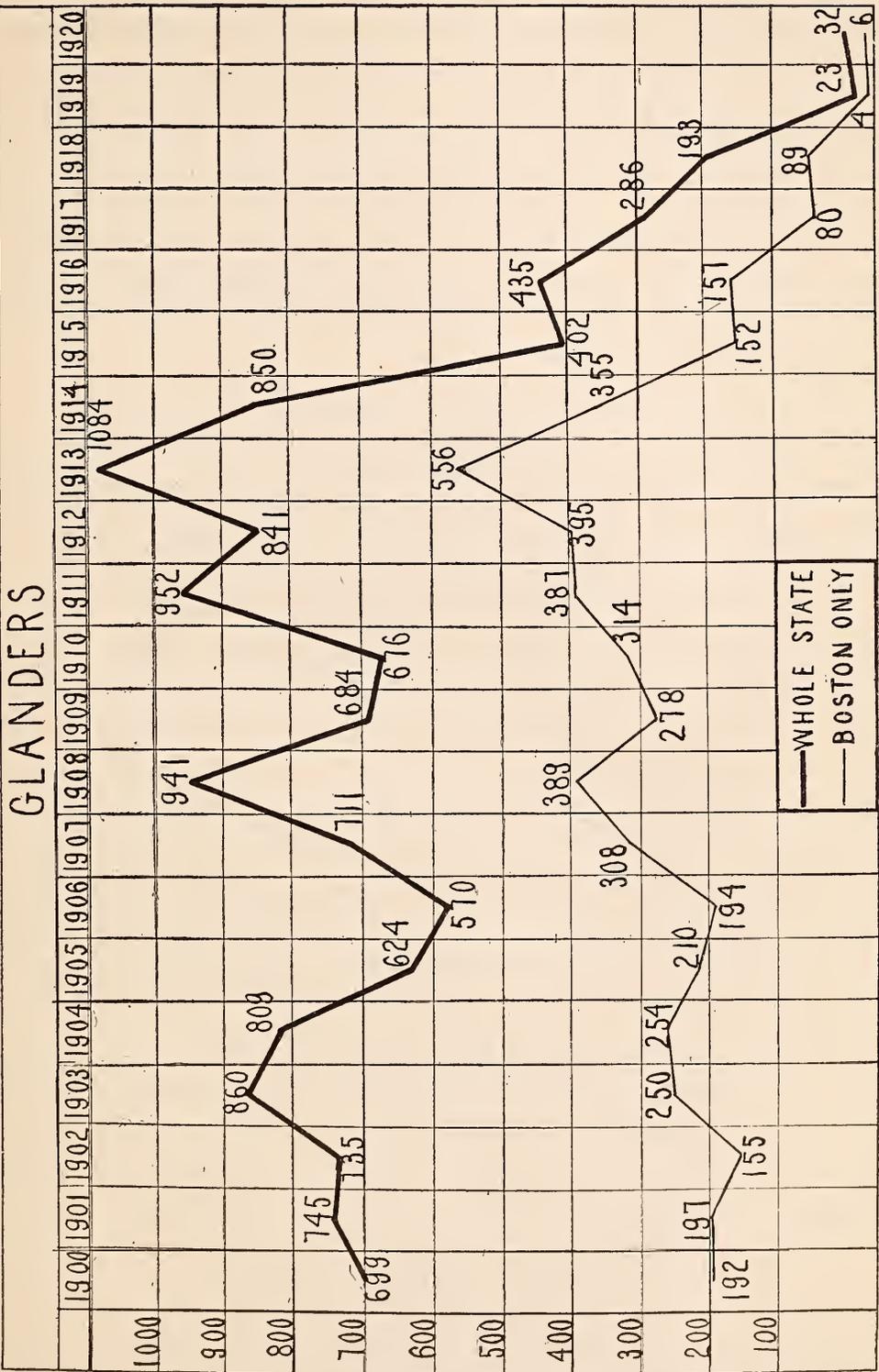
*Disposal of Above Horses.*

Appraised and killed, positive, . . . . .	28	
Killed by owner, positive, . . . . .	1	
Reported by renderer, positive, . . . . .	3	
		— 32
Killed at owner's request, no lesions found, . . . . .	3	
Appraised and killed, no lesions found (2 interstate, 1 State), . . . . .	3	
Killed by owner or died, no lesions found, . . . . .	2	
Released as not affected with glanders, . . . . .	335	
Awaiting disposition, . . . . .	3	
		— 378

Following is a table giving the number of cases of this disease covering a period of twenty-two years. In this table cases which have occurred in the city of Boston are shown separately, on account of the fact that Boston was for many years the storm center of this disease. Special tabulation of the number of cases in that city has always been made in order that its relative importance to other sections of the State may be studied.

*Number of Cases.*

YEAR.	CASES.		
	In Boston.	In Other Places.	Totals.
1899, . . . . .	159	384	543
1900, . . . . .	192	507	699
1901, . . . . .	197	548	745
1902, . . . . .	155	580	735
1903, . . . . .	250	610	860
1904, . . . . .	254	555	809
1905, . . . . .	210	414	624
1906, . . . . .	194	376	570
1907, . . . . .	308	403	711
1908, . . . . .	389	552	941
1909, . . . . .	278	406	684
1910, . . . . .	314	362	676
1911, . . . . .	387	565	952
1912, . . . . .	395	446	841
1913, . . . . .	556	528	1,084
1914, . . . . .	355	495	850
1915, . . . . .	152	250	402
1916, . . . . .	157	278	435
1917, . . . . .	80	206	286
1918, . . . . .	89	104	193
1919, . . . . .	4	19	23
1920, . . . . .	6	26	32



The Massachusetts Society for the Prevention of Cruelty to Animals, the Boston Workhorse Relief Association, the Animal Rescue League, and the branches of these various associations in many cities and towns of the State have through their agents always been of material aid to the Division in the work of controlling this disease. Their close observation of working animals of all classes has in the past, when the disease was more prevalent, brought to light many showing suspicious symptoms, which they have promptly reported to this Division, and many of the animals so reported have proved to be positive cases of the disease.

The constant activity of the humane societies in removing disabled animals from work and destroying those which, on account of extreme age or poor condition, are no longer useful has undoubtedly been a factor in the suppression of glanders, as such animals are very susceptible to infection.

The maximum amount, fixed by chapter 646 of the Acts of 1913, which may be paid for any one animal condemned and destroyed on account of being affected with glanders being \$50, the appraised value of the animals condemned is a subject of considerable interest. Of the 32 positive cases of glanders occurring during the year, 28 were appraised at a total valuation of \$3,370, the average amount per animal being \$120.36. On the remaining 4 animals no appraisal was made for the following reasons: 3 of them were reported by a renderer and 1 was killed by owner, the disease being found on autopsy.

Of the 28 horses which were appraised, 22 have been paid for, the amount paid being \$1,100; in 3 cases there was no award, as the horses had not been in the Commonwealth the required length of time; and 3 cases are awaiting the filing of claims for payment.

#### *Complement-fixation Test.*

Of the 8 horses under observation at the end of the year 1919, 2 were released without further test, 1 died, and 5 were subjected to the complement-fixation test, with the result that they were released as probably free from the disease.

Two hundred and twenty samples of blood were taken from

195 horses during the year 1920, and the following disposal of the animals was made: —

Animals held over from 1919, disposed of as above, . . . . .	5
Animals released on first test, . . . . .	145
Released on second test, . . . . .	18
Died or killed by owner after first test, . . . . .	4
Condemned on first test, . . . . .	18
Condemned on second test, . . . . .	2
Condemned on third test, . . . . .	2
Held for further observation after second test, . . . . .	1
	195

#### *Ophthalmic-mallein Test.*

This test has been applied to 310 State and 619 interstate horses during the year. It happens that the test in some instances was repeated on the same animals, and 938 such tests have been made. The results are as follows: —

Tests giving positive reaction, . . . . .	13
Tests giving no reaction, . . . . .	910
Tests giving unsatisfactory results, . . . . .	15
	938

#### *Interstate Horses.*

Horses, asses and mules shipped to Massachusetts from the States of New York, New Jersey, Connecticut and Rhode Island must be accompanied by a permit from the Director of Animal Industry. This regulation was established on account of the prevalence of glanders among the horses of the States mentioned, and in order that upon arrival the animals might be immediately located and examined by agents of this Division.

The number of horses, mules and asses shipped from these States has decreased from 4,168 in the year 1919 to 4,082 in the year ending Nov. 30, 1920, the statistics following: —

#### EQUINE ANIMALS FROM NEW YORK, NEW JERSEY, CONNECTICUT AND RHODE ISLAND.

Mules, . . . . .	5
Horses, . . . . .	4,077
	4,082

*Disposal of Above Animals.*

Released upon physical examination, . . . . .	3,442
Released upon accompanying papers without examination,	5
Released after test, . . . . .	619
Released on route to other States, . . . . .	14
Reacted to test, killed, no lesions found, . . . . .	2
	————— 4,082

It is worthy of notice that no interstate horses or mules were found during the past year to have been affected with glanders. Many of the animals brought from the above-mentioned States are of the better class, being highly bred horses used for carriage work and breeding purposes. The second-hand horses, which are trafficked in and sent from the markets of one State to those of another for purpose of public sale, have been specially watched on account of their being considered more liable to be subjects of contagious disease than the higher class animals, and if not accompanied by a satisfactory certificate of test have been tested on arrival by inspectors of the Division.

## RABIES.

All species of domestic animals are susceptible to rabies, it is readily communicable to man, and a high rate of mortality always follows its development. For these reasons we realize the necessity for close observation on the part of town and State officials charged with its control.

An outbreak in any locality can generally be confined within reasonable limits if there is prompt notification given to local inspectors of animals or to this Division, so that the measures generally recognized as effective in its control may be at once put into operation. In its spread from one locality to another, the dog is *alone* the factor, unless the possibility of its being continuously prevalent, to a greater or less degree, in wild animals is admitted, and that the contagion is readily transmitted to the dog running at large. The ownerless or stray dog is generally the first rabid animal to be found in any community, and the extent to which he may have spread the infection depends on how soon he has been apprehended after he developed the disease. No one being interested in the

whereabouts or physical condition of the ownerless dog, he becomes an active spreader of the disease before attention is centered on him. A more rigid enforcement of the dog laws would be of great assistance in suppressing this troublesome disease.

The quarantining of animals which are found to have been exposed to a suspected or positive case, their confinement and restraint, causes much inconvenience and in some cases considerable expense to their owners. When persons have been bitten by animals positively known to be rabid at the time, or subsequently proved to be infected with the disease, there follows in some instances more or less nervousness on the part of the people; also considerable monetary loss occasionally occurs by the death of valuable dogs or other infected animals.

While dogs are the animals which are principally the victims of this disease, a few cases yearly occur in horses, cattle, sheep, swine or cats, the source of which can generally be traced to the canine animal.

Division records this year show a larger number of cases reported than in any year since 1916, when the lowest prevalence for fifteen years was recorded, since which time there has been a gradual increase in their numbers. It is probable that we have not yet reached the peak of the upward trend of prevalence as yearly recorded, on account of the vast amount of contagion recently existing in near-by States, the invasion of Massachusetts by it having been forecasted in our reports for the past three years.

Local inspectors of animals are familiar with the situation, and those of border towns are specially advised as to the importance of early quarantine, thorough investigation and prompt detailed reports to this office.

Following is a general outline of the Division's present methods in rabies control work:—

Upon report being made to the Division that a person has been bitten by a dog, the inspector of animals of the town or city in which it occurs is ordered to make an examination of the animal, and, even if it appears to be healthy, to have it restrained for a period of fourteen days for the purpose of observation. The restraint for this length of time is deemed necessary for the reason that competent authorities have

shown that in some instances the bite of a dog infected with rabies may communicate the infection fourteen days before the animal shows clinical symptoms. If at the end of this period no symptoms of rabies have developed, the animal may be released. In case a person is bitten by a dog which, upon examination by the inspector of animals or any other person, shows evidence of already being affected with rabies, or there is a history of its having been in contact with a rabid animal, the dog in either case is immediately confined in strict quarantine. If it is subsequently killed or dies, its head is at once sent to the Division's office, and a laboratory examination of the brain is made for the purpose of positively determining whether or not the animal was affected with the disease. Information as to the laboratory findings is promptly communicated to the person or persons who have been bitten. The State Department of Public Health is given the information received in every case of dog bite reported to this office, whether the bite has been inflicted by an animal suspected of rabies or not. We also order the local inspector of animals not only to ascertain the names of all persons who have been bitten by dogs suspected of rabies but to find out if animals have also been bitten, and if so to place the same in quarantine for a period of at least ninety days. All dogs which are found to have been in contact with a rabid animal, whether or not it appears that they have been bitten by it, are also placed in quarantine for the same period.

If an unusual number of cases of rabies is found to exist in any town or city, the selectmen or the mayor or board of aldermen are asked to issue a restraining order, under the provisions of section 158 of chapter 102 of the Revised Laws. Such an order obliges all dog owners to confine their animals to their own premises for a certain period, or take them therefrom only on leash. This restraining order is much more effective in the local control of an outbreak than is an order which compels owners to muzzle the animals only but not restrain them, as a muzzled animal let loose may in some way get the muzzle off and bite other animals or people. A muzzled dog at large may therefore become much more dangerous than an unmuzzled one which is at all times confined upon

owner's premises or taken therefrom only on leash. Dogs found running at large while a restraining order issued by town or city authorities is in force may be killed on the issuance of a warrant for the same to a police officer. It was found advisable to ask for general restraining orders in fifteen towns of the Commonwealth during the past year. These orders were for periods of ninety days.

Our force of district agents, all of whom are veterinarians and located in different parts of the State, together with the local inspectors of animals, of whom there is one or more in every city and town of the State, constitutes an organization by which systematic local control of an outbreak of this disease can generally be accomplished within a reasonably short time.

During the year ending Nov. 30, 1920, 769 animals were reported to the Division for diagnosis, observation or quarantine on account of the prevalence of rabies, and 28 were brought forward from the year 1919. The records have been classified as follows: —

Animals suspected of rabies, primary cases, . . . . .	171
Animals exposed to rabies (26 reported in 1919, 385 in 1920), . . . . .	411
Animals which have inflicted bites upon persons (2 reported in 1919, 213 in 1920), . . . . .	215

*Animals suspected of Rabies, Primary Cases.*

	Dogs.	Cattle.	Cats.	Swine.
Diagnosis positive, . . . . .	121	3	1	-
Diagnosis negative, . . . . .	34	-	1	1
Diagnosis questionable, . . . . .	8	-	1	1

*Animals exposed to Rabies.*

	Dogs.	Cattle.	Cats.	Swine.	Horses.	Drake.
Number released after a quarantine of ninety days.	148	36	2	102	4	1
Number killed, no symptoms having developed.	42	-	4	-	-	-
Number killed, positive symptoms having developed.	34	5	-	6	1	-
Number still held under observation,	25	-	-	-	1	-

*Animals which have inflicted Bites upon Persons.*

	Dogs.	Cats.
Number killed during quarantine, no symptoms having developed.	27	3
Number killed, no examination, . . . . .	4	-
Number released after fourteen days' quarantine, . . . . .	178	1
Number still held under observation, . . . . .	2	-

Of the 28 animals which were under observation at the close of the year 1919, 27 were released, no symptoms of rabies having developed. One, a horse, developed symptoms of the disease five months after contact with a rabid dog, and was killed.

The questionable cases given in the preceding table may be briefly referred to as follows: 3 dogs were killed by police officers, showing symptoms which they considered suspicious; 1 dog was found dead, 2 were killed, and 1 pig was killed, laboratory examination in all 4 cases being unsatisfactory; 1 dog was chloroformed by its owner, having shown suspicious symptoms; 1 dog, which had probably been exposed, disappeared; and in case of 1 cat no laboratory examination was made.

During the past year the Division received reports of 296 persons having been bitten by dogs, and 5 persons having been bitten by cats. Sixty-two of these persons were bitten by 26 of the dogs classified in the tables as positive cases. In all cases of dog bite which are reported, the dog is immediately quarantined for observation except in cases where the animal is immediately killed. Of the cases of dog bite reported, 231 were inflicted by dogs proved not to be affected with rabies. One case was that of a dog on which laboratory examination was questionable, and 2 cases of bite were by dogs which are still in quarantine for observation.

All persons bitten were officially notified of the results of laboratory examination of the brains of the rabid animals. Prompt notice was also given the State Department of Public Health, and it is probable that in many cases where examina-

tion gave positive results, the Pasteur treatment in prevention of rabies was administered to the persons bitten, either under supervision of health officials or by private physicians. Six dogs bitten by rabid animals were also given antirabic treatment.

It is deemed advisable, in all cases where possible, that the heads of animals supposed to be affected with rabies should be examined at the laboratory in order to confirm diagnosis. During the past year laboratory examination has been made of the brains of 149 dogs, 3 cats, 7 swine and 4 cattle. Of this number, 93 dogs, 5 swine and 4 cattle showed positive evidence of the disease.

Of the 769 animals reported for observation, diagnosis or quarantine during the year, 48 dogs were, as far as could be ascertained, ownerless and unlicensed, 29 of which proved to be positive cases of the disease.

One dog which was killed in April on account of being affected was known to have been bitten in August of 1919.

In another case, the disease developed 83 days after the animal was bitten.

A dog was killed in Townsend, Vt., in February, having traveled there from Ashby, Mass., a distance of approximately 100 miles. This dog prior to leaving Ashby was known to have bitten a dog at the same premises, which latter dog developed rabies in June.

In 1 case which proved to be rabies the dog had been brought into Massachusetts from Kansas City, Mo., a few weeks before the development of the disease. Upon inquiry it was found that rabies was very prevalent in that city about that time.

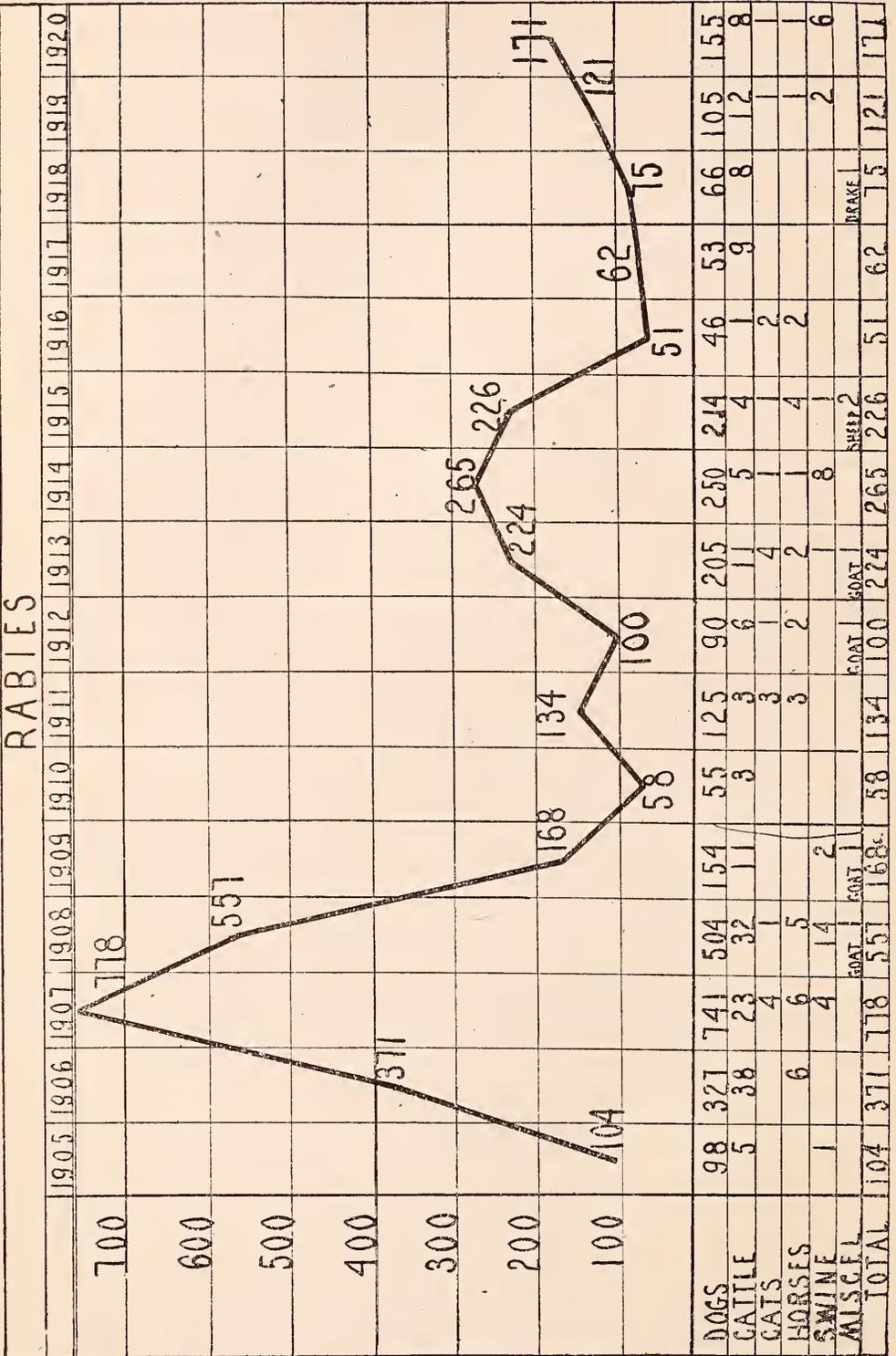
In one instance a Great Dane dog ran through five different towns, and was known to have come in contact with 12 other dogs, which were immediately quarantined, 5 of which later developed the disease.

The following table shows the number of positive cases of rabies by cities and towns:—

CITY OR TOWN.	Dogs.	Cattle.	Horses.	Pigs.	Cats.
Arlington, . . . . .	2	-	-	-	-
Ashby, . . . . .	1	-	-	-	1
Athol, . . . . .	1	-	-	-	-
Attleboro, . . . . .	3	-	-	-	-
Barnstable, . . . . .	1	-	-	-	-
Berkley, . . . . .	2	-	-	-	-
Bolton, . . . . .	2	-	-	-	-
Boston (Hyde Park 1, Roxbury 2), . . . . .	3	-	-	-	-
Boylston, . . . . .	1	-	-	-	-
Brockton, . . . . .	10	-	-	-	-
Canton, . . . . .	1	-	-	-	-
Dartmouth, . . . . .	1	-	-	-	-
Dedham, . . . . .	4	-	-	-	-
Douglas, . . . . .	1	-	-	-	-
East Bridgewater, . . . . .	2	-	-	-	-
Easton, . . . . .	2	-	-	-	-
Fall River, . . . . .	20	-	-	-	-
Fitchburg, . . . . .	1	-	-	-	-
Foxborough, . . . . .	-	1	-	-	-
Franklin, . . . . .	1	-	-	-	-
Freetown, . . . . .	1	-	-	-	-
Grafton, . . . . .	1	-	-	-	-
Hanover, . . . . .	3	-	-	-	-
Hopedale, . . . . .	1	-	-	-	-
Hopkinton, . . . . .	4	-	-	-	-
Lancaster, . . . . .	2	-	-	-	-
Leicester, . . . . .	1	-	-	-	-
Mansfield, . . . . .	3	-	-	-	-
Medfield, . . . . .	6	-	-	-	-
Medway, . . . . .	1	-	-	-	-
Mendon, . . . . .	1	-	-	-	-
Middleborough, . . . . .	1	-	-	-	-
Millbury, . . . . .	2	-	-	-	-
Millis, . . . . .	3	-	-	-	-
Milton, . . . . .	1	-	-	-	2
Needham, . . . . .	3	-	-	-	-
New Bedford, . . . . .	1	-	-	-	-
Newburyport, . . . . .	1	-	-	-	-
Paxton, . . . . .	1	-	-	-	-
Plainville, . . . . .	-	1	-	-	-

CITY OR TOWN.	Dogs.	Cattle.	Horses.	Pigs.	Cats.
Rehoboth, . . . . .	1	-	-	-	-
Royalston, . . . . .	1	-	-	-	-
Seekonk, . . . . .	3	2	-	1	-
Sharon, . . . . .	2	-	-	-	-
Somerset, . . . . .	1	-	-	-	-
Stoughton, . . . . .	1	-	-	-	-
Sutton, . . . . .	1	-	-	-	-
Swansea, . . . . .	4	-	-	5	-
Taunton, . . . . .	16	-	1	-	-
Uxbridge, . . . . .	1	-	-	-	-
Walpole, . . . . .	3	-	-	-	-
Wayland, . . . . .	1	-	-	-	-
Webster, . . . . .	2	-	-	-	-
Wellesley, . . . . .	1	-	-	-	-
Westborough, . . . . .	1	-	-	-	-
West Boylston, . . . . .	1	-	-	-	-
Westminster, . . . . .	1	-	-	-	-
Weston, . . . . .	1	-	-	-	-
Westport, . . . . .	8	4	-	-	-
Westwood, . . . . .	2	-	-	-	-
Weymouth, . . . . .	1	-	-	-	-
Worcester, . . . . .	3	-	-	-	-
Wrentham, . . . . .	3	-	-	-	-
Totals, . . . . .	155	8	1	6	1

Following is a chart showing the proved cases of rabies in the several species of animals covering the period from 1905 to 1920, inclusive.



## HOG CHOLERA.

The reports from our annual inspection show that the number of swine found on the farms this year has reduced from 108,108, last year's record, to 100,982, a reduction of approximately 7,500 head, or 7 per cent. This is a much smaller decline than had been forecasted, but undoubtedly it will still further continue unless market conditions change for the better.

During the progress of the World War, when an increased production in this country of all kinds of animal products used for food became a vital necessity in order that the world supply of food might be maintained, the raising of swine was rapidly taken up by many people not previously engaged therein. They did this in many instances from patriotic motives alone, and the number of animals raised in one or two pig lots was larger by thousands than one would estimate. During these war years, therefore, the number of swine raised in the State was far beyond the average, but soon returned to normal when the stimulus of war conditions ceased to be operative.

Certain other conditions have this year operated to largely reduce the number of swine in the State. The high price of feed of all kinds continuing for the greater part of the year, during all of which time the market price of live hogs has steadily declined, are two conditions very discouraging to the swine owner who may be raising hogs for the market as a business project. For these reasons alone many persons formerly engaged in that business have suspended operations until market conditions shall have become more favorable. We consequently find this year that numbers of swine in the State have largely reduced, and that the average amount of contagious disease prevalent has declined in proportion.

The Division's work in prevention of disease in swine, which was commenced in 1914, was undertaken primarily on account of the existence of hog cholera, which disease prevailed to such an extent and carried such a high mortality rate that the raising of swine in any considerable numbers was a very un-

certain enterprise, especially so if their principal food was garbage, a proved carrier of this contagion.

Although it had been shown that garbage contained all the food elements necessary to proper growth of swine, and furthermore that in many communities it was a complete waste, not utilized in any economic way whatever, yet many were deterred from using it as a food for swine on account of what was a common experience, namely, an outbreak of hog cholera, which in many instances destroyed a whole herd.

The raisers of pure-bred swine also found the chances in their business greatly increased by the danger of this contagion, even though garbage was not fed.

For seven years the Division has been engaged in the immunization of swine against this scourge, with the result that the production and successful raising of this species on garbage as a food has been rendered a safe project, and the foundation stock as represented by pure-breds has been protected against a serious danger. The only thing necessary to success in all instances is the immunization of the animals while healthy, not waiting until the disease has appeared before applying for our service. The treatment is specifically in prevention of disease and is not a curative. While we always endeavor to save the animals which are sick, more or less deaths are bound to occur when the disease is actually present in the herd.

The objective striven for during the past seven years by the Division of Animal Industry's work in this line has already been reached, and we now unhesitatingly refer to it as a public sanitary control service of much importance, of great value to the live-stock industry, and a work directly in conservation of the people's food supply.

Following is a list of cities and towns in which hog cholera prevention work has been carried on during the year ending Nov. 30, 1920: —

CITY OR TOWN.	Herds inoculated.	INOCULATIONS.		
		Serum and Virus.	Serum only.	Total.
Abington, . . . . .	2	20	40	60
Acton, . . . . .	1	4	8	12
Adams, . . . . .	2	40	0	40
Agawam, . . . . .	7	114	58	172
Amesbury, . . . . .	1	3	1	4
Amherst, . . . . .	5	138	19	157
Andover, . . . . .	4	39	5	44
Arlington, . . . . .	1	6	6	12
Ashburnham, . . . . .	2	2	0	2
Ashland, . . . . .	1	2	1	3
Athol, . . . . .	2	10	19	29
Attleboro, . . . . .	3	109	60	169
Auburn, . . . . .	18	80	86	166
Ayer, . . . . .	2	287	460	747
Barnstable, . . . . .	5	57	57	114
Barre, . . . . .	1	0	13	13
Becket, . . . . .	1	9	0	9
Belmont, . . . . .	4	690	634	1,324
Berlin, . . . . .	3	9	0	9
Beverly, . . . . .	1	118	11	129
Billerica, . . . . .	2	13	11	24
Bolton, . . . . .	2	19	0	19
Boston, . . . . .	7	675	577	1,252
Bourne, . . . . .	1	28	6	34
Braintree, . . . . .	4	73	89	162
Bridgewater, . . . . .	1	257	154	411
Brockton, . . . . .	5	639	718	1,357
Brookfield, . . . . .	3	80	8	88
Brookline, . . . . .	2	28	10	38
Burlington, . . . . .	3	919	1	920
Canton, . . . . .	2	58	57	115
Charlton, . . . . .	1	40	20	60
Chelmsford, . . . . .	3	36	0	36
Cheshire, . . . . .	1	7	0	7
Chester, . . . . .	1	19	1	20
Chicopee, . . . . .	24	293	104	397
Clarksburg, . . . . .	1	6	0	6
Clinton, . . . . .	14	83	20	103
Cohasset, . . . . .	1	2	23	25
Concord, . . . . .	5	141	55	196
Dalton, . . . . .	1	170	84	254
Dana, . . . . .	1	4	0	4
Danvers, . . . . .	1	239	186	425
Dartmouth, . . . . .	3	79	42	121
Dedham, . . . . .	4	62	14	76
Deerfield, . . . . .	3	23	0	23
Dover, . . . . .	3	69	27	96
Dracut, . . . . .	1	7	0	7
Easthampton, . . . . .	9	29	23	52
East Longmeadow, . . . . .	6	43	50	93
Easton, . . . . .	2	12	8	20
Enfield, . . . . .	1	1	0	1
Fairhaven, . . . . .	6	13	20	33
Fall River, . . . . .	2	3	13	16
Fitchburg, . . . . .	23	454	287	741
Foxborough, . . . . .	2	80	186	266
Gardner, . . . . .	19	219	263	482
Gill, . . . . .	2	32	37	69
Gloucester, . . . . .	7	382	198	580
Grafton, . . . . .	6	171	186	357
Granby, . . . . .	1	9	0	9
Greenfield, . . . . .	4	163	60	223
Greenwich, . . . . .	1	0	25	25
Groton, . . . . .	1	6	6	12
Hadley, . . . . .	2	5	6	11
Hampden, . . . . .	2	17	0	17
Hancock, . . . . .	1	6	0	6
Hanover, . . . . .	1	0	8	8
Hanson, . . . . .	1	9	0	9
Hardwick, . . . . .	2	16	6	22
Harvard, . . . . .	4	21	0	21
Harwich, . . . . .	1	2	0	2

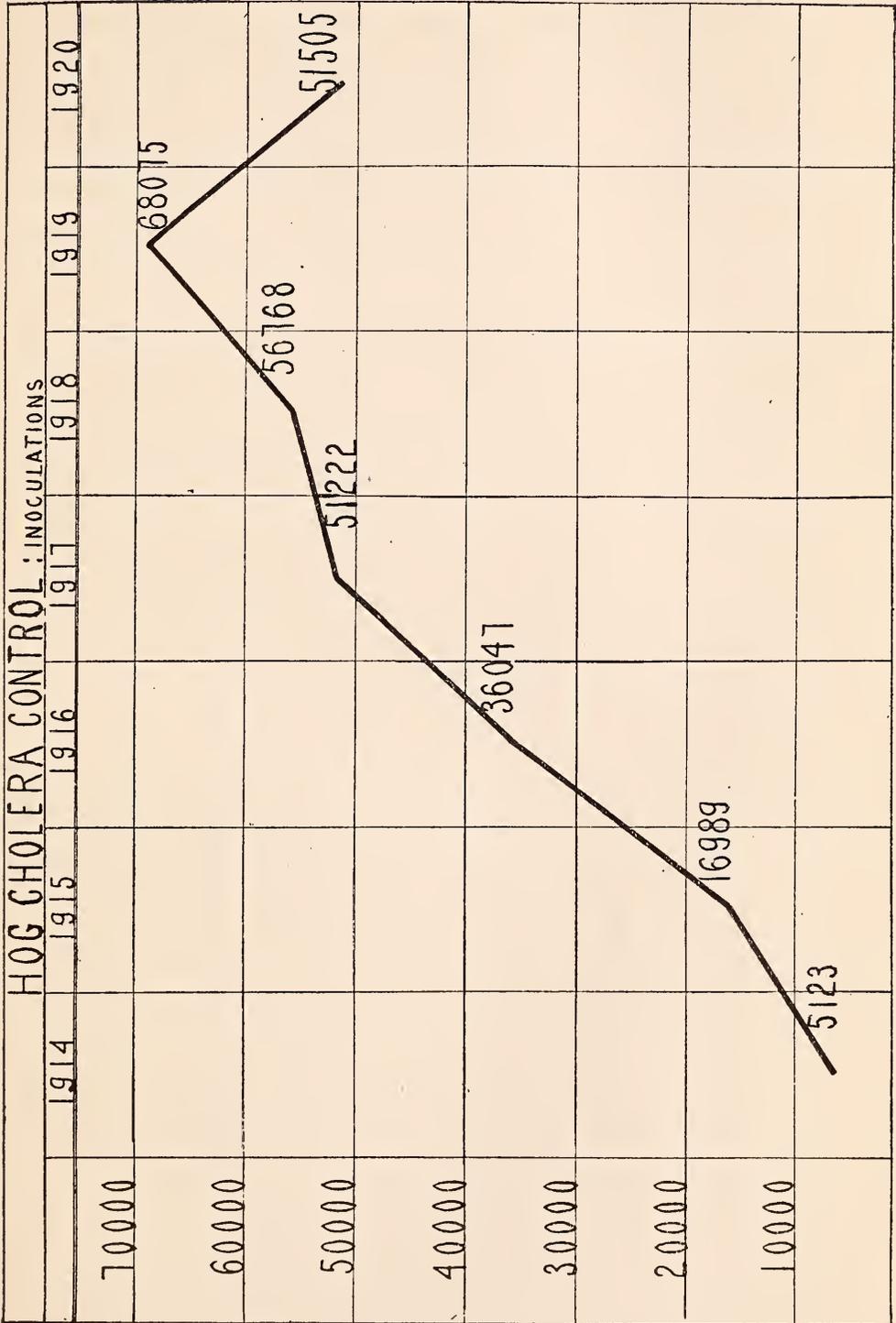
CITY OR TOWN.	Herds inoculated.	INOCULATIONS.		
		Serum and Virus.	Serum only.	Total.
Haverhill, . . . . .	4	73	11	84
Holden, . . . . .	3	27	17	44
Holliston, . . . . .	1	17	0	17
Holyoke, . . . . .	10	205	105	310
Hudson, . . . . .	2	17	0	17
Huntington, . . . . .	1	7	0	7
Ipswich, . . . . .	4	49	143	192
Kingston, . . . . .	1	1	0	1
Lakeville, . . . . .	1	124	286	410
Lancaster, . . . . .	8	34	8	42
Lanesborough, . . . . .	1	12	2	14
Lawrence, . . . . .	3	44	66	110
Lee, . . . . .	4	15	10	25
Leicester, . . . . .	2	28	32	60
Lenox, . . . . .	1	58	17	75
Leominster, . . . . .	1	113	109	222
Lexington, . . . . .	17	2,420	1,466	3,886
Lincoln, . . . . .	9	363	130	493
Littleton, . . . . .	2	91	98	189
Longmeadow, . . . . .	4	454	352	806
Lowell, . . . . .	3	195	255	450
Ludlow, . . . . .	6	368	234	602
Lunenburg, . . . . .	2	138	39	177
Lynn, . . . . .	2	43	14	57
Malden, . . . . .	2	7	10	17
Manchester, . . . . .	4	50	20	70
Marblehead, . . . . .	10	195	78	273
Marion, . . . . .	1	15	54	69
Marlborough, . . . . .	2	15	9	24
Mattapoisett, . . . . .	2	9	1	10
Medfield, . . . . .	2	176	131	307
Medford, . . . . .	2	10	0	10
Medway, . . . . .	3	6	1	7
Melrose, . . . . .	1	2	0	2
Methuen, . . . . .	2	12	9	21
Milford, . . . . .	6	36	61	97
Millbury, . . . . .	5	113	115	228
Milton, . . . . .	3	167	118	285
Monson, . . . . .	1	33	66	99
Nantucket, . . . . .	8	15	7	22
Natick, . . . . .	7	239	180	419
Needham, . . . . .	10	498	413	911
New Bedford, . . . . .	2	83	151	234
Newbury, . . . . .	3	13	0	13
Newburyport, . . . . .	22	68	47	115
Newton, . . . . .	3	94	20	114
North Adams, . . . . .	4	398	210	608
Northampton, . . . . .	15	364	184	548
North Andover, . . . . .	1	3	0	3
North Attleborough, . . . . .	3	103	99	202
Northbridge, . . . . .	5	64	80	144
Northfield, . . . . .	3	217	75	292
North Reading, . . . . .	2	101	131	232
Norton, . . . . .	2	36	30	66
Norwood, . . . . .	2	9	70	79
Orange, . . . . .	2	7	4	11
Oxford, . . . . .	2	57	58	115
Palmer, . . . . .	1	46	9	55
Paxton, . . . . .	2	34	78	112
Peabody, . . . . .	10	470	277	747
Pepperell, . . . . .	1	3	0	3
Pittsfield, . . . . .	29	680	340	1,020
Plymouth, . . . . .	5	148	246	394
Princeton, . . . . .	2	11	6	17
Provincetown, . . . . .	40	83	5	88
Quincy, . . . . .	1	0	20	20
Randolph, . . . . .	2	17	27	44
Reading, . . . . .	2	7	12	19
Rehoboth, . . . . .	1	4	1	5
Revere, . . . . .	6	1,101	788	1,889
Rockport, . . . . .	3	30	9	39
Rowley, . . . . .	2	11	0	11

CITY OR TOWN.	Herds inoculated.	INOCULATIONS.		
		Serum and Virus.	Serum only.	Total.
Russell, . . . . .	1	6	0	6
Rutland, . . . . .	3	57	75	132
Salem, . . . . .	5	192	116	308
Salisbury, . . . . .	2	5	1	6
Sandwich, . . . . .	1	0	5	5
Saugus, . . . . .	9	95	146	241
Seekonk, . . . . .	12	650	475	1,125
Sharon, . . . . .	4	0	12	12
Shelburne, . . . . .	1	1	7	8
Sherborn, . . . . .	3	62	45	107
Shirley, . . . . .	1	125	142	267
Shrewsbury, . . . . .	2	143	218	361
Somerset, . . . . .	1	0	2	2
Somerville, . . . . .	1	15	0	15
Southborough, . . . . .	4	19	8	27
Southbridge, . . . . .	3	0	20	20
South Hadley, . . . . .	6	99	47	146
Spencer, . . . . .	1	4	0	4
Springfield, . . . . .	36	1,613	653	2,266
Stoneham, . . . . .	1	14	0	14
Stoughton, . . . . .	8	48	26	74
Sturbridge, . . . . .	1	1	0	1
Sudbury, . . . . .	1	52	2	54
Sunderland, . . . . .	6	25	0	25
Sutton, . . . . .	1	1	0	1
Swampscott, . . . . .	1	29	6	35
Swansea, . . . . .	5	1,606	708	2,314
Taunton, . . . . .	5	275	198	473
Templeton, . . . . .	7	20	63	83
Tewksbury, . . . . .	1	171	150	321
Townsend, . . . . .	8	16	14	30
Tyngsborough, . . . . .	1	14	55	69
Uxbridge, . . . . .	1	11	21	32
Wakefield, . . . . .	5	7	0	7
Walpole, . . . . .	1	0	8	8
Waltham, . . . . .	16	1,540	1,196	2,736
Watertown, . . . . .	3	200	161	361
Wayland, . . . . .	1	2	0	2
Webster, . . . . .	11	27	23	50
Wellesley, . . . . .	2	33	18	51
Wenham, . . . . .	2	27	8	35
Westborough, . . . . .	3	191	133	324
Westfield, . . . . .	8	57	87	144
Weston, . . . . .	4	56	49	105
Westport, . . . . .	1	3	0	3
West Springfield, . . . . .	5	32	20	52
Westwood, . . . . .	3	261	361	622
Weymouth, . . . . .	5	3	53	56
Whately, . . . . .	3	10	2	12
Wilbraham, . . . . .	2	38	8	46
Williamstown, . . . . .	1	9	0	9
Wilmington, . . . . .	5	3	24	27
Winchendon, . . . . .	7	46	46	92
Woburn, . . . . .	8	180	171	351
Worcester, . . . . .	20	3,822	2,729	6,551
Wrentham, . . . . .	2	111	202	313
Totals, . . . . .	874	30,280	21,225	51,505

The preceding table shows that work has been done in 200 cities and towns this year, 32 less than during 1919, but necessitating 1,675 visits by one or more inspectors. In addition there were 73 visits made to places where the swine were not treated for the following reasons: the animals in some instances had no chance of recovery; in others the trouble was

found to be some non-contagious infection; again in some of the cases proper sanitary conditions necessary to successful work could not be established; and in a few cases the owners did not desire to have the animals treated.

The chart on the opposite page shows in a general way the hog cholera prevention work from the time of its inception to the present, and comparative statistics in detail are shown in tables which follow it.



Comparative Statistics on Hog Cholera Control Work for 1914, 1915, 1916, 1917, 1918, 1919 and 1920.

	1914.	1915.	1916.	1917.	1918.	1919.	1920.
Outbreaks reported in which a negative diagnosis was made, . . . . .	20	122	57	42	39	54	41
Number of herds known to be infected, . . . . .	80	227	253	359	232	184	89
Number of herds known to be infected in which serum treatment was not administered, <sup>1</sup>	-	77	43	77	75	35	42
Number of infected herds in which serum treatment was administered, . . . . .	65	150	192	282	157	149	47
<i>Herds infected at the Time Treatment was administered.</i>							
Number of "serum only" treatments, including those administered to infected animals and to those too young for simultaneous treatment.	428	10,300	14,747	24,828	7,559	3,076	5,813
Mortality from hog cholera following "serum only" treatment (per cent), <sup>2</sup> . . . . .	9.5	7.0	3.70	1.75	3.90	5.5	1.27
Number of simultaneous treatments. These were administered to animals apparently healthy at time of treatment.	591	5,826	13,643	15,524	4,055	1,282	6,393
Mortality from hog cholera following the simultaneous treatment in infected herds (per cent), <sup>2</sup>	2.0	1.2	.60	.44	2.26	2.1	.33
Total number of treatments administered in infected herds, . . . . .	1,019 <sup>3</sup>	16,126	28,390	40,352	11,614	4,358	12,206
Total mortality following both "serum only" and simultaneous treatment in infected herds (per cent), <sup>2</sup>	5.2	4.9	2.21	1.24 <sup>4</sup>	3.34	4.5	.78

*Preventive Inoculation in Apparently Healthy Herds.*

Number of herds, . . . . .	2	95	113 <sup>5</sup>	470 <sup>5</sup>	1,275	1,440	785
Number of inoculations, . . . . .	104	863	7,657	10,870	44,754	63,717	39,299
Number of animals which died following simultaneous inoculations, . . . . .	0	1	0	3	8 <sup>6</sup>	42 <sup>6</sup>	51
Total number of inoculations, . . . . .	5,123	16,989	36,047	51,222	56,768	68,075	51,505

<sup>1</sup> Due to animals being too sick to treat, showing symptoms of secondary infection, or to owners not desiring the same.

<sup>2</sup> These figures show percentages, not animals.

<sup>3</sup> Plus 4,000 which were treated, and died or were killed before results could be ascertained. These deaths were due to the use of serum which was impotent and virus which was not virulent, before the present regulations were made.

<sup>4</sup> This does not include approximately 50 animals which died on one farm, on which a final diagnosis was not made. Clinically and by autopsies, it was impossible to determine whether the disease was hog cholera or hemorrhagic septicemia. Laboratory examinations indicate the latter, but before the work could be completed the losses stopped, and more material which was needed for a final diagnosis was not available.

<sup>5</sup> The large majority under this classification are herds which in previous years were classified as infected herds and which had yearly sustained heavy losses from hog cholera. The majority of them are garbage-fed, and experience shows that should treatments be discontinued an outbreak of hog cholera would follow very closely. They are therefore classified as herds in which no infection was apparent at the time of treatment, whereas in reality they are infected herds in which the disease is kept completely under control while treatments are continued.

<sup>6</sup> None of these animals were autopsied; consequently, we are unable to say whether or not death was due to cholera.

The preceding chart and tables of comparative statistics relating to our hog cholera control work show the following facts which should be briefly referred to:—

Very many less treatments with anti-hog cholera serum or hog cholera virus, applied either as “serum only” or “simultaneous” treatment, have been called for this year than during the year closing Nov. 30, 1919. In our opinion, this indicates an improvement in the general situation this year as to prevalence of the contagion. A similar diminution of cases has been reported to be the situation in all other sections of the country, 1920 being referred to as a “low year” as to incidence of the disease.

The tables also show that the number of herds positively known to be infected at time of treatment is lower this year than during any of the previous *five* years, and this decrease in number of infected herds is so very marked that it must be considered another very strong indication of improvement in the general situation.

Finally, the mortality rates, as shown in the statistics of work done in these infected herds, are so low as to merit particular attention, even in comparison with our own records of previous years. It may be said in passing that Massachusetts records in this particular, and in comparison with those of other sections of the country, have always commanded special attention and have brought forth much commendation as indicating a high quality of work done.

The sanitary conditions under which swine are kept, while found to be somewhat improved from year to year, are nevertheless far from what they ought to be. We have found in many instances where serious losses of animals have occurred that the primary causative factor has been unsanitary or poor housing conditions, which have lowered the vitality and the normal resistance of the animals to disease, allowing bacterial invasion a favorable opening. Such conditions also seriously handicap recovery from disease and delay the elimination of infection. While perfect sanitary conditions are hard to obtain in piggeries as generally managed, yet very great improvement can be made on many premises and would be followed by results which undoubtedly would be evident in more pigs, healthier pigs, and consequently a better financial showing.

At the present time the diseases of swine are probably receiving more attention on the part of swine raisers, veterinarians, live-stock sanitary officials and those engaged in scientific research than at any period in the history of control work in contagious diseases of animals. The ultimate result will undoubtedly be the solution of many of the control problems which now confront us.

By reason of our work in the control of hog cholera we have been brought in close touch with many other disease conditions, some of which are of serious menace to the raisers of swine. In their clinical aspects many so closely resemble hog cholera that differential diagnoses are difficult and only arrived at after considerable investigation both in the field and in the laboratory.

Hemorrhagic septicemia, necrotic enteritis, and various mixed infections have been more prevalent than usual this year, either as primary or secondary invaders often co-existent with hog cholera. Against these diseases, and to accomplish their prevention or cure, we are at all times at the service of swine owners, and are endeavoring to execute in this direction the best quality of work suggested by the present-day knowledge concerning these infections. Results in the main are highly satisfactory in a practical sense, as many thousands of animals are saved by treatment.

During the past year approximately 16,000 treatments in prevention or cure of hemorrhagic septicemia have been administered in the form of either sera vaccines or bacterins, singly or in combinations as deemed advisable, and the prospect is that this branch of our work will be actively continued the coming year on account of general recognition by swine owners of its value.

#### MISCELLANEOUS DISEASES.

*Anthrax.* — Although an extensive prevalence of anthrax has not occurred in Massachusetts for many years, there are recorded every year the deaths of a small number of animals from this disease. Our records show that in this State cattle and sheep are the species most commonly affected, and we have an occasional case in the horse. Nearly all species of domesticated animals are susceptible, however, and infection

of the human subject frequently occurs. The mode of transmission to man is generally by the handling of carcasses, hides or wool of animals which have been affected with the disease. We record this year one case of the disease in the human subject. The person affected was the owner of a number of cattle whose deaths from the disease had occurred at different times during a period of several months, which animals had been cared for by him and whose carcasses had been handled by him. He fortunately recovered.

On account of the danger of transmission of this disease to people it can be readily seen that we should be particularly anxious to limit its prevalence by every means at our command. All reported cases of an outbreak among animals are immediately investigated and subsequent action is taken as deemed advisable by the facts disclosed. Positive diagnosis is first necessary, and, as the animals generally either are found dead or die before arrival of a veterinarian or Division inspector, a post-mortem examination would ordinarily be depended upon to confirm the suspicions of anthrax. As post-mortem appearances in this disease are often not sufficiently characteristic to justify a positive diagnosis, and as the opening of a carcass allows the body fluids to escape and possibly spread the infection, it is advised that the suspected carcass be not opened, but that a specimen of blood be drawn from the cadaver on to a piece of glass and then allowed to dry in the air. If this specimen is not badly contaminated by careless preparation, and is promptly forwarded to a laboratory, there is no difficulty in determining whether or not anthrax bacilli are present.

A field diagnosis or suspicion of anthrax having been confirmed, preventive measures at once follow. They consist of proper disposal of diseased carcasses, disinfection of premises, and preventive inoculation of susceptible and exposed animals.

To prevent infection spreading from a carcass it should be burned or deeply buried, covered with quicklime. Anthrax bacilli or their spores if not destroyed may continue to infect soil for a long time; in many instances these organisms have been found to remain active for a number of years. We recommend that any contaminated ground be burned over and the surface area above a buried carcass be fenced and

burned over yearly. Any contaminated portions of buildings if wooden should be torn out and burned, and if concrete should be thoroughly disinfected.

The remaining animals of the herd should be at once removed to other buildings or areas, and the apparently healthy ones inoculated in prevention of the disease. Animals already affected are sometimes successfully treated, but ordinarily the disease runs such a rapid course that death takes place before the animal is noticed to be seriously sick, and our efforts are consequently limited to protection of the animals not showing symptoms. Although a certain percentage of deaths may reasonably be expected to occur among the inoculated animals, we find in actual experience that fatalities are very few.

Preventive inoculation is supposed to confer immunity for a period of at least twelve months. At premises where an outbreak has occurred and there is reason to fear permanent infection, it is advised that all susceptible animals be given a preventive inoculation each succeeding year for a certain period.

During the past year the disease has occurred in 11 head of cattle, 1 horse and 7 sheep on 4 different premises in 3 towns. Of these 19 animals, 2 were in the town of Conway, 13 in the town of Cummington, and 4 in Sheffield. The preventive inoculation has been applied to 263 head of cattle, 11 horses and 38 sheep on 12 different premises located in 6 towns.

In one herd of 29 cattle where the disease broke out and two immediately died, all the remaining animals were given preventive inoculation and no additional deaths occurred. In one herd of 40 cattle given preventive inoculation, 1 cow died within an hour. Reported anthrax in 4 instances proved upon investigation to be some other disease.

*Blackleg.* — This disease, more or less prevalent in many parts of the world and generally fatal, affects young cattle only, except in rare instances. It is readily prevented by a yearly protective inoculation of the susceptible animals. As it generally develops during the pasture season we recommend that the inoculations be made just before turning the animals to pasture in the spring. This service is rendered by the Division free of expense to cattle owners, and if it is called for at the proper season, or in case of outbreak among un-

treated animals it is promptly reported and the non-affected ones are thereupon inoculated in prevention of the disease, and then removed to other pastures, its prevalence is limited and the fatalities are few.

Blackleg is a disease generally contracted from infected soil and is seldom transmitted directly from animal to animal, differing in this respect from many other contagious diseases. Authorities agree that the bacilli seem to be capable of multiplying in the soil, and through their resisting spores to preserve their capacity of development and infectiousness even under unfavorable conditions. This, as well as the fact that bacteria from carcasses of dead animals again infect the soil, explains the fact that we always fear a yearly recurrence of the disease on certain farms, and consequently recommend preventive treatment of all young cattle pastured on premises where the disease has once existed.

During this year we have administered preventive inoculation to 989 animals on 143 farms in 47 towns; as tabulated below:—

	Premises.		Premises.
Ashburnham, . . . . .	4	Montague, . . . . .	1
Ashby, . . . . .	9	New Marlborough, . . . . .	1
Ashfield, . . . . .	1	North Adams, . . . . .	1
Athol, . . . . .	2	Northampton, . . . . .	5
Ayer, . . . . .	1	Orange, . . . . .	12
Becket, . . . . .	2	Otis, . . . . .	1
Blandford, . . . . .	1	Peru, . . . . .	1
Boxborough, . . . . .	4	Pittsfield, . . . . .	5
Brimfield, . . . . .	1	Prescott, . . . . .	1
Buckland, . . . . .	1	Rowe, . . . . .	7
Cheshire, . . . . .	2	Royalston, . . . . .	3
Chester, . . . . .	3	Sandisfield, . . . . .	5
Dalton, . . . . .	1	Shelburne, . . . . .	4
Fitchburg, . . . . .	3	Southampton, . . . . .	2
Gardner, . . . . .	2	Templeton, . . . . .	3
Great Barrington, . . . . .	1	Townsend, . . . . .	4
Greenwich, . . . . .	2	Tyringham, . . . . .	3
Harvard, . . . . .	3	Warwick, . . . . .	6
Holyoke, . . . . .	5	Wendell, . . . . .	1
Lee, . . . . .	9	Westhampton, . . . . .	2
Leicester, . . . . .	1	Williamstown, . . . . .	1
Leverett, . . . . .	1	Winchendon, . . . . .	1
Littleton, . . . . .	7	Windsor, . . . . .	1
Middlefield, . . . . .	6		

The records show that our work this year has been done on 213 fewer animals than last year and on 5 fewer farms, the number of towns in which these farms are located being the same. The deaths reported are 15 head of cattle on 3 different premises, a reduction of 12 in the number of fatalities.

The same general recommendations as in anthrax outbreaks, regarding disposal of infected carcasses by burning or deep burial, followed by disinfection of contaminated areas or buildings, are applicable in outbreaks of blackleg.

*Actinomycosis.* — Eleven cases of this disease have been reported this year, located as follows: 1 each in Avon, Boston, Colrain, Harwich, Millis, Milton, New Bedford, Northfield and Scituate, and 2 in the town of Plymouth.

It is our custom to quarantine affected animals so that they may not be sold, but allow the owner to have treatment applied by a veterinarian, or to fatten them for slaughter. In a few cases recovery takes place and such animals are then released from quarantine.

Of the 11 cases on this year's record, 8 have been slaughtered, 2 have been released as recovered, and the remaining 1 is still held in quarantine.

*Hemorrhagic Septicemia in Cattle.* — This is a disease of very great prominence in some sections of the country, where it causes the sudden death of large numbers of cattle. Its prevalence in Massachusetts, however, is limited, and confined to isolated cases in widely separated localities. Our records show fewer deaths from the disease this year than last, 22 fatalities only being reported. These occurred in the towns of Berlin (3), Medfield (2), Templeton (9), Winchendon (4), and 1 each in the towns of Gardner, Hubbardston, Spencer and Wellfleet.

Preventive inoculation of all animals in a herd where the disease has appeared is generally successful in controlling its further extension, and we advise also that all animals be removed from a pasture where an outbreak occurs. This alone is sometimes sufficient to prevent further losses. Preventive inoculation has been administered to 43 head of cattle during the year.

An analogous type of hemorrhagic septicemia appeared in

a herd of goats in the town of Lexington, resulting in the death of six animals. The remainder of the herd, 85 in number, was given preventive inoculation, and no additional fatalities occurred.

*Parasitic Diseases.* — The study of animal parasites and their damaging effect on profitable live-stock raising is at the present time going on in a more intensive and scientific manner than ever before in the history of animal-disease control work. The result of this study is already being reflected in the increased attention given the subject by stock owners and veterinarians, and in their heeding of the convincing arguments as to the great economical waste resulting from the poorer growth of animals infested with parasites, either internal or external, and the lessened amount of their products.

The most prevalent parasitic condition which the Division has to deal with is that known as mange, which affects large numbers of cattle during certain seasons, and is also found prevailing to some extent among horses. While we have received reports of 421 head of cattle affected on 16 different premises, we know that this number is no indication of the number of animals infested, for the reason that many cattle owners do not take the trouble to report their cases.

Many owners also do not trouble to treat their animals, but successful treatment is possible if owners or attendants will faithfully carry out the local application of proper medicinal remedies. Treatment is not expensive, but is very inconvenient of application.

It is our custom to quarantine reported cases, if the animals are kept under conditions favorable to spread of the infestation, and particularly where owners or attendants cannot be depended upon to properly apply treatment. An increasing number of owners, however, now realize that it really pays to do everything possible to rid their animals of these parasites.

Thirty cases of the disease in horses have been reported during the year, from 5 different premises. Quarantined infested horses are generally allowed to work during treatment, but are forbidden to enter enclosures other than their own stables. Seven of the horse cases were detected on the ar-

rival of the animals from another State, and were at once quarantined. In one stable where infested horses and cattle were found, 3 dogs and 6 cats were also victims of these parasites.

Among the parasitic diseases met with is what is called "nodular disease" in sheep, not often fatal but greatly inhibiting the growth of the animals, especially the lambs.

Stomach worms were found to be the cause of the death of 75 sheep out of a flock of 100.

*Foot-and-mouth Disease.* — This disease fortunately has not appeared in Massachusetts during the past four years, although it has been reported from two different towns this year. Prompt investigation of these reports proved them to be unfounded. The disease has prevailed to an alarming extent in many foreign countries during the past year, and we have therefore considered the possibility of its appearance at any time in this country. The Federal authorities are carefully watching the situation and have formulated plans for immediate control work if the emergency occurs. In Massachusetts all Division veterinarians, inspectors of animals, and private veterinarians have been notified of the danger and asked to be constantly on the watch, and to promptly report any suspicious cases in order that they may be immediately investigated, and measures taken to at once prevent the spread of the disease. In one reported instance this year, occurring in a herd of 16 cattle, the symptoms shown by 2 animals sufficiently resembled foot-and-mouth disease to render it desirable to make inoculation of susceptible animals in order to arrive at a positive diagnosis. The inoculations all proved negative to this disease.

*Bovine Infectious Abortion.* — This disease has not as yet been especially designated as reportable by notification to cattle owners, inspectors of animals or veterinarians. Until additional knowledge pointing to the control of this scourge has been gained, whereby strictly official control methods would appear to be advisable, the functions of the Division officials must necessarily be limited to the giving of advice as to the general management of infected herds, and how to carry out the various sanitary measures recognized as essential

to progress in control of the disease. Without doubt its prevalence is quite extensive and its ravages are well known to every one engaged in dairying or breeding of thoroughbreds. The losses occasioned by it and by its many concurrent conditions are estimated to be second only to the losses from tuberculosis. It does not, however, seem advisable for the Division to enter the field of specific treatment of infected herds or individual animals, work which can probably be more satisfactorily attended to by the private veterinarian.

*Other Infectious Diseases.*—Twenty-two cases of tuberculosis in swine have been reported this year from 9 different towns. Undoubtedly this disease is more prevalent than these reports indicate; most of our reports come from slaughter houses where the disease is found at time of slaughter, and where the inspectors of slaughtering are interested to furnish us the information. As a tuberculous hog generally indicates tuberculous cattle as the source of the disease, it is our custom to examine all cattle on the premises from which the diseased hog comes.

Contagious disease of the eyes was reported as affecting an entire herd of 20 cattle on one farm. In a herd of 30 sheep, 9 were found also to have a contagious disease affecting their eyes.

Infectious pneumonia was reported in a lot of 10 cows, one of which died. Fourteen horses were affected with a contagious form of pneumonia in a stable of 100 animals, and 4 deaths occurred.

The Division has frequently been called upon to make examination of animals suspected of being affected with a contagious disease, and where it has been found that the animals were suffering from a disease not of a contagious nature. Among such instances the following may be mentioned:—

Twenty-three horses were taken suddenly sick immediately after being fed from a new consignment of oats, and 4 deaths occurred. Subsequent investigation showed that the car in which the oats were transported had contained castor beans

as the previous shipment, and this was probably the cause of the fatalities.

Forage poisoning caused the death of 3 cattle in Princeton, 5 in Middleborough, 5 in Wakefield, 3 horses in Hingham, 8 in Taunton, and 1 in Cohasset. Poison, the nature of which was not determined, caused the death of 6 dogs in Oak Bluffs, 1 cow in Rutland, 2 horses in Lenox, and 3 swine in Mattapoisett.

Other cases, in small numbers, were foot rot in cattle, enteritis, milk fever, paralysis of throat, cancerous growth, white scours, and malnutrition.

#### LABORATORY EXAMINATIONS.

Laboratory service is a necessary and important adjunct to successful work of any organization charged with the control and eradication of contagious disease among animals. It happens in many instances in the Division's work that a diagnosis cannot be positively made from the clinical symptoms shown by the animals, and as all the subsequent work in a case is formulated from the starting point of a correct diagnosis, the aid of the laboratory at this point becomes quite important.

The Division is most fortunate in having at its request the service of the bacteriological laboratory of the State Department of Public Health. Its service in our behalf has been most satisfactorily attended to, our entire work for the year having been efficiently and promptly performed.

The most important service has been the examination of the brains of 163 animals submitted because suspected of rabies, and in such cases a prompt and positive conclusion as to the existence or non-existence of the infection is necessary, especially so if persons have been bitten by the suspected animal.

Two hundred and twenty samples of blood taken from horses in our work of glanders control have been tested. In addition to these principal services, 56 specimens were examined, listed below by diseases suspected: —

	Positive.	Negative.
Anthrax, . . . . .	3	18
Fatty degeneration, . . . . .	1	-
Glanders, . . . . .	-	3
Hemorrhagic septicemia, . . . . .	8	8
Hodgkins disease, . . . . .	1	-
Intestinal parasites, . . . . .	3	-
Nodular disease, . . . . .	1	-
Pneumonia, . . . . .	2	-
Poisoning, . . . . .	2	-
Ringworm, . . . . .	1	-
Tuberculosis, . . . . .	-	2
Tumor, . . . . .	1	-
	23	31
Specimens too decomposed for diagnosis, . . . . .		2

Ten of the 21 specimens listed under anthrax were also examined for hemorrhagic septicemia, to which they were negative. One was also examined for blackleg and found to be negative. In addition to the above, 56 samples of blood from cows on 3 different farms were submitted for examination for bovine infectious abortion, 17 of which proved positive, 34 negative, and 5 questionable. One specimen which was recorded as positive for pneumonia was also examined for hemorrhagic septicemia. Two specimens were received in so decomposed a state as to make laboratory diagnosis impossible.

#### ANNUAL INSPECTION OF FARM ANIMALS AND PREMISES.

On receipt of the inspectors' reports in the Division's office they are carefully gone over, and the information which they contain is classified and tabulated in a way convenient for reference.

From this tabulation a fairly correct and comprehensive survey may be drawn of the general health conditions of the live stock on the farms of the State and the sanitary conditions under which they are kept. Its study is of value when formulating our general policies for disease control work and for the betterment of stable conditions:

Inspectors' reports also furnish the only correct "census" which is made of farm animals in the State, and in that connection are of interest and value not only to the Division and the Department of Conservation but to other State departments, also to individuals and associations interested in the breeding and raising of live stock, or engaged in any of the many lines of business closely related thereto.

In many instances cases of contagious disease not previously reported are found. Such are immediately quarantined and brought to the notice of Division officials and an important work in disease control is executed.

In many other instances unhealthful stabling conditions are brought to the attention of owners, and recommendations for improvement are suggested and insisted upon. If these are not attended to within a reasonable length of time, the cases are brought to the attention of Division officials who, either through the district veterinary inspector or through correspondence direct with the owner, endeavor to have them carried out. District veterinary inspectors have during the past year made 968 visits to premises where unsanitary conditions existed, and in a majority of instances full or partial correction of them has resulted.

It will be seen, therefore, that the annual inspection made by the local inspectors in cities and towns is a valuable aid to proper execution of the work imposed by law upon the Division of Animal Industry.

A gross tabulation of the reports of this year's inspection by local inspectors of animals follows: —

Total number of herds of cattle inspected, . . . . .	30,039
Number of herds containing not over 5 dairy cows, . . . . .	21,677
Number of neat cattle inspected, . . . . .	226,800
Number of dairy cows inspected, . . . . .	154,407
Number of herds found clean and in good condition, . . . . .	28,928
Number of stables inspected, . . . . .	30,746
Number of stables properly drained, . . . . .	30,538
Number of stables well ventilated, . . . . .	30,340
Number of stables sufficiently lighted, . . . . .	30,031
Number of stables found clean, . . . . .	29,422
Number of stables in which improvements were recommended, . . . . .	821
Number of herds of swine inspected, . . . . .	14,692
Number of swine inspected, . . . . .	100,982
Number of herds of swine garbage-fed, . . . . .	2,844
Number of swine garbage-fed, . . . . .	52,219
Number of sheep inspected, . . . . .	17,002
Number of goats inspected, . . . . .	1,360

The annual inspection from which the above tabulation was made took place during the spring months of 1920. Compar-

ing the statistics with those of the year previous we find the following interesting fact: —

While the total number of bovine animals of all ages shows a decrease of 3,391, yet the number of dairy cows shows an unusual increase this year of 3,814. From a strictly dairy point of view this is cause for congratulation. It places the number of dairy cows in the State, 154,407, at a higher point than at any time since 1913, and shows it to be rapidly getting back toward the average number for the past seventeen years, namely, 158,778.

In connection with the references made to the statistics gathered by local inspectors of cities and towns, and the many ways in which such statistics are of value as well as of extreme interest, the importance of inspectors' services, of varied character, in connection with sudden outbreaks of contagious disease, such as rabies, should be mentioned; also their work in identification and release of animals shipped from other States. These officials are a very necessary part of our organization, and according as they are observant, prompt to act, and faithful in performance of their duties, render the Division valuable aid in the execution of its work in control and eradication of disease.

The fact of the statistics showing this year a decrease in the number of swine has been commented upon under the section referring to contagious diseases of that species. We predict that when market conditions again approach the normal there will be a substantial increase in the number of these animals.

The number of sheep in the State has decreased somewhat, undoubtedly influenced, as with swine, by the prevailing high prices of fodder and the low prices of marketed carcasses used for food.

Meetings of inspectors were called at different points in the State, as follows: Pittsfield, November 10; Springfield, November 11; Greenfield, November 12; Worcester, November 16; Boston, November 17.

At these meetings matters of especial interest to the inspectors were discussed, such as general live-stock conditions, the prevalence of contagious diseases among the several species of farm animals, the increasing prevalence of rabies in dogs

and the necessity for prompt control methods in all outbreaks reported.

A question box was instituted at each meeting, and a new feature this year was the illustration by means of lantern slides of a talk on bovine tuberculosis. Charts, showing the yearly progress of the Division's activities in control work of different diseases, were also shown.

#### REPORTS OF RENDERING COMPANIES.

Section 111 of chapter 75 of the Revised Laws, as amended by chapter 243 of the Acts of 1907, requires rendering companies to report to this Division every animal received by them which is found to be infected with a contagious disease, and the information thus furnished is of value in bringing to the attention of the Division occasional cases of these diseases which otherwise would not be known. A table of reports of rendering companies follows:—

RENDERING COMPANIES.	Number of Reports.	Number of Cases of Glanders.	Number of Cases of Tuberculosis.	Number of Cases of Actinomycosis.	Number of Cases of Glanders not previously reported.	Number of Cases of Tuberculosis not previously reported.
Ayer Rendering Company, . . .	4	-	4	-	-	-
Edwin G. Baker & Son, Providence, R. I.	1	1	-	-	-	-
C. S. Bard, Haverhill, . . . . .	3	-	3	-	-	2
Boston Rendering Company, Saugus,	3	3	-	-	-	-
J. H. Castle, Taunton, . . . . .	1	1	-	-	-	-
Home Soap Company, Millbury, . .	12	2	21	-	2	5
Lowell Rendering Company, . . . .	11	1	18	-	1	2
James E. McGovern, Andover, . . .	3	-	3	-	-	1
New England Rendering Company, Brighton.	9	8	4	-	-	2
Parmenter & Polsey Fertilizer Company, Peabody.	5	-	11	-	-	-
N. Roy, Jr., Fall River, . . . . .	1	-	1	-	-	-
N. Roy & Son, South Attleborough, .	3	-	4	-	-	-
Springfield Rendering Company, . .	4	5	-	-	-	-
N. Ward Company, Boston, . . . .	4	3	-	1	-	-
Totals, . . . . .	64	24	69	1	3	12

NOTE. — All the above cases are included in statistics occurring elsewhere in this report.

RECEIPTS OF LIVE STOCK AT THE STOCKYARDS IN BOSTON  
AND VICINITY FOR TWELVE MONTHS ENDING NOV. 30,  
1920.

For several years, at the request of the United States Department of Commerce and Labor, a report of the receipts of all live stock at Boston has been sent to Washington each month. The following table shows the receipts by months for the past year:—

FOR MONTH OF —	Cattle.	Calves.	Sheep.	Swine.	Horses.
December, . . . . .	11,169	13,388	20,482	88,062	675
January, . . . . .	8,733	10,793	8,674	132,816	923
February, . . . . .	7,526	12,602	4,502	97,221	546
March, . . . . .	9,062	21,154	5,922	102,367	1,051
April, . . . . .	8,280	20,011	3,447	52,517	1,180
May, . . . . .	6,243	20,879	11,361	72,139	1,120
June, . . . . .	8,135	19,196	25,448	119,243	1,667
July, . . . . .	5,815	12,547	22,510	78,977	1,548
August, . . . . .	9,151	15,746	37,732	59,568	2,189
September, . . . . .	7,603	12,219	34,071	43,930	1,470
October, . . . . .	10,694	18,226	36,954	44,888	844
November, . . . . .	16,261	19,411	48,867	81,132	994
Totals, . . . . .	108,672	196,172	259,970	972,860	14,207

FINANCIAL STATEMENT.

Appropriation for the salary of the Director, chapter 225, Acts of 1920,	\$3,500 00
Expended during the year for the salary of the Director, . . . . .	3,500 00
Appropriation for personal services of clerks and stenographers, chapter 225, Acts of 1920, . . . . .	\$7,900 00
Supplementary appropriation, chapter 629, Acts of 1920,	650 00
Total amount appropriated, . . . . .	\$8,550 00
Expended during the year for the following purposes:—	
Personal services of clerks and stenographers, . . . . .	\$7,420 59
Extra clerical and stenographic service, . . . . .	240 59
Total expenditure, . . . . .	\$7,661 18
Unexpended balance, . . . . .	888 82
	\$8,550 00

Appropriation for services other than personal, including printing the annual report, traveling expenses of the Director, and office supplies and equipment, chapter 225, Acts of 1920, . . . . .		\$4,400 00
Brought forward from 1919 appropriation, . . . . .		95 93
		<hr/>
Total amount appropriated, . . . . .		\$4,495 93
Expended during the year for the following purposes:—		
Books and maps, . . . . .		\$96 60
Express and messenger service, . . . . .		230 35
Postage, . . . . .		631 21
Printing report, . . . . .		181 19
Other printing, . . . . .		809 95
Telephone and telegrams, . . . . .		601 35
Stationery and office supplies, . . . . .		686 36
Typewriter, . . . . .		58 15
Expenses of the Director, . . . . .		531 23
		<hr/>
Total expenditure, . . . . .		\$3,826 39
Unexpended balance, . . . . .		669 54
		<hr/>
		\$4,495 93
Appropriation for personal services of veterinarians and agents engaged in the work of extermination of contagious diseases among domestic animals, chapter 225, Acts of 1920, . . . . .		
		\$50,000 00
Expended during the year for the following purposes:—		
Services of regular agents, . . . . .		\$33,521 81
Services of <i>per diem</i> agents, . . . . .		9,059 00
Labor hired, . . . . .		104 00
		<hr/>
Total expenditure, . . . . .		\$42,684 81
Unexpended balance, . . . . .		7,315 19
		<hr/>
		\$50,000 00
Appropriation for the traveling expenses of veterinarians and agents, chapter 225, Acts of 1920, . . . . .		
		\$24,000 00
Expended during the year for the following purposes:—		
Traveling expenses of regular agents, . . . . .		\$13,789 75
Traveling expenses of <i>per diem</i> agents, . . . . .		4,546 42
		<hr/>
Total expenditure, . . . . .		\$18,336 17
Unexpended balance, . . . . .		5,663 83
		<hr/>
		\$24,000 00
Appropriation for reimbursement of owners of cattle and horses killed, travel, when allowed, of inspectors of animals, incidental expenses of killing and burial, quarantine and emergency services, and for laboratory and veterinary supplies and equipment, chapter 225, Acts of 1920, . . . . .		
		\$55,000 00
Brought forward from 1919 appropriation, . . . . .		1,322 30
Total amount appropriated, . . . . .		<hr/>
		\$56,322 30
Expended during the year for the following purposes:—		
1,016 head of cattle condemned and killed on account of tuberculosis in 1918, 1919, 1920, paid for in 1920, . . . . .		\$42,609 50
26 horses condemned and killed on account of glanders and farcy in 1919 and 1920, paid for in 1920, . . . . .		1,375 00

Supplies for veterinary inspectors, . . . . .	\$432 13	
Laundry, . . . . .	376 78	
Antiseptics, biologics and disinfectants, . . . . .	469 70	
Thermometers, needles, syringes, etc., . . . . .	775 25	
Ear-tags, punches, chains, etc., . . . . .	553 50	
Expenses of killing and burial, . . . . .	82 90	
Expenses of travel allowed inspectors of animals, . . . . .	587 95	
Quarantine expenses, . . . . .	62 25	
Rent of quarantine office, . . . . .	120 00	
Sundries, . . . . .	97 95	
		<hr/>
Total expenditures, . . . . .	\$47,542 91	
Unexpended balance, . . . . .	8,779 39	
		<hr/>
		\$56,322 30

The average amount paid for condemned tuberculous cattle this year is \$40.64.

During that portion of the year (eight and one-half months) in which the maximum amount payable by the Commonwealth for any one animal was fixed at \$40, the average price paid was \$37.91. For the remaining three and one-half months of the year during which the maximum amount of \$60 per animal was available, the average amount awarded was \$44.90, an increase of \$7. The numbers of cattle condemned, however, in this latter period increased more than 90 per cent.

Two hundred and forty-eight claims for reimbursement for cattle condemned and killed as tuberculous during the year, amounting to \$10,314.50, remain unsettled, to be paid for on proof.

Claims applying to 5 horses condemned and killed during the year because affected with glanders remain unsettled, the claims not having been proved. The amount of these claims is \$250.

There has been received during the year from the sale of hides and carcasses of condemned animals \$523.05, and for the testing of cattle for non-resident owners \$16.75, a total amount of \$539.80.

Respectfully submitted,

LESTER H. HOWARD,

*Director.*

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The Commonwealth of Massachusetts

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ANNUAL REPORT

OF THE

DIRECTOR OF ANIMAL INDUSTRY

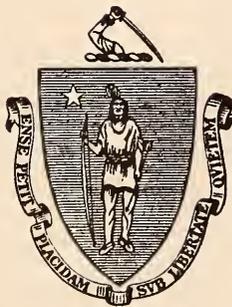
FOR THE

YEAR ENDING NOVEMBER 30, 1921

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DEPARTMENT OF CONSERVATION

*April 20 1922*



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# The Commonwealth of Massachusetts

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## DEPARTMENT OF CONSERVATION.

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DIVISION OF ANIMAL INDUSTRY,  
BOSTON, Nov. 30, 1921.

*To the Commissioner of Conservation.*

I have the honor to present the following report of the work of this Division for the year ending Nov. 30, 1921.

The functions of the Division of Animal Industry and the duties of its officials may be described as follows: Inspection and examination of horses, cattle, sheep and swine within the Commonwealth, and of the conditions under which they are kept; the execution of measures in prevention, control or cure of contagious disease among them and the other species of domestic animals; the slaughter when necessary of such as are affected with, or have been exposed to, contagious disease, to be followed by the burial or other disposal of their carcasses; the cleansing and disinfection of districts, buildings or places where contagion exists or has existed. Another duty is the regulation of the transportation of horses, cattle, sheep and swine from other States to Massachusetts, in order that their condition of health may be established and no prevalence of contagious disease be caused by their entry. This regulatory work calls for the inspection and mallein testing of many horses, and the examination and tuberculin testing of such cattle as are to be used for dairy or breeding purposes and are not accompanied by satisfactory records of test. Tuberculin tests of cattle of whatever age moving interstate must have been made by veterinarians authorized by State and Federal officials to do this work, and, if regulations have not been complied with in all particulars, their violation must be investigated and proper tests applied by Division inspectors.

The maintenance of the health of the several species of domestic animals is of great importance for many reasons. It adds to the food supply of the people, bettering its quality. It materially increases the financial returns from the many lines of business with which the live-stock industry is inseparably connected. The important industry of dairying, to be financially successful, must produce large amounts of milk, butter and cheese, and to this result healthy animals are a first and prime requisite. The conservation of the health of all the species of animals whose carcasses are used for human food — cattle, sheep and swine — is necessary for their successful propagation and their raising to maturity or to the point where they are available as human food. Numbers are largely increased and growth is more rapid if they can be kept free from contagious disease. Not only is their money value as food animals enhanced, but the quality and amount of their commercial by-products, such as hides, wool, fat, fertilizer, and many other salable ones, are much greater than from animals stunted in growth or reduced in numbers by prevalence of disease.

Preservation of the health of the people is dependent in no small degree upon the elimination from animals of those diseases which are communicable to the human subject. Glanders, tuberculosis, rabies, anthrax and actinomycosis carry a high rate of mortality in man, and a diseased animal is often found to be the source of the contagion. For this reason also it is important that this class of diseases be prevented, controlled or, if possible, eradicated from the animal kingdom.

Agriculture in very many of its branches is so dependent upon successful live-stock raising, and prospers in such a direct ratio to the numbers of animals produced and maintained on the farm, that there is no question as to the superior economy in raising and maintaining healthy animals only. Satisfactory revenue from the investment in our farm animals of time, labor and capital can only be returned by horses, cattle, sheep and swine which are sound and not inhibited in their propagation, growth and economical use by contagious disease.

In considering the work of this Division of the Department of Conservation, and in argument that it is important as a

public function, we call attention to the fact that each succeeding year there is manifested an increased dependence of the public for food material upon domestic animals, as represented not only by dairy products but by the meat value of the carcasses of cattle, sheep and swine. That these carcasses may be found fit for human food at the time they are converted to that use, it is necessary that the animals shall have been raised under proper sanitary conditions, and maintained free of contagious disease up to that time. The carcasses of thousands of animals are yearly condemned in the country as a whole on account of lesions of contagious disease being found at time of slaughter. It is an economic necessity of the State and Nation that this great waste be reduced to a lower point than has yet been reached. Although progress in this direction is yearly advancing through the active co-operation of Federal, State and municipal authorities to this end, the Division of Animal Industry recognizes that its work of elimination of animal diseases has a broad field for expansion, and that its duty in relation to an increased food supply for the people is well defined.

The following report consists of a brief summary of this year's work of this Division, illustrated by charts showing the control work of recent years of some of the principal contagious diseases of animals. These charts will probably be of considerable interest to those who have been familiar with the workings of our organization during a period of years. They show the number of cases we have had to deal with, and the working out of policies that have been pursued, with such occasional variations as seemed advisable, for a considerable length of time.

Following is a gross summary of the work of the Division for the year ending Nov. 30, 1921:—

#### CATTLE.

31,892 Massachusetts cattle were physically examined by inspectors.

2,995 Massachusetts cattle were tuberculin tested by Division veterinarians.

3,507 interstate cattle were tuberculin tested by Division veterinarians.

8,518 tested interstate cattle were examined at Brighton and their test records viséed.

5,442 tested interstate cattle were inspected and identified at other points.

1,137 animals on 164 farms in 51 towns were given preventive treatment against blackleg.

94 animals on 8 farms in 4 towns were given preventive treatment against anthrax.

137 animals were given preventive treatment against hemorrhagic septicemia.

1,294 visits to unsanitary premises were made by district veterinarians.

#### HORSES.

206 tests for glanders were made by Division veterinarians.

4,382 interstate horses were examined by inspectors.

5 tests of whole stables were made by Division veterinarians.

#### DOGS.

959 cases of possible rabies in dogs were investigated.

#### SWINE.

54,346 head of swine were treated in prevention or cure of hog cholera.

10,580 head of swine were treated in prevention or cure of hemorrhagic septicemia.

#### MISCELLANEOUS DISEASES.

299 cases of miscellaneous diseases were investigated by Division veterinarians.

#### BOVINE TUBERCULOSIS.

This disease, widely prevalent, existing in all sections of the world where cattle are raised, and recorded in Massachusetts statistics for at least forty years, continues to be the greatest disease control problem of our time. All owners of cattle suffer financial loss from its ravages, whether their business is the raising of dairy products, the production and marketing of cattle for food purposes, or the propagation and sale of pure-bred animals as foundation stock for the establishment of new herds and for raising the quality of those composed of grade animals.

On account of the large number of carcasses and parts of carcasses condemned as unfit for human food because of the extent of tuberculous lesions found therein, the disease operates as a large factor in raising the price of beef and dairy products to the consumer. In fact, the significance of this great waste

of good food products was the original basis of the appeal by the live-stock industry of North America to the Federal government to inaugurate a campaign for its elimination.

The possibility of infection of the human subject from animal sources of the disease, now recognized as a well-established fact in many instances of tuberculous children, should be referred to as sufficient reason in itself for continuous study of any and all methods of control which promise any degree of success.

The major part of the yearly expenditures of the Division of Animal Industry is applied in indemnification of owners as reimbursement for cattle condemned and killed because affected with tuberculosis, as disclosed by physical examination. The expense incurred in carrying on this work is also one of our largest items and is gradually mounting from year to year, as the increased number of cases brought to light by improved methods of detection, and influenced by market conditions, calls for official action in their disposal. It cannot be said that a larger percentage of our herds is infected than formerly, or that the disease exists in a more virulent or active form than usual. On the other hand, many observers contend that there is a very marked improvement in this direction, and that the larger number of cases now brought to official attention is the result of more intelligent and skillful observation and of closer attention to the well-recognized necessity of promptly ridding the herds of their infected members.

During the year the local market for slaughter cattle, carcasses and by-products has been so low that an owner having animals which under ordinary market conditions he would send to the butcher when for any reason found not profitable to keep has not so disposed of them because of the small amount of money returns from their sale. He has turned to the prospect of a more satisfactory disposal of his cattle through condemnation of them by State officials as cases of tuberculosis. It very frequently is the case that the worn-out cow, or the one unthrifty or for any reason unprofitable, is a physical case of tuberculosis. Such a case if brought to official notice must be condemned in accordance with the law, and, if so condemned, operating to the owner's financial advantage is the present indemnity paid by the State, which indemnity was in-

creased 50 per cent, effective Aug. 18, 1920. The owner therefore submits the animal to our Division for examination. If not found to be diseased, he still has left the sale for slaughter; but if condemned, the money returns are bound to be more satisfactory than from sale. Division inspectors are all instructed to be absolutely fair to citizens of the Commonwealth when making appraisal of animals. On the other hand, there is much evidence that the cattle buyer, or the packing house official, is not always actuated by a similar spirit.

As a result of these conditions we have this year officially condemned very many animals which, under the former conditions of a good beef market on the one hand and a lower State indemnity on the other, would have been sent to slaughter without official attention having been called to them. It is probable that the appropriation to this Division for carrying out the law applying to the disposal of tuberculous cattle will have to be maintained at its present size or increased, at least while market conditions remain so unfavorable to the seller of animals fit for slaughter only, or unless the amount of indemnity be reduced in its maximum by amendment of the law now applying to such cases.

For thirty years the regulatory live-stock officials of Massachusetts have carried out such measures in the control of bovine tuberculosis as were authorized by law, supplementing them by regulations which seemed applicable to the conditions which from time to time arose. These measures have undoubtedly resulted in limiting the prevalence of the disease and controlling its spread, but it is probably true that its ultimate eradication cannot be hoped for so long as tuberculous animals remain in a herd until they show clinical symptoms sufficiently well marked to arouse the suspicion of the owner or of the inspectors of animals.

The diagnostic value of the tuberculin test carefully applied and interpreted by competent veterinarians is very generally recognized, and should be taken advantage of at every opportunity for the purpose of disclosing the non-clinical cases. Without its aid satisfactory control of the prevalence of tuberculosis among our cattle is not possible. The application of official tests at request of cattle owners shows a steady

increase each succeeding year, but the number of animals so tested is such a small percentage of the total number in the State that as yet no appreciable effect on eradication is to be noticed.

If it were practicable under our present laws to pay indemnity for cattle which reacted to an official tuberculin test, very many owners would seek its application, and some real progress in eradication of this great plague would be accomplished.

The Division is giving its support to the Federal movement in eradication of bovine tuberculosis, and co-operating with national authorities in this work to the fullest extent possible under existing law. The most prominent feature of the Federal movement is the "tuberculosis-free accredited herd" plan, upon which plan the movement largely depends for its indorsement by the cattle-owning public. Under this plan certain indemnity is paid for reacting cattle which are slaughtered, the owners of which have submitted their herds for official tests applied under Federal and State supervision. This payment of Federal indemnity, however, is contingent upon a like indemnity being paid by the State wherein the cattle are owned. Under existing Massachusetts law, indemnity is paid by the Commonwealth only for cattle which are condemned by Division officials, such condemnation occurring as a result of physical examination. As the majority of cattle reacting to a tuberculin test are not cases that can be readily condemned by physical examination, indemnity for such reactors is not paid by the State, and for that reason alone no Federal indemnity is available. The Massachusetts cattle owner, therefore, who desires to eradicate tuberculosis from his herd by slaughter of the reactors to an official test, finds himself denied both State and Federal indemnity as partial reimbursement for his losses, and consequently the work of eradication by the "tuberculosis-free accredited herd" plan has not progressed in this State to the extent it has in most other States of the Union, or to the extent it would if our laws were more favorable to its progress. In forty-seven States full co-operative action by the two governments is functioning satisfactorily, and nearly ten thousand herds have already been declared free from tuberculosis.

Believing that advantage should be taken of every factor

which promises to be of any assistance in the eradication of this scourge from Massachusetts live stock, it is to be regretted that the recommendations of the commission, appointed by His Excellency the Governor in 1919 to study the tuberculosis situation, were not favorably acted upon by the Legislatures of 1920 and 1921. These recommendations suggested an amendment to our laws providing for payment, under proper regulation, to owners of cattle whose animals were killed on account of having reacted to tuberculin tests applied under official supervision. We are still of the opinion that an active campaign against bovine tuberculosis, made more workable by an amendment to existing statutes, is what is greatly needed for relief of the situation in this State.

A public work of this sort means the expenditure of a considerable amount of money by the Commonwealth, but considering that such expenditure would command the award of a like amount by the national government, and that these combined indemnities would make the official tuberculin test popular, the result would undoubtedly be the "cleaning up" of many infected herds. Ultimately as the work of testing increased the effect would be to so reduce the prevalence of the disease that the large annual appropriation now necessary to combat it would be very much reduced.

Following is a chart showing for a period of twenty years the number of cases reported to this Division and the number actually found diseased as proved by post-mortem examination, with marginal notes stating the methods of disposal.

This year's tabulation, as shown in the opposite chart, probably more nearly approaches a correct record of the prevalence of tuberculosis in our herds than that of any other one year. In addition to a diligent search for clinical cases as formerly, and the bringing to our attention of many more cases by the operation of the amended law increasing the indemnity payable by the Commonwealth, the tuberculin test reactors appear this year as a greater factor than ever before in our statistics. These show an increase in the number of positively diseased animals killed as reactors to State and private tests of nearly 40 per cent.

Comparing the last four years' records, we find the percent-



age of reactors to total number killed, as follows: 1918, 23.5 per cent; 1919, 28.1 per cent; 1920, 33.4 per cent; 1921, 30 per cent. In other words, nearly one-third of all the tuberculous cattle killed under our supervision this year were reactors to a tuberculin test and killed for that reason. Very few of these cases could have been detected by physical examination.

Following are various tables showing the extent of the work of the Division in connection with the control of bovine tuberculosis in Massachusetts for the year ending Nov. 30, 1921:—

*Massachusetts Cattle.*

Cattle reported as diseased in 1920 disposed of in 1921 . . . . .	24
Cattle reported as diseased during the year . . . . .	3,032
	—— 3,056

*Disposal of Above Animals.*

	Killed, Lesions found.	Killed, No Lesions found.	Permit to kill, Lesions found.	Permit to kill, No Lesions found.	Died.	Released.	Forward to 1922.	Totals.
Reported by inspectors, owners, etc. . . . .	1,686	30	75	33	75	319	7	2,225
Reacted to Division tests . . . . .	-	-	343	36	-	-	-	379
Reacted to private tests . . . . .	56	-	245	23	2	-	2	328
Reacted to United States tests . . . . .	-	-	113	11	-	-	-	124
Totals . . . . .	1,742	30	776	103	77	319	9	3,056

The preceding table shows the disposal of Massachusetts cattle suspected of tuberculosis and reported from all different sources.

Following is a tabulation of tuberculin tests only, made by Division inspectors, reported by private veterinarians, and by inspectors of the United States Bureau of Animal Industry. It shows also the disposal of such reactors as came under the jurisdiction of the Division and such as could be arranged for by consultation with owners:—

DEPARTMENT TESTS.		1920.	1921.
Premises on which tests were made . . . . .		37	59
Number of animals tested . . . . .		1,924	2,995
Number of reactors . . . . .		496	1,005

*Disposal of Reactors.*

Killed, lesions found . . . . .	289
Killed, no lesions found . . . . .	36
Awaiting action . . . . .	680

NOTE. — In addition to above, 54 animals which reacted in 1920 were killed in 1921, in which lesions were found.

TESTS REPORTED BY PRIVATE VETERINARIANS.		1920.	1921.
Number of herds in which animals were reported . . . . .		153	162
Number of animals tested . . . . .		3,631	2,740
Number of reactors . . . . .		758	741

*Disposal of Reactors.*

Condemned on physical examination . . . . .	56
Killed, lesions found . . . . .	175
Killed, no lesions found . . . . .	23
Showing no physical symptoms of tuberculosis, no record of disposal . . . . .	485
Awaiting action . . . . .	2

NOTE. — In addition, 70 animals reacting to test made in 1920 were killed and lesions found.

TESTS REPORTED BY UNITED STATES BUREAU OF ANIMAL INDUSTRY.

Number of Massachusetts animals tested . . . . .	8,589
Number of reactors . . . . .	273

The tables show only a small increase from last year of the total number of cattle tested by Division inspectors and reported by private veterinarians. The figures are correct as to the Division tests, but undoubtedly many tests have been made by private veterinarians which have not been reported.

The significance of the figures is an increase this year of the percentage of reactors found in State tests from 25.5 per cent to 33 per cent, and in private tests from 22 to 27 per cent. This may possibly be due to the more general use of the ophthalmic and intradermic methods in place of, or in combina-

tion with, the subcutaneous method. Each of the three methods now in use occasionally discloses cases which fail to react to either of the others.

The record of tests made by the United States Bureau of Animal Industry inspectors should be especially noted. It shows a very low percentage (about 3 per cent) of reactors, due to the fact that many of the herds are composed of pure-bred animals under their constant supervision, regularly tested once or twice a year, and from which the reactors have been immediately removed. By these methods the disease has been partially or completely eradicated, and such of the herds as are not already accredited are well on the way thereto.

The Federal Bureau's work in this State constitutes a good example of the possibilities of tuberculosis eradication by application of the tuberculin test under proper supervision.

During the year Division and local inspectors have physically examined 2,517 herds, comprising 31,892 cattle. Much of this was "follow up" work at premises classified as *infected* because of the existence of one or more recent cases of tuberculosis. The number of herds and cattle examined is practically double that of the year 1920. It does not include any portion of the regular annual inspection of all herds by local inspectors.

#### *Interstate Cattle.*

In accordance with present regulations of the Federal government, all dairy or breeding cattle of whatever age shipped interstate must have passed a tuberculin test applied by veterinarians approved by the live-stock officials of the State where tested and by the chief of the Bureau of Animal Industry, United States Department of Agriculture.

A modification of this regulation is applicable, however, to cattle shipped to so-called "public stockyards" which are under the supervision of Bureau officials and where the animals can be tested upon arrival. On July 1, 1919, the Brighton cattle market was designated as "public stockyards," and such of the dairy or breeding cattle in the weekly shipments to that point as have not been tested before shipment are tested by inspectors of the Bureau of Animal Industry and of this Division working in co-operation. Check tests are also made

from time to time on interstate cattle supposed to have been properly tested before shipment, in order that the quality of this work done in other States may be determined.

Additional quarantine stations for receipt of animals for Brighton market are maintained at Watertown and Somerville, at which points many of the cattle destined for that market are unloaded. The protection of Massachusetts cattle interests at these points is carefully attended to by our force of inspectors, and we feel sure that no cattle which can be suspected of tuberculosis are released for any purpose except for immediate slaughter.

Brighton stockyards being the only point in the State to which untested cattle may be shipped, in strict compliance with Federal regulations, our former work of testing at other points is reduced to a minimum and consists only of testing such animals as may arrive not accompanied by a record of tuberculin test. A few violations of the regulations occur, some of them through ignorance of Federal and State requirements, and others in willful disregard of them. These latter cases are investigated when reported and prosecution in the courts is instituted if deemed advisable.

Following are tabulations showing in detail the interstate cattle work of the Division at Brighton and other points: —

AT BRIGHTON QUARANTINE STATION FROM DEC. 1, 1920, TO NOV. 30, 1921.

Number accepted on approved records of test . . . . .	8,518	
Number received and tuberculin tested . . . . .	3,374	
		————— 11,892

*Disposal of Above Animals.*

Number released on accepted records of test . . . . .	8,518
Number released on first test . . . . .	3,037
Number released on second test . . . . .	49
Number released on third test . . . . .	12
Number released on fourth test . . . . .	4
Number released for slaughter on first test . . . . .	29
Number released for slaughter on second test . . . . .	13
Number released for slaughter on third test . . . . .	1
Number slaughtered on first test, lesions of tuberculosis found . . . . .	179
Number slaughtered on second test, lesions of tuberculosis found . . . . .	15

Number slaughtered on third test, lesions of tuberculosis found . . . . .	1	
Number slaughtered on first test, lesions of tuberculosis not found . . . . .	27	
Number slaughtered on second test, lesions of tuberculosis not found . . . . .	5	
Number slaughtered on third test, lesions of tuberculosis not found . . . . .	1	
Number held awaiting disposal . . . . .	1	
		11,892

NOTE.— In addition to above, 2 animals held from last year were released, 1 on first test and 1 on second test.

AT OTHER POINTS FROM DEC. 1, 1920, TO NOV. 30, 1921.

Number condemned in 1920 awaiting slaughter in 1921 . . . . .	2	
Number held from 1920 awaiting disposal in 1921 . . . . .	13	
Number received during the year . . . . .	5,606	
		5,621

*Disposal of Above Animals.*

Number released on accepted records of test . . . . .	5,442	
Number released on test made after arrival . . . . .	109	
Number condemned, lesions of tuberculosis found . . . . .	20	
Number condemned, lesions of tuberculosis not found . . . . .	3	
Number condemned in 1920, slaughtered in 1921, lesions of tuberculosis found . . . . .	2	
Number condemned awaiting slaughter in 1922 . . . . .	1	
Number condemned on physical examination, lesions of tuberculosis found . . . . .	1	
Number brought in as reactors, killed on "permit to kill," lesions of tuberculosis found . . . . .	2	
Number arrived but not released at close of year . . . . .	41	
		5,621

SUMMARY.

Total interstate dairy cattle received at Brighton station	11,892	
Total interstate dairy cattle received at other points . . . . .	5,621	
		17,513

*Origin of the Above Interstate Cattle.*

Vermont . . . . .	4,662	
Maine . . . . .	5,750	
New Hampshire . . . . .	4,802	
New York . . . . .	2,008	
Connecticut . . . . .	92	
Rhode Island . . . . .	59	
Other States and Canada . . . . .	140	
		17,513

Animals other than dairy cattle requiring tuberculin test received at other points than the quarantine stations may be classified as below: —

*Cattle not requiring Tuberculin Test.*

Cattle for immediate slaughter . . . . .	1,120
Calves for immediate slaughter . . . . .	1,408
Dairy calves under six months old . . . . .	153
Cattle returned from out-of-State pastures . . . . .	154
Cattle pastured in the State during the season . . . . .	113
Feeder cattle . . . . .	112
Lost . . . . .	2
Condemned on physical examination . . . . .	1
Returned from temporary stay in other States for breeding purposes, etc. . . . .	14
Remaining in State for brief periods only, for breeding purposes, etc. . . . .	13
For temporary stay at sales or exhibitions . . . . .	979
	4,069
Total . . . . .	4,069

There are large numbers of cattle and calves from other States slaughtered at Haverhill and Springfield, at abattoirs which are under Federal inspection, which are not included in the statistics of this Division.

Twenty-nine permits allowing shipment of cattle into the State were brought over from 1920 not expired or reported upon before close of the year. There were 998 permits issued during the year; on 10 of these no report has yet been received. There were 110 instances brought to our attention where animals were shipped into the State unaccompanied by the permit required by State regulations, covering 384 head of cattle; 252 of these were accompanied by acceptable records of test; 39 were tested by Division veterinarians; 25 were feeder cattle; 12 were calves under six months of age; 23 came in for sale or exhibition; 2 were returning from pasture in another State; 1 remained for a brief period only, and 30 were immediately slaughtered. These figures are included in the statistical tables.

There were 395 head of cattle tested for shipment into New Hampshire for pasture and 82 head tagged only for that

purpose, going into other States, also 2 calves reported but not tagged.

At a sale of Ayrshire cattle held in Springfield in June, 58 head came from other States, 12 of which were sold to remain. At the annual New England Fair held in Worcester in September, 195 head from out of the State were exhibited, none being sold to remain.

At the Eastern States Exposition held in Springfield in the latter part of September, and a sale of Aberdeen-Angus cattle held in connection therewith, 680 head were brought from other States, of which number 9 dairy cattle were sold to remain in Massachusetts, and 1 was sold for immediate slaughter. There was a small number of baby beeves and 76 nurse cows on the grounds. Including cattle exhibited by Massachusetts owners, there was on the grounds a total of 995 head of cattle. There were also 262 sheep, 334 head of swine, and 293 horses.

The Division keeps records of all animals received at the several quarantine stations, also the States from which neat cattle are shipped, as shown by the following figures:—

*Receipts of Stock at the Watertown Stockyards for the Year ending Nov. 30, 1921.*

New Hampshire cattle . . . . .	2,184
Vermont cattle . . . . .	4,952
Calves . . . . .	26,010
Sheep and lambs . . . . .	1,411
Swine . . . . .	1,455

*Receipts of Stock at the New England Dressed Meat and Wool Company's Yards at Somerville for the Year ending Nov. 30, 1921.*

Maine cattle . . . . .	1,502
New Hampshire cattle . . . . .	882
Vermont cattle . . . . .	6,047
Massachusetts cattle . . . . .	928
Canada cattle . . . . .	495
Western cattle . . . . .	14,644 <sup>1</sup>
Calves . . . . .	96,576
Sheep and lambs . . . . .	347,958
Swine . . . . .	749,700

<sup>1</sup> Including 6,130 intended for export.

*Receipts of Stock at Brighton for the Year ending Nov. 30, 1921.*

Maine cattle . . . . .	6,358
New Hampshire cattle . . . . .	5,739
Vermont cattle . . . . .	3,143
Connecticut cattle . . . . .	50
Massachusetts cattle . . . . .	9,784
New York cattle . . . . .	8,620
Western cattle . . . . .	52,597 <sup>1</sup>
Calves . . . . .	64,304
Sheep and lambs . . . . .	7,038
Swine . . . . .	36,239

## GLANDERS.

The prevalence of this disease among the equine species in Massachusetts is not only under perfect control at the present time but all indications are that it is well on the way to complete extermination.

These indications are based on steady, progressive diminution in prevalence from year to year since 1913. In that year there were destroyed 1,084 glandered horses, 556 of which were in the city of Boston, whereas during the year 1921 there have been killed 11 affected horses only, 1 of which was in Boston. A comparison of the records of these two years shows that the loss from this disease at the present time is in the ratio of one death to one hundred deaths in 1913.

Notwithstanding the fact that the prevalence in 1921 has been low, and unimportant from a disease control standpoint, we believe it necessary to closely watch the situation, and consequently we still enforce the same regulations as to interstate shipments as formerly, and still pursue the same methods in handling an outbreak of the disease.

Although the horse as a necessity in many lines of business and as a means of healthful recreation and pleasure has to some extent been replaced by motor vehicles, it has been conclusively shown that he cannot be entirely dispensed with in any of these lines of usefulness. He is now of priceless value in the field of preventive medicine, being used in large numbers for the manufacture of various biological preparations found

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<sup>1</sup> Including 3,765 intended for export.

effective in the prevention and cure of many diseases of animals and man. He must therefore still be produced in considerable numbers, and be maintained free from contagious disease if possible.

The successful methods by which the number of cases of glanders has been rapidly reduced in the past few years, and which have apparently solved what was formerly a difficult problem of disease control, may be briefly referred to as follows:—

Immediate quarantine of all reported cases; prompt killing of all clinical cases, followed by disinfection of the premises where kept, of the blacksmith shops where shod, and of watering troughs where they were in the habit of drinking; examination and re-examination of all contact animals, together with application of the several diagnostic tests when necessary; extension of the plan of testing whole stables; closing of public watering troughs in sections where an outbreak of the disease occurs; testing of all horses and mules shipped interstate from New York, New Jersey, Connecticut and Rhode Island, unless accompanied by satisfactory records of recent tests.

The records of the Division for the year ending Nov. 30, 1921, show the following facts:—

At the end of 1920, 3 horses were under observation. Of this number, 1 was condemned, and 2 have been released as free from the disease.

During the past year 96 suspected animals, in addition to the 3 mentioned above, have been examined. Of this number, 7 animals proved to be positive cases and were destroyed in accordance with the requirements of the law; 1 was killed by its owner, autopsy proving it to have been a case of glanders; 1 State horse and 1 interstate horse were condemned and killed, no lesions of glanders being found on post-mortem examination, their full appraised value amounting to \$150; 2 horses died before final diagnosis was made; 83 were released as free from the disease; and 1 was still held under observation at the end of the year.

In the so-called "stable tests," or tests of all animals in stables where glanders has been found, 20 horses have been tested in 5 stables; among them 1 case of glanders was found.

The above figures are all included in the tabulations which follow: —

HORSES REPORTED AS SUSPECTED.

Brought forward from the year 1920 . . . . .	3	
Reported by renderers . . . . .	1	
Reported by inspectors, humane societies, veterinarians, owners, etc. . . . .	94	
Interstate, reported by inspectors . . . . .	2	
Contact animals examined in stable tests . . . . .	20	
		— 120

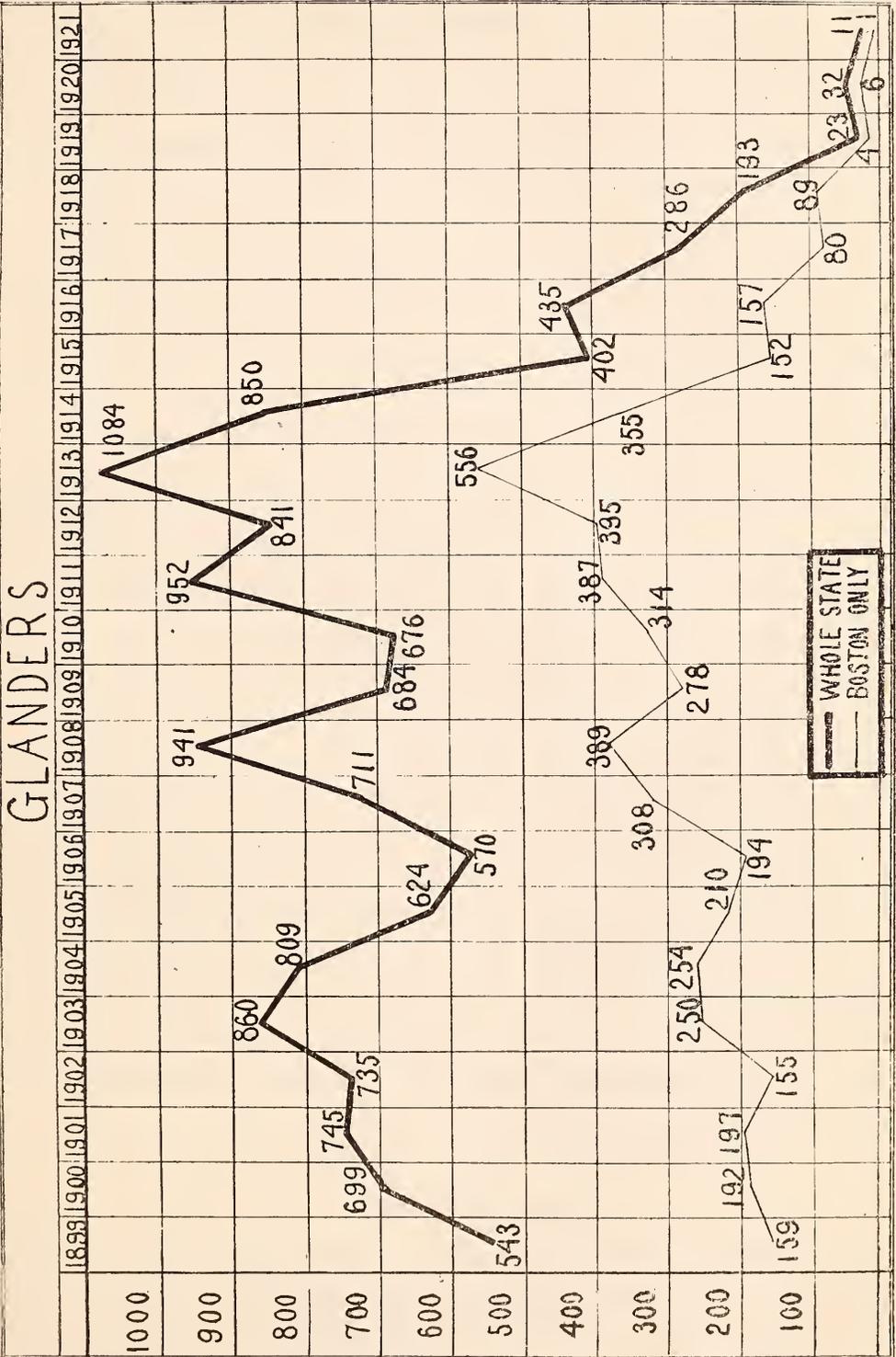
*Disposal of Above Horses.*

Appraised and killed, positive . . . . .	9	
Killed by owner, positive . . . . .	1	
Reported by renderer, positive . . . . .	1	
		— 11
Appraised and killed, no lesions found (1 interstate, 1 State) . . . . .	2	
Killed by owner or died, no lesions found . . . . .	2	
Released as not affected with glanders . . . . .	104	
Awaiting disposition . . . . .	1	
		— 120

Following is a table giving the number of cases of this disease covering a period of twenty-three years. In this table cases which have occurred in the city of Boston are shown separately, on account of the fact that Boston was for many years the storm center of this disease. Special tabulation of the number of cases in that city has always been made in order that its relative importance to other sections of the State may be studied.

*Number of Cases.*

YEAR.	CASES.		
	In Boston.	In Other Places.	Totals.
1899 . . . . .	159	384	543
1900 . . . . .	192	507	699
1901 . . . . .	197	548	745
1902 . . . . .	155	580	735
1903 . . . . .	250	610	860
1904 . . . . .	254	555	809
1905 . . . . .	210	414	624
1906 . . . . .	194	376	570
1907 . . . . .	308	403	711
1908 . . . . .	389	552	941
1909 . . . . .	278	406	684
1910 . . . . .	314	362	676
1911 . . . . .	387	565	952
1912 . . . . .	395	446	841
1913 . . . . .	556	528	1,084
1914 . . . . .	355	495	850
1915 . . . . .	152	250	402
1916 . . . . .	157	278	435
1917 . . . . .	80	206	286
1918 . . . . .	89	104	193
1919 . . . . .	4	19	23
1920 . . . . .	6	26	32
1921 . . . . .	1	10	11



The Massachusetts Society for the Prevention of Cruelty to Animals, the Boston Workhorse Relief Association, the Animal Rescue League, and the branches of these various associations in many cities and towns of the State have through their agents always been of material aid to the Division in the work of controlling this disease. Their close observation of working animals of all classes has in the past, when the disease was more prevalent, brought to light many showing suspicious symptoms, which they have promptly reported to this Division, and many of the animals so reported have proved to be positive cases of the disease.

The constant activity of the humane societies in removing disabled animals from work and destroying those which, on account of extreme age or poor condition, are no longer useful has undoubtedly been a factor in the suppression of glanders, as such animals are very susceptible to infection.

The maximum amount, fixed by section 13, chapter 129 of the General Laws, which may be paid for any one animal condemned and destroyed on account of being affected with glanders being \$50, the appraised value of the animals condemned is a subject of considerable interest. Of the 11 positive cases of glanders occurring during the year, 9 were appraised at a total valuation of \$1,155, the average amount per animal being \$128.33. On the remaining 2 animals no appraisal was made for the following reasons: 1 of them was reported by a renderer and 1 was killed by owner, the disease being found on autopsy.

Of the 9 horses which were appraised, 7 have been paid for, the amount paid being \$350; and 2 cases are awaiting the filing of claims for payment.

#### *Complement-fixation Test.*

The 3 horses under observation at the end of the year 1920 were subjected to the complement-fixation test, with the result that 1 was condemned and 2 were released as probably free from the disease.

One hundred and twenty-six samples of blood were taken from 101 horses during the year 1921, and the following disposal of the animals was made:—

Animals released on first test . . . . .	80
Released on second test . . . . .	11
Released on fourth test . . . . .	2
Died or killed by owner after first test . . . . .	1
Condemned on first test . . . . .	2
Condemned on second test . . . . .	2
Condemned on third test . . . . .	2
Held for further observation after third test . . . . .	1
	101

*Ophthalmic-mallein Test.*

This test has been applied to 80 State and 163 interstate horses during the year. It happens that the test in some instances was repeated on the same animals, and 248 such tests have been made. The results are as follows: —

Tests giving positive reaction . . . . .	2
Tests giving no reaction . . . . .	239
Tests giving unsatisfactory results . . . . .	7
	248

*Interstate Horses.*

Horses, asses and mules shipped to Massachusetts from the States of New York, New Jersey, Connecticut and Rhode Island must be accompanied by a permit from the Director of Animal Industry. This regulation was established on account of the prevalence of glanders among the horses of the States mentioned, and in order that upon arrival the animals might be immediately located and examined by agents of this Division.

The number of horses, mules and asses shipped from these States has increased from 4,082 in 1920 to 4,500 in the year ending Nov. 30, 1921, the statistics following: —

EQUINE ANIMALS FROM NEW YORK, NEW JERSEY, CONNECTICUT AND  
RHODE ISLAND.

Mules . . . . .	8
Horses . . . . .	4,492
	4,500

*Disposal of Above Animals.*

Released upon physical examination . . . . .	4,218
Released upon accompanying papers without examination . . . . .	114
Released after test . . . . .	163
Released in transit to other States . . . . .	4
Suspicious to test, killed, no lesions found . . . . .	1
	4,500

It is worthy of notice that no interstate horses or mules were found during the past year to have been affected with glanders. Many of the animals brought from the above-mentioned States are of the better class, being highly bred horses used for carriage work and breeding purposes. The secondhand horses, which are trafficked in and sent from the markets of one State to those of another for purpose of public sale, have been specially watched on account of their being considered more liable to be subjects of contagious disease than the higher class animals, and if not accompanied by a satisfactory certificate of test have been tested on arrival by inspectors of the Division.

#### RABIES.

Rabies is one of the more important infectious diseases of domestic animals with which the Division of Animal Industry has to contend. It is prevalent in practically all civilized countries, and especially so in the United States.

When once established in a territory, it is tenacious in its hold, and complete eradication becomes a difficult matter. The control of its prevalence, however, is ordinarily accomplished quickly in a community where it breaks out when all agencies have been lined up against it and are functioning in a thorough and systematic manner. We find that it progressively spreads from one community to another until gradually many different sections eventually experience an outbreak. In addition to the loss of animals, some of them highly valued for one reason or another, the prevalence of rabies always carries with it more or less danger to human life. The restraint of animals is necessary to its suppression, and the regulatory measures called for are the cause of much trouble, expense and irritative inconvenience to the dog-owning public.

Rabies is primarily a disease of animals, all the various species being susceptible to it. The dog, however, is the one most often affected and is the chief factor in its spread from section to section. On account of its ready communicability to the human subject and the tendency of rabid animals to attack persons, the prompt application of all control methods becomes an important duty, and is especially to be so consid-

ered on account of fatalities which may occur. During the prevalence of rabies it unfortunately happens that some persons are bitten by the infected dogs, and in many instances the bite is inflicted before the animal shows sufficiently well-marked symptoms of the disease to be suspected or to put a person on guard against him. In such unfortunate occurrences, as well as in cases where persons are not able to avoid the attack of a furiously rabid animal, the Pasteur treatment in prevention of the disease is available and may be obtained by application to public health officials. This treatment being nearly 100 per cent effective, the loss of human life seldom occurs.

As a protective health measure all dogs, whether suspected of rabies or not, which have bitten persons should be restrained and confined at least fourteen days for observation, in order that it may be positively determined whether or not they were infected at the time the biting occurred. If a local inspector or the Division of Animal Industry is notified, such animals are officially quarantined for that period and released at the end of it if no symptoms of rabies have developed.

Based on the successful prevention in man, treatment in prevention of rabies in exposed animals is now available and is being taken advantage of in many instances apparently with success. The immunization of animals against the disease, conferring absolute protection to them if unfortunately coming in contact with a rabid animal, has been recently developed to what is thought to be a sufficiently effective stage to offer it for practical use. Many owners of valuable dogs, when there is an unusual prevalence of rabies, are having their animals protected by this means. If immunization against this disease can be proved practicable by further experience in this direction, and all dogs can be treated, it may be that the problem of rabies eradication will be somewhat nearer solution than at present.

The ownerless or stray dog is generally the first rabid animal to be found in any community, and the extent to which he may have spread the infection depends on how soon he has been apprehended after he developed the disease. No one being interested in the whereabouts or physical condition of the ownerless dog, he becomes an active spreader of the disease

before attention is centered on him. A more rigid enforcement of the dog laws would be valuable assistance in suppressing rabies, and is a factor which should be working in every community at all times.

Division records this year show a larger number of cases reported than in any year since 1916, when the lowest prevalence for fifteen years was recorded, since which time there has been a gradual increase in their numbers. It is probable that we have not yet reached the peak of the upward trend of prevalence as yearly recorded on account of the vast amount of contagion recently existing in near-by States, the invasion of Massachusetts by it having been forecasted in our reports.

Local inspectors of animals are familiar with the situation and are specially advised as to the importance of early quarantine, thorough investigation and prompt detailed reports to this office.

Following is a general outline of the Division's present methods in rabies control work:—

Upon report being made to the Division that a person has been bitten by a dog, the inspector of animals of the town or city in which it occurs is ordered to make an examination of the animal, and, even if it appears to be healthy, to have it restrained for a period of fourteen days for the purpose of observation. The restraint for this length of time is deemed necessary for the reason that competent authorities have shown that in some instances the bite of a dog infected with rabies may communicate the infection fourteen days before the animal shows clinical symptoms. If at the end of this period no symptoms of rabies have developed, the animal may be released. In case a person is bitten by a dog which, upon examination by the inspector of animals or any other person, shows evidence of already being affected with rabies, or there is a history of its having been in contact with a rabid animal, the dog in either case is immediately confined in strict quarantine. If it is subsequently killed or dies, its head is at once sent to the Division's office, and a laboratory examination of the brain is made for the purpose of positively determining whether or not the animal was affected with the disease. Information as to the laboratory findings is promptly communi-

cated to the person or persons who have been bitten. The State Department of Public Health is given the information received in every case of dog bite reported to this office, whether the bite has been inflicted by an animal suspected of rabies or not. We also order the local inspector of animals not only to ascertain the names of all persons who have been bitten by dogs suspected of rabies but to find out if animals have also been bitten, and if so to place the same in quarantine for a period of at least ninety days. All dogs which are found to have been in contact with a rabid animal, whether or not it appears that they have been bitten by it, are also placed in quarantine for the same period.

If an unusual number of cases of rabies is found to exist in any town or city, and the selectmen or the mayor or board of aldermen have not taken any special action in the emergency, we request them to issue a restraining order, under the provisions of section 167 of chapter 140 of the General Laws. Such an order obliges all dog owners to confine their animals to their own premises for a certain period, or take them therefrom only on leash. This restraining order is much more effective in the local control of an outbreak than is an order which compels owners to muzzle the animals only but not restrain them, as a muzzled animal let loose may in some way get the muzzle off and bite other animals or people. A muzzled dog at large may therefore become much more dangerous than an unmuzzled one which is at all times confined upon owner's premises or taken therefrom only on leash. Dogs found running at large while a restraining order issued by town or city authorities is in force may be killed on the issuance of a warrant for the same to a police officer.

Our force of district agents, all of whom are veterinarians and located in different parts of the State, together with the local inspectors of animals, of whom there is one or more in every city and town of the State, constitutes an organization by which effective local control of an outbreak of this disease can generally be accomplished within a reasonably short time.

During the year ending Nov. 30, 1921, 948 animals were reported to the Division for diagnosis, observation or quarantine on account of the prevalence of rabies, and 28 were brought

forward from the year 1920. The records have been classified as follows:—

Animals suspected of rabies, primary cases . . . . .	303
Animals exposed to rabies (26 reported in 1920, 362 in 1921) . . . . .	388
Animals which have inflicted bites upon persons (2 reported in 1920, 283 in 1921) . . . . .	285

*Animals suspected of Rabies, Primary Cases.*

	Dogs.	Cattle.	Cats.	Swine.	Horses.
Diagnosis positive . . . . .	247	1	—	—	1
Diagnosis negative . . . . .	38	—	4	1	—
Diagnosis questionable . . . . .	10	—	1	—	—

*Animals exposed to Rabies.*

	Dogs.	Cattle.	Cats.	Horses.	Goats.
Number released after a quarantine of ninety days.	258	1	1	1	—
Number killed, no symptoms having developed.	47	1	—	—	—
Number killed, positive symptoms having developed.	35	1	—	—	1
Number still held under observation . . . . .	42	—	—	—	—

*Animals which have inflicted Bites upon Persons.*

	Dogs.	Cats.
Number killed during quarantine, no symptoms having developed.	25	3
Number killed, no examination . . . . .	4	—
Number released after fourteen days' quarantine . . . . .	251	—
Number still held under observation . . . . .	2	—

Of the 28 animals which were under observation at the close of the year 1920, 3 were killed and 25 were released, no symptoms of rabies having developed.

The questionable cases given in the preceding table may be briefly referred to as follows: 6 dogs and 1 cat were killed or

died, having shown symptoms which might indicate rabies but on which the laboratory could arrive at no definite diagnosis; 2 were killed or died, report on which was considered unreliable; 2 "contact cases" escaped quarantine and were not again located.

During the past year the Division received reports of 383 persons having been bitten by dogs, and 6 persons having been bitten by cats. Eighty-two of these persons were bitten by 54 of the dogs classified in the tables as positive cases. In all cases of dog bite which are reported, the dog is immediately quarantined for observation except in cases where the animal is immediately killed. Of the cases of dog bite reported, 298 were inflicted by dogs proved not to be affected with rabies. One case was that of a dog on which laboratory examination was questionable, and 2 cases of bite were by dogs which are still in quarantine for observation.

It is deemed advisable, in all cases where possible, that the heads of animals supposed to be affected with rabies should be examined at the laboratory in order to confirm diagnosis. During the past year laboratory examination has been made of the brains of 268 dogs, 7 cats, 1 swine and 1 horse. Of this number, 203 dogs and 1 horse showed positive evidence of the disease.

Of the 948 animals reported for observation, diagnosis or quarantine during the year, 39 dogs were, as far as could be ascertained, ownerless and unlicensed, 29 of which proved to be positive cases of the disease.

An early symptom in very many cases of rabies in dogs is a tendency to wander away from home, and before an owner has noticed any change in the animal. As showing the distance a case may travel before being apprehended, 1 dog was killed in the town of Rockland, which was owned in New Bedford; 1, killed in Dartmouth, was owned in Wrentham; 1, killed in Millbury, was owned in Wellesley; 1, killed in Attleboro, was owned in Providence, R. I.

As showing the wide variance in the incubation period of rabies, the following tabulation, covering 37 contact cases, may be of interest: —

1 dog	developed rabies	on the 5th day.
1 dog	“ “ “ “	9th “
7 dogs	“ “	between the 10th and 20th day.
1 calf	“ “	“ “ “ “ “ “
1 goat	“ “	“ “ “ “ “ “
10 dogs	“ “	“ “ 20th “ 30th “
1 dog	“ “	“ “ 30th “ 40th “
3 dogs	“ “	“ “ 40th “ 50th “
2 dogs	“ “	“ “ 50th “ 60th “
1 dog	“ “	“ “ 60th “ 70th “
2 dogs	“ “	“ “ 70th “ 80th “
1 dog	“ “	“ “ 80th “ 90th “
1 dog	“ “	on the 137th day.
1 dog	“ “	“ “ 210th “
4 dogs	“ “	time uncertain.

—  
37

Attention is called to the fact that the shortest period of incubation was 5 days, and the longest period 210 days.

Our quarantine period is fixed at 90 days, that being considered a safe time at which to release contact dogs not showing symptoms of the disease. The cases having a longer period of incubation are so few that they should be considered exceptions.

The following table shows the number of positive cases of rabies, by cities and towns, during the year ending Nov. 30, 1921:—

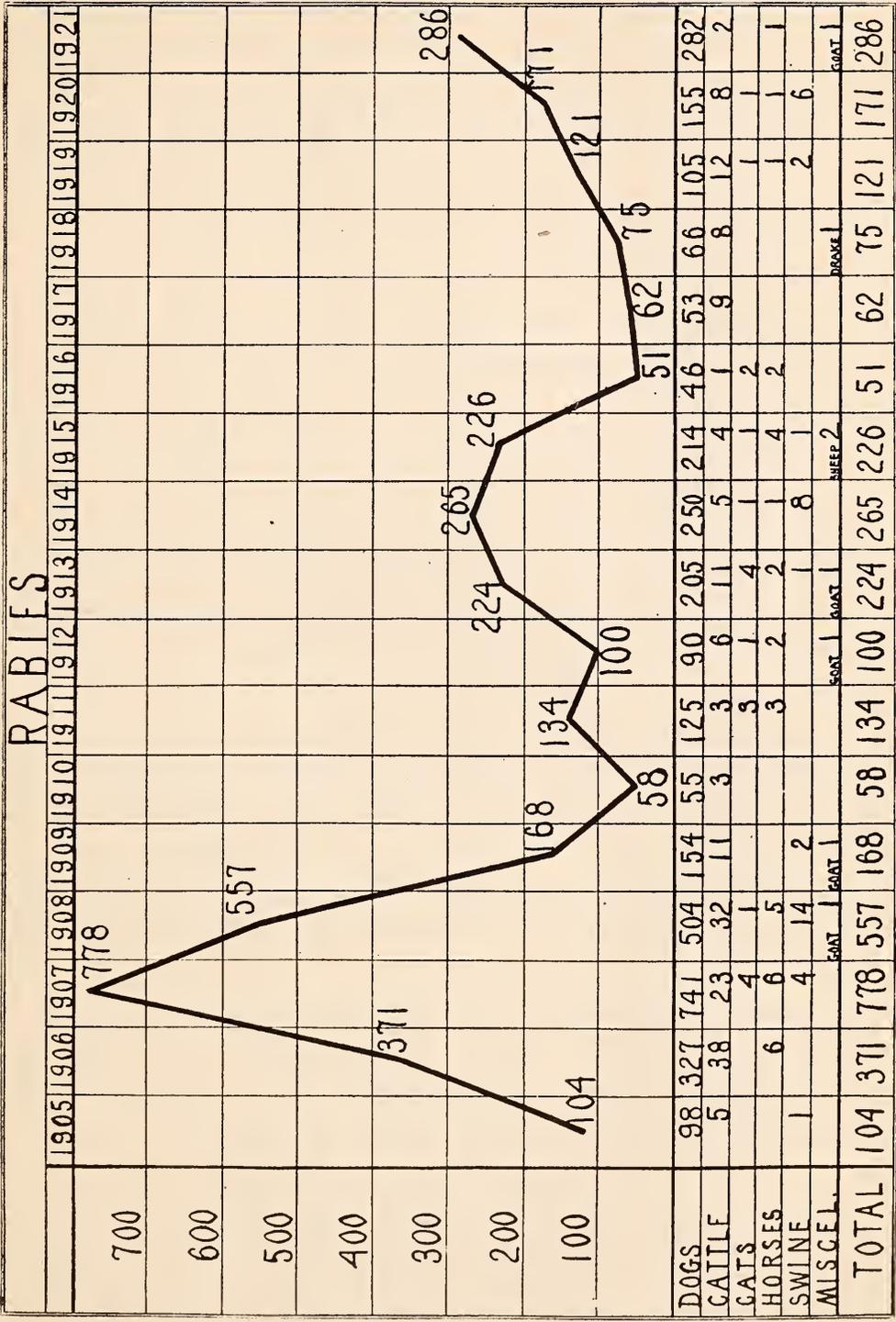
CITY OR TOWN.	Dogs.	Cattle.	Horses.	Goats.
Abington . . . . .	5	—	—	—
Acushnet . . . . .	2	—	—	—
Arlington . . . . .	5	—	—	—
Attleboro . . . . .	3	1	—	—
Belmont . . . . .	1	—	—	—
Billerica . . . . .	1	—	—	—
Boston . . . . .	14	—	—	—
Braintree . . . . .	2	—	—	—
Bridgewater . . . . .	5	—	—	—
Brookline . . . . .	10	—	—	—
Cambridge . . . . .	2	—	—	—

CITY OR TOWN.	Dogs.	Cattle.	Horses.	Goats.
Dalton . . . . .	11	-	1	-
Danvers . . . . .	1	-	-	-
Dartmouth . . . . .	9	1	-	-
Dedham . . . . .	5	-	-	-
Dighton . . . . .	3	-	-	-
Dudley . . . . .	3	-	-	-
Duxbury . . . . .	1	-	-	-
East Bridgewater . . . . .	1	-	-	-
Easton . . . . .	1	-	-	-
Everett . . . . .	2	-	-	-
Fall River . . . . .	22	-	-	-
Foxborough . . . . .	1	-	-	-
Gloucester . . . . .	1	-	-	-
Groveland . . . . .	1	-	-	-
Haverhill . . . . .	2	-	-	-
Hingham . . . . .	2	-	-	-
Holbrook . . . . .	1	-	-	-
Hull . . . . .	2	-	-	-
Lawrence . . . . .	1	-	-	-
Lexington . . . . .	3	-	-	-
Lincoln . . . . .	1	-	-	-
Lowell . . . . .	1	-	-	-
Lunenburg . . . . .	1	-	-	-
Lynn . . . . .	4	-	-	-
Lynnfield . . . . .	1	-	-	-
Mansfield . . . . .	1	-	-	-
Medfield . . . . .	1	-	-	-
Medford . . . . .	2	-	-	-
Melrose . . . . .	2	-	-	-
Middleborough . . . . .	1	-	-	-
Millbury . . . . .	1	-	-	-
Milton . . . . .	4	-	-	-
Natick . . . . .	2	-	-	-
Needham . . . . .	5	-	-	-
New Bedford . . . . .	24	-	-	-
Newton . . . . .	4	-	-	-
North Attleborough . . . . .	4	-	-	1
North Brookfield . . . . .	1	-	-	-
Norwell . . . . .	2	-	-	-

CITY OR TOWN.	Dogs.	Cattle.	Horses.	Goats.
Norwood . . . . .	8	-	-	-
Oakham . . . . .	1	-	-	-
Pittsfield . . . . .	7	-	-	-
Quincy . . . . .	5	-	-	-
Randolph . . . . .	1	-	-	-
Reading . . . . .	5	-	-	-
Rehoboth . . . . .	1	-	-	-
Revere . . . . .	1	-	-	-
Rockland . . . . .	1	-	-	-
Salem . . . . .	1	-	-	-
Saugus . . . . .	5	-	-	-
Sharon . . . . .	1	-	-	-
Shirley . . . . .	3	-	-	-
Somerset . . . . .	1	-	-	-
Somerville . . . . .	4	-	-	-
Springfield . . . . .	1	-	-	-
Stoneham . . . . .	2	-	-	-
Sudbury . . . . .	2	-	-	-
Swampscott . . . . .	2	-	-	-
Taunton . . . . .	12	-	-	-
Wakefield . . . . .	1	-	-	-
Watertown . . . . .	1	-	-	-
Webster . . . . .	11	-	-	-
Westport . . . . .	2	-	-	-
Westwood . . . . .	2	-	-	-
Weymouth . . . . .	1	-	-	-
Whitman . . . . .	1	-	-	-
Wilmington . . . . .	3	-	-	-
Winchester . . . . .	1	-	-	-
Winthrop . . . . .	2	-	-	-
Woburn . . . . .	1	-	-	-
Worcester . . . . .	6	-	-	-
Wrentham . . . . .	1	-	-	-
Totals . . . . .	282	2	1	1

Following is a chart showing the proved cases of rabies in the several species of animals covering the period from 1905 to 1921, inclusive.

RABIES



## HOG CHOLERA.

Next in importance to its work in control of contagious diseases of cattle is that now being carried on by the Division in the protective treatment of swine against hog cholera, and also when necessary the preventive or curative treatment to those exposed to or affected with any of the many other infections to which they are susceptible.

In recent years more attention has been given to swine diseases than formerly. They were causing a serious loss which was tending toward complete failure of this class of live stock to adequately contribute to the public food supply or in a degree that might reasonably be expected. Hog cholera was fast decimating Massachusetts herds of swine, especially where garbage was being used as their principal food. On account of this material being a recognized carrier of contagion, the economic utilization of this great waste of the household was threatened unless the ravages of this disease could be controlled.

The Division's work in this direction was commenced in 1914 after a complete survey of the situation. Its plans were carefully drawn, methods of execution were studied in minute detail, and a system of procedure was inaugurated which is in operation at the present day with very few changes other than those in technique, as dictated from time to time by experience.

The great economic value of this State work lies in its preventive aspect. It is a line of effort parallel to the direction of all medical progress of the present day, *i.e.*, *prevention* of disease rather than cure, thus rendering unnecessary all the time, trouble and expense of curative treatment.

During the year the number of protective inoculations against hog cholera administered by Division inspectors constituted about 70 per cent of the total number of swine found on the farms at the latest inspection in the spring of 1921. Numbers of these animals were found to have rapidly reduced since the count made one year before, the decrease amounting to about 25 per cent, namely, about 25,000 head. This condition is regrettable from the standpoint of the well-recognized necessity

for increased production in every line of endeavor if living conditions are to improve, but it is acknowledged that market rates paid the hog raiser for the past two years have been altogether too low to encourage the raising of larger numbers, and have in fact discouraged maintaining the industry at a level anywhere near the normal.

The decrease in the swine industry this year owing to market conditions would naturally have diminished the amount of the Division's work in their protection from disease, but we find such not to be the case. It has been a low year in the incidence of hog cholera in this section of the country, although present local prevalence and reports from the Middle West indicate a gradual return to its former wide prevalence, and to a type showing as formerly a higher degree of virulence.

The number of preventive inoculations administered to swine this year is about the same as in 1920. The percentage of them now protected against hog cholera is probably larger than at any time since this work was undertaken.

As a contagious-disease control work which if successful was bound to become of large magnitude, it was deemed necessary to so regulate it by official order at its very beginning as to avoid the danger acknowledged to be present in an unrestricted or indiscriminate use of the active virus of the disease, the only successful method of treatment yet developed, and which calls for the careful use of this dangerous material; therefore, it must be handled by men responsible to some authority.

Another necessity seemed to be the selection of veterinarians for this work who, physically able to perform the strenuous labor of restraining and treating swine, should at the same time be inclined to make a thorough study of a new problem and intelligently interpret their field experiences.

We also decided it to be vitally necessary that all biological preparations used, although manufactured under the United States Bureau of Animal Industry license, should be proved by our *own* tests to be potent, and thereafter held and stored under our control and direction.

In no way could all these important phases of the plan be taken care of other than to restrict the field work to veterinarians responsible to a central head, subject to orders changed

from time to time as conditions indicated the necessity; men who would be available for daily consultation with the Director and for discussion with their fellow workers, all these requirements being necessary in order that every individual worker might have the benefit of the composite experience of the entire force of workers.

The proving by test of all products used in treatment was arranged for and has been continued, and the use of them has, by Department order, been restricted to veterinarians selected by the Director and under his supervision.

The soundness of the policies above indicated has been proved, and the efficiency of the work is a matter of record. We find this to be readily acknowledged by live-stock owners.

We respectfully submit that our present methods should be continued, and that any proposed legislation to modify them should be opposed as against public interest as a whole and the swine industry in particular.

Following is a list of cities and towns in which hog cholera prevention work has been carried on during the year ending Nov. 30, 1921:—

CITY OR TOWN.	Herds inoculated.	INOCULATIONS.		
		Serum and Virus.	Serum only.	Total.
Abington . . . . .	1	7	6	13
Acushnet . . . . .	2	7	4	11
Adams . . . . .	1	67	5	72
Agawam . . . . .	13	84	52	136
Amesbury . . . . .	2	8	0	8
Amherst . . . . .	4	88	15	103
Andover . . . . .	1	28	0	28
Arlington . . . . .	3	10	14	24
Athol . . . . .	2	17	32	49
Attleboro . . . . .	5	34	88	122
Auburn . . . . .	3	10	18	28
Ayer . . . . .	1	109	50	159
Barnstable . . . . .	3	19	21	40
Becket . . . . .	1	40	28	68
Bedford . . . . .	1	31	12	43
Belmont . . . . .	6	822	464	1,286
Beverly . . . . .	1	209	109	318
Billerica . . . . .	3	77	86	163
Bolton . . . . .	4	11	28	39
Boston . . . . .	5	487	846	1,333
Boylston . . . . .	1	22	0	22
Braintree . . . . .	3	267	157	424
Bridgewater . . . . .	3	141	120	261
Brockton . . . . .	3	1,058	1,011	2,069
Brookfield . . . . .	4	66	29	95
Brookline . . . . .	1	12	0	12
Burlington . . . . .	2	115	16	131
Cambridge . . . . .	1	10	2	12
Canton . . . . .	1	9	7	16

CITY OR TOWN.	Herds inoculated.	INOCULATIONS.		
		Serum and Virus.	Serum only.	Total.
Charlton . . . . .	3	45	28	73
Cheshire . . . . .	1	2	0	2
Chicopee . . . . .	20	309	196	505
Clarksburg . . . . .	1	6	0	6
Clinton . . . . .	8	19	8	27
Dalton . . . . .	1	59	33	92
Danvers . . . . .	3	356	201	557
Dartmouth . . . . .	5	84	209	293
Dedham . . . . .	5	20	23	43
Deerfield . . . . .	1	71	32	103
Dighton . . . . .	1	27	20	47
Dracut . . . . .	2	9	16	25
Dudley . . . . .	5	18	17	35
East Bridgewater . . . . .	2	3	19	22
East Brookfield . . . . .	2	0	5	5
Easthampton . . . . .	4	24	7	31
East Longmeadow . . . . .	1	1	0	1
Easton . . . . .	2	8	5	13
Edgartown . . . . .	2	8	2	10
Essex . . . . .	1	3	5	8
Fall River . . . . .	4	16	13	29
Fitchburg . . . . .	16	132	72	204
Foxborough . . . . .	2	135	259	394
Framingham . . . . .	2	88	39	127
Gardner . . . . .	8	169	216	385
Georgetown . . . . .	1	0	2	2
Gill . . . . .	1	10	33	43
Gloucester . . . . .	10	354	231	585
Grafton . . . . .	9	216	417	633
Granby . . . . .	1	5	0	5
Great Barrington . . . . .	1	5	0	5
Greenfield . . . . .	5	126	123	249
Greenwich . . . . .	1	15	13	28
Groton . . . . .	1	22	0	22
Hadley . . . . .	1	14	2	16
Hamilton . . . . .	1	5	0	5
Hampden . . . . .	1	8	6	14
Hardwick . . . . .	1	0	15	15
Harvard . . . . .	4	20	11	31
Haverhill . . . . .	4	31	15	46
Hingham . . . . .	1	5	5	10
Holden . . . . .	8	25	40	65
Holyoke . . . . .	11	233	153	386
Hudson . . . . .	1	17	0	17
Huntington . . . . .	3	7	0	7
Ipswich . . . . .	2	37	24	61
Lakeville . . . . .	1	130	189	319
Lancaster . . . . .	4	19	0	19
Lawrence . . . . .	1	91	53	144
Leicester . . . . .	3	11	5	16
Leominster . . . . .	1	94	32	126
Lexington . . . . .	21	2,230	2,326	4,556
Lincoln . . . . .	8	336	231	567
Littleton . . . . .	4	66	84	150
Longmeadow . . . . .	3	620	371	991
Lowell . . . . .	6	354	184	538
Ludlow . . . . .	8	496	271	767
Lunenburg . . . . .	2	61	23	84
Lynn . . . . .	3	68	27	95
Lynnfield . . . . .	1	45	44	89
Manchester . . . . .	3	12	6	18
Marblehead . . . . .	8	153	123	276
Marion . . . . .	1	29	7	36
Mattapoisett . . . . .	1	2	0	2
Medfield . . . . .	3	227	159	386
Medford . . . . .	3	27	49	76
Methuen . . . . .	6	30	22	52
Milford . . . . .	5	121	31	152
Millbury . . . . .	5	65	73	138
Milton . . . . .	4	139	85	224
Monson . . . . .	2	66	6	72
Natick . . . . .	3	230	108	338
Needham . . . . .	8	128	146	274

CITY OR TOWN.	Herds inoculated.	INOCULATIONS.		
		Serum and Virus.	Serum only.	Total.
New Bedford . . . . .	3	35	65	100
Newbury . . . . .	3	15	16	31
Newburyport . . . . .	11	46	6	52
Newton . . . . .	8	211	203	414
Norfolk . . . . .	3	47	74	121
North Adams . . . . .	5	124	49	173
Northampton . . . . .	15	445	333	778
North Attleborough . . . . .	3	105	87	192
Northbridge . . . . .	3	146	106	252
Northfield . . . . .	1	94	48	142
North Reading . . . . .	1	76	92	168
Norton . . . . .	1	10	31	41
Norwood . . . . .	1	14	14	28
Orange . . . . .	2	11	8	19
Otis . . . . .	1	7	0	7
Oxford . . . . .	6	15	47	62
Palmer . . . . .	1	6	0	6
Paxton . . . . .	1	42	44	86
Peabody . . . . .	13	434	301	735
Pepperell . . . . .	2	21	53	74
Pittsfield . . . . .	18	763	209	972
Plymouth . . . . .	2	106	165	271
Provincetown . . . . .	32	82	3	85
Quincy . . . . .	3	140	132	272
Randolph . . . . .	2	104	34	138
Reading . . . . .	2	46	0	46
Rehoboth . . . . .	2	12	25	37
Revere . . . . .	8	1,664	892	2,556
Richmond . . . . .	1	0	1	1
Rockport . . . . .	2	103	17	120
Rowley . . . . .	1	11	0	11
Rutland . . . . .	2	84	133	217
Salem . . . . .	4	337	193	530
Salisbury . . . . .	2	1	9	10
Saugus . . . . .	9	117	44	161
Seekonk . . . . .	10	543	312	855
Sharon . . . . .	1	4	11	15
Shelburne . . . . .	2	12	0	12
Sherborn . . . . .	2	164	145	309
Shirley . . . . .	1	48	51	99
Shrewsbury . . . . .	2	101	328	429
Somerset . . . . .	1	0	3	3
Southbridge . . . . .	5	10	44	54
South Hadley . . . . .	15	165	32	197
Springfield . . . . .	21	1,224	453	1,677
Sterling . . . . .	1	7	2	9
Stoughton . . . . .	4	6	0	6
Sudbury . . . . .	1	11	0	11
Sutton . . . . .	2	0	13	13
Swansea . . . . .	4	1,974	1,219	3,193
Taunton . . . . .	5	381	388	769
Templeton . . . . .	9	85	32	117
Tewksbury . . . . .	1	263	112	375
Townsend . . . . .	2	10	13	23
Tyngsborough . . . . .	1	6	0	6
Upton . . . . .	1	3	0	3
Wakefield . . . . .	3	9	34	43
Walpole . . . . .	4	20	53	73
Waltham . . . . .	11	1,970	1,700	3,670
Wareham . . . . .	1	0	2	2
Watertown . . . . .	1	20	39	59
Wayland . . . . .	2	12	11	23
Webster . . . . .	13	40	40	80
Wellesley . . . . .	2	90	8	98
Wenham . . . . .	1	7	3	10
Westborough . . . . .	4	253	247	500
West Boylston . . . . .	1	33	67	100
Westfield . . . . .	9	129	160	289
Westford . . . . .	2	8	0	8
Westminster . . . . .	3	25	3	28
West Newbury . . . . .	1	11	0	11
Weston . . . . .	5	74	22	96
Westport . . . . .	2	9	21	30

CITY OR TOWN.	Herds inoculated.	INOCULATIONS.		
		Serum and Virus.	Serum only.	Total.
West Springfield . . . . .	4	41	92	133
Westwood . . . . .	3	193	60	253
Weymouth . . . . .	2	56	28	84
Whately . . . . .	1	3	0	3
Whitman . . . . .	2	3	20	23
Wilbraham . . . . .	3	38	67	105
Wilmington . . . . .	1	66	171	237
Winchendon . . . . .	2	1	5	6
Woburn . . . . .	9	286	229	515
Worcester . . . . .	10	2,490	5,203	7,693
Wrentham . . . . .	3	170	48	218
Yarmouth . . . . .	1	1	0	1
Totals . . . . .	740	29,031	25,315	54,346

The preceding table shows that work has been done in 187 cities and towns this year, 13 less than during 1920, but necessitating 1,635 visits by one or more inspectors. In addition there were 112 visits made to places where the swine were not treated for the following reasons: the animals in some instances had no chance of recovery; in others the trouble was found to be some non-contagious infection; again in some of the cases proper sanitary conditions necessary to successful work could not be established; and in a few cases the owners did not desire to have the animals treated.

Comparative statistics in detail are shown in the following table, and the chart on page 44 shows in a general way the hog cholera prevention work from the time of its inception to the present: —

Comparative Statistics on Hog Cholera Control Work from 1914 to 1921, inclusive.

	1914.	1915.	1916.	1917.	1918.	1919.	1920.	1921.
<i>General Herd Statistics.</i>								
Herds known to be infected . . . . .	80	227	253	359	232	184	89	159
Infected herds treated . . . . .	65	150	192	282	157	149	47	135
Infected herds not treated <sup>1</sup> . . . . .	—	77	43	77	75	35	42	24
Negative diagnoses in reported outbreaks . . . . .	20	122	57	42	39	54	41	36
<i>Treatments in Infected Herds.</i>								
Serum (includes infected, uninfected, and very young animals) . . . . .	428	10,300	14,747	24,828	7,559	3,076	5,813	9,322
Serum and virus (to healthy animals) . . . . .	591	5,826	13,643	15,524	4,055	1,282	6,393	6,782
Total treatments . . . . .	1,019 <sup>2</sup>	16,126	28,390	40,352	11,614	4,358	12,206	16,104
Mortality in serum treatments (per cent) <sup>3</sup> . . . . .	9.5	7.0	3.70	1.75	3.90	5.5	1.27	2.80
Mortality in serum and virus treatments (per cent) <sup>3</sup> . . . . .	2.0	1.2	.60	.44	2.26	2.1	.33	.74
Mortality in total number (per cent) <sup>3</sup> . . . . .	5.2	4.9	2.21	1.24 <sup>4</sup>	3.34	4.5	.78	1.92

*Preventive Treatments in Healthy Herds.*

Number of herds . . . . .	2	95	113 <sup>5</sup>	470 <sup>5</sup>	1,275	1,440	785	581
Number of inoculations . . . . .	104	863	7,657	10,870	44,754	63,717	39,299	38,242
Number of animals which died . . . . .	0	1	0	3	8 <sup>6</sup>	42 <sup>6</sup>	51	41
Total number of treatments . . . . .	5,123	16,989	36,047	51,222	56,768	68,075	51,505	54,346

<sup>1</sup> Due to animals being too sick to treat, showing symptoms of secondary infection, or to owners not desiring the same.

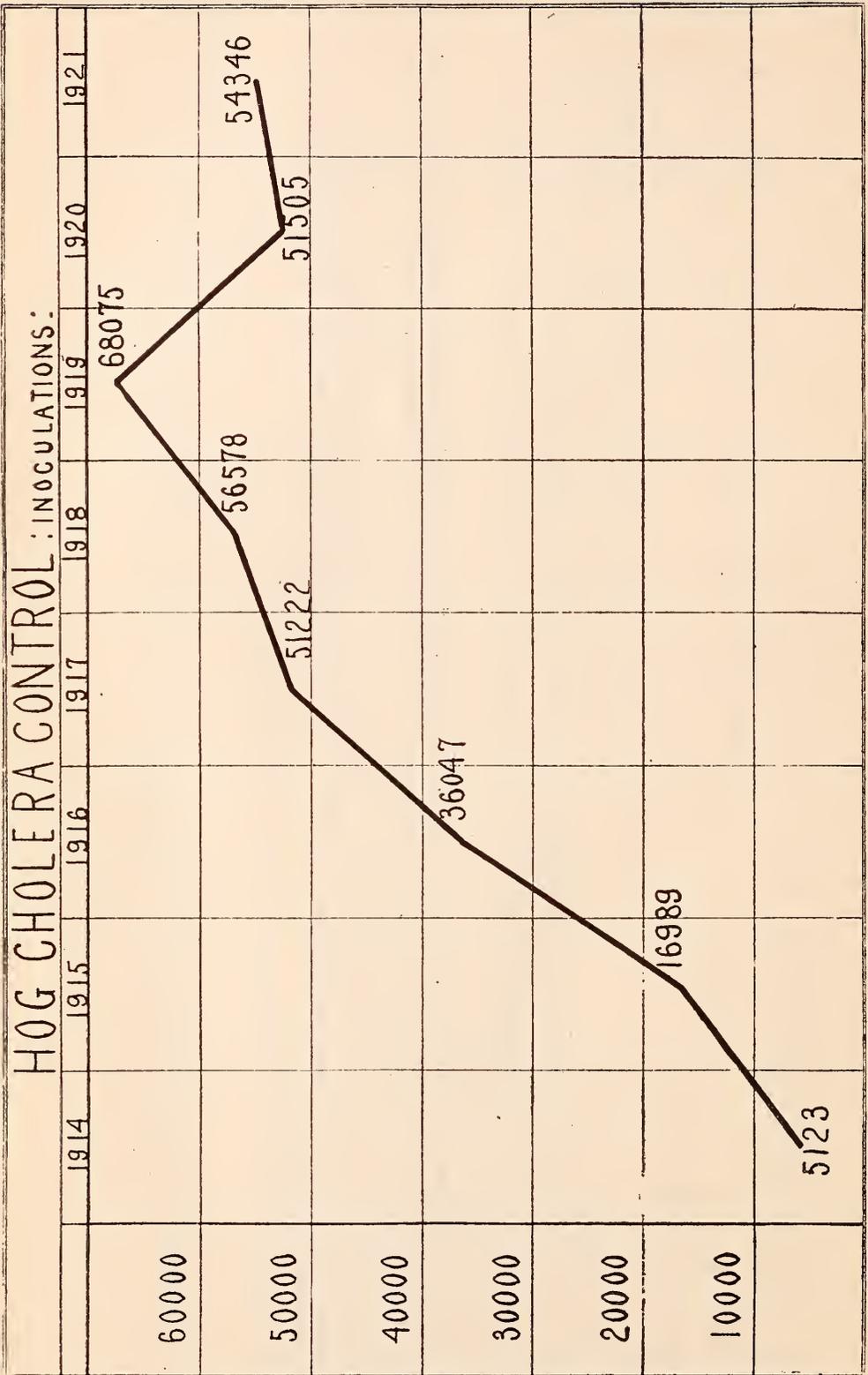
<sup>2</sup> Plus 4,000 which were treated, and died or were killed before results could be ascertained. These deaths were due to the use of serum which was impotent and virus which was not virulent, before the present regulations were made.

<sup>3</sup> These figures show percentages, not animals.

<sup>4</sup> This does not include approximately 50 animals which died on one farm, on which a final diagnosis was not made. Clinically and by autopsies, it was impossible to determine whether the disease was hog cholera or hemorrhagic septicemia. Laboratory examinations indicate the latter, but before the work could be completed the losses stopped, and more material which was needed for a final diagnosis was not available.

<sup>5</sup> The large majority under this classification are herds which in previous years were classified as infected herds and which had yearly sustained heavy losses from hog cholera. The majority of them are garbage-fed, and experience shows that should treatments be discontinued an outbreak of hog cholera would follow very closely. They are therefore classified as herds in which no infection was apparent at the time of treatment, whereas in reality they are infected herds in which the disease is kept completely under control while treatments are continued.

<sup>6</sup> None of these animals were autopsied; consequently, we are unable to say whether or not death was due to cholera.



The preceding pages of statistics tabulating eight years' work of this Division in control of hog cholera may be interpreted and considered as a fairly correct history of the actual prevalence of the disease in Massachusetts, except during the earlier years in the table when the work had only commenced and was not known to swine owners generally.

The high point of our work in 1919 was reached when hog cholera was raging extensively in many different sections of the country. This was followed by a "low" year in 1920 all over the country. Early in 1921 the Middle West reported rapidly increasing prevalence of the disease, its virulence also becoming very much intensified. We began to note the same condition appearing in this State in the early fall months, and it is still continuing at much the same rate at the date of this report. All indications point to a largely increased amount of control work for the winter and spring months.

Total eradication of hog cholera cannot be looked forward to with any degree of confidence, as the very nature of the infection and the unfavorable conditions under which the susceptible animals are maintained preclude any such result of even the most carefully planned and well-executed measures.

Closely supervised, well-regulated service by a well-organized unit responsible to a central head will undoubtedly control the disease within reasonable limits. Unquestionably it would be a serious mistake to relax in any particular the restrictions now applying to the sale and use of hog-cholera serum and virus, — products which in their careful administration by well-trained men make for positive control of the disease, but in the hands of untrained men not responsible to any authority become a certain means of spreading the disease and defeating the purpose of their manufacture and use.

We call particular attention to the mortality rates shown in the preceding tabulation as in a concrete way showing the quality of the work; it is generally recognized that careless administration, faulty technique, and errors in judgment are the principal factors in increasing the mortality rate. Massachusetts records in this work as shown by this tabulation of years will bear comparison with that of any yet published. They have always commanded special attention and have brought forth much commendation by interested observers.

The sanitary conditions under which swine are kept, while found to be somewhat improved from year to year, are nevertheless far from what they ought to be. We have found in many instances where serious losses of animals have occurred that the primary causative factor has been unsanitary or poor housing conditions, which have lowered the vitality and the normal resistance of animals to disease, allowing bacterial invasion a favorable opening. Such conditions also seriously handicap recovery from disease and delay the elimination of infection. While perfect sanitary conditions are hard to obtain in piggeries as generally managed, yet very great improvement can be made on many premises and would be followed by results which undoubtedly would be evident in more pigs, healthier pigs, and consequently a better financial showing.

At the present time the diseases of swine are probably receiving more attention on the part of swine raisers, veterinarians, live-stock sanitary officials and those engaged in scientific research than at any period in the history of control work in contagious diseases of animals. The ultimate result will undoubtedly be the solution of many of the control problems which now confront us.

By reason of our work in the control of hog cholera we have been brought in close touch with many other disease conditions, some of which are of serious menace to the raisers of swine. In their clinical aspects many so closely resemble hog cholera that differential diagnoses are difficult and only arrived at after considerable investigation both in the field and in the laboratory.

*Hemorrhagic Septicemia in Swine.* — This disease has prevailed quite extensively during the year. Its prevention, control and cure are intimately connected with our hog cholera work on account of the similarity of many of the symptoms presented by both diseases. A differential diagnosis is often beset with many difficulties, and our trained veterinarians who are having daily experience in the treatment of both diseases find that they need to consider all the circumstances surrounding a case, such as the history of the outbreak, symptoms exhibited, and post-mortem appearances. Even then there is possibility of both infections being present, and which is the

primary factor and what shall be the line of treatment adopted become matters dependent on the good judgment of the experienced field worker. Owing to the difficulties of such situations we believe that errors in diagnoses are more readily avoided by the Division inspector than by one of more limited experience.

Notwithstanding the use of the biological preparations for the prevention and cure of hemorrhagic septicemia is in no way restricted by law or Department order, and can be lawfully used by any registered veterinarian, the Division treats many animals affected with this disease on account of its association with outbreaks at first thought to be hog cholera and so reported, and under the premise that its duty is clearly defined in the case of outbreak of any animal disease classified as contagious. During the year 10,580 treatments in the prevention, control or cure of hemorrhagic septicemia have been administered, and all indications are that this branch of work will necessarily be continued the coming year.

Various mixed infections of swine have been encountered in our work in hog cholera. They are often coexistent with that disease and are handled as circumstances indicate necessary. The study of their importance and of their particular significance in many widely varied combinations is one of the principal present-day activities of those interested in these infections from a scientific standpoint.

#### MISCELLANEOUS DISEASES.

*Anthrax.* — During this year only one authenticated case of anthrax has been recorded, that of one cow in a town in the central part of the State. The record is unusual in that any source of anthrax generally produces more than a single case and the case itself is almost certain to leave the infection, which is later picked up by one or more susceptible subjects even though all known precautions are taken against such occurrences.

Nearly all species of the domesticated animals are susceptible to the disease and infection of the human subject sometimes occurs, the latter generally caused by handling carcasses, hides or wool of infected animals.

No extensive prevalence of the disease in animals has occurred in Massachusetts for several years, and from the low record of this year we assume that the former sources of the contagion are gradually being eliminated. What must be a factor in this elimination is the annual protective inoculation given all animals on premises known to have been infected. As this inoculation is supposed to confer an immunity for twelve months and possibly not any longer, treatment is advised every succeeding year as the anthrax bacillus or its spores are known to retain their potency for a long period of time under favorable circumstances, and soil once infected is considered a possible source of an outbreak for many years thereafter.

During the past year preventive inoculation has been applied to 94 head of cattle on 8 different premises located in 4 towns.

Our method of procedure in reported anthrax is as follows: Every report is immediately investigated and subsequent action is taken as deemed advisable by consideration of the facts disclosed. Positive diagnosis is first necessary, and, as the animals generally either are found dead or die before arrival of a veterinarian or Division inspector, a post-mortem examination would ordinarily be depended upon to confirm the suspicions of anthrax. As post-mortem appearances in this disease are often not sufficiently characteristic to justify a positive diagnosis, and as the opening of a carcass allows the body fluids to escape and possibly spread the infection, it is advised that the suspected carcass be not opened, but that a specimen of blood be drawn from the cadaver onto a piece of glass and then allowed to dry in the air. If this specimen is not badly contaminated by careless preparation, and is promptly forwarded to a laboratory, there is no difficulty in determining whether or not anthrax bacilli are present.

A field diagnosis or suspicion of anthrax having been confirmed, preventive measures at once follow. They consist of proper disposal of diseased carcasses, disinfection of premises, and preventive inoculation of susceptible and exposed animals.

To prevent infection spreading from a carcass it should be burned or deeply buried, covered with quicklime. Anthrax bacilli or their spores if not destroyed may continue to infect soil for a long time; in many instances these organisms have

been found to remain active for a number of years. We recommend that any contaminated ground be burned over and the surface area above a buried carcass be fenced and burned over yearly. Any contaminated portions of buildings if wooden should be torn out and burned, and if concrete should be thoroughly disinfected.

The remaining animals of the herd should be at once removed to other buildings or areas, and the apparently healthy ones inoculated in prevention of the disease. Animals already affected are sometimes successfully treated, but ordinarily the disease runs such a rapid course that death takes place before the animal is noticed to be seriously sick, and our efforts are consequently limited to protection of the animals not showing symptoms. Although a certain percentage of deaths may reasonably be expected to occur among the inoculated animals, we find in actual experience that fatalities are very few.

Preventive inoculation is supposed to confer immunity for a period of at least twelve months. At premises where an outbreak has occurred and there is reason to fear permanent infection, it is advised that all susceptible animals be given a preventive inoculation each succeeding year for a certain period.

*Blackleg.* — This is a disease the causative organisms of which are found in the soil of infected pastures, where they multiply and through their resistant spores preserve their capacity for development even under unfavorable conditions. Animals are infected by coming in contact with such material and seldom by transmission of the disease from other animals. This explains the fact that we seldom have an outbreak in animals which are stabled, but find it always occurring during the pasture season.

It is readily prevented by inoculation of certain biological products prepared for the purpose and which confer an immunity lasting at least for one entire season. As the disease seldom develops in adult cattle, only those between the ages of six months and three years are treated in prevention.

We recommend the inoculation every season of all the young cattle on premises where the disease has been known to exist, and the best time to do this is of course just previous to the turning out of the young stock in the spring. On the occur-

rence of a new outbreak, however, all the susceptible animals should be immediately treated and as an extra precaution removed from the particular lot or pasture where the disease appeared.

We have many farms in Massachusetts where blackleg has been known to exist at one time or another, and there are undoubtedly many pastures in which young cattle have died from blackleg without the cause of death having been positively determined. It should therefore be considered a circumstance suspicious of this disease if young cattle have been found dead in pasture from no readily explainable cause. The preventive inoculation of young cattle against this disease is a service rendered by Division inspectors free of expense to owners.

During the year we have administered this treatment to 1,137 animals on 164 farms located in 51 different towns, as tabulated below:—

	Premises.		Premises.
Agawam . . . . .	4	Montague . . . . .	1
Ashburnham . . . . .	3	New Marlborough . . . . .	1
Ashby . . . . .	27	New Salem . . . . .	1
Ashfield . . . . .	1	North Adams . . . . .	1
Athol . . . . .	5	Northampton . . . . .	1
Auburn . . . . .	1	Orange . . . . .	17
Becket . . . . .	2	Peru . . . . .	1
Blandford . . . . .	2	Pittsfield . . . . .	2
Boxborough . . . . .	1	Prescott . . . . .	1
Brimfield . . . . .	2	Rowe . . . . .	4
Cheshire . . . . .	1	Royalston . . . . .	2
Chester . . . . .	7	Shelburne . . . . .	4
Dalton . . . . .	1	South Hadley . . . . .	1
Fitchburg . . . . .	3	Southampton . . . . .	2
Gardner . . . . .	2	Southwick . . . . .	1
Granby . . . . .	1	Templeton . . . . .	1
Greenwich . . . . .	2	Townsend . . . . .	12
Harvard . . . . .	4	Tyringham . . . . .	2
Holyoke . . . . .	4	Warwick . . . . .	4
Huntington . . . . .	1	Washington . . . . .	1
Lee . . . . .	7	Wendell . . . . .	1
Leicester . . . . .	2	Westhampton . . . . .	2
Leverett . . . . .	1	Williamstown . . . . .	3
Littleton . . . . .	6	Winchendon . . . . .	1
Lunenburg . . . . .	1	Windsor . . . . .	1
Middlefield . . . . .	5		

The records show that we have treated this year 148 more animals than last year and on 21 more farms, the location of which comprised 4 additional towns. The deaths reported are 22 head of stock on 8 different premises.

The same general recommendations as in anthrax outbreaks, as to disposal of infected carcasses by burning or deep burial, are applicable following occurrence of this disease.

*Actinomycosis.* — Ten cases of this disease have been reported this year, located as follows: 1 each in Bridgewater, Deerfield, Duxbury, Florida, Harvard, Kingston, Norfolk, Plymouth, Southbridge and Winchester.

Of the 10 cases on this year's record, 4 have been slaughtered, 1 was released as having recovered after having been given treatment, and 5 proved to be some condition other than actinomycosis.

*Hemorrhagic Septicemia in Cattle.* — The prevalence of this disease in Massachusetts is of somewhat greater importance than formerly as far as number of reported deaths is concerned, the increase being 50 per cent this year. We do not, however, have the experience of many other States, which receive most of their incoming cattle from public stockyards, picking up an acute form of this infection somewhere *en route* from shipping point. Our outbreaks generally occur among pasture cattle and are characterized by sudden death generally of one creature. Removal of all the other animals in the same enclosure oftentimes stops the extension of the disease.

Preventive inoculation is, however, advised for all remaining animals in the herd which are not showing symptoms, and curative treatment of those apparently sick is quite often effective if the disease is not too far advanced. Preventive inoculation has been administered to 137 cattle this year. Prompt report generally means prompt relief of a situation of this kind, and as a laboratory examination is often necessary for positive diagnosis, we encourage the early shipment of specimens in suspected cases.

Our records this year show 33 deaths from hemorrhagic septicemia in cattle, occurring in the following towns: Ashburnham, 3; Chesterfield, 4; Gloucester, 1; Hardwick, 5; Lexington, 6; Mendon, 4; Royalston, 7; West Boylston, 3.

A small number of cases of this disease in sheep was reported from the towns of Conway and Royalston, the latter case being investigated by a Division inspector.

*Parasitic Diseases.* — Profitable live-stock raising is not possible if infestation of farm animals with external or internal parasites exists to an extent not readily controllable. A great economical waste of good food takes place and is shown in the slower or totally inhibited growth of cattle, sheep or swine which are infested. In young stock especially, which is more susceptible to attack than adult animals, the most serious damage by these parasites is noted, often rendering the raising or further feeding of the affected animals inadvisable from an economical standpoint.

Irritation in all degrees of intensity, much acute suffering, and occasional deaths are caused by these low forms of animal life, and it certainly is opportune that the study of this variety of animal infliction is being rapidly brought to a point where practical benefits may be obtained by scientific treatment.

The most important parasitic condition brought to the attention of the Division is that known as mange, which affects large numbers of cattle during certain seasons and prevails to some extent among horses. Many fewer cases have been reported this year than usual, indicating a subsidence of this troublesome affection. While we have received reports of 170 head of cattle affected on 6 farms, — less than one-half the number reported in 1920, — we know that our reports are not a very good indication of the extent of infestation for the reason that many cattle owners do not consider their cases of sufficient importance to engage our attention.

Treatment of mange is not expensive but is very inconvenient of application, and success depends alone on faithful application of proper medicinal remedies. Owners of horses infested with the mange parasite now realize that the ridding of their animals of it means additional days' service of the animals and less food necessary to keep them in proper condition of flesh.

It is our custom to quarantine all reported cases of mange, especially if owners or attendants are not disposed to apply

proper treatment. Eighteen cases of the disease in horses have been reported this year from 8 different premises. Quarantined horses are generally allowed to work during treatment but are forbidden to enter inclosures other than their own stables.

*Foot-and-mouth Disease.* — Five years have now passed since this disease was eradicated from this country, but it still prevails to an alarming extent in South America and many other foreign countries with which the United States has intimate trade relations. The possibility of the infection being conveyed to this country through the channels of commerce constitutes an ever-present danger to our live-stock interests and necessitates constant watchfulness in order to promptly discover the first outbreak should this country again be visited by the contagion. Live-stock officials of the Nation and the several States are fortunately very much alive to the impending danger, and are prepared to take immediate steps to surround and control the disease at the first notice of its appearance. It is probable that all the precautionary measures now ready to be put in operation will effectively prevent any wide extension of the malady if it does appear, and will confine its prevalence within narrow limits.

Up to date the development of a serum for the immunization of susceptible animals against foot-and-mouth disease has not progressed to a point showing it to be of practical value in control work, and it is probable that the stamping-out process, which has always been successful in this country, would be the method pursued in fighting the contagion on its appearance.

In Massachusetts all live-stock officials, Division veterinarians, local inspectors of animals, and private veterinarians have been notified of the real danger of an invasion of the disease, and asked to immediately notify the Division office of any suspicious cases that are found. We have had this year reports from four different sections of such suspicious cases, but upon prompt investigation all of them proved negative.

*Bovine Infectious Abortion.* — Without doubt the prevalence of bovine infectious abortion is very extensive, and the losses caused by it and its many concurrent conditions are second only to those caused by bovine tuberculosis. Many dairymen

and breeders of thoroughbred cattle assert that of the two conditions infectious abortion is the more serious when the animal loss is taken into consideration and immediate profits alone are not made the basis of reckoning.

Although a condition acknowledged to be communicable from animal to animal, and one in which control measures are successful to a degree, strictly official action in this direction is of course not advisable and would be of practically no aid in local relief of such a situation. The intimate handling of a herd problem of this kind is naturally one for the private veterinarian to cope with, and the functions of live-stock officials would seem properly to be limited to rendering such aid as might be given by advice regarding the general management of infected herds, and how to carry out the various sanitary measures recognized as essential to progress in the control of any infection.

Sale restrictions by official order may eventually be found advisable after some of the problems of this infection now being studied have been definitely solved.

*Other Infectious Diseases.* — Inspectors of slaughtering occasionally bring to our attention the finding of tuberculosis in swine at time of their slaughter, and in all such instances if we get the information as to what premises the animals came from, we immediately have all the cattle examined which may be thereon. The source of this disease in swine is often found in the cattle with which they are kept, and a slaughterer's report may therefore be the means of leading us to a tuberculous cow. Thirteen cases of swine tuberculosis have been reported this year from 11 different towns.

Tuberculosis in horses occurs only very rarely, but one such case has been reported this year. It is interesting that it occurred in the practice of the same veterinarian who reported an unusually severe case of this disease two years ago. No connection between the two cases can be established, however, as they were 10 miles apart. The case this year was in a draft horse stabled for some years in town and where there had never been any bovine animals. Unfortunately the type of the bacillus, whether human or bovine, was not determined.

Avian tuberculosis is probably very prevalent among poultry,

and is a serious menace to many flocks: The Division's office is, however, very seldom notified of its existence or called upon for advice regarding its control or extermination.

In the late summer and early fall each year a contagious affection of the eyes of cattle breaks out in different sections of the State. If not immediately attended to, it is very apt to spread until all members of a herd are affected, some of which suffer partial or complete blindness. Not many of these outbreaks are reported to the Division's office, only 3 being reported this year. They are locally controlled under veterinary advice, and early treatment generally prevents serious results.

Infectious pneumonia in cattle was reported in one instance, 9 members of a herd being affected.

The Division has frequently been called upon to make examination of animals suspected of being affected with a contagious disease, and where it has been found that the animals were suffering from a disease not of a contagious nature.

#### LABORATORY SERVICE.

The Division of Animal Industry is most fortunate in having at its service the bacteriological laboratory of the State Department of Public Health, where are made the many examinations necessary to the successful prosecution of its work.

There are many instances in contagious disease control where correct diagnosis can only be made in the laboratory, and many additional instances where diagnoses made from the exhibition of clinical symptoms or from macroscopical appearances post mortem are not entirely satisfactory unless corroborated by the findings of a trained bacteriologist. The value of this service as a constant auxiliary to the progress of the Division's work and to its maintenance at a proper standard of efficiency is immeasurable. We are pleased to testify to the fine spirit of co-operation exhibited by this organization in the solution of many of the Division's problems.

One important service rendered us this year has been the examination of the brains of 277 animals submitted because

suspected of rabies. Prompt and positive conclusions as to the existence or non-existence of this infection are necessary, and especially so if persons have been bitten by the suspected animals. Complement-fixation tests of 126 samples of blood taken from horses suspected of or exposed to glanders have been made. In addition to these principal services, 45 specimens have been examined, listed below by diseases suspected:—

	Positive.	Negative.
Actinomycosis . . . . .	1	1
Anthrax . . . . .	—	3
Carcinoma . . . . .	1	—
Glanders . . . . .	—	1
Hemorrhagic septicemia . . . . .	11	5
Infectious abortion . . . . .	2	3
Multiple infaret . . . . .	1	—
Nephritis . . . . .	1	—
Nodular disease . . . . .	2	—
Osteomyelitis . . . . .	1	—
Tuberculosis . . . . .	6	11
	26	24

#### ANNUAL INSPECTION OF FARM ANIMALS AND PREMISES.

In accordance with the provisions of chapter 129, sections 18 to 26, inclusive, of the General Laws, an order calling for the inspection of all cattle, sheep and swine in the State and the premises on which they are kept was issued by the Director Jan. 10, 1921, to the inspectors of animals of all towns and cities.

A gross tabulation of the information contained in the reports of this inspection follows. The inspection was completed in a majority of the cities and towns during the late winter and early spring months.

Total number of herds of cattle inspected . . . . .	31,054
Number of herds containing not over 5 dairy cows . . . . .	21,273
Number of neat cattle inspected . . . . .	230,981
Number of dairy cows inspected . . . . .	160,192
Number of herds found clean and in good condition . . . . .	29,981

Number of stables inspected . . . . .	31,791
Number of stables properly drained . . . . .	31,552
Number of stables well ventilated . . . . .	31,422
Number of stables sufficiently lighted . . . . .	31,063
Number of stables found clean . . . . .	30,703
Number of stables in which improvements were recommended . . . . .	917
Number of herds of swine inspected . . . . .	12,151
Number of swine inspected . . . . .	76,527
Number of herds of swine garbage-fed . . . . .	1,807
Number of swine garbage-fed . . . . .	41,662
Number of sheep inspected . . . . .	15,503
Number of goats inspected . . . . .	1,329

An important showing in this tabulation as compared with that of the previous year is an increase in the total number of cattle of 4,181, and of those designated as dairy cows an increase is shown of 5,785. This increase of dairy cows, taken with that shown last year over the year 1919, makes a total increase of approximately 9,600 in the last two years. We have now a total of over 160,000 dairy cows in Massachusetts, a larger number than for many years.

Going over the period of the last fifty years we find the average yearly count of dairy cows to be approximately 160,000. Whereas several times during that period the number has dropped to about 140,000, it is a cause for congratulation that at present we have a number well above the average for that long period, and, contrary to the frequently expressed opinion of many men supposedly well informed as to the live-stock industry of the State, we find that our dairy animals are *not* gradually disappearing from the farms, but on the other hand are constantly increasing in number.

A large decrease in the number of swine found on the farms is noted, amounting to about 25 per cent, and due principally to market conditions. These are commented upon in the section of this report referring to contagious diseases of that species. We predict that when market conditions again approach the normal there will occur a proportionate increase in the number of these animals.

The number of sheep in the State has also decreased somewhat, undoubtedly influenced, as with swine, by the prevailing

high prices of fodder and the low prices of marketed carcasses used for food.

The preceding tabulation is compiled from the reports of local inspectors of animals. These consist of individual records of conditions at all premises where cattle, sheep and swine are kept. The tabulation relates not only to the animals themselves but also to the sanitary condition of the barns, stables and yards. From the reports a fairly correct and comprehensive survey may be drawn of the general health conditions of the live stock on Massachusetts farms, and of the intimate surroundings having a bearing on the maintenance of such health conditions at a proper standard. The study of this survey is of great value in formulating our general policies both in disease control work and for progress in the campaign for betterment of stabling conditions.

Inspectors' reports also furnish the only correct "census" which is made of farm animals in the State, and in that connection are of interest and value not only to the Division and the Department of Conservation but to other State departments, also to individuals and associations interested in the breeding and raising of live stock, or engaged in any of the many lines of business closely related thereto.

In many instances cases of contagious disease not previously reported are found. Such are immediately quarantined and brought to the notice of Division officials, and an important work in disease control is executed.

In many other instances unhealthful stabling conditions are brought to the attention of owners, and recommendations for improvement are suggested and insisted upon. If these are not attended to within a reasonable length of time, the cases are brought to the attention of Division officials who, either through the district veterinary inspector or through correspondence direct with the owner, endeavor to have them carried out. District veterinary inspectors have during the past year made 1,294 visits to premises where insanitary conditions existed, and in a majority of instances full or partial correction of them has resulted.

In connection with the references made to the statistics gathered by local inspectors of cities and towns, and the many

ways in which such statistics are of value as well as of extreme interest, the importance of inspectors' services, of varied character, in connection with sudden outbreaks of contagious disease, such as rabies, should be mentioned, also their work in identification and release of animals shipped from other States. These officials are a very necessary part of our organization, and according as they are observant, prompt to act, and faithful in performance of their duties render the Division valuable aid in the execution of its work in control and eradication of disease.

Meetings of inspectors of animals were called at different points in the State for the purpose of discussing matters of mutual interest to them and to the Division officials. These meetings, in charge of Division officials, are held in the fall of each year. They are acknowledged by the inspectors to be of considerable value to them in that many questions relating to the performance of their duties under unusual circumstances are made clear. The personnel changes somewhat each year, a certain percentage of new men taking the places of those who for one cause and another are no longer in the service, and the meetings are to a certain extent schools of instruction for the recently appointed inspectors. They gather much information not only in the sessions but by private conversation with fellow inspectors of longer service and with the Division officials in charge.

The meetings this year were held at different points, as follows: Greenfield, November 8, attendance 20; Pittsfield, November 9, attendance 21; Springfield, November 10, attendance 20; Worcester, November 15, attendance 32; Boston, November 16, attendance 82.

#### REPORTS OF RENDERING COMPANIES.

Section 154 of chapter 111 of the General Laws requires rendering companies to report to this Division every animal received by them which is found to be infected with a contagious disease, and the information thus furnished is of value in bringing to the attention of the Division occasional cases of these diseases which otherwise would not be known. A table of reports of rendering companies follows: —

RENDERING COMPANIES.	Number of Reports.	Number of Cases of Glanders.	Number of Cases of Tuberculosis.	Number of Cases of Glanders not previously reported.	Number of Cases of Tuberculosis not previously reported.
Abbott Tallow Company, Holyoke . . . . .	1	1	-	-	-
Ayer Rendering Company . . . . .	1	-	2	-	-
C. S. Bard, Haverhill . . . . .	1	-	3	-	1
John J. Erwin, Wayland . . . . .	2	1	1	-	-
Home Soap Company, Millbury . . . . .	7	-	66	-	2
Lowell Rendering Company . . . . .	23	-	41	-	2
W. H. Nankervis, Marlborough . . . . .	1	-	1	-	1
New England Rendering Company, Brighton	1	1	-	-	-
Parmenter & Polsey Fertilizer Company, Pea- body.	4	-	4	-	1
N. Roy & Son, South Attleborough . . . . .	11	-	24	-	-
Springfield Rendering Company . . . . .	1	1	-	1	-
N. Ward Company, Boston . . . . .	6	1	6	-	-
Totals . . . . .	59	5	148	1	7

NOTE. — All the above cases are included in statistics occurring elsewhere in this report.

### RECEIPTS OF LIVE STOCK AT THE STOCKYARDS IN BOSTON AND VICINITY FOR TWELVE MONTHS ENDING NOV. 30, 1921.

For several years, at the request of the United States Department of Commerce and Labor, a report of the receipts of all live stock at Boston has been sent to Washington each month. The following table shows the receipts by months for the past year:—

FOR MONTH OF —	Cattle.	Calves.	Sheep.	Swine.	Horses.
December . . . . .	9,242	10,521	28,899	81,650	716
January . . . . .	8,517	9,418	17,221	83,793	779
February . . . . .	6,973	9,650	23,680	78,964	1,339
March . . . . .	9,001	20,858	28,352	57,944	2,194
April . . . . .	7,907	23,661	22,567	37,293	1,776
May . . . . .	11,842	23,838	32,167	64,026	2,124
June . . . . .	8,090	15,089	26,958	69,504	1,436
July . . . . .	7,235	13,471	26,604	79,963	1,028
August . . . . .	9,819	15,305	43,738	72,342	1,128
September . . . . .	9,394	12,696	20,369	46,323	1,064
October . . . . .	11,997	14,568	37,096	44,369	952
November . . . . .	17,908	17,815	48,756	71,223	1,217
Totals . . . . .	117,925	186,890	356,407	787,394	15,753

## FINANCIAL STATEMENT.

Appropriation for the salary of the Director, chapter 203, Acts of 1921	\$3,500 00	
Expended during the year for the salary of the Director . . . . .	3,500 00	
Appropriation for personal services of clerks and stenographers, chapter 203, Acts of 1921 . . . . .	\$8,100 00	
Expended during the year for the following purposes:—		
Personal services of clerks and stenographers . . . . .	\$7,522 50	
Extra clerical and stenographic service . . . . .	58 78	
	<hr/>	
Total expenditure . . . . .	\$7,581 28	
Unexpended balance . . . . .	518 72	
	<hr/>	\$8,100 00
Appropriation for services other than personal, including printing the annual report, traveling expenses of the Director, and office supplies and equipment, chapter 203, Acts of 1921 . . . . .	\$3,800 00	
Transferred from small item account . . . . .	16 81	
	<hr/>	
Total amount appropriated . . . . .		\$3,816 81
Expended during the year for the following purposes:—		
Books and maps . . . . .	\$119 28	
Express and messenger service . . . . .	274 44	
Postage . . . . .	791 42	
Printing report . . . . .	160 05	
Other printing . . . . .	1,155 19	
Telephone and telegrams . . . . .	648 20	
Stationery and office supplies . . . . .	354 09	
Expenses of the Director . . . . .	314 14	
	<hr/>	
Total expenditure . . . . .		\$3,816 81
Appropriation for personal services of veterinarians and agents engaged in the work of extermination of contagious diseases among domestic animals, chapter 203, Acts of 1921 . . . . .	\$50,000 00	
Brought forward from 1920 appropriation . . . . .	5 00	
	<hr/>	
Total amount appropriated . . . . .		\$50,005 00
Expended during the year for the following purposes:—		
Services of regular agents . . . . .	\$34,847 92	
Services of per diem agents . . . . .	8,886 00	
Labor hired . . . . .	106 00	
	<hr/>	
Total expenditure . . . . .	\$43,839 92	
Unexpended balance . . . . .	6,165 08	
	<hr/>	\$50,005 00
Appropriation for the traveling expenses of veterinarians and agents, chapter 203, Acts of 1921 . . . . .	\$24,000 00	
Expended during the year for the following purposes:—		
Traveling expenses of regular agents . . . . .	\$16,568 04	
Traveling expenses of per diem agents . . . . .	4,444 22	
	<hr/>	
Total expenditure . . . . .	\$21,012 26	
Unexpended balance . . . . .	2,987 74	
	<hr/>	\$24,000 00

Appropriation for reimbursement of owners of cattle and horses killed, travel, when allowed, of inspectors of animals, incidental expenses of killing and burial, quarantine and emergency services, and for laboratory and veterinary supplies and equipment, chapter 203, Acts of 1921 . . . . .	\$65,000 00	
Supplementary appropriation, chapter 502, Acts of 1921 . . . . .	20,000 00	
Brought forward from 1920 appropriation . . . . .	8,757 40	
Total amount appropriated . . . . .		\$93,757 40
Expended during the year for the following purposes:—		
1,955 head of cattle condemned and killed on account of tuberculosis in 1919, 1920, 1921, paid for in 1921 . . . . .	\$89,081 30	
11 horses condemned and killed on account of glanders and farcy in 1918, 1920, 1921, paid for in 1921 . . . . .	600 00	
Supplies for veterinary inspectors . . . . .	301 38	
Laundry . . . . .	393 35	
Antiseptics, biologics and disinfectants . . . . .	778 29	
Thermometers, needles, syringes, etc. . . . .	409 82	
Ear-tags, punches, chains, etc. . . . .	746 53	
Expenses of killing and burial . . . . .	347 50	
Expenses of travel allowed inspectors of animals . . . . .	614 98	
Quarantine expenses . . . . .	11 33	
Rent of quarantine office . . . . .	120 00	
Sundries . . . . .	64 50	
Total expenditures . . . . .	\$93,468 98	
Unexpended balance . . . . .	288 42	
		\$93,757 40

The average amount paid for condemned tuberculous cattle this year is \$43.90.

Two hundred and twenty-five claims for reimbursement for cattle condemned and killed as tuberculous during the year, amounting to \$9,353, remain unsettled, to be paid on proof.

Claims applying to 2 horses condemned and killed during the year because affected with glanders remain unsettled, the claims not having been proved. The amount of these claims is \$100.

There has been received during the year from the sale of hides and carcasses of condemned animals \$307.49.

Respectfully submitted,

LESTER H. HOWARD,

*Director.*





The Commonwealth of Massachusetts

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ANNUAL REPORT

OF THE

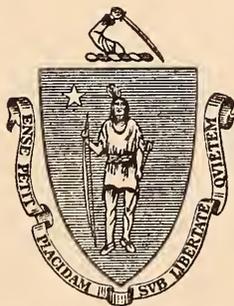
DIRECTOR OF ANIMAL INDUSTRY

FOR THE

YEAR ENDING NOVEMBER 30, 1922

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DEPARTMENT OF CONSERVATION



BOSTON  
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Mass. Secretary of the Commonwealth

APR 28 1943

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APPROVED BY THE

COMMISSION ON ADMINISTRATION AND FINANCE.

# The Commonwealth of Massachusetts

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## DEPARTMENT OF CONSERVATION.

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DIVISION OF ANIMAL INDUSTRY,  
BOSTON, Nov. 30, 1922.

*To the Commissioner of Conservation.*

I have the honor to present the following report of the work of this Division for the year ending Nov. 30, 1922.

The functions of the Division of Animal Industry and the duties of its officials may be described as follows: Inspection and examination of horses, cattle, sheep and swine within the Commonwealth, and of the sanitary conditions under which they are kept; the execution of measures in prevention, control or cure of contagious disease among them and the other species of domestic animals; the condemnation and slaughter when necessary of such as are affected with, or have been exposed to, contagious disease, to be followed by the burial or other disposal of their carcasses; the cleansing and disinfection of districts, buildings or places where contagion exists or has existed. Another duty is the enforcement of regulations applying to the transportation of horses, cattle, sheep and swine from other States to Massachusetts, in order that their condition of health may be established and no prevalence of contagious disease be caused by the entry of infected animals. This regulatory work calls for the inspection and mallein testing of many horses, and the examination and tuberculin testing of such cattle as are to be used for dairy or breeding purposes and are not accompanied by satisfactory records of test. Tuberculin tests of cattle of whatever age moving interstate must have been made by veterinarians authorized by State and Federal officials to do this work, and, if regulations apply-

ing thereto have not been complied with in all particulars, their violation must be investigated and proper tests applied by Division inspectors.

The maintenance of the health of the several species of domestic animals is of great importance for many reasons. It conserves the food supply of the people by bettering its quality. It materially affects the financial returns from the many lines of business with which the live-stock industry is inseparably connected. The important industry of dairying, to be financially successful, must produce large amounts of milk, butter and cheese, and to this end healthy animals are a first and prime requisite. The conservation of the health of all the species of animals whose carcasses are used for human food — cattle, sheep and swine — is necessary for their successful propagation and their rapid development to maturity or to the point where they are available as human food. Numbers are largely increased and growth is more rapid if they can be kept free from contagious disease. Not only is their money value as food animals enhanced, but the quality and amount of commercial by-products, such as hides, wool, fat, fertilizer, and many other salable ones, are much greater from healthy animals than from those stunted in growth or reduced in numbers by prevalence of disease.

Preservation of the health of the people is dependent in no small degree upon the elimination from animals of those diseases which are communicable to the human subject. Glanders, tuberculosis, rabies, anthrax and actinomycosis carry a high rate of mortality in man, and a diseased animal is often found to be the source of the contagion. For this reason it is vitally important that this class of diseases be prevented, controlled or, if possible, eradicated from the animal kingdom.

Agriculture in very many of its branches is so dependent upon successful live-stock raising, and prospers in such a direct ratio to the number of animals produced and maintained on the farm, that there is no question as to the superior economy in raising and maintaining only such animals as are healthy. Satisfactory revenue from the investment of time, labor and capital in farm animals can only be returned by horses, cattle, sheep, swine and poultry which are sound and

not inhibited in their propagation, growth and economical use by contagious disease.

In considering the work of this Division of the Department of Conservation, and in argument that it is important as a public State activity, we call attention to the fact that each succeeding year there is shown an increased dependence of the public for food and raiment upon domestic animals, as represented not only by dairy products and the meat value of the carcasses of cattle, sheep and swine, but also by their products used in the manufacture of clothing, such as wool and leather. That their carcasses may be found fit for human food at the time they are converted to that use, it is necessary that the animals shall have been raised under proper sanitary conditions, and maintained free of contagious disease up to that time. In the country as a whole the carcasses of thousands of animals are yearly condemned as unfit for food on account of lesions of contagious disease being found at time of slaughter. It is an economic necessity of the State and Nation that this great waste be reduced to a lower point than has yet been reached. Although progress in this direction is yearly advancing through the active co-operation of Federal, State and municipal authorities to this end, the Division of Animal Industry recognizes that its work of elimination of animal diseases has a broad field for expansion, and that its duty in relation to an increased food and raiment supply for the people is well defined.

Following is a gross summary of the work of the Division for the year ending Nov. 30, 1922: —

#### CATTLE.

- 25,569 Massachusetts cattle were physically examined by inspectors.
- 2,458 Massachusetts cattle were tuberculin tested by Division veterinarians.
- 3,019 Massachusetts cattle were tuberculin tested by Federal and State co-operation.
- 2,998 interstate cattle were tuberculin tested by Division veterinarians.
- 8,800 tested interstate cattle were examined at Brighton and their test records viscéed.
- 5,424 tested interstate cattle were inspected and identified at other points.
- 1,101 animals on 164 farms in 44 towns were given preventive treatment against blackleg.

91 animals on 15 farms in 7 towns were given preventive treatment against anthrax.

66 animals were given preventive treatment against hemorrhagic septicemia.

1,511 visits to unsanitary premises were made by district veterinarians.

#### HORSES.

524 tests for glanders were made by Division veterinarians.

3,081 interstate horses were examined by inspectors.

5 tests of whole stables were made by Division veterinarians.

44 horses were given preventive treatment against anthrax.

#### DOGS.

1,401 cases of possible rabies in dogs were investigated.

#### SWINE.

67,909 head of swine were treated in prevention or cure of hog cholera.

7,283 head of swine were treated in prevention or cure of hemorrhagic septicemia.

#### MISCELLANEOUS DISEASES.

198 cases of miscellaneous diseases were investigated by Division veterinarians.

#### BOVINE TUBERCULOSIS.

Ever since the isolation of the micro-organism which is the cause of tuberculosis and the recognition which immediately followed of its transmissibility from one bovine animal to another, the State of Massachusetts has been engaged in an effort to control the disease by limiting its prevalence. It was early found to exist in a very large number of our herds of cattle and was not confined to any one section of the State. It was also found to be constantly increasing as circumstances of environment favored its spread and contributed to its development. It could be foreseen that its unopposed advance from one group of cattle to another would result in steadily increasing the losses to the live-stock industry and that this would also indirectly affect in a similar way many allied agricultural and other business interests.

The great importance of control measures was therefore recognized promptly, and such measures as were in accordance

with the most intelligent thought of the time were devised and put in operation. These measures were authorized by the Legislature, carried out by our live-stock officials, and generally well supported by public sentiment. They have necessarily varied from time to time as developing circumstances indicated change to be desirable, but the prominent objectives have always been an effective control of the disease and as much progress toward complete eradication as could possibly be made.

Although it must be conceded that control of this great plague has to a certain degree been gained, and all the evidence at hand shows that the number of animals in advanced stages of tuberculosis has materially decreased in recent years, yet the extent of progress toward real eradication has been disappointing. While by stricter quarantine measures, improved methods of diagnosis, "follow-up" inspections of infected herds, improved service of inspectors, encouragement of tuberculin testing, and complete co-operation of veterinarians we feel that great advance has been made in the disclosure and subsequent slaughter of active spreaders of the disease, we have for a long time realized that the situation as a whole was unsatisfactory and one to which any new plan promising more in the way of permanent improvement should be welcomed.

In recent years many owners of valuable herds of cattle in this State have taken advantage of the perfected tuberculin test and by the service of private veterinarians have succeeded in ridding diseased herds of the infection and establishing them as *tuberculosis-free*. Although in many instances the financial loss has been heavy — too great for the ordinary cattle owner to withstand — such instances have clearly demonstrated that eradication of the disease in herd units is possible. The Division of Animal Industry has also shown this to be possible in a considerable number of instances where badly infected herds have in recent years been tuberculin tested, upon request of their owners, and freed from the disease. However, not until legislation could be obtained authorizing the payment by the Commonwealth of indemnity to owners of cattle slaughtered because of reaction to an official tuberculin

test could any general movement toward eradicating tuberculosis by this plan be expected. The proportion of reacting cattle to be found in herds previously untested might in many instances reasonably be feared to be so large as to cause financial disaster to their owners if indemnity were not provided for.

The Legislature of 1922, in chapter 353, Acts of 1922, authorized the payment of indemnity for reacting cattle officially tuberculin tested in accordance with rules and regulations prescribed by the Director of Animal Industry, and later appropriated a limited amount of money therefor.

This new law, which became effective Aug. 1, 1922, put in operation a plan for the eradication of bovine tuberculosis radically different from anything attempted in Massachusetts during recent years. Although the Division of Animal Industry had tuberculin tested a great many herds of cattle at owners' request, it had never before been authorized to pay for the animals which reacted to the test and were slaughtered. When the new law authorizing payment of indemnities went into effect, many applications for the official test were already on file. The Federal government had agreed to co-operate with the State in doing the testing and in the payment of indemnities, provided their so-called "tuberculosis-free accredited herd plan," now in operation in every other State in the Union, were adopted and its requirements properly protected by our rules and regulations for carrying on the work. To such owners as desired the test for their herds this co-operative plan was offered for their acceptance. Its financial advantages were readily seen, and thus far all testing has been carried on under this plan, although owners have the privilege of having their animals tested under the provisions of the Massachusetts law alone if they so elect.

The new plan at once became so popular that within a few weeks of its first application the appropriation for State indemnities — \$15,000 for the balance of the fiscal year ending Nov. 30, 1922 — had been exhausted. This was largely due to the high percentage of reactors disclosed by the test and the fact that so large a proportion of them were pure-bred cattle, for which the indemnity is twice that paid for grade animals.

An additional appropriation of \$5,000 was obtained by transfer from other funds and authorized by action of the Governor and the Executive Council. This additional appropriation allowed the continuance of the work which had necessarily been suspended by exhaustion of the original appropriation.

Owing to the popularity of the new plan and the fact that present indications point to its rapid growth in favor, it is estimated that a much larger appropriation for 1923 will be required to comply with the requests of cattle owners for this service. It is hoped, however, that a widespread elimination of tuberculous animals by means of a general adoption of the accredited herd plan will result in a progressive decrease of the present prevalence of the disease, and as a consequence the present large amount annually expended will eventually be proportionately decreased. For the past thirty years the State has averaged to spend \$50,000 annually in payment for physical cases of bovine tuberculosis, and in 1921 the payment amounted to nearly \$90,000, an amount which of itself suggests the necessity for adopting any new plan of extermination which may promise relief of the present situation.

For such bovine animals as have been found by physical examination alone to be affected with tuberculosis, the maximum amount to be paid by the Commonwealth for any one case has recently been \$60. The Legislature of 1922, however, reduced this maximum to \$25, and it further provided that after Aug. 1, 1923, no indemnity whatever can be paid for this class of cases.

In our opinion the reduction mentioned, from \$60 to \$25, was wise and the present maximum of \$25 takes care of the situation in a reasonable way, with a fair protection of owners' interests, and will immediately reduce the amount of this item of expenditure to less than one-half its present total. The effect, however, of withdrawal on Aug. 1, 1923, of all reimbursement for cattle condemned on physical examination may prove to be unfavorable to final eradication of the disease.

If an owner cannot be reimbursed by the Commonwealth for a tuberculous animal which is condemned on official examination, it is of no pecuniary advantage to him to report

it, and he will fail to do so in most instances. He dislikes the publicity of the matter, which cannot be entirely avoided, and will probably do one of two things, — either he will kill and bury the diseased animal on his own place, or he will sell it for whatever he can get.

In the first instance, because not reported, no veterinary examination of the remainder of his herd will be made for the purpose of disclosing additional cases which may be as necessary to be disposed of as was the original case. No disinfection of the premises where the diseased animal was kept will be ordered, as is now found to be necessary in order to prevent further spread of the disease, and which order under present regulations must be carried out before the owner can obtain reimbursement for his condemned animal. If he sells the diseased animal, for which he could probably get only a small price, on leaving his premises it may carry the disease to other cattle and perhaps will be used as a cheap milk supply for a family of children. That portion of the population ignorant or unaware of the danger of milk from tuberculous cows is a market for this class of animals, and it would seem that, out of consideration for the public health alone, traffic in them should be prevented.

In our opinion the wisdom of the policy of no reimbursement for cattle condemned because affected with tuberculosis may well be questioned. Granted it will immediately effect a saving of State money, yet looking to the future, and considering not only the unhampered spread of the disease we are spending money to control but also the danger from tuberculous milch cows to the public health, would it not be better for the Commonwealth to buy and bury these diseased animals rather than allow them to spread the infection broadcast? A very small indemnity per head would result in their being reported to the proper officials, and their being reported is the only thing necessary to their proper disposal, because they then receive official attention and are promptly slaughtered.

During the year just closed we have followed the same policy of disclosing as many physical cases of tuberculosis as possible by requesting an early examination by local inspec-

tors, the quarantining of such animals as showed any suspicious symptoms, thorough physical examination of them by veterinary inspectors, condemnation and slaughter of all positive cases, a "follow-up" inspection of every herd in which any case has been found, and finally the cleansing and disinfection of infected premises.

This policy in all its details has been carried out during recent years and has been the one relied upon to effect a control of the disease and keep it within reasonable limitations. It is undoubtedly true, however, that final extermination cannot be expected or satisfactory progress made in that direction so long as tuberculous animals are allowed to remain in a herd until they show clinical symptoms sufficiently well marked to arouse the suspicion of the owner or of the local inspector of animals.

The diagnostic value of the tuberculin test carefully applied and interpreted by competent veterinarians is very generally recognized, and should be taken advantage of at every opportunity for the purpose of disclosing the non-clinical cases. Without its aid satisfactory control of the prevalence of tuberculosis among our cattle is not possible. The application of official tests at request of cattle owners has shown a steady increase each succeeding year, but the number of animals so tested has been such a small percentage of the total number in the State that no appreciable effect on eradication has been noticed. Now that it is possible under the new law enacted by the 1922 Legislature to pay indemnity for cattle which react to an official tuberculin test, and believing that the advantages of service under the provisions of this law will be widely sought for by cattle owners, it is confidently hoped that substantial decrease in the prevalence of the disease will soon be evident.

The amount of tuberculin testing which will be done, and the number of cases of tuberculosis which will thereby be removed from our herds, will necessarily depend upon the amount of money appropriated therefor by the Legislature. It would seem to be an important public work of conservation, not only on account of its intimate relation to the live-stock industry as

a commercial business of large proportions, but as an aid in the maintenance of a normal food supply for the people and directly in protection of the public health.

Tuberculin test reactors appear this year as a greater factor than ever before in our statistics. Comparing the last five years' records, we find the percentage of reactors to total number killed as follows: 1918, 23.5 per cent; 1919, 28.1 per cent; 1920, 33.4 per cent; 1921, 30 per cent; 1922, 38.7 per cent. In other words, more than one-third of all the tuberculous cattle killed under our supervision this year were reactors to a tuberculin test and killed for that reason. Very few of these cases could have been detected by physical examination.

Division inspectors have tested 2,458 head of cattle on 53 farms, 276 reactors being found. Federal inspectors have tested 5,120 animals, 101 reactors being found. Tests by Federal and State co-operation, under the provisions of chapter 353, Acts of 1922, were applied to 3,019 cattle on 127 farms, 666 reactors being found and 26 suspects. Private veterinarians have reported tests of 3,606 cattle on 204 premises, among which 824 reactors were found.

The tests recorded as "co-operative" were made after the passage of the new legislation referred to and by agreement with the United States Bureau of Animal Industry inspector in charge of tuberculosis eradication in this section of New England.

Referring to what is really a new plan of tuberculosis eradication in this State, under the 1922 legislation mentioned above, special attention may be called to a few significant facts that appear in the record of this work. In the short time the plan has been in operation — four months — more herds of cattle have been tuberculin tested than during any other entire year in the recent history of the State's work. The number of tests has increased each succeeding month, the month of October only being an exception on account of exhaustion of the first appropriation for indemnities. A rapid decrease in the percentage of reactors found — from 27 per cent in the first month of operation to less than 17 per cent in the fourth month — indicates that some badly infected herds were the first ones to be submitted for test, and that their owners had

been cognizant of the real conditions and had only been awaiting legislation more favorable to the disposal of reactors to the test.

In comparing the total reactions of pure-bred cattle with those of grade animals, we find them to be 17.8 per cent of the former and 25 per cent of the latter. The relative difference is not as great as might be expected considering the extra care given to, and precautions taken with, the more valuable animals of pure breeds, and that grade cows constitute the larger portions of herds in which dairying of an intensive character is carried on, in some instances even to the extent of rapidly lowering vitality and resistance to disease.

It must be said in passing that the number of cattle tested to date is not great enough to permit of an estimate of the prevalence of tuberculosis among Massachusetts cattle as shown by the tuberculin test, and that an entire year's work is necessary as the basis of a reasonable appraisal of the real situation.

#### *Interstate Cattle.*

In accordance with present regulations of the Federal government, all dairy or breeding cattle of whatever age shipped interstate must have passed a tuberculin test applied by veterinarians approved by the live-stock officials of the State where tested and by the chief of the Bureau of Animal Industry, United States Department of Agriculture.

A modification of this regulation is, however, applicable to cattle shipped to so-called "public stockyards" which are under the supervision of Bureau officials and where the animals can be tested upon arrival. On July 1, 1919, the Brighton cattle market was designated as "public stockyards," and such of the dairy or breeding cattle in the weekly shipments to that point as have not been tested before shipment are tested by inspectors of the Bureau of Animal Industry and of this Division working in co-operation. Check tests are also made from time to time on interstate cattle supposed to have been properly tested before shipment, in order that the quality of this work done in other States may be determined.

Additional quarantine stations for the receipt of animals for Brighton market are maintained at Watertown and Somerville,

at which points many of the cattle destined for that market are unloaded. The protection of Massachusetts cattle interests at these points is carefully attended to by our force of inspectors, and we feel sure that no cattle which can be suspected of tuberculosis are released for any purpose except immediate slaughter.

Brighton stockyards being the only point in the State to which untested cattle may be shipped, in strict compliance with Federal regulations, our former work of testing at other points is reduced to a minimum and consists only of testing such animals as may arrive not accompanied by a record of tuberculin test. A few violations of the regulations occur, some of them through ignorance of Federal and State requirements, and others in willful disregard of them. These latter cases are investigated when reported and prosecution in the courts is instituted if deemed advisable.

There have been received at the Brighton quarantine station during the year 11,682 head of dairy cattle. Of these, 8,800 were accepted on approved records of test, and 2,882 were tuberculin tested after arrival. The majority of these animals were released for sale, a few being disposed of for slaughter. At other points in the State 5,585 dairy cattle were received, making the total number of interstate dairy cattle recorded 17,267.

#### GLANDERS.

The prevalence of this disease among the equine species in Massachusetts is apparently under perfect control at the present time and all indications warrant the expectation of complete extermination in the near future.

Steady progressive decrease in prevalence is shown from year to year since 1913. In that year was reached the peak of what had been a gradual increase in number of cases during a long period. During that one year 1,084 positive cases were killed, 556 of which were found in the city of Boston.

During the present year 21 cases have occurred in the whole State, only one of which was in Boston. Of these 21 cases, 10 were contact cases taken from two stables in each of which one clinical case occurred, and the others were disclosed by application of the mallein test to all the animals. The record

this year shows ten more cases than in 1921, for which increase the two stables mentioned are apparently responsible, and the increase therefore does not show that the general situation is to be regarded as indicating any serious change.

Notwithstanding the fact that the prevalence of this disease is low, and unimportant from a disease control standpoint, it is necessary to closely watch the situation and if possible keep it at its present satisfactory aspect. We are consequently applying the same regulations to interstate traffic in horses and mules, and are pursuing the same methods of handling outbreaks of the disease as have been found effective in lowering the high record of 1913 to its present figure.

Although the horse as a necessity in many lines of business and as a means of healthful recreation and pleasure has been to some extent replaced by motor vehicles, it has been conclusively shown that he cannot be entirely dispensed with in any of these lines of usefulness. He is still the economic power for the average New England farm and for many lines of commercial business. That he is indispensable in military operations has been conclusively shown by his service in the late war. The saddle horse is by no means decreasing in numbers, but, on the other hand, has returned to and is now exceeding his former popularity. This is also true of the light driving animal used for speed purposes. Wherever animal expositions are held the horses of all the different types — draft, coach, saddle and speed — receive the greatest attention and win the admiration of the larger number of spectators.

In recent years the horse has become of priceless value in the field of preventive medicine, and is now used in large numbers for the production of various biological preparations found effective in the prevention and cure of many diseases of animals and man. He must therefore still be produced in considerable numbers and be maintained free from contagious disease.

The successful methods by which the number of cases of glanders has been rapidly reduced in the past few years, and which have apparently solved what was formerly a difficult problem of disease control, may be briefly referred to as follows: —

Immediate quarantine of all reported cases; prompt killing of all clinical cases, followed by disinfection of the premises where kept, of the blacksmith shops where shod, and of watering troughs where they were in the habit of drinking; examination and re-examination of all contact animals, together with application of the several diagnostic tests when necessary; extension of the plan of testing whole stables; closing of public watering troughs in sections where an outbreak of the disease occurs; testing of all horses and mules shipped interstate from New York, New Jersey, Connecticut and Rhode Island, unless accompanied by satisfactory records of recent tests.

There were 72 horses reported during the year as suspected of glanders, and these, with 151 contact animals, were subjected to the mallein test. Of this number, 21 were killed as positive cases; 2 died and 1 killed, no lesions of glanders being found, and 199 were released from observation.

The Massachusetts Society for the Prevention of Cruelty to Animals, the Boston Workhorse Relief Association, the Animal Rescue League, and the branches of these various associations in many cities and towns of the State have, through their agents, always been of material aid to the Division in the work of controlling glanders. Their close observation of working animals of all classes has in the past, when the disease was more prevalent, brought to light many showing suspicious symptoms, which they have promptly reported to this Division, and many of the animals so reported have proved to be positive cases of the disease.

The constant activity of the humane societies in removing disabled animals from work and destroying those which, on account of extreme age or poor condition, are no longer useful has undoubtedly been a factor in the suppression of glanders, as such animals are very susceptible to infection.

Two hundred and seventy-nine samples of blood, taken from 188 horses during the year, were examined in the laboratory by the complement-fixation test. The ophthalmic mallein test has been applied to 196 State and 145 interstate horses during the year.

There were 3,229 horses shipped into Massachusetts from

the States of New York, New Jersey, Connecticut and Rhode Island, accompanied by permits from the Director of Animal Industry. All of these horses were released after physical examination or application of the ophthalmic mallein test.

It is worthy of notice that no interstate horses were found during the past year to have been affected with glanders. Many of the animals brought from the above-mentioned States are of the better class, being highly bred horses used for carriage work and breeding purposes. The second-hand horses, which are trafficked in and sent from the markets of one State to those of another for purpose of public sale, have been specially watched on account of their being considered more liable to be subjects of contagious disease than the higher class animals, and if not accompanied by a satisfactory certificate of test have been tested on arrival by inspectors of the Division.

#### RABIES.

Rabies, a specific infectious disease, is prevalent in practically all civilized countries and especially so in the United States.

Its prevalence in Massachusetts is one of the most serious problems with which the Division of Animal Industry has to contend, and its rapid increase in the past two years has called attention to the importance of marshaling every available force which can be employed to limit its further extension. When once established in a community, it maintains itself for a considerable time, and its complete eradication requires much well-directed effort. The control of its prevalence, however, is ordinarily accomplished fairly promptly in a community where it breaks out if all agencies can be lined up against it and if these function thoroughly and systematically. We find that it progressively spreads from one town or city to another until gradually many different sections are involved. In addition to the loss of animals, some of them highly valued for one reason or another, the prevalence of rabies always carries with it more or less danger to human life. As the restraint of animals is necessary to its suppression, regulatory measures are called for, and these are the cause of much trouble, expense and irritative inconvenience to the dog-owning public.

Rabies is primarily a disease of animals, all the various

species being susceptible to it. The dog, however, is the one most often affected and is the chief factor in its spread from section to section. On account of its ready communicability to the human subject and the tendency of rabid animals to attack persons, the prompt application of all control methods becomes a public health duty, and should be considered a very important one. During the prevalence of rabies it occasionally happens that persons are bitten by the infected dogs, and in many instances the bite is inflicted before the animal shows sufficiently well-marked symptoms of the disease to be suspected or to put a person on guard against him. In such unfortunate occurrences, as well as in cases where persons are not able to avoid the attack of a furiously rabid animal, the Pasteur treatment in prevention of the disease is available, and if promptly applied is successful in practically 100 per cent of the cases.

As a protective health measure all dogs, whether suspected of rabies or not, which have bitten persons should be restrained and confined at least fourteen days for observation, in order that it may be positively determined whether or not they were infected at the time the biting occurred. If a local inspector or the Division of Animal Industry is notified, such animals are officially quarantined for that period and then released if no symptoms of rabies have developed.

Based on the successful prevention in man, treatment in prevention of rabies in animals is now available and has already been taken advantage of in many instances with success. The immunization of animals against the disease, conferring absolute protection to them if unfortunately exposed to the infection, has been recently developed to what is thought to be a sufficiently effective stage to offer it for practical use. Many owners of valuable dogs, when there is an unusual prevalence of rabies, are having their animals protected by this means. If immunization can be proved practicable by further experience in this direction, and if all dogs can be treated, it may be that the problem of how to exterminate rabies will be solved. The elimination of the unlicensed dogs will be first necessary, and this should be attended to now by enforcement of present laws.

The ownerless or stray dog is generally the first rabid animal to be found in any community, and the extent to which he may have spread the infection depends on how soon he has been apprehended after he developed the disease. No one being interested in the whereabouts or physical condition of the ownerless dog, he becomes an active spreader of the disease before attention is centered on him. It will thus be seen that a more rigid enforcement of the dog laws would be valuable assistance in the suppression of rabies.

Division records this year show a larger number of cases reported than in any year since 1908. In 1916 the lowest prevalence for ten years was recorded, since which time there has been a gradual increase in their numbers. It is probable that we have not yet reached the peak of the upward trend of prevalence as yearly recorded, on account of the vast amount of contagion existing all over the country, the invasion of Massachusetts by it having been forecasted in our reports.

Local inspectors of animals are familiar with the situation and are specially advised as to the importance of early quarantine, thorough investigation and prompt detailed reports to this office.

Following is a general outline of the Division's present methods in rabies control work: —

Upon report being made to the Division that a person has been bitten by a dog, the inspector of animals of the town or city in which it occurs is ordered to make an examination of the animal, and, even if it appears to be healthy, to have it restrained for a period of fourteen days for the purpose of observation. The restraint for this length of time is deemed necessary for the reason that competent authorities have shown that in some instances the bite of a dog infected with rabies may communicate the infection fourteen days before the animal shows clinical symptoms. If at the end of this period no symptoms of rabies have developed, the animal may be released. In case a person is bitten by a dog which, upon examination by the inspector of animals or any other person, shows evidence of already being affected with rabies, or there is a history of its having been in contact with a rabid animal, the dog in either case is immediately confined in strict quaran-

tine. If it is subsequently killed or dies, its head is sent at once to the Division's office, and a laboratory examination of the brain is made for the purpose of positively determining whether or not the animal was affected with the disease. Information as to the laboratory findings is promptly communicated to the person or persons who have been bitten. The State Department of Public Health is given the information received in every case of dog bite reported to this office, whether the bite has been inflicted by an animal suspected of rabies or not. We also order the local inspector of animals not only to ascertain the names of all persons who have been bitten by dogs suspected of rabies but to find out if animals have also been bitten; and if so to place the same in quarantine for a period of at least ninety days. All dogs which are found to have been in contact with a rabid animal, whether or not it appears that they have been bitten by it, are also placed in quarantine for the same period.

If an unusual number of cases of rabies is found to exist in any town or city, and the selectmen or the mayor or board of aldermen have not taken any special action in the emergency, we request them to issue a restraining order, under the provisions of section 167 of chapter 140 of the General Laws. Such an order obliges all dog owners to confine their animals to their own premises for a certain period, or take them therefrom only on leash. This restraining order is much more effective in the local control of an outbreak than is an order which compels owners only to muzzle the animals but not restrain them, as a muzzled animal let loose may in some way get the muzzle off and bite other animals or people. A muzzled dog at large may therefore become much more dangerous than an unmuzzled one which is at all times confined upon owner's premises or taken therefrom only on leash. Dogs found running at large while a restraining order issued by town or city authorities is in force may be killed on the issuance of a warrant for the same to a police officer.

Our force of district agents, all of whom are veterinarians and located in different parts of the State, together with the local inspectors of animals, of whom there is one or more in every city and town of the State, constitutes an organization

by which effective local control of an outbreak of this disease should be accomplished within a reasonably short time.

In many communities, however, where no attention is given to the enforcement of the dog license laws, and numberless stray dogs run at large without restraint of any kind, an outbreak of rabies becomes a serious matter. Active co-operation by local authorities is immediately necessary, both in enforcement of the dog laws now on the statute books and the issuance of such additional orders as the situation demands. Selectmen, mayors and aldermen should at once use the powers vested in them by law to aid in controlling a dangerous situation.

Where our organization receives co-operation of this kind, — namely, the issuing of local restraining orders and the calling upon constables and police officers for the continuous enforcement of these orders without fear or favor in a strictly impartial manner, — the prevalence of rabies is quickly limited. During the past year 30 such restraining orders were issued by local town or city authorities.

During the year ending Nov. 30, 1922, 1,411 animals were reported to the Division for diagnosis, observation or quarantine on account of the prevalence of rabies, and 44 were brought forward from the year 1921. Of these 1,411 animals, 452 dogs, 6 cattle, 4 cats, 1 horse and 1 goat were proved to be positive cases of rabies.

During the year the Division received reports of 715 persons having been bitten by dogs, 8 persons bitten by cats, and 1 by a horse. The majority of the animals which inflicted the bites were afterwards released as showing no symptoms of rabies.

Of the 1,411 animals reported for observation, diagnosis or quarantine, 95 dogs were, as far as could be ascertained, ownerless and unlicensed, 50 of which proved to be positive cases of the disease.

There has been noticed a wide variance in the incubation period of rabies, the larger number of cases, however, showing it to be between the tenth and twentieth day. Exceptional cases have shown this period to extend for a very much longer time. There is a record of one dog which developed rabies at the end of a period of fourteen months after having been

bitten, and one cow which developed rabies at the end of nineteen months after being bitten. Our quarantine period is fixed at ninety days, that being considered a safe time at which to release contact dogs not showing symptoms of the disease. The cases having a longer period of incubation are so few that they should be considered exceptions.

#### HOG CHOLERA.

An important work which has been carried on by the Division for several years is the treatment of swine in prevention of hog cholera. This disease formerly decimated our herds to such an alarming extent, often taking every animal in a herd within a short period of time, that it threatened to destroy the industry of swine production, especially in communities where garbage was depended upon for the principal article of their food. Household garbage if in good condition makes a satisfactory ration for swine, containing all the elements necessary for perfect nutrition. Furthermore its use as food for swine is an economic utilization of a product which formerly was entirely wasted in many communities. However, on account of this material being a recognized carrier of the infection of hog cholera, the only animals to which it could be fed with safety were those which were carrying a natural immunity to the disease, and such were few in number.

On the discovery made by Dorset and Niles, of the United States Bureau of Animal Industry, that swine could be artificially immunized against this infection, the way to control the ravages of hog cholera seemed clear, and in recent years very great success in many parts of the world has attended the work suggested by this discovery.

In Massachusetts preventive treatment of this kind has been carried on continuously under supervision of this Division since its inception in 1914. Its great economic value is beyond question, and as a work of conservation ranks next in importance to that which we are doing in control of contagious diseases of cattle.

Other diseases of swine are now being given very much more attention than formerly, and no longer is it the custom of swine owners to ignore an unusual death rate in their herds. The

success of hog cholera prevention work has probably been a factor in changing this custom. It frequently happens that in our supervision of hog cholera work we have brought to our notice the prevalence of another contagion and are able to render valuable service in its control. Among such other diseases may be mentioned hemorrhagic septicemia, commonly called "swine plague," necrotic enteritis, and mixed infections of various kinds.

Department restrictions are found to be necessary in the administration of the so-called simultaneous treatment in prevention of hog cholera, for the reason that the active virus of the disease is used in that treatment. Its careless use would result in the spread of the disease rather than its prevention. Consequently the administration of this treatment is limited by department order to veterinarians holding a permit of the Director and subject to his orders. The sale of the preparations used — anti-hog cholera serum and hog cholera virus — is also regulated by the same order.

The Division started its work in 1914 under this plan of supervision and regulation, and the policy instituted at that time has been continued in this direction without change. A further precaution has been the testing by our own methods of the potency of serum and the virulency of virus, although they are manufactured under Bureau of Animal Industry license. All such products shipped to this State are held and stored in refrigeration under our control and direction at the expense of the manufacturers.

We think that all details of our plan are well taken care of, and that the resulting work has proved the soundness of our original policies relating thereto.

We respectfully submit that in our opinion any proposed legislation to modify present methods is in opposition to public interest as a whole and the swine industry in particular.

Our records show that a total of 67,909 treatments have been administered to swine in 655 herds, in prevention and cure of hog cholera. This work has been done this year in 181 cities and towns, necessitating 1,709 visits by one or more inspectors. In addition there were 50 visits made to places where the swine were not treated for one of the following reasons: the animals

in some instances were so badly infected as to preclude all chance of recovery and their treatment would involve too great waste of time and material; in other cases the trouble was found to be some non-contagious disease, not calling for State service; again, the sanitary conditions necessary to successful work could not be established; and in a few cases owners withdrew their requests for treatment of their animals after arrival of the veterinarians at the premises.

An analysis of our record of work this year shows the following outstanding facts which are worthy of notice: the number of treatments administered has increased by 13,563, which brings the total number to within 166 of our highest record made in 1919. The analysis shows further that while our number of treatments has increased there has been a decrease in the prevalence of the infection. This indicates that swine owners are realizing that the best way to escape the ravages of hog cholera in their herds is to have their animals given preventive treatment while healthy rather than attempt to cure them after the disease has appeared.

While satisfactory control of hog cholera has been established, complete eradication cannot be looked forward to with any degree of confidence, as the very nature of the infection and the unfavorable conditions under which the susceptible animals are maintained preclude any such result of even the most carefully planned and well-executed measures.

Closely supervised, well-regulated service by a well-organized unit responsible to a central head will undoubtedly control the disease within reasonable limits. The time has not yet arrived to relax in any particular the restrictions now applying to the sale and use of hog-cholera serum and virus, — products which in their careful administration by well-trained men make for positive control of the disease, but in the hands of untrained men not responsible to any authority become a certain means of spreading the disease and defeating the purpose of their manufacture and use.

The mortality rates computed from our record show in a concrete way the quality of work done; it is generally recognized that careless administration, faulty technique and errors in judgment are the principal factors in increasing the mortality

rate. The record of this work in Massachusetts over a period of years will favorably compare with that of any yet published. Our work has always commanded special attention and has brought forth much commendation by interested observers.

The conditions under which swine are kept, while found to be somewhat improved from year to year, are nevertheless far from what they ought to be. We have found in many instances where serious losses of animals have occurred that the primary causative factor has been unsanitary or poor housing conditions, which have lowered the vitality and the normal resistance of animals to disease, allowing bacterial invasion a favorable opening. Such conditions also seriously handicap recovery from disease and delay the elimination of infection. While perfect sanitary conditions are hard to obtain in piggeries as generally managed, yet very great improvement can be made on many premises, and would be followed by results which undoubtedly would be evident in more pigs, healthier pigs, and consequently a better financial showing.

By reason of our work in the control of hog cholera we have been brought in close touch with many other disease conditions, some of which are of serious menace to the success of swine production. In their clinical aspects many so closely resemble hog cholera that differential diagnoses are difficult and only arrived at after considerable investigation both in the field and in the laboratory.

*Hemorrhagic Septicemia in Swine.* — This is an infectious disease of swine which prevails more or less extensively from time to time, and which often resembles hog cholera in the exhibition of its clinical symptoms. A differential diagnosis between the two diseases is often difficult even by our field veterinarians, who by daily experience are familiar with both. It is generally necessary to carefully consider all the circumstances surrounding an outbreak, such as its history, clinical symptoms exhibited and post-mortem appearances, before positively deciding which of the two infections is present. Frequently they are found coexistent, and it must then be decided if possible which is the primary and which the secondary factor, in order that a proper line of treatment may be followed.

Therefore our work in the prevention, control and cure of

hemorrhagic septicemia in swine is intimately connected with our original hog cholera control, and the field work is attended to by the same veterinarians.

Notwithstanding the fact that the use of various biological preparations for the prevention and cure of hemorrhagic septicemia is in no way restricted by law or by Division order, and that they may be lawfully used by any registered veterinarian, our field men treat many animals affected with this disease on account of its being the cause of outbreaks which were at first thought to be due to hog cholera and for which emergency their services were requested.

During the year 7,283 treatments in the prevention or cure of hemorrhagic septicemia have been administered, and the indications are that this work will necessarily be continued the coming year.

Various mixed infections have been encountered in our swine work, and have been treated as circumstances indicated to be advisable. Their widely varied combinations and what they signify constitute one of the principal present-day studies of persons interested in these infections from a scientific standpoint.

#### MISCELLANEOUS DISEASES.

*Anthrax.* — Nearly all the species of domestic animals are susceptible to this disease, and the infection is transmissible to man under certain conditions of actual contact, such as the handling of carcasses, hides or wool of infected animals.

In some previous years there have been numerous cases among cattle, but our record for the past two years shows practically no prevalence in bovine animals. During 1921 only one case was recorded and none in 1922. Such a record is remarkable considering that we have a number of farms which are classified as infected with anthrax, the germs or spores of which live in the soil for a long time, and are therefore to be considered as a possible source of an outbreak for many years. On these farms the bovine animals are regularly given preventive treatment every year, the immunity given by this treatment being depended upon as effective for at least twelve months. The low incidence of the disease, as shown by the

records of recent years, indicates that the policy of yearly preventive treatment is effective to a marked degree and should be continued.

During the year preventive treatment has been administered to 91 cattle and 44 horses on 15 different premises located in 7 towns.

Seven authenticated cases of anthrax have occurred in horses this year, all in the same town but on three different premises. Investigation of these cases indicates that in all probability they arose from a common source. The first animals to contract the disease had been stabled for a few days in a barn which had been unused for a long time. Undoubtedly this building was infected, as some evidence — based on rumor alone, however — was to the effect that a number of “mysterious deaths” of horses had occurred on these premises some years ago, and for that reason the building had never since been occupied until the horses mentioned were stabled there temporarily. This building has since been thoroughly disinfected under the supervision of a district agent of the Division and placed in permanent quarantine.

Our method of procedure in reported anthrax is as follows: Every report is immediately investigated and subsequent action is taken as deemed advisable by consideration of the facts disclosed. Positive diagnosis is first necessary; and as the animals generally either are found dead or die before arrival of a veterinarian or Division inspector, a post-mortem examination would ordinarily be depended upon to confirm the suspicions of anthrax. As post-mortem appearances in this disease are often not sufficiently characteristic to justify a positive diagnosis, and as the opening of a carcass allows the body fluids to escape and possibly spread the infection, it is advised that the suspected carcass be not opened, but that a specimen of blood be drawn from the cadaver onto a piece of glass and then allowed to dry in the air. If this specimen is not badly contaminated by careless preparation, and is promptly forwarded to a laboratory, there is no difficulty in determining whether or not anthrax bacilli are present.

A field diagnosis or suspicion of anthrax having been con-

firmed, preventive measures at once follow. They consist of proper disposal of diseased carcasses, disinfection of premises, and preventive inoculation of susceptible and exposed animals.

To prevent infection spreading from a carcass it should be burned or deeply buried, covered with quicklime. Anthrax bacilli or their spores if not destroyed may continue to infect soil for a long time. In many instances these organisms have been found to remain active for a number of years. We recommend that any contaminated ground be burned over and the surface area above a buried carcass be fenced and burned over yearly. Any contaminated portions of buildings if wooden should be torn out and burned, and if concrete should be thoroughly disinfected.

The remaining animals of the herd should be at once removed to other buildings or areas, and the apparently healthy ones inoculated in prevention of the disease. Animals already affected are sometimes successfully treated, but ordinarily the disease runs such a rapid course that death takes place before the animal is noticed to be seriously sick, and our efforts are consequently limited to protection of the animals not showing symptoms. Although a certain percentage of deaths may reasonably be expected to occur among the inoculated animals, we find in actual experience that fatalities are very few.

Preventive inoculation is supposed to confer immunity for a period of at least twelve months. At premises where an outbreak has occurred and there is reason to fear permanent infection, it is advised that all susceptible animals be given a preventive inoculation each succeeding year for a certain period.

*Blackleg.* — This infectious disease generally occurs during the pasture season only, as its causative organisms live in the soil, where their resistant spores preserve their ability to infect animals for a long time even under severe conditions of weather. The infection is not believed to readily pass from one animal to another, but prevails in numbers of animals only when all are exposed to the same source of contagion. This explains the fact that we seldom have an outbreak occur during that portion of the year when the animals are stabled.

It is readily prevented by treatment with certain biological

products prepared for the purpose and which confer an immunity lasting at least for an entire season. As the disease seldom affects adult cattle, only those under three years of age are treated in prevention.

As we have many farms in the State where blackleg has been known to exist at one time or another, we recommend the preventive treatment every season of all the young cattle on these premises, and the best time to do this is of course just previous to the turning out of the animals in the spring.

On the occurrence of an outbreak all the susceptible stock should be immediately given the preventive treatment and removed from the pasture in which the disease appeared, as an extra precaution. It should always be considered a suspicious circumstance if young cattle have been found dead in pasture from no readily explainable cause, as undoubtedly blackleg has killed the animals in many of these instances.

The preventive treatment of young cattle against this disease is a service rendered by Division inspectors free of expense to owners. It is quite generally availed of, and during the year the treatment has been administered to 1,101 animals on 164 farms located in 44 different towns.

This year's records compared with 1921 show 36 fewer animals treated on the same number of farms but in 7 fewer towns. Only one death has been reported.

The same general recommendations as in anthrax outbreaks, as to disposal of infected carcasses by burning or deep burial, are applicable following occurrence of this disease.

*Actinomycosis.* — Seventeen cases of this disease have been reported this year, located as follows: 1 each in the towns of Beverly, Charlton, Concord, Grafton, Leominster, Plymouth, Sharon and Spencer, and 3 in the town of Hancock, all of which proved to be positive cases.

Of the 17 cases reported, 8 have been slaughtered, 3 have been released as having recovered on treatment, 5 proved on investigation to be other diseases, and 1 is still in quarantine undergoing treatment.

*Hemorrhagic Septicemia in Cattle.* — The prevalence of this disease in Massachusetts, while very much lower than in many

other States which receive large numbers of cattle through public stockyards, is nevertheless to be carefully noted. Our outbreaks generally occur among pasture cattle, take on a very acute form, and frequently cause sudden deaths, with no opportunity for treatment. Prevention and cure are often successful, however, if the animals can be treated early and before reaching the final stages. It is our custom to advise the immediate removal of all animals from the pasture where the disease first appears, and if this is attended to, and the animals are not already showing symptoms of the disease, it generally happens that no additional cases follow.

Preventive treatment is, however, advised for all remaining animals in the herd and curative treatment for those apparently infected. Prompt report generally results in early suppression of outbreaks, and as a laboratory examination is sometimes necessary for positive diagnosis, we request the early shipment of specimens in suspected cases or where the field symptoms resemble those of anthrax, with which disease hemorrhagic septicemia is sometimes confused.

Our records this year show 28 deaths in cattle caused by hemorrhagic septicemia, in the following towns: Ashfield, 2; Fitchburg, 1; Framingham, 2; Northfield, 4; Phillipston, 4; Scituate, 6; Shelburne, 2; Templeton, 2; Tewksbury, 5. Preventive treatment was administered to 66 cattle.

An outbreak of disease in a flock of sheep in the town of Montague, which had caused 25 deaths, was diagnosed as hemorrhagic septicemia, and the remainder of the flock was immediately given preventive treatment by one of our district agents. Three additional deaths occurred following treatment.

*Parasitic Diseases.*—The external and internal infestation of farm animals by parasites to any extensive degree has a marked effect in reducing the profits to be gained in the raising of live stock. They cause irritation in all degrees of intensity even to the point of acute suffering and death in some instances. In all cases they inhibit growth, and therefore, when infesting cattle, sheep or swine, cause a great waste of animal products used for human food. In young animals especially the greatest damage is to be noted, often rendering their continued feeding inadvisable from an economic standpoint.

The importance of this condition and its real significance as a factor working against successful live-stock raising is being more generally recognized than ever before, and with such recognition comes the more special attention to its relief. Scientific investigations both in laboratory and field are revealing many facts regarding parasitic life which have never before been known, and the continuation of the research work in this direction promises valuable aid in the solution of many problems now confronting those engaged in the raising and development of animals to the point where their products are marketable.

Mange in its different forms is the parasitic condition most often reported to this office. Large numbers of cattle and a few horses become affected each season, the number varying widely from year to year. Fewer cases have been reported this year than usual, but we are well aware that our reports are not a very correct indication of the extent of infestation, for the reason that many cattle owners do not consider their cases of sufficient importance to demand official attention.

The successful treatment of mange in horses and cattle depends solely upon faithful application of proper medicinal remedies. These remedies are not expensive but their application is very inconvenient, the result often being that the disease prevails to a much greater extent than it should. Many owners of live stock, however, now realize that keeping their animals free from the irritation caused by the mange parasite means additional production and less food necessary to keep them in healthy condition.

It is our custom to quarantine all reported cases whose owners are not disposed to apply proper treatment. One hundred and twelve cases of mange have been reported this year on 5 premises in 4 different towns.

Nodular disease, a parasitic infection of the intestinal tract, was reported as prevailing extensively in a flock of 1,250 sheep in the town of Gosnold. No measures for relief of a condition of this kind being practical under the circumstances, the owner was advised as to slaughter. One case of parasites infesting the lungs of sheep was reported from the town of Bridgewater.

*Foot-and-mouth Disease.* — Although no outbreak of this

disease has occurred during the year, we have been very apprehensive regarding the possibilities of its reappearance. It has prevailed to an alarming extent in many countries with which the United States has intimate trade relations, and the channels of commerce provide a ready way for its conveyance. All kinds of merchandise furnish a suitable vehicle for its transmission; and considering its prevalence not only in the British Isles and continental Europe but also nearer by in Mexico and South American countries, it is really remarkable that an outbreak in this country has not occurred. Live-stock officials of the Nation and the several States are very much alive to the impending danger and are prepared to take immediate steps to surround and control the disease at the first notice of its appearance. By the exercise of all the precautionary measures now taken or ready to be put in operation, it is hoped that any wide extension of the disease will be prevented in case it appears.

Considerable experimental work is now being done looking to the development of a biological product to be used in the immunization of susceptible animals, but such work has not progressed to a point where it can be shown to be of practical value. The successful stamping-out method used in former outbreaks in this country will undoubtedly be relied upon in the emergency of its outbreak.

In this State all live-stock officials, Division veterinarians, local inspectors of animals, and private veterinarians have been notified of the impending danger of an outbreak and asked to immediately call this office if any suspicious cases are found.

*Bovine Infectious Abortion.* — The prevalence of this infection is very widespread and is second in importance only to bovine tuberculosis. The losses caused by it and its many concurrent conditions are so extensive as to command the serious attention of all dairymen and breeders of thoroughbred cattle.

We still await further knowledge of a definite nature regarding its cause, dissemination and practical control. While scientific investigators are not entirely agreed upon many important phases of the problem, especially the possibility and practicability of immunization of susceptible animals by arti-

ficial means, yet all concur in recognition of the value and absolute necessity of the well-known hygienic measures which have long been recommended in preventing the spreading of the infection in an individual herd.

Control measures to be instituted by official authority, with the idea of preventing the carrying of infection from one herd to another by restricting the sale or transfer of affected animals, may eventually be found to be advisable and necessary, but in the light of our present knowledge such official action is not deemed practicable. The intimate handling of a herd problem of this kind is naturally one to be worked out with the assistance of a private veterinarian, who should be relied upon for advice as to general herd management and the proper way to carry out the various sanitary measures recognized as essential to progress in the control of any infection.

*Other Infectious Diseases.* — Inspectors of slaughtering occasionally bring to our attention the finding of tuberculosis in swine at time of their slaughter, and in all such instances if we get the information as to what premises the animals came from, we immediately have all the cattle examined which may be thereon. The source of this disease in swine is often found in the cattle with which they are kept, and a slaughterer's report may therefore be the means of leading us to a tuberculous cow. Nineteen cases of swine tuberculosis have been reported this year from seven different towns.

Tuberculosis in horses, a very rare occurrence but an occasional case of which has been reported in recent years, has not been found to exist during 1922.

The Division has frequently been called upon to examine animals suspected of contagious disease which on investigation proved to be affected with disease of a non-contagious character.

Among such instances the following may be mentioned: A flock of sheep in the town of Monterey dying apparently from old age; a herd of 3 cows in Montague dying from starvation; 2 cows in Blandford suffering from a chemical poison; 1 cow in Heath infected by pus absorption; 1 cow in Princeton with a piece of wire puncturing the heart; a large number of

horses owned by a business concern in Boston, which had been maliciously injured by punctured wounds which became infected.

#### LABORATORY SERVICE.

The bacteriological laboratory of the Department of Public Health has rendered this Division the same valuable service as during previous years.

In our contagious disease control work there are many instances in which correct diagnosis can only be made as the result of laboratory examination, and there are many additional instances where diagnoses made from clinical symptoms or from macroscopical appearances post-mortem are not entirely satisfactory unless confirmed by the laboratory findings of a trained bacteriologist. The service of the laboratory as an auxiliary to Division investigations is therefore invaluable. From the standpoint of economy, rendering unnecessary the maintenance of a laboratory by this Division, it is a fine example of the value of co-operation between State departments.

The most important service of the laboratory this year has been the examination of the brains of 483 animals submitted because suspected of rabies. Prompt and definite conclusions as to the existence or non-existence of this infection are necessary, and especially so if persons have been bitten by the suspected animals.

Complement-fixation tests of 279 samples of blood taken from horses suspected of or exposed to glanders have been made.

In addition to these principal services, 46 specimens have been examined taken from animals suspected of the following diseases: anthrax, 9; blackleg, 2; glanders, 2; hemorrhagic septicemia, 15; tuberculosis, 11; actinomycosis, epithelioma, Johne's disease, necrobacillosis, nodular disease, pneumonia and ulcerative gastritis, 1 each.

#### ANNUAL INSPECTION OF FARM ANIMALS AND PREMISES.

Under the provisions of section 19, chapter 129 of the General Laws, an order was issued by the Director on Jan. 10, 1922, to every inspector of animals in the cities and towns of

the Commonwealth calling for an inspection of all cattle, sheep and swine and of the premises where kept.

This order called for the completion of the inspection by March 1, and for a report of the same to be promptly forwarded to the Division's office. The inspectors' reports came forward in most instances in good season and were duly examined and tabulated in minute detail.

Grossly these reports show an increase from last year of 6,205 cattle of all classes. The number of dairy cows — 168,870 — shows an increase of 8,678 from last year, and the increase for the past two years is 14,463. This brings the total number of dairy cows in Massachusetts to a higher figure than for several years.

There were 32,650 stables inspected, showing that animals were kept on 859 more premises than in 1921.

The number of swine — 68,579 — shows a decrease of 7,948, and the number of sheep — 13,542 — a decrease of 1,961.

Inspecting the records for the past fifty years we find the average yearly count of dairy cows to be approximately 160,000. Whereas several times during that period the number has dropped to 140,000, it is to be especially noted that at present we have a number well above the average for a long period of years, and, contrary to the frequently expressed opinion of many men supposedly well informed as to the live-stock industry of the State, dairy animals are *not* gradually disappearing from Massachusetts farms, but are constantly increasing in numbers.

The decreases in sheep and swine are undoubtedly due to the high prices of fodder and the relatively low prices of marketed carcasses sold for food purposes.

A word should be said as to the character of the work done by local inspectors of animals and the value of their reports. From these reports a fairly correct and comprehensive survey may be drawn of the general health conditions of the live stock on Massachusetts farms, and of the conditions under which they are kept. Such a survey is of great aid in formulating our general policies both in disease control and in the campaign for gradual betterment of stabling conditions.

The only correct "census" of farm animals in the State is

made up from these reports, and it is not only of interest and value to the Department of Conservation but to other State departments, and to individuals and associations interested in the breeding and raising of live stock, or engaged in any of the many lines of business closely related thereto.

The emergency service of inspectors in connection with sudden outbreaks of contagious disease is invaluable, and the organization as a whole forms a very important branch of the Division's force.

Meetings of inspectors were held this year at Greenfield, Pittsfield, Springfield, Worcester and Boston. These meetings were well attended and various subjects of interest were discussed.

District veterinarians have made 1,511 visits to premises where unsanitary conditions existed and which local inspectors had failed in having corrected. In the majority of instances the final result has been a satisfactory improvement.

#### REPORTS OF RENDERING COMPANIES.

Section 154 of chapter 111 of the General Laws requires rendering companies to report to this Division every animal received by them which is found to be infected with a contagious disease, and the information thus furnished is of value in bringing to the attention of the Division occasional cases of these diseases which otherwise would not be known.

Thirty reports covering 76 cases of contagious diseases were received from rendering companies, 2 of which had not been otherwise recorded.

#### FINANCIAL STATEMENT.

Appropriation for the salary of the Director, chapter 129, Acts of 1922	\$3,500 00
Expended during the year for the salary of the Director . . . . .	\$3,500 00
Appropriation for personal services of clerks and stenographers, chapter 129, Acts of 1922 . . . . .	\$8,100 00
Expended during the year for the following purposes:—	
Personal services of clerks and stenographers . . . . .	\$7,876 50
Extra clerical and stenographic service . . . . .	77 79
	<hr/>
Total expenditure . . . . .	\$7,954 29
Unexpended balance . . . . .	145 71
	<hr/>
	\$8,100 00

Appropriation for services other than personal, including printing the annual report, traveling expenses of the Director, and office supplies and equipment, chapter 129, Acts of 1922 . . . . .	\$5,200 00	
Additional appropriation granted by Legislature to cover 1921 deficiency . . . . .	6 70	
	<hr/>	\$5,206 70
Expended during the year for the following purposes:—		
Books and maps . . . . .	\$75 00	
Express and messenger service . . . . .	242 84	
Postage . . . . .	911 84	
Printing report . . . . .	168 66	
Other printing . . . . .	1,599 77	
Telephone and telegrams . . . . .	651 97	
Stationery and office supplies . . . . .	880 75	
Expenses of the Director . . . . .	519 71	
	<hr/>	
Total expenditure . . . . .	\$5,050 54	
Unexpended balance . . . . .	156 16	
	<hr/>	\$5,206 70
Appropriation for personal services of veterinarians and agents engaged in the work of extermination of contagious diseases among domestic animals, chapter 129, Acts of 1922 . . . . .		
	\$47,000 00	
Brought forward from 1921 appropriation . . . . .	30 00	
	<hr/>	
Total amount appropriated . . . . .		\$47,030 00
Expended during the year for the following purposes:—		
Services of regular agents . . . . .	\$33,685 87	
Services of per diem agents . . . . .	7,398 00	
Labor hired . . . . .	100 00	
	<hr/>	
Total expenditure . . . . .	\$41,183 87	
Unexpended balance . . . . .	5,846 13	
	<hr/>	\$47,030 00
Appropriation for the traveling expenses of veterinarians and agents, chapter 129, Acts of 1922 . . . . .		
	\$23,000 00	
Brought forward from 1921 appropriation . . . . .	15 40	
	<hr/>	
Total amount appropriated . . . . .		\$23,015 40
Expended during the year for the following purposes:—		
Traveling expenses of regular agents . . . . .	\$16,382 28	
Traveling expenses of per diem agents . . . . .	3,444 95	
	<hr/>	
Total expenditure . . . . .	\$19,827 23	
Unexpended balance . . . . .	3,188 17	
	<hr/>	\$23,015 40
Appropriation for reimbursement of owners of cattle and horses killed during the present and previous years, travel, when allowed, of inspectors of animals, incidental expenses of killing and burial, quarantine and emergency services, and for laboratory and veterinary supplies and equipment, chapter 129, Acts of 1922 . . . . .		
		\$71,000 00

Expended during the year for the following purposes:—	
1,657 head of cattle condemned and killed on account of tuberculosis in 1920, 1921, 1922, paid for in 1922 . . . . .	\$58,214 00
14 horses condemned and killed on account of glanders . . . . .	800 00
Supplies for veterinary inspectors . . . . .	213 74
Laundry . . . . .	391 62
Antiseptics, biologics and disinfectants . . . . .	573 95
Thermometers, needles, syringes, etc. . . . .	663 08
Ear-tags, punches, chains, etc. . . . .	2,477 42
Expenses of killing and burial . . . . .	331 30
Expenses of travel allowed inspectors of animals . . . . .	623 55
Quarantine expenses . . . . .	51 50
Rent of quarantine office . . . . .	65 00
Rent of halls and services for inspectors' meetings . . . . .	133 50
Sundries . . . . .	48 00
	<hr/>
Total expenditures . . . . .	\$64,586 66 <sup>1</sup>
Unexpended balance . . . . .	6,413 34
	<hr/>
	\$71,000 00
Appropriation for reimbursement of owners of certain cattle killed in accordance with agreements made under authority of chapters 353 and 546, Acts of 1922 . . . . .	
	\$15,000 00
Transferred from the Extraordinary Fund . . . . .	10,000 00
	<hr/>
Total amount appropriated . . . . .	\$25,000 00
Expended during the year for the following:—	
400 head of cattle killed (chapter 353, Acts of 1922) . . . . .	\$12,889 32
Unexpended balance . . . . .	12,110 68
	<hr/>
	\$25,000 00

The average amount paid for condemned tuberculous cattle for the entire year is \$32.41. For the first five months of the year, before the maximum indemnity as fixed by law was reduced from \$60 to \$25, the average indemnity paid on each animal was \$39.92. For the remaining seven months, during which the lowered maximum rate was in force, the average indemnity paid for each animal was \$24.26.

One hundred and fifty-five claims for reimbursement for cattle condemned and killed as tuberculous during the year remain unsettled, these claims amounting to \$4,263.

Thirty unpaid claims covering 267 cattle, to which the provisions of chapter 353, Acts of 1922, apply, remain unpaid, amounting to \$7,964.34.

<sup>1</sup> This amount reduced by \$120 refunded on account of expense of previous years.

A claim amounting to \$50, applying to 1 horse condemned and killed during the year because affected with glanders, remains unsettled.

There has been received during the year from the sale of hides and carcasses of condemned animals \$8.51.

Respectfully submitted,

LESTER H. HOWARD,

*Director.*



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APPENDIX

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GRAPHS SHOWING THE WORK OF THE  
DIVISION OF ANIMAL INDUSTRY

IN SOME OF THE

PRINCIPAL CONTAGIOUS DISEASES OF ANIMALS

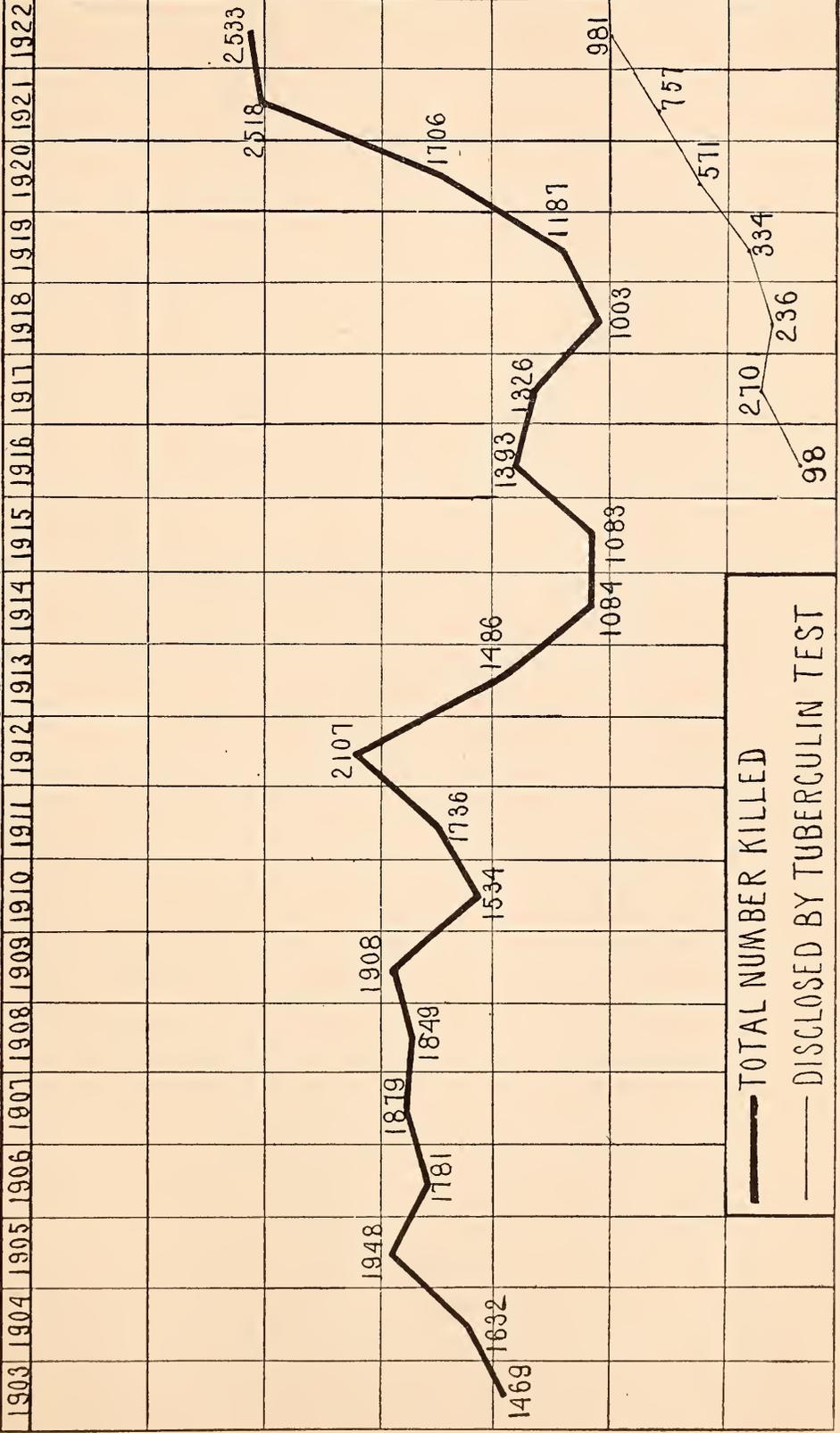
FOR A PERIOD OF SEVERAL YEARS

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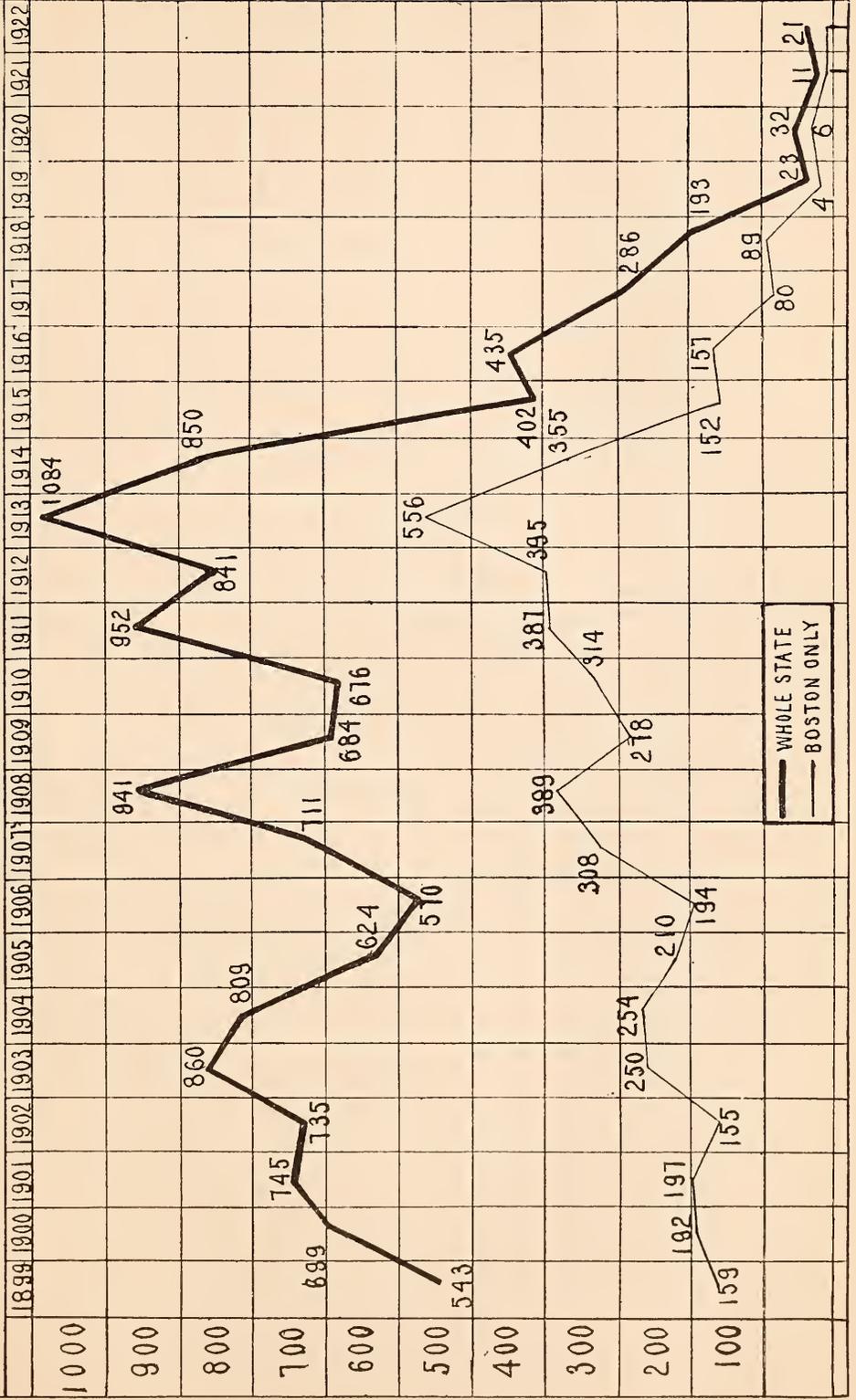
# BOVINE TUBERCULOSIS



TOTAL NUMBER KILLED  
 DISCLOSED BY TUBERCULIN TEST

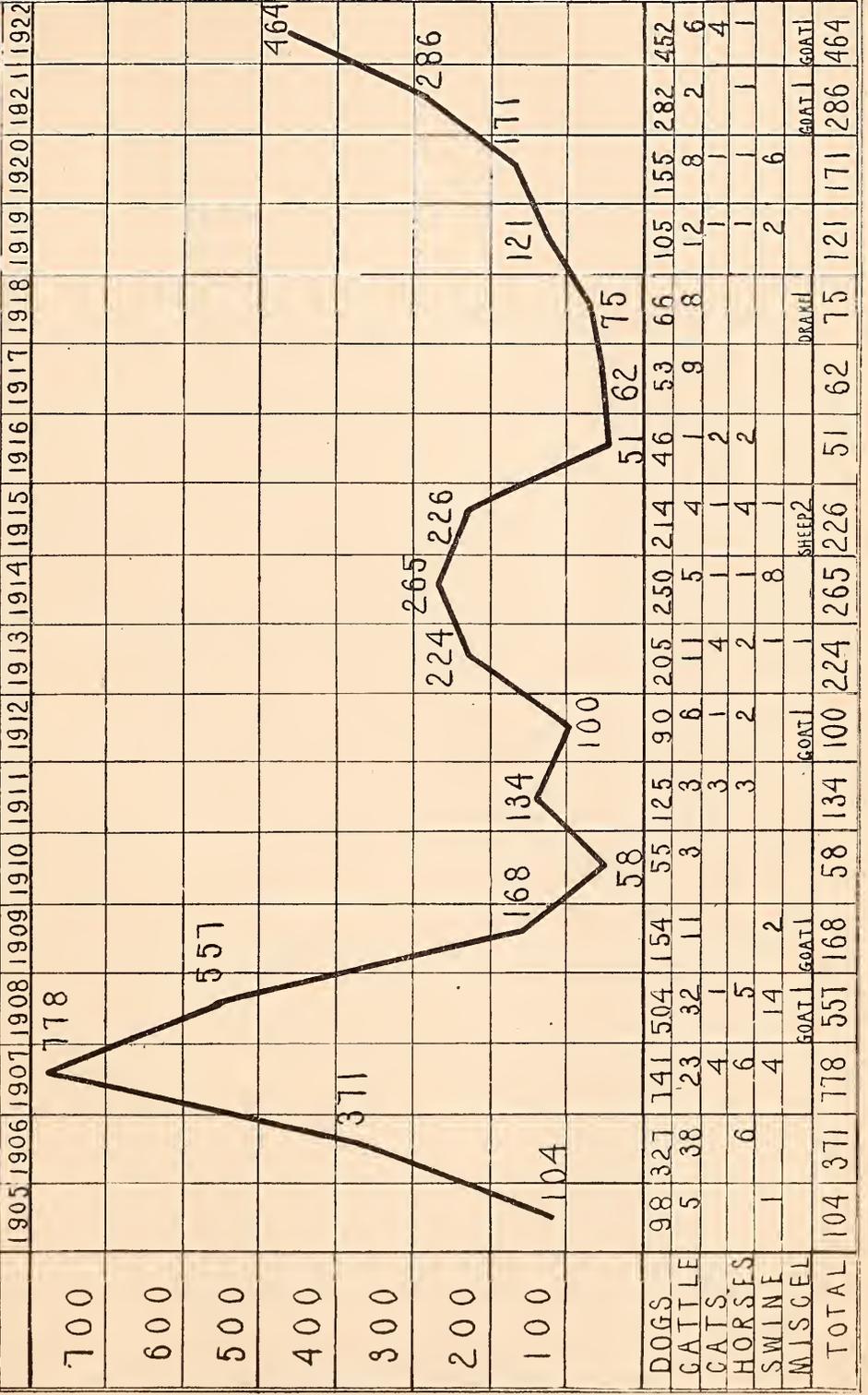


# GLANDERS



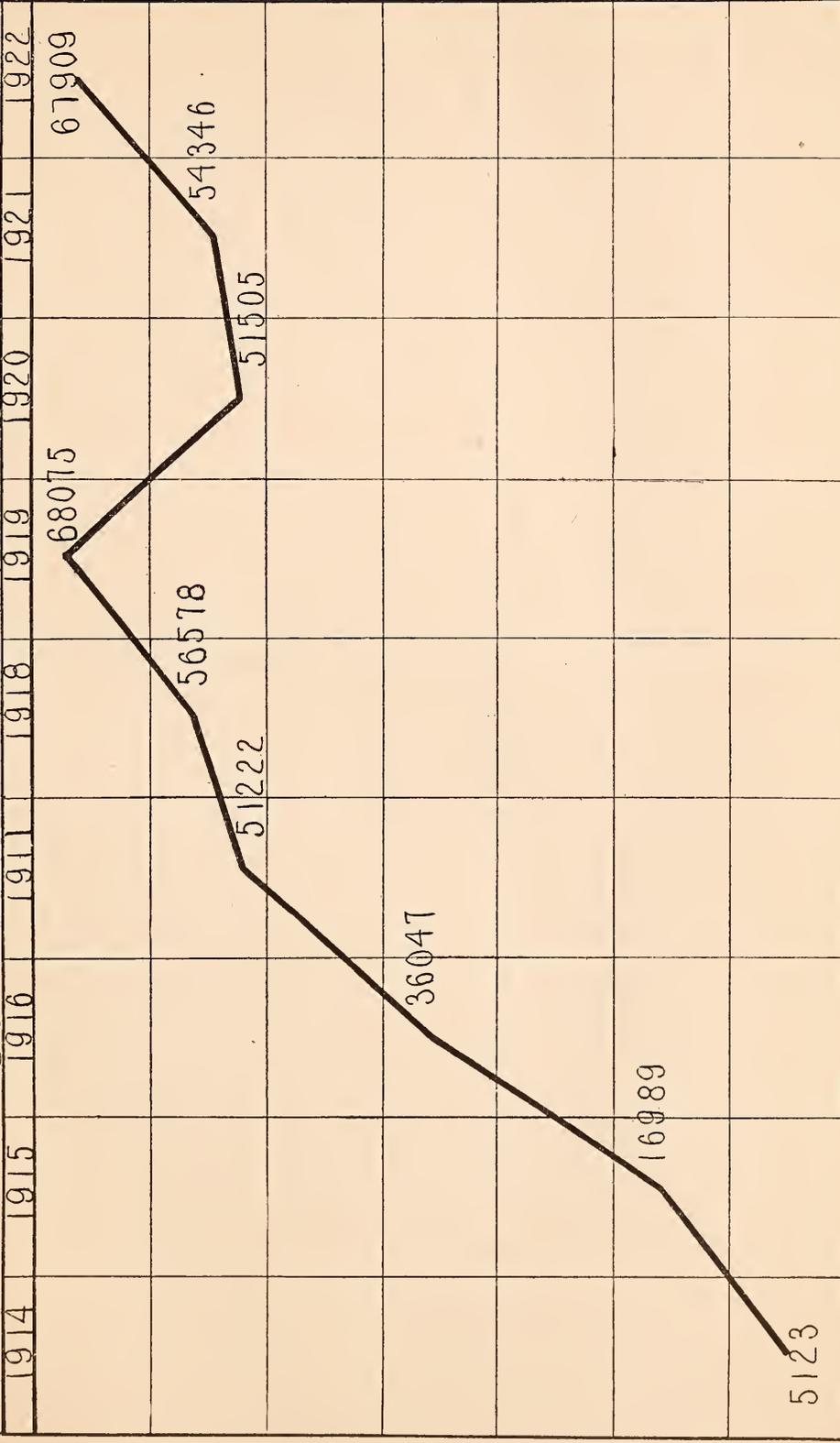


# RABIES





# HOG CHOLERA CONTROL - INOCULATIONS -









The Commonwealth of Massachusetts

ANNUAL REPORT

OF THE

DIRECTOR OF ANIMAL INDUSTRY

FOR THE

YEAR ENDING NOVEMBER 30, 1923

DEPARTMENT OF CONSERVATION



MASSACHUSETTS DEPARTMENT OF THE COMMONWEALTH  
May 20, 1924.

# The Commonwealth of Massachusetts

## DEPARTMENT OF CONSERVATION

DIVISION OF ANIMAL INDUSTRY,  
BOSTON, Nov. 30, 1923.

*To the Commissioner of Conservation.*

I have the honor to present the following report of the work of this Division for the year ending Nov. 30, 1923.

The present year has been one of increased activities in the Division, partly owing to the rapidly developing interest of cattle owners in the eradication of bovine tuberculosis by use of the tuberculin test under the provisions of Chapter 353 of the Acts of 1922, which allows the payment of indemnity for reacting cattle.

The continued prevalence of rabies, with its attending dangers to human life, has also greatly added to the work of the Division by the necessary increase in regulatory measures of quarantine, and also by the increased laboratory examinations called for.

Contagious diseases of swine have claimed a larger part of our field activities than usual, as this branch of the service is one constantly calling for extended effort in prevention of hog cholera, hemorrhagic septicemia and various mixed infections attacking that species.

The regular continuous duties of inspection of horses, cattle, sheep and swine and of the sanitary conditions under which they are kept, execution of measures in prevention, cure or control of contagious diseases among all the several species of domestic animals, and the condemnation and slaughter when necessary of such as are affected with certain forms of such diseases, followed by supervision of the burial or other disposal of their carcasses, have been attended to promptly and in accordance with the methods found by many years' experience to be most effective.

The enforcement of regulations applying to the transportation of animals from other states to Massachusetts is another important duty of this Division, as by these methods we make sure that no prevalence of contagious disease shall be caused by the entry of infected animals. Mallein testing of horses from certain states in which glanders has extensively prevailed, and tuberculin testing of dairy or breeding cattle shipped from other states and not accompanied by satisfactory records of tuberculin test, are continuous activities calling for prompt determination of actual health conditions at time of entry. Although Federal regulations now require that all cattle of whatever age shipped from one state to another for any purpose except immediate slaughter shall have passed a tuberculin test applied by an approved veterinarian before the shipment takes place, and we ordinarily depend on this regulation being complied with by cattle shippers, yet we find that many cases of violation occur either intentionally or through ignorance of the existence of any regulatory measures of the United States government applying to this class of interstate commerce. In such instances official action becomes immediately necessary in protection of the live-stock interests of the state, and all animals involved are immediately inspected and tuberculin tested. Failure to pass inspection and test requires condemnation and killing, without indemnity to owner unless post-mortem examination discloses no evidence of disease.

The Division attempts first of all to prevent the outbreak of contagious disease, and as far as possible thereby to maintain our animals in a state of health. If such can be accomplished it operates to conserve in great measure that portion of the public food supply produced by our domestic animals and said to be more than one-third of its total. It also establishes its quality and nutritive value at a high standard.

The dairying industry depends for its business success on the production of large amounts of milk of standard quality, and for this production healthy animals are a first necessity. Neither propagation in sufficient numbers nor satis-

factory development to maturity or to the point where their products are available for human food can be expected in animals affected with any form of contagious disease.

The relation of animal disease to the public health has been previously mentioned but should be referred to in further detail. A diseased animal is sometimes found to be the source of the contagion of glanders, tuberculosis, rabies, anthrax, and other diseases appearing in the human subject. Such cases are fortunately of rare occurrence but their high mortality rate when attacking man calls attention to the vital importance of controlling these maladies at their most common source, and if possible eradicating them entirely from the animal kingdom.

Following is a gross summary of the work of the Division for the year ending Nov. 30, 1923: —

#### CATTLE.

- 13,768 Massachusetts cattle were physically examined by inspectors.
- 101 Massachusetts cattle were tuberculin tested by Division veterinarians at Brighton stockyards.
- 22,368 tuberculin tests of Massachusetts cattle were made by Federal and State veterinarians in co-operation.
- 2,712 interstate cattle were tuberculin tested by Division veterinarians.
- 8,700 tested interstate cattle were examined at Brighton and their test records viséed.
- 6,025 tested interstate cattle were inspected and identified at other points.
- 942 animals on 124 farms in 43 towns were given preventive treatment against blackleg.
- 21 animals were given preventive treatment against anthrax.
- 93 animals were given preventive treatment against hemorrhagic septicemia.
- 772 visits to unsanitary premises were made by district veterinarians.

#### HORSES.

- 302 tests for glanders were made by Division veterinarians.
- 3,391 interstate horses were examined by inspectors.
- 9 tests of whole stables were made by Division veterinarians.
- 5 horses were given preventive treatment against anthrax.

#### DOGS.

- 1,898 cases of possible rabies in dogs were investigated.

#### SWINE.

- 66,627 head of swine were treated in prevention or cure of hog cholera.
- 26,540 head of swine were treated in prevention or cure of hemorrhagic septicemia.

#### MISCELLANEOUS DISEASES.

- 256 cases of miscellaneous diseases were investigated by Division veterinarians.

#### BOVINE TUBERCULOSIS.

Our work in the control and eradication of this disease during the year has been carried on much as in former years but with the added efficiency made possible by the operation of the so-called tuberculin-testing law passed by the legislature of 1922 and effective on Aug. 1 of that year. The indications of real progress in the campaign against tuberculosis of the bovine animal are now very much more apparent than at any previous time in the history of this branch of State service.

For many years this eradication work had been practically limited to the disposal of physical cases of the disease, — animals so far advanced in the stages of tuberculosis as to be readily recognized by a physical examination alone, earlier diagnosis by the use of tuberculin being prohibited by law except in special instances of rare occurrence. By the time tuberculous animals have reached the stage of disease development where they become clinical cases they

have been active spreaders of the infection for a long time, and eradication work which is limited to the killing of such cases cannot be expected to be successful in any marked degree; during the development stage infection is being continuously planted in new centers and is developing faster than it can possibly be reduced by the killing of advanced cases only. For real progress in eradication earlier diagnosis is necessary, and the diseased animals must be slaughtered or isolated before reaching the point where they become sources of contagion to others.

For the purpose of early diagnosis the tuberculin test has been available for some years, during which it has been rapidly advanced to a satisfactory stage of perfection, and adapted to several different methods of application. It now comes to our aid through the agency of the new law referred to, and we believe that within a few years we will be able to show a very marked diminution in the prevalence of this great plague which has so devastated our herds and has caused such a great economic loss to cattle raisers, to milk producers, and to the many business interests allied to the live-stock industry.

In Massachusetts, as in all other States of the Union, the Federal government is co-operating in this work under the provisions of its "accredited tuberculosis-free herd plan" instituted in 1917 by its Bureau of Animal Industry. In the six years during which this plan has been in operation in different parts of the country in connection with local State activities, the combined service has progressed to a point where it is recognized as a public work of undoubted value. Its increasing popularity from year to year, as attested by the large number of herds voluntarily submitted for test under its regulations, and the published statistics of its practical workings both in individual herds and in defined areas such as towns or whole counties where all the cattle have been tested, would seem to indicate that this plan was well conceived, has been efficiently administered, and has accomplished wonderful results in the eradication of the disease.

While the work in Massachusetts has hardly been in operation long enough to show by actual figures its effect in the reduction of the prevalence of bovine tuberculosis, we have no reason to doubt that the satisfactory experience of other States where the work was started much earlier will be repeated here.

The official tuberculin test is applied only on request of the cattle owner, and only if he agrees to comply with the rules and regulations devised for proper administration of the law. The principal provisions of these rules and regulations refer to the disposal of animals which react to the test, the cleansing, disinfection and necessary repairs of the premises where they are found, and the determination of the health conditions of the cattle to be afterwards added to these herds under official supervision.

We find the requests for this service showing a steady increase in number from month to month as cattle owners become more thoroughly informed of the opportunity which it offers for elimination of diseased animals from their herds under conditions allowing fairly liberal reimbursement for them. We also find other potent factors influencing their decisions.

In many communities different civic or welfare organizations are now discussing the desirability of regulating by municipal authority the purity of their milk supply in this particular direction by prohibiting the sale of raw milk unless produced by animals which have passed a tuberculin test. Many milk producers foresee the probable establishment in the near future of regulations of this kind and decide it to be good business policy to be getting their herds into a condition where they can at once comply with the new requirements when instituted. At the end of the year, Nov. 30, 1923, we have 104 herds comprising 3,538 cattle which have been accredited by the Federal government as tuberculosis-free.

Animals in accredited tuberculosis-free herds command an increased price when offered for sale, and their market value is bound to still further advance as testing becomes more general and the demand for clean cattle becomes greater. Dairy products from herds which can be officially certified to as healthy are already in greater demand at advanced rates than the present supply can fulfill.

There are, therefore, many reasons for the rapidly increasing number of requests for our service under the new law, and we foresee that the end of the coming year will show very many herds added to our list as tuberculosis-free. New requests for this service are constantly being presented, and on Nov. 30 there were 81 on file, which will be complied with early in the new fiscal year.

Following is the year's record of tuberculin tests under the provisions of chapter 353, Acts of 1922:—

Total number of herds tested: 874.

Total number of cattle tested: 22,368 (purebreds 9,878, grades 12,490); passed the test, 19,162; reacted, 3,206; percentage of reactions: 14.3.

*First test*, 426 herds, 8,128 cattle; passed, 5,585; reacted, 2,543; percentage of reactions: 31.

*Second test*, 229 herds, 4,668 cattle; passed, 4,337; reacted, 331; percentage of reactions: 7.

*Third test*, 155 herds, 7,186 cattle; passed, 6,866; reacted, 320; percentage of reactions: 4.5.

Tests made of 64 herds comprising 2,386 cattle, previously accredited and due for retest, showed only 12 reactors, *i.e.*, one-half of 1 per cent.

In commenting on the above record attention is directed to the fact that although the percentage of reactors found — all records of tests being included — is 14.3, that figure does not correctly indicate the prevalence of the disease in Massachusetts, as the records on which it is computed comprise not only original first tests of herds but also the retests subsequently made in many of the same herds after the animals reacting to previous tests had been removed. A better basis, therefore, on which to estimate the percentage of tuberculous cattle in the State which the tuberculin test might disclose would be the results obtained on first tests only. The percentage so computed is 31, and undoubtedly more correctly indicates the true condition of our herds as regards tuberculosis, and at the same time emphasizes the magnitude of the work to be done in the future if ultimate eradication or more effective control of this disease is to be obtained under this plan.

A comparison between the number of reactors found in grade animals and those found in purebreds shows 18 per cent of the former and only 9 per cent of the latter. This may be accounted for largely by the fact that many purebred herds, on account of their high values, have been kept free from the disease by constant testing by private veterinarians over a period of years, while herds of grade animals of less money value have not been given similar attention.

As clearly showing what a continuous use of the tuberculin test may be expected to accomplish, a comparison of percentages of reactors found on first, second and third tests, showing a decrease from 31 per cent on first tests to 7 per cent on second tests and thence to 4.5 per cent on third tests, is at once convincing. There seems to be no doubt that continued work of this kind, efficiently and faithfully carried out, with due regard for all the necessary precautions against re-infection, will result in rapid progress toward elimination of the disease.

An "accredited" herd is one which has passed three semi-annual or two annual tests without a reacting animal having been found, and our record of the retests of such herds, showing that only one-half of 1 per cent reacted, indicates that continuous tuberculin testing with "accreditation" in view is well worth while from the standpoints both of the cattle owner and of the officials in charge of the control of this disease.

On Oct. 15, 1923, a regulation went into effect at the Brighton stockyards requiring that all cattle sold at those premises, unless for immediate slaughter, must have passed a tuberculin test. Formerly cattle arriving at those premises from Massachusetts farms were not tested and were sold without restriction.

The Brighton stockyards are an important distributing center for dairy cattle, and it would seem a very necessary control measure that the animals there sold to go to the farms in different parts of the State should be tuberculosis-free. We confidently expect that the effect of this new regulation will be noticeable

in the near future, and, what is quite important to the cattle trade itself, that a long existing criticism of the cattle business as carried on at this point will cease.

From Oct. 15 to Nov. 30, 1923, the period during which cattle from Massachusetts farms have been tested at this market, 459 animals have been received, 101 of which were tested on arrival, and 358, which were accompanied by satisfactory certificates of recent test made by approved veterinarians, were released for sale without restriction.

Of the 101 animals held for examination, 6 were released for slaughter and not tested, 1 was returned to owner because not in condition to test, 67 were tested and passed, and 27 reacted and were either slaughtered or returned to owners' premises, each animal so returned bearing a reactor tag for identification. These returned reactors were only 7 in number, the remaining ones being slaughtered. The percentage of diseased animals disclosed by the test at these premises (27) proves the value of this regulation, and points to its probable efficacy as a means of limiting in a measure the spread of bovine tuberculosis from farm to farm within the State.

#### *Recommendations for New Legislation.*

1. A condition which now threatens to offset in a large measure the progress being made in the eradication of bovine tuberculosis under the provisions of chapter 353 of the Acts of 1922, approved May 2, 1922, and known as the tuberculin-testing law, is the operation of section 4 of that Act, which provided that on and after August 1, 1923, section 12 of chapter 129, as amended by section 2 of chapter 353, should be repealed.

Said section 12 of chapter 129, General Laws, is the statute under which, until its repeal (Aug. 1, 1923), the Commonwealth paid for cattle condemned and killed because affected with tuberculosis, and the operation of which resulted in the slaughter of many badly diseased animals so far advanced in the stages of tuberculosis as to be readily recognized by their owners and by local inspectors. They then became subjects for immediate quarantine, which was followed by their condemnation and killing under orders of the Director of Animal Industry.

An owner of such an animal would always report its condition to his local town inspector or direct to the Division of Animal Industry, knowing that official condemnation and killing meant the payment of a certain amount of money as a partial reimbursement for his loss. As soon, however, as State indemnity was withdrawn by the repeal of this section of law, the attitude of the owners of this class of animals immediately changed. They now, in many instances, fail to report them, as nothing is to be received from the State as reimbursement, and the disagreeable publicity of quarantine is avoided.

What now happens in such instances is that a badly diseased tuberculous cow is kept milking as long as possible, and in the meantime she is rapidly spreading the disease to other cattle, not to mention the possibility of its spread to the human subject. The final disposal of such an animal is death from the disease, slaughter by the owner, or sale at whatever price she will bring in the market. In the latter case there is the extension of a center of infection to another location, other cattle are exposed, and possibly other human lives jeopardized.

Before the law referred to was repealed these animals, as stated, were reported, then quarantined, killed and paid for; further, members of the same herd were examined for additional cases, and the premises were cleaned and disinfected. These measures undoubtedly limited to a large degree the spread and prevalence of the disease, were measures of sound economy, and immeasurably effective in protection of the public health.

Upon *repeal* of the law providing for reimbursement for this class of cases, we found their number reported to official authority immediately dropping 75 *per cent*. This means that a large per cent of the badly diseased tuberculous cows in the State are continuing to live and spread the infection. In my opinion it would be far better for the Commonwealth to pay something for these creatures, and have them condemned and killed. This would be of itself a measure of true economy and would certainly be greatly in aid of the present movement to eradicate tuberculosis by use of the tuberculin test.

The Commonwealth is now spending large amounts of money to eradicate the disease by scientific methods, and to allow active spreaders of the disease to exist because of no practicable law by which to exterminate them would seem to be a paradoxical condition which should be remedied.

I therefore recommend the enactment of legislation whereby the present condition, brought about by the repeal of section 12, chapter 129, General Laws, may be eliminated.

2. A condition operating directly against the eradication of bovine tuberculosis by use of the tuberculin test, in accordance with the provisions of chapter 353, Acts of 1922, is the indiscriminate sale of animals which have reacted to such test.

Chapter 137 of the Acts of 1922 places certain restrictions on the sale of this class of animals, but does not absolutely prohibit it. Consequently there is more or less traffic in them, resulting in spread of the disease from one farm to another.

In my opinion the owner of an animal which has reacted to a tuberculin test should not be allowed to sell the same except for purposes of immediate slaughter. If he desires to retain such an animal in his own herd he alone should assume the responsibility, be the consequences what they may, but the public should be protected against the consequences of this traffic in diseased animals.

It is my opinion that the expenditure of money by the Commonwealth to eradicate bovine tuberculosis is rendered more or less futile if the disease is allowed to be carried from one farm to another by the sale of animals known to be affected therewith.

I therefore recommend that said chapter 137, Acts of 1922, recorded as section 33 A of chapter 129 of the General Laws, be so amended as to prohibit the sale of reacting cattle except for immediate slaughter.

#### *Interstate Cattle.*

Federal regulations applying to the shipment of dairy or breeding cattle from one State to another now require that all animals of that class of whatever age shall have passed a recent tuberculin test before the shipment takes place, an exception to this regulation being that animals from "accredited tuberculosis-free" herds may be shipped interstate without test.

These Federal regulations relieve us to a large extent of the former necessity of applying the tuberculin test to the majority of cattle arriving within the State, and consequently this branch of our work has been very much diminished since this Federal regulation became operative.

Another modification of the Federal regulations is that untested cattle may be shipped interstate if consigned to "public stockyards," under which designation the Brighton stockyards are now classified. Dairy or breeding cattle must be tested on arrival at Brighton unless accompanied by satisfactory certificates showing they have passed a recent test applied by a veterinarian whose work is approved by the live-stock official of the State where the shipment originates. Check tests are made from time to time on these certified animals to make sure that the efficiency of the testing is up to the proper standard and that dishonesty or misrepresentation has not been practiced.

Receiving stations for cattle consigned to the Brighton market are maintained at Watertown and Somerville and are under the same quarantine restrictions as the main yards at Brighton.

During the year 11,140 interstate dairy cattle have been received at Brighton, either shipped thereto direct or through the other receiving stations mentioned. Of these, 4,234 were from New Hampshire, 4,110 from Maine, 2,680 from Vermont, 108 from New York, and 8 from Connecticut. Of the total number received, 8,700 were released for sale on approved records of tuberculin test, and 2,440 were held for test by State and Federal officials, the reactors being slaughtered.

At other points in the State there have been received 6,302 dairy or breeding cattle from other States, all tuberculin tested either before shipment or immedi-

ately after arrival in cases where interstate regulations have not been complied with through ignorance or wilful intent.

The total number of dairy or breeding cattle received from other States at all points in Massachusetts shows a grand total of 17,442, approximately the same number as in 1922, an increase, however, of 175 animals.

#### CONTAGIOUS DISEASES OF SWINE.

*Hog Cholera* is the principal disease of swine that is contagious and the one which originally directed the attention of live-stock officials to the importance of applying measures of control to diseases affecting that species. Ten years ago when the campaign against this disease was first started in Massachusetts, it was prevailing so extensively that many whole herds were being wiped out of existence, or the deaths were so many that swine production as an industry was rapidly being abandoned on account of the financial losses sustained. A large proportion of swine raisers, who had previously been successful in the production of pork for the market by the utilization of garbage for feeding the animals, were being forced to abandon this cheap material for other of much higher cost, or go out of the business. All the elements necessary to perfect nutrition and rapid growth of swine are to be found in ordinary household garbage, and the feeding of this material, which in many communities had been entirely wasted, originally promised to become not only a great community economy but also the foundation of a successful business. The venture, however, was proving disastrous on account of garbage frequently being the carrier of disease by scraps of tissue originally coming from swine slaughtered and sold after being affected with hog cholera, and not until the development of a treatment by which swine could be immunized against this infection could they be safely raised to marketable age in sufficiently large numbers to be profitable.

When this Division undertook a campaign against the prevalence of hog cholera, immunization had already been successfully developed by the United States Bureau of Animal Industry and has since been progressively improved to the point where it is now generally recognized as a safe, effective and inexpensive treatment, sure to prevent the disease if properly administered before infection takes place. We have therefore always urged all swine owners to have their herds protected by applying early to this Division for this service, which is rendered free of charge, the owner having to pay only for the materials used.

As in many other ways where people are unmindful or careless of their own best interests, swine owners often delay their requests for service until too late for complete protection against disaster, as we can only partially avert their losses if hog cholera has already broken out on their premises. However, even in such cases we are generally able to minimize losses to a degree well worth while, but always regret financial losses that were really preventable.

The prevention of contagious disease in swine is a conservation work of really great economic value, and our service in this direction is second in importance only to our control and eradication of contagious diseases of cattle. While hog cholera is the most disastrous of swine diseases, others are now commanding increased attention each succeeding year as their importance to the successful outcome of swine raising as a business industry is more generally recognized. Further on in this report, for instance, it will be shown that we have administered this year more than three times as many treatments in the cure or prevention of swine plague (hemorrhagic septicemia) as during last year.

Starting hog cholera prevention work in 1914 under plans well considered and comprising restrictions against the indiscriminate use of biologics which were valuable if used carefully and with good judgment, but dangerous if used without discrimination, we have found no reason to change our policies or regulatory orders in this branch of the service.

There have been 66,627 treatments in prevention and cure of hog cholera administered this year to swine in 625 herds, these herds varying in size from those consisting of one pig only to some exceeding four thousand in number. The herds were located in 171 cities and towns and necessitated 1,508 visits by one or more field veterinarians.

In addition there were 77 visits made to places where no treatment was applied, either because the swine were so badly infected as to preclude all chance of recovery, or because, as in some instances, the trouble was of a non-contagious nature not calling for State service. In other instances sanitary conditions necessary to successful treatment could not be established.

Attention is directed to a graph in the appendix to this report showing the number of treatments in control of hog cholera over the period of years from the inception of this work to the present time.

*Hemorrhagic Septicemia in Swine.*— This disease, otherwise known as "swine plague," has prevailed to a greatly increased extent this year, our records showing that treatment has been applied by our field veterinarians to three times as many animals as during the year 1922.

Symptomatically it very much resembles hog cholera in many outbreaks, and a differential diagnosis in the field is often difficult even by well trained veterinarians of extensive experience. Frequently these infections are found coexistent and it is impossible to determine which of them is the primary invader, and in such cases treatment must be directed against both diseases.

Similar conditions have been reported from many other States during the present year, and a factor which may have influenced the number of reported instances is the rapid development of more acute observation on the part of those who have made careful study of field conditions and have based their diagnoses on such observation and study.

Various biological preparations designed for the prevention or cure of hemorrhagic septicemia in swine are now available and are being used successfully. Private veterinarians are not restricted from the use of these materials and in some sections of the State many swine are treated by them. However, as a swine owner generally considers any outbreak of disease to be hog cholera and applies to this Division for service, it happens that the great majority of cases of hemorrhagic septicemia are referred to us, designated as hog cholera; the animals involved therefore come under our supervision and proper service in the emergency is rendered.

During the year 26,540 treatments have been administered for the prevention or cure of hemorrhagic septicemia in swine. This number represents three times the service of this kind rendered in 1922, and as we are still busily engaged in this work at the end of the year the prospect for 1924 is that we shall be called upon for a service still further increased.

#### RABIES.

Among specific infectious diseases rabies is one of the more important, especially because of its high mortality, its constant prevalence in practically all civilized countries, and the difficulty in its extermination when once it has become firmly established. Although primarily a disease of animals and mostly prevalent among dogs, which species is the principal factor in its spread, nearly all mammals are susceptible to the infection and under certain circumstances of communicability may become its victims. Because of these facts the danger to people during any unusual prevalence of the disease among dogs must be recognized, and the circumstances surrounding local outbreaks given careful attention.

Until this year the general prevalence in Massachusetts has shown a gradual yearly increase since 1918, progressively spreading from one community to another, in some instances disappearing from one section only to be found cropping out in another, so that the total number of cases recorded in the State as a whole has still remained high. We have reason to hope, however, that it has now arrived at the peak of its prevalence, as the number of positive cases recorded this year is practically the same as in 1922, and we confidently expect a recession to be shown in the coming year. Many diseases of this character seem to follow a cycle of incidence, and the fact of no increase of positive cases of rabies occurring this year leads us to expect that the high point in its cycle has been reached and a recession is due in the near future.

Its control in any one community can generally be accomplished fairly promptly if we can get all agencies co-operating to this end. Among these agencies strict enforcement of the dog license laws is of great importance. Unfortunately, however, these laws seem to be practically ignored in many towns and cities or are only spasmodically enforced. Many dogs, especially those of low grade and value, would be destroyed if any one was obliged to pay for a license to keep them, and, as animals of this class are very potent factors in the spread of rabies, the lax enforcement of the dog license laws is an unfortunate condition, especially in communities where an outbreak of rabies has occurred and control measures of every kind are necessary to its suppression.

Selectmen, mayors and boards of aldermen have the authority to issue orders calling for the muzzling or restraining of the dogs in their municipalities whenever the same seems to be necessary. In the excitement attending a fresh outbreak of this disease, when public opinion is acutely alive to the dangers of the situation, such orders are deemed necessary and are at first generally well observed by the dog owners and well enforced by the police authorities. As soon, however, as the first excitement has subsided, we find that in many instances there is no observance of them by the public, no enforcement by the authorities, and conditions relax to the same level of non-attention as in case of the State laws regarding the licensing of dogs. Effective control of rabies in any community is not to be gained in a short time, and how to offset the perplexing conditions of non-observance and non-enforcement of State laws and local regulations is yet a problem.

There is some promise of relief of the rabies situation in the recent development of a practicable method of treatment for the prevention of this disease by immunization of susceptible animals. This method has now been brought to a point where in many cases animals may be protected against rabies by a single injection of a properly prepared canine rabies vaccine. A general use of this treatment on dogs licensed according to law, and the impounding or humane destruction of all ownerless or unlicensed dogs, would undoubtedly immediately reduce the prevalence of rabies to a negligible point. There would arise many difficulties in the carrying out of such a plan by official authority, but the fact that it is possible to protect animals which for any reason are valued by their owners is being taken advantage of, and is of some relief to the general situation. Dogs which have been exposed to rabies are ordinarily quarantined for a period of 90 days, but if owners have them immunized this Division will now release them from quarantine at the end of 21 days following treatment if no symptoms of rabies have appeared.

During the year ending Nov. 30, 1923, 2,017 animals were reported to the Division for diagnosis, observation or quarantine on account of the prevalence of rabies, and 53 reported cases were brought forward from the year 1922. Of these 2,070 animals, 455 dogs, 3 cattle, 3 cats, 3 pigs and 1 horse proved to be positive cases of rabies. Diagnoses were arrived at either by clinical symptoms, or laboratory examination of brains and the inoculation of small animals. These records show just one more positive case than the previous year.

The Division received reports during the year of 1,032 persons who had been bitten by dogs, 13 persons who were bitten by cats, and 1 by a horse.

In all cases reported of persons bitten by dogs, the local inspector of animals of the town or city where the animal is owned or kept is ordered to make an examination of the animal, and, even if it appears to be healthy, to have it quarantined for a period of 14 days for observation. This is a measure directly in protection of the public health. If by any chance the biting dog is affected with rabies at the time the bite is inflicted, unmistakable clinical symptoms of the disease will probably appear before the end of the quarantine period, and in such cases the bitten persons will have definite knowledge of that fact and will seek medical advice. If at the end of the 14-day period dogs which are quarantined on account of biting persons have not developed symptoms of rabies, they are released from quarantine.

The majority of the animals which inflicted bites on 1,046 persons as above

recorded were released at the end of the quarantine period showing no symptoms of rabies.

Of the 2,070 animals reported for observation, 93 dogs and 3 cats were, as far as could be ascertained, ownerless and the dogs unlicensed, and 44 of these ownerless dogs proved to be positive cases of rabies.

#### GLANDERS.

Attention is directed to a graph in the appendix of this report showing the history of glanders prevalence in this State for a period of twenty years.

It will be seen that while at some periods the number of cases indicated a very serious situation, notably in year 1913 when 1,084 horses were destroyed because affected, the following five years' record of cases showed a rapid decline to a point where the situation could be said to be a satisfactory one, and from that period to the present time — 1919 to 1923, inclusive — the situation has remained practically the same.

The use of modern methods of diagnosing the disease, including the mallein testing of all exposed animals, such as the stable and working mates of positive cases, may be given the greater part of credit for the present satisfactory aspect of the situation. Another factor to be recognized also is the lowering number of horses in commercial use and their better working conditions, which operate to lessen their susceptibility to disease of any kind. The horse's work-day has been shortened and he has been largely relieved by the motor truck of the heartbreaking long hauls of heavy loads which formerly were his task. The effort of various organizations having his welfare as their principal object has done much to educate his caretaker to an understanding of his needs and to a realization of his greater usefulness if well fed, comfortably stabled and properly cared for. All of these are influences of value in the control and eradication of disease of any kind in any species of live stock.

The horse is still a necessity in many lines of commercial trade, and on the average New England farm he is still the economic power. He and his near relative, the mule, are indispensable in military operations, and as a means of healthful recreation and pleasure the horse is in much greater demand than at any time for many years. Note his continuing importance as a drawing card at all animal expositions where the different types, draft, coach, saddle or speed, still receive genuine attention of interest.

Another and one of the most important uses of the horse to-day and in which he is well-nigh indispensable is in the manufacture of various biological preparations now used for the prevention or cure of many diseases of the human subject. Modern preventive medicine is rapidly increasing its use of these preparations, and this materially increases the demand for healthy horses for their manufacture.

Horses must therefore still be produced in considerable numbers and maintained free from contagious disease.

There were 53 horses reported during the year as suspected of glanders, of which number 13 proved to be positive cases of the disease. Horses in any way associated with these positive cases and classified as "contacts" — 79 in number — were mallein tested, 6 positive cases being found, making a total number of 19 positive cases for the year.

Of these 19 cases, 4 were condemned on clinical examination, and diagnoses in the remaining 15 cases were arrived at either by use of the ophthalmic mallein test or by laboratory examination of blood samples submitted to the complement-fixation test.

Of the reported cases 3 died or were killed by owners, and 110 of the total of reported and contact cases were released from observation as not diseased.

The 19 positive cases were located in 10 different cities and towns. Boston, which was formerly the storm center of the disease, has had only one case a year for the past three years. One other city and one town have each had 4 cases this year, one city and two towns have each had 2 cases, and two cities and two towns have each had one.

The laboratory work in this branch of the service is quite necessary and very important, and this year has consisted of the complement-fixation test of 140 samples of blood taken from 119 horses, for the purpose of diagnosis.

Ophthalmic mallein tests to the number of 82 have been applied to 66 horses owned in the State permanently, and 80 tests to 80 horses recently arrived from other States, a total of 162 tests to 146 animals. The results of these tests were 10 positive, 152 negative.

Under present regulations (Department Order No. 36) horses shipped to Massachusetts from New York, New Jersey, Rhode Island and Connecticut must be accompanied by a permit of the Director of Animal Industry. From these States there has been reported the arrival of 3,471 horses. They have been mallein tested on arrival unless accompanied by an approved record of test, or shown to be horses of the better class which ordinarily do not become exposed to the disease.

It is to be noted that no interstate horses have been found this year to be affected with glanders. Many of the animals from these States are of the better class referred to, used for carriage work, breeding, racing or exhibition purposes, and many of them are brought to the State for the summer season only. These of the better class do not require special attention on our part, but second-hand horses, trafficked in and sent from the markets of one State to those of another for public sale, have been specially watched on account of their being considered more liable to be subjects of contagious disease.

#### MISCELLANEOUS DISEASES.

*Anthrax.*— We are singularly fortunate in our freedom from outbreaks of this disease the past year. While during recent years the incidence of anthrax has been steadily declining and has this year reached the lowest point in its history as recorded, we are not unmindful of the terrible damage it sometimes occasions in a very short time following an outbreak, and often before local control measures can be set in motion. Its onset is so rapid and its mortality rate so high that many deaths of live stock are liable to occur even before centralized control authorities are notified of its outbreak.

An animal found dead in pasture from no recognized cause is generally the first incident to which attention is called, if any notice whatever has been thought necessary, and before the true nature of the trouble is determined and the danger is recognized, it sometimes happens that many other animals have been exposed to the disease and a certain number have become infected and later succumb. If such occurs and carcasses are not promptly buried, the infection may be carried in numberless ways to surrounding territory and a more or less general prevalence of the disease be started.

The bacillus of anthrax and its spore formations are very resistant to the conditions which ordinarily destroy germ life, and will remain potent for a long time—often for many years—living in the soil and ready to infect any susceptible animal which may come in close contact with them. It therefore happens that places where it has existed at any time may remain infected and subsequent outbreaks may occur even after the lapse of years. Consequently, following a positive diagnosis of anthrax it becomes necessary to at once put in operation preventive measures against its future occurrence.

Deep burial or burning of infected carcasses and material with which they have been in contact, disinfection of buildings, the burning over of surface ground where carcasses are buried or over which they may have been dragged, the protective inoculation of all exposed animals and those which afterwards are to be stabled or pastured on the same premises, and a thorough investigation as to possible sources of the original outbreak are the control measures which have generally been found to be effective, and to which our present favorable situation is undoubtedly due.

On several farms which have been previously infected we take the precaution to annually treat all susceptible animals with antianthrax serum and spore vaccine. An occasional death from the treatment occurs, but very infrequently, and

the majority of the animals are given absolute protection against the infection.

We have one horse barn in the central part of the State which has remained infected with anthrax for several years, in spite of as thorough application of disinfectants as can be devised. This building is therefore permanently quarantined and no animals are allowed to occupy it except those previously immunized against the disease.

The communicability of anthrax to the human subject is well recognized, more or less danger existing to those whose occupations require the handling of hides and wool which may have been taken from infected carcasses of cattle or sheep. The Division's work in control of this disease has therefore a public health relation of considerable importance.

Our records for the year show no positive cases of anthrax. Although 1 horse and 3 cattle were reported as affected, laboratory examination of specimens gave a negative result. Preventive treatment was applied to 21 cattle and 5 horses.

*Blackleg.* — This disease, otherwise designated as "symptomatic anthrax," is one to which much that has been said in our reference to that disease will apply, especially its sudden development, high mortality rate, resistant powers of its causative organisms, and the precautions necessary to prevent its spread. It generally develops, however, only during the pasture season and affects only the young cattle. It is unusual to find a case in an animal over two and one-half or three years of age, adult animals for some reason not being susceptible except in very rare instances.

Preventive treatment is also available and is completely successful in nearly all cases if applied before infection has taken place. This protection is considered to be effective for a period of one year at least. We have many farms in the State where blackleg has existed at one time or another, and we recommend that all the young cattle on these places be given the protective treatment, the best time for it being just before the cattle are turned out to pasture in the Spring. This service is furnished free and we find it quite generally availed of, especially in those sections where the disease has at any time prevailed.

On the occurrence of an outbreak we advise as a precaution the immediate removal of all susceptible animals from the pasture in which the disease has developed, and their treatment in prevention of the disease.

During the year 942 animals have been given protective treatment on 124 farms located in 43 different towns. Twelve deaths have been reported in untreated animals on farms located in 5 different towns.

The same general recommendations as in anthrax outbreaks, as to disposal of infected carcasses by burning or deep burial, are applicable following occurrence of this disease.

*Actinomycosis.* — A few cases of this disease are recorded every year and are generally disposed of by slaughter without reimbursement to the owner. If a case is not serious we allow the owner to have it treated by a private veterinarian and in some cases allow the animal to be held for fattening purposes under quarantine restrictions, to be released only for slaughter.

There have been 12 cases reported this year, one each in ten different towns and two in one town. Of these, 8 have been slaughtered, 1 has recovered and been released from quarantine, 1 proved to be a case of another disease, and 2 are undergoing treatment under quarantine restrictions.

*Hemorrhagic Septicemia in Cattle.* — This disease, of very great importance in some sections of the country, where large numbers of cattle are received through public stockyards, does not often occur in this State in the form which is reported from those sections. Our cases are of the acute, purely septicemic type, developing very rapidly and causing sudden death. At its onset it resembles anthrax in many of its symptoms and some cases are reported as that disease, the diagnosis of hemorrhagic septicemia being arrived at only by laboratory examination of material taken from the carcasses.

Ordinarily the spread of the disease can be prevented if we have early report of its outbreak, by immediate removal of contact animals to other premises and

their treatment by preventive methods. The losses are generally confined to the animals first affected, deaths occurring so suddenly that diagnosis is not made, and treatment cannot be applied early enough to save them. Our efforts are therefore in many instances effective only in saving the other members of the herd which may have been exposed to the same infection.

Our records show that outbreaks of this disease have occurred in eight towns this year, in which 17 deaths occurred. Preventive treatment was applied to 93 head of cattle.

A flock of 13 sheep in a suburb of Boston was reported as showing symptoms of contagious disease, and hemorrhagic septicemia was diagnosed by a Division veterinarian. Prompt treatment saved all the animals and stopped the spread of the disease.

Although the function of this Division is the control and eradication of such diseases of animals as are contagious or infectious, we naturally have many other disease conditions referred to us which are not in that category. Among such, and regarding which we have given advice to live-stock owners whenever requested, may be mentioned the following:—tuberculosis in a dog; poisoning of cattle by eating of fodder which had been sprayed with an arsenic mixture; foot rot; malignant tumors; tuberculosis in sheep, diagnosis negative; parturient paresis; an outbreak of disease causing death of seven young cattle at a State institution, no diagnosis made but contagion eliminated.

Infestation by parasites whose sphere of activity or cycle of existence in whole or in part may be in intimate relation to the animal body, externally or internally, is a condition often seriously interfering with normal health. As such a condition may be said to be a communicable one where certain kinds of these organisms are the ones involved, the Division is frequently called upon for advice as to the best methods of extermination.

The prevalence of scabies or "mange" affecting horses, cattle or sheep is at times widespread and when brought to our attention demands quarantine measures. Much less prevalent than formerly, we have had a relatively small number of cases to contend with. Thorough application of remedies according to directions furnished generally results in destruction of the parasites within a reasonable period and the infested animals are then released from quarantine. Unfortunately many cattle owners are not disposed to carry out the necessary treatment or to take proper precautions against a spread of the infestation from one animal to another, and in that way they lose much of the normal producing power of their animals. There have been 214 cases of mange in cattle reported this year on 15 premises in 10 towns, and only 3 infested horses.

The treatment of conditions due to internal parasites was never before given the attention by progressive live-stock raisers which it now commands, and much valuable information of a scientific character is now being taken advantage of by veterinarians and live-stock owners. Wonderful results are being obtained in the way of better growth of young animals and increased production by the mature ones, and larger revenue in consequence.

An instance showing the great loss which may be occasioned by delay in investigation of causes of malnutrition is one where we were called in for advice and found that 132 sheep had died because infested with stomach worms. The owner was advised to slaughter the remainder of the flock and take precautions against such a condition again occurring.

Nodular disease, a parasitic infestation of the intestinal tract quite common in sheep, has not been reported this year, but it probably prevails more or less extensively, being often found at the abattoirs at time of slaughter.

*Foot-and-Mouth Disease.*—For another year we have been fortunate in not experiencing an outbreak of this disease, although at no other period has this country been in such great danger of an invasion. Great Britain, since the World War, has had the largest number of outbreaks in her history, and has been spending millions of dollars for its extermination. It has also prevailed in many European and Asiatic countries, and in parts of South America with which the United States has intimate trade relations. The contagion is thought to be

very readily transmitted from place to place, and our freedom from an invasion of it is really remarkable. Live-stock officials of the Nation and the several States are very much alive to the impending danger and are ready to take immediate steps to control the disease on the first report of its appearance.

*Bovine Infectious Abortion.*— This disease is a specific infection existing in practically every section of the country, and for many years has been the cause of much anxiety on the part of cattle owners and live-stock officials on account of the great losses in breeding efficiency and a consequent diminution in the amount of dairy products which animals may be expected to yield under normal conditions of health.

For many years its cause, means of dissemination, and possible methods of control have been subjects of study by the most eminent scientific investigators in veterinary medicine, and while as yet there is not entire agreement on many phases of the subject, yet the wide discussions of it have brought forth the great importance of many correlating pathological conditions formerly ignored and not considered to be related to the phenomenon of premature birth or to that of true abortion.

The problem of control does not seem at present to be one for the application of regulatory methods by live-stock officials. It is rather to be solved in individual herds by private veterinarians who, in addition to well known hygienic measures of value, have at hand the evidence of many as to the practicability of immunization of animals by the use of biological preparations.

One State (Georgia) is making the experiment of prohibiting the shipment to that State of animals affected with abortion disease. The difficulties attending the enforcement of regulations to accomplish control must be many, if all interests are to be considered with fairness. The result of Georgia's departure in a new direction for the protection of its cattle interests by interstate regulation will be awaited with much interest by this Division.

We render service in the way of obtaining laboratory diagnosis as to the presence of the *bacillus abortus* in animals. There have been received this year 63 samples of blood for this diagnosis. They were taken from animals on 11 different farms. Of these samples, 12 were diagnosed as positive, these 12 coming from 6 different farms.

*Other Infectious Diseases.*— The finding of tuberculosis in swine at time of slaughter often means the presence of that disease in cattle on the same premises. Inspectors of slaughtering occasionally bring to our attention cases of swine tuberculosis, and we immediately examine all members of the herd of cattle for evidence of the disease. Only four cases have been reported this year from four different towns, but in our opinion many inspectors neglect their duty in this direction.

Among rare cases of infectious disease reported are one of tuberculosis in a dog, and one of Johne's disease in a cow.

#### LABORATORY SERVICE.

A very important auxiliary to the work of this Division is the laboratory service rendered by the bacteriological laboratory of the Department of Public Health.

We have many instances occur in which positive conclusions as to identity of disease can only be established by laboratory diagnosis, and in many other instances we desire confirmation, by laboratory examination, of clinical diagnosis made in the field. This service is therefore invaluable, and in many directions well nigh indispensable.

In the control of rabies in many instances we could not proceed properly without the information to be gained only by the laboratory examination of the brains of animals suspected of the disease or of having been exposed to it. This information is of very vital importance from a public health protection point of view, when it happens that persons have been bitten by the suspected or exposed animals.

During the year the brains of 417 animals have been examined for diagnosis

as to the presence of rabies infection. This number is a reduction from last year of 66 examinations.

In the control of glanders the laboratory examination of samples of blood taken from horses suspected of or exposed to this disease is found necessary. Complement-fixation tests of 140 blood samples have been made this year.

In addition to the above, 20 specimens have been examined taken from animals suspected of the following diseases: anthrax, 3; blackleg, 1; glanders, 3; hemorrhagic septicemia, 9; tuberculosis, 2; Johne's disease, 1.

#### ANNUAL INSPECTION OF FARM ANIMALS AND PREMISES.

Under the provisions of section 19, chapter 129 of the General Laws, an order was issued by the Director on Jan. 10, 1923, to every inspector of animals in the cities and towns of the Commonwealth calling for an inspection of all cattle, sheep and swine and of the premises where kept.

This order called for the completion of the inspection by March 1, and for a report of the same to be promptly forwarded to the Division's office. The inspectors' reports came forward in most instances in good season and were duly examined and tabulated in minute detail.

These reports first of all constitute a "census" of the cattle, sheep and swine on the 31,000 farms or premises in the State where these species of animals are kept. From these reports the following interesting facts are gathered:—

The number of cattle of all kinds has decreased from the 1922 record of 237,186 to 232,090 in 1923, a difference of 5,096 head. This year's record is, however, still above that of 1921 by about 1,100 head, and approximately 5,300 head above the record of 1920.

The number of dairy cows we find to have reduced by 509 head from the number recorded in 1922. The number this year is, however, greater than in 1921 by 8,169 head, and exceeds that of 1920 by 13,954, the total for this year being 168,361.

As the records for fifty years show the average number of dairy cows in Massachusetts to have been approximately 160,000, it can be truthfully said that this class of food-producing animals are holding their own as far as numbers are concerned, but it must be admitted are unfortunately not keeping pace with the fast increasing population.

The number of swine has been steadily decreasing for the past five years. During the World War pork production was so stimulated that the number of swine raised in the State increased very rapidly, those recorded reaching a number of over 100,000. Due to a constantly lowering market in recent years the swine industry has rapidly declined and inspectors this year record only 62,766 found upon the farms visited, a reduction of 5,813 head from the previous year.

The number of sheep has also continued to decrease, only 11,633 being recorded this year, a number less by 1,909 than in 1922. This decline in the sheep industry has also been a gradual one, the number now on the farms having decreased 33 per cent since 1917.

Several factors have undoubtedly entered into the decline in the sheep and swine industries, one of which is the increasing prices of feed and another the lowering prices of marketed carcasses.

Referring to the service of local inspectors of animals in their annual examination of all cattle, sheep and swine, and the premises on which they are kept, it should be said that in the great majority of towns and cities the work has been thoroughly and faithfully attended to. It has happened that in a few towns the work has not been of a character to be commended and reports of the inspection have been very much delayed, no report being received this year from two towns. It will probably be necessary therefore for the Director to exercise the coming year his prerogative of disapproval of the renomination of such inspectors as have not rendered satisfactory service.

A capable inspector who performs his duty faithfully and promptly is a valuable asset to the live-stock industry of his community and is a public health auxiliary of no small importance. It happens in most of the smaller towns,

however, that his remuneration is not commensurate with the value of good service, and this condition in some communities lowers the high standard to which we would like to see this valuable work attain in every city and town.

Meetings of local town and city inspectors were held this year at Greenfield, Pittsfield, Springfield, Worcester, Falmouth and Boston. These meetings, called primarily for the purpose of discussing matters relating to the service in which the inspectors and officials of the Division are mutually interested, were this year thrown open to the public, and the eradication of bovine tuberculosis under the tuberculin testing law was made the principal subject for discussion. The attendance of inspectors was fairly good, but the number of cattle owners, or of the general public who came to the meetings, was disappointingly small.

District veterinarians have made 772 visits to premises where unsanitary conditions existed and which local inspectors had failed in having corrected. In the majority of instances the final result has been a satisfactory improvement.

REPORTS OF RENDERING COMPANIES.

Section 154 of chapter 111 of the General Laws requires rendering companies to report to this Division every animal received by them which is found to be infected with a contagious disease, and the information thus furnished is of value in bringing to the attention of the Division occasional cases of these diseases which otherwise would not be known.

Twenty-two reports covering 50 cases of contagious diseases were received from rendering companies, 4 of which had not been otherwise recorded.

FINANCIAL STATEMENT.

Appropriation for the salary of the Director, chapter 126, Acts of 1923 . . . . .		\$3,500 00	
Expended during the year for the salary of the Director . . . . .		\$3,500 00	
Appropriation for personal services of clerks and stenographers, chapter 126, Acts of 1923 . . . . .		\$9,300 00	
Expended during the year for the following purposes:—			
Personal services of clerks and stenographers . . . . .	\$8,615 66		
Extra clerical and stenographic service . . . . .	33 75		
Total expenditure . . . . .	\$8,649 41		
Unexpended balance . . . . .	650 59		
			\$9,300 00
Appropriation for services other than personal, including printing the annual report, traveling expenses of the Director, and office supplies and equipment, chapter 126, Acts of 1923 . . . . .		\$6,200 00	
Expended during the year for the following purposes:—			
Books and maps . . . . .	\$107 99		
Express and messenger service . . . . .	209 66		
Postage . . . . .	555 49		
Printing report . . . . .	107 24		
Other printing . . . . .	714 27		
Telephone and telegrams . . . . .	699 97		
Stationery and office supplies . . . . .	1,149 36		
Expenses of the Director . . . . .	468 24		
Total expenditure . . . . .	\$4,012 22		
Unexpended balance . . . . .	2,187 78		
			\$6,200 00
Appropriation for personal services of veterinarians and agents engaged in the work of extermination of contagious diseases among domestic animals, chapter 126, Acts of 1923 . . . . .		\$48,000 00	
Brought forward from 1922 appropriation . . . . .		18 00	
Total amount appropriated . . . . .			\$48,018 00

Expended during the year for the following purposes:—		
Services of regular agents . . . . .	\$31,187 58	
Services of per diem agents . . . . .	6,332 00	
Labor hired . . . . .	104 00	
	<hr/>	
Total expenditure . . . . .	\$37,623 58	
Unexpended balance . . . . .	10,394 42	
	<hr/>	\$48,018 00
Appropriation for the traveling expenses of veterinarians and agents, chapter 126, Acts of 1923 . . . . .		
	\$23,000 00	
Brought forward from 1922 appropriation . . . . .	4 50	
	<hr/>	
Total amount appropriated . . . . .		\$23,004 50
Expended during the year for the following purposes:—		
Traveling expenses of regular agents . . . . .	\$16,064 52	
Traveling expenses of per diem agents . . . . .	2,953 71	
	<hr/>	
Total expenditure . . . . .	\$19,018 23	
Unexpended balance . . . . .	3,986 27	
	<hr/>	\$23,004 50
Appropriation for reimbursement of owners of cattle and horses killed during the present and previous years, travel, when allowed, of inspectors of animals, incidental expenses of killing and burial, quarantine and emergency services, and for laboratory and veterinary supplies and equipment, chapter 126, Acts of 1923 . . . . .		
		\$32,000 00
Expended during the year for the following purposes:—		
985 head of cattle condemned and killed on account of tuberculosis in 1916, 1918, 1920, 1921, 1922, 1923, paid for in 1923 . . . . .	\$25,608 50	
18 horses condemned and killed on account of glanders . . . . .	900 00	
Supplies for veterinary inspectors . . . . .	292 89	
Laundry . . . . .	357 05	
Antiseptics, biologics and disinfectants . . . . .	315 86	
Thermometers, needles, syringes, etc. . . . .	498 81	
Ear-tags, punches, chains, etc. . . . .	1,515 52	
Expenses of killing and burial . . . . .	218 83	
Expenses of travel allowed inspectors of animals . . . . .	454 58	
Quarantine expenses . . . . .	62 00	
Rent of halls for inspectors' meetings . . . . .	18 50	
Sundries . . . . .	48 00	
	<hr/>	
Total expenditures . . . . .	\$30,290 54 <sup>1</sup>	
Unexpended balance . . . . .	1,709 46	
	<hr/>	\$32,000 00
Appropriation for reimbursement of owners of certain cattle killed in accordance with agreements made under authority of chapters 353 and 546, Acts of 1922 . . . . .		
	\$100,000 00	
Brought forward from 1922 transfer from the Extraordinary fund . . . . .	5,000 00	
Brought forward from 1922 appropriation . . . . .	7,110 68	
	<hr/>	
Total amount appropriated . . . . .		\$112,110 68
Expended during the year for the following:—		
2,283 head of cattle killed (chapter 353, Acts of 1922) . . . . .	\$67,835 22	
Unexpended balance . . . . .	44,275 46	
	<hr/>	\$112,110 68

<sup>1</sup> This amount reduced by \$31.50 refunded on account of expense of previous years.

The average amount paid for condemned tuberculous cattle for the year is \$24.27.

Fifty-seven claims for reimbursement for cattle condemned and killed as physical cases of tuberculosis during the year remain unsettled, these claims amounting to \$1,355.

One hundred and two unpaid claims covering 1,011 cattle, to which provisions of chapter 353, Acts of 1922, apply, remain unpaid, amounting to \$28,367.10.

Two claims amounting to \$100, applying to horses condemned and killed during the year because affected with glanders, remain unsettled.

There has been received during the year from the sale of hides and carcasses of condemned animals \$127.60.

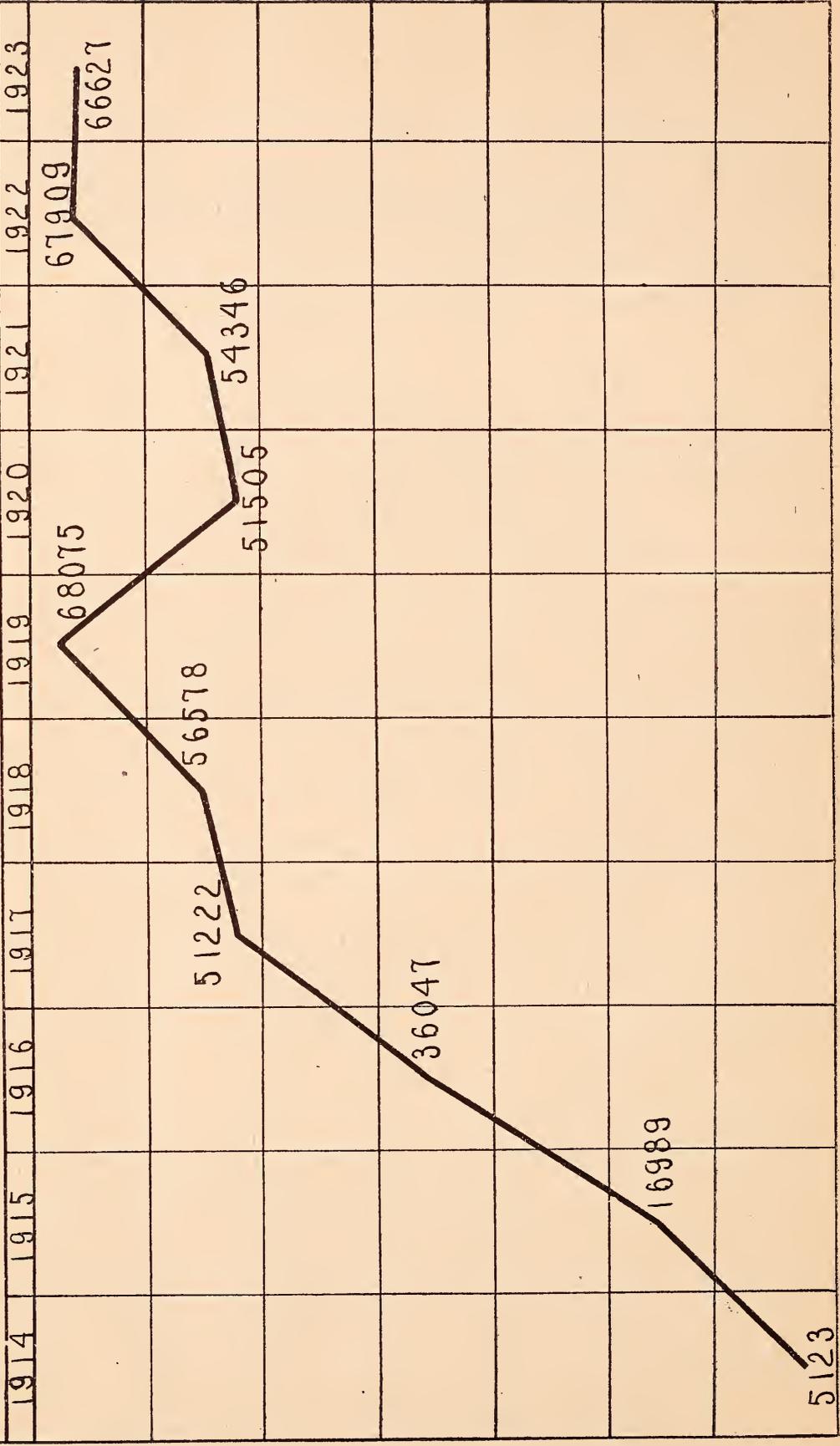
Respectfully submitted,

LESTER H. HOWARD, *Director.*

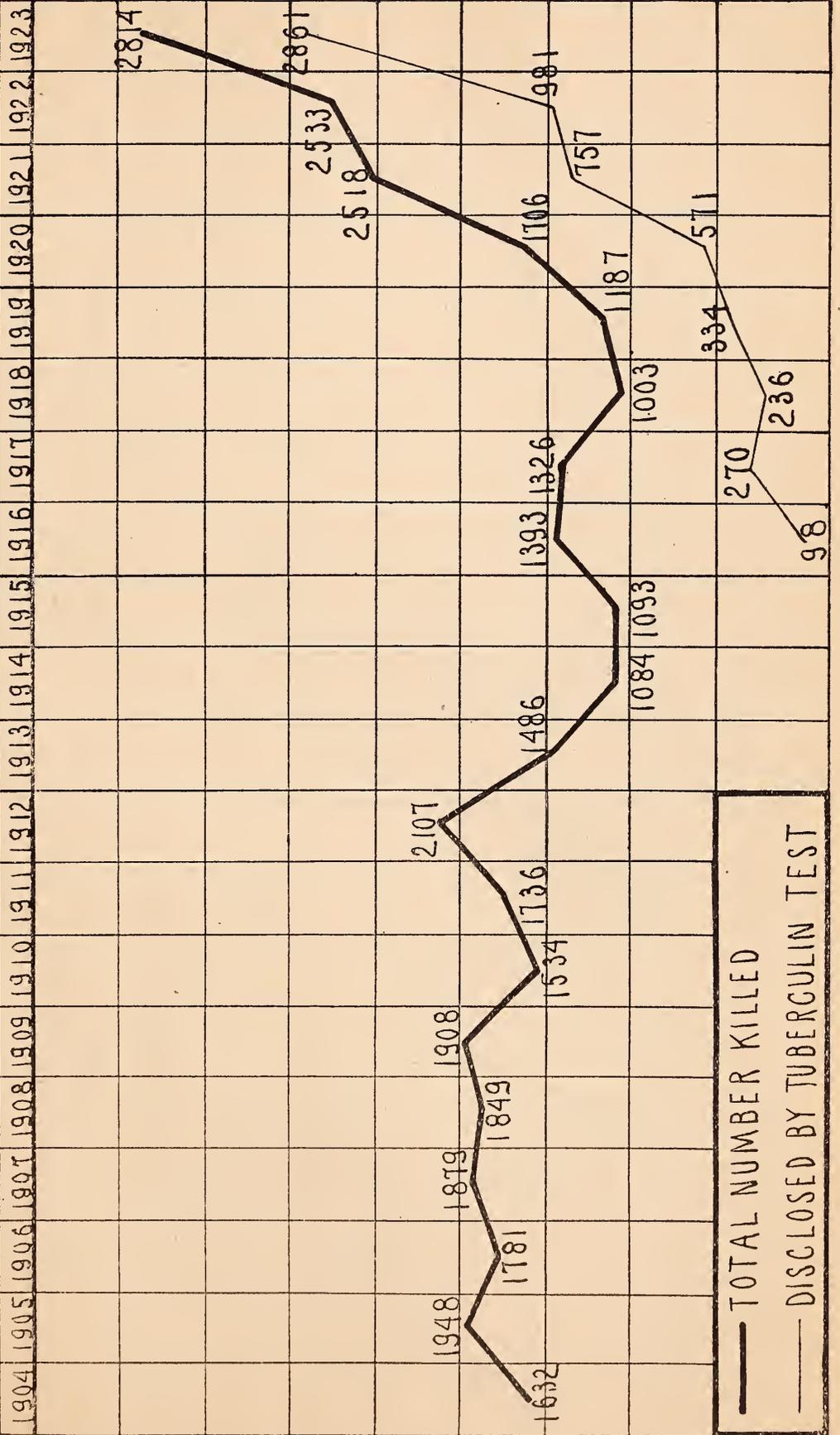
#### APPENDIX.

The following graphs show the work of the Division of Animal Industry in control of the principal contagious diseases of animals for a period of years.

# HOG CHOLERA CONTROL - INOCULATIONS -

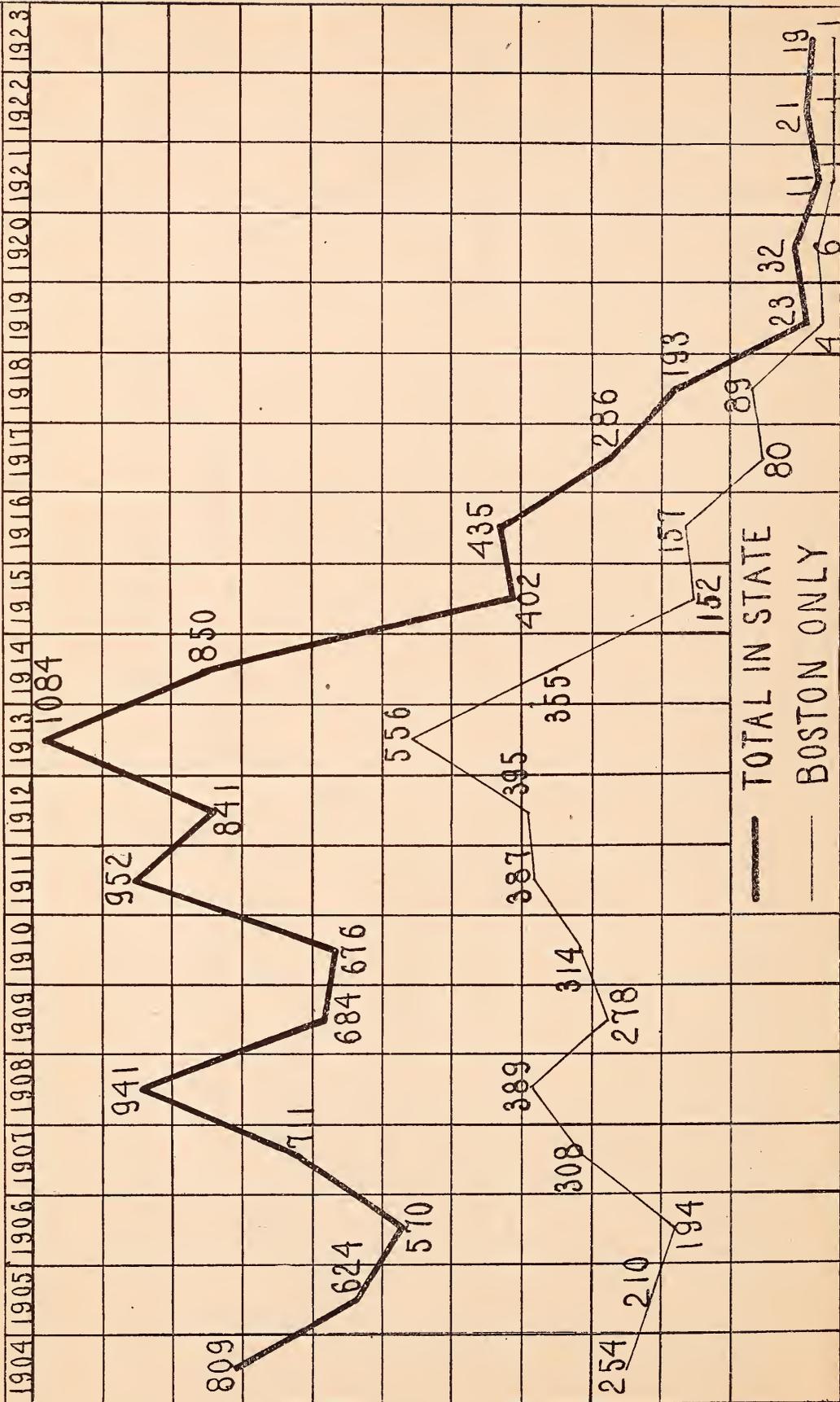


# BOVINE TUBERCULOSIS

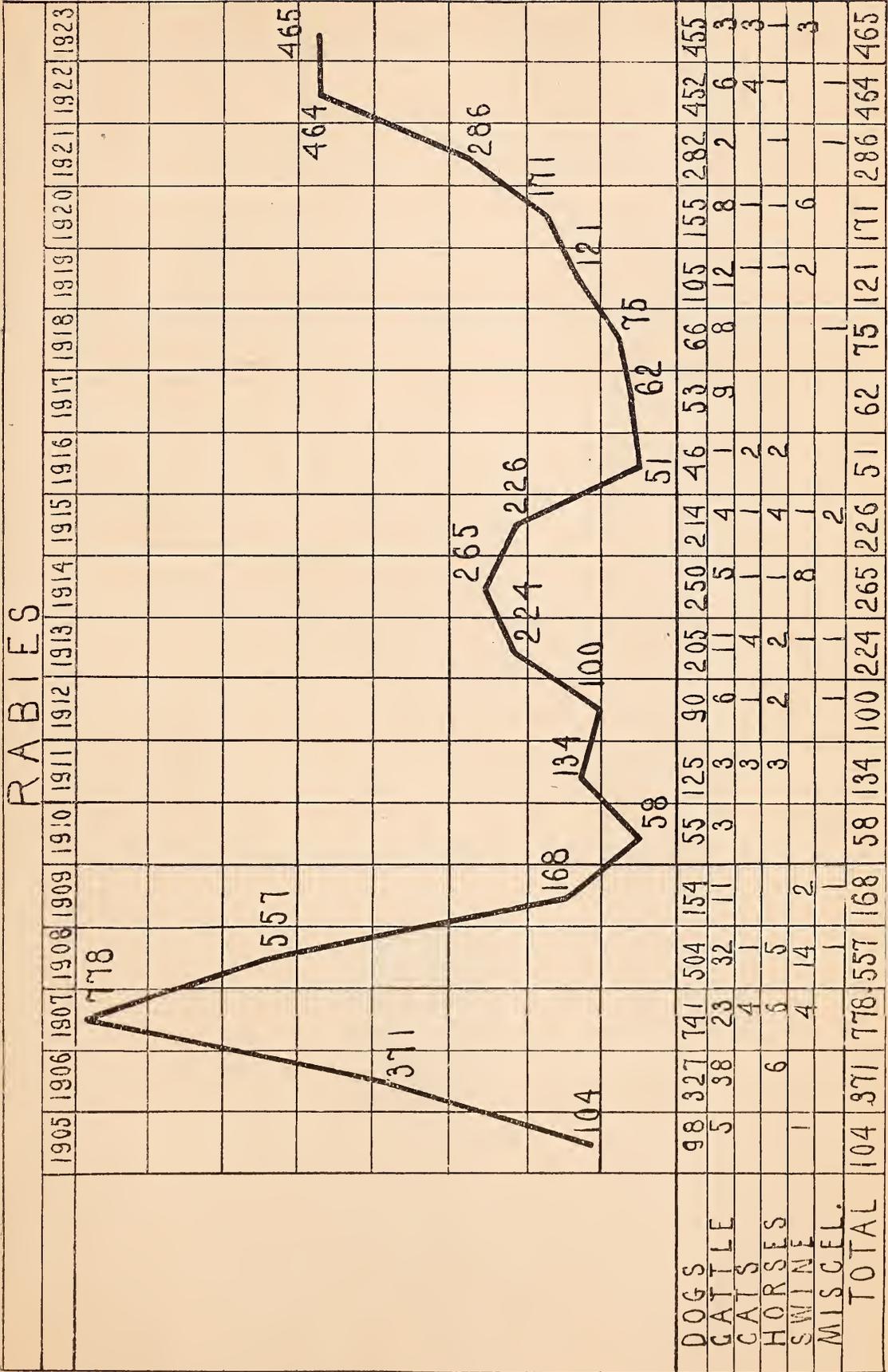


— TOTAL NUMBER KILLED  
 - - - DISCLOSED BY TUBERCULIN TEST

# GLANDERS



# RABIES





The Commonwealth of Massachusetts

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ANNUAL REPORT

OF THE

DIRECTOR OF ANIMAL INDUSTRY

FOR THE

YEAR ENDING NOVEMBER 30, 1924

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DEPARTMENT OF CONSERVATION



June 13, 1925

# The Commonwealth of Massachusetts

## DEPARTMENT OF CONSERVATION

DIVISION OF ANIMAL INDUSTRY,  
BOSTON, NOVEMBER 30, 1924.

*To the Commissioner of Conservation.*

I have the honor to present the following report of the work of this Division for the year ending November 30, 1924.

The Division attempts first of all to prevent the outbreak of contagious disease among our domestic animals, and to that extent assist in maintaining them in a condition of health. If such can be accomplished it operates to render them a source of revenue to their owners and to conserve in great measure that portion of the public food supply derived from their products while living and from their carcasses when slaughtered. The quality and nutritive value of this portion of our food supply is also found to be in direct ratio to the health of the animals producing it.

The dairying industry depends for its success on the production of large quantities of animal products of standard quality, and for good volume and high quality healthy animals are a first necessity. Neither propagation in sufficient numbers nor satisfactory development to maturity or to the point where their products become a source of revenue can be expected in animals affected with any form of contagious disease.

The relation of animal disease to the public health should be referred to. A diseased animal is sometimes found to be the source of the contagion of glanders, tuberculosis, rabies, anthrax, and other diseases appearing in the human subject. Such cases are fortunately of rare occurrence but their high mortality rate when attacking man calls attention to the vital importance of controlling these maladies at their most common source, and if possible eradicating them entirely from the animal kingdom.

Whereas the work of the Division this year in many of its less important branches has been of approximately the same volume as of recent years, the request for service in our most important branch—the control and eradication of bovine tuberculosis — has called for largely increased activity. The provisions of the so-called tuberculin test law have proven to be of such great aid to the progressive cattle owner who desires to raise and use only healthy cattle, and the number of local health boards which have directed their attention to the public health phase of the movement to eradicate all disease from animals whose dairy products are used for human consumption have so rapidly increased, that the result has been a greatly increased demand for our service in this direction.

It has happened that the general popularity of this work has far exceeded our expectations, and while we have been physically equipped to attend to all requests for the application of the tuberculin test, the exhaustion of funds appropriated for payment of indemnities for reacting cattle necessitated a slowing up of the work during the latter part of the fiscal year. We have on file a large number of requests from farmers, dairymen and the raisers of purebred cattle, to place their herds under our supervision for the eradication of tuberculosis, and it would seem that the amount of progress we may expect to make the coming year in this direction will depend largely on the funds appropriated by the incoming legislature for payment for cattle found to be diseased.

The prevalence of rabies is at all times a condition which calls for prompt attention on the part of this Division. Although somewhat reduced from the record of recent years it is still a situation of dire importance calling for strict regulatory measures. The lax enforcement of the dog laws and the lack of co-operation on the part of the public in ordinary preventive measures are often the cause of serious outbreaks of the disease, or make their control a much more serious problem.

The prevention of contagious diseases of swine constitutes quite an important part of the work of the Division, in volume amounting this year to about the same as in recent years.

While our recommendations to swine owners are for them to call for our service before sickness appears in their herds so that the animals may be given the present day successful immunization against disease, nevertheless it often occurs that they wait until too late for preventive treatment to be successful.

Hog Cholera, Hemorrhagic Septicemia and various mixed infections are the contagious diseases prevalent in this species and for the control of which our service is rendered.

The regular continuous duties of inspection of horses, cattle, sheep and swine and of the sanitary conditions under which they are kept, execution of measures in prevention, cure or control of contagious diseases among all the several species of domestic animals, and the condemnation and slaughter when necessary of such as are affected with certain forms of such diseases, followed by supervision of the burial or other disposal of their carcasses, have been attended to promptly and in accordance with the methods found by many years' experience to be most effective.

The enforcement of regulations applying to the transportation of animals from other states to Massachusetts is another important duty of this Division, as by these methods we make sure that no prevalence of contagious disease shall be caused by the entry of infected animals. Mallein testing of horses from certain states in which glanders has extensively prevailed, and tuberculin testing of dairy or breeding cattle shipped from other states and not accompanied by satisfactory records of tuberculin test, are continuous activities calling for prompt determination of actual health conditions at time of entry. Although Federal regulations now require that all cattle of whatever age shipped from one state to another for any purpose except immediate slaughter shall have passed a tuberculin test applied by an approved veterinarian before the shipment takes place, and we ordinarily depend on this regulation being complied with by cattle shippers, yet we find that many cases of violation occur either intentionally or through ignorance of the existence of any regulatory measures of the United States government applying to this class of interstate commerce. In such instances official action becomes immediately necessary in protection of the live-stock interests of the state, and all animals involved are immediately inspected and tuberculin tested. Failure to pass inspection and test requires condemnation and killing, without indemnity to owner unless post-mortem examination discloses no evidence of disease.

Following is a gross summary of the Division's work for the year ending November 30, 1924: —

## GENERAL SUMMARY

### CATTLE

2,372 Massachusetts cattle were physically examined by inspectors.

417 Massachusetts cattle were tuberculin tested by Division veterinarians at Brighton stockyards.

30,174 tuberculin tests of Massachusetts cattle were made by Federal and State veterinarians in co-operation.

1,542 interstate cattle were tuberculin tested by Division veterinarians.

9,917 tested interstate cattle were examined at Brighton and their test records viséed.

5,755 tested interstate cattle were inspected and identified at other points.

855 animals on 111 farms in 48 towns were given preventive treatment against blackleg.

19 animals were given preventive treatment against anthrax.

59 animals were given preventive treatment against hemorrhagic septicemia.

403 visits to unsanitary premises were made by district veterinarians.

### HORSES

242 tests for glanders were made by Division veterinarians.

2,506 interstate horses were examined by inspectors.

4 tests of whole stables were made by Division veterinarians.

### DOGS

1,680 cases of possible rabies in dogs were investigated.

## SWINE

73,290 head of swine were treated in prevention or cure of hog cholera.

28,208 head of swine were treated in prevention or cure of hemorrhagic septicemia.

## MISCELLANEOUS DISEASES

216 cases of miscellaneous diseases were investigated by Division veterinarians.

## BOVINE TUBERCULOSIS

The division's work in the control and eradication of this disease has been carried on this year by continuation of the policies formulated in 1922 for the administration of the so-called tuberculin test law (chapter 353, Acts of 1922).

In addition to work under the provisions of that law we resumed on August first of this year reimbursement to owners for animals which on physical examination alone were found to be diseased; we have done this under the provisions of a law which is practically a re-enactment of one formerly on the statute books for many years, but which was repealed in 1922. The conditions which arose as a result of this repeal were recognized as having a very deterrent influence on the eradication work as a whole and efforts were therefore made to have enacted a law carrying similar provisions to the one repealed. These efforts were successful, and we have worked under the re-enacted law's provisions for the latter portion of the year, a period of approximately four months.

Under these two plans of eradication more effective work has been possible and we feel that more real progress has been made this year in the extermination of tuberculosis than during any similar period in the history of this service.

While the extent of the disease in our herds as revealed by the tuberculin test has been somewhat appalling and calls attention to the enormity of the problem of eradication as a whole, we feel confident that if the work can be continued in a vigorous way under present policies of administration over a period of years, the result cannot but be satisfactory and justify the large expenditure of time, labor and money which the procedure will entail.

If the work goes on in accordance with recommendations justified by this year's results, it is possible that we will soon be able to show a gradual diminution in the prevalence of this great plague which for many years has devastated our herds and has caused such a great economic loss to cattle raisers, to milk producers, to the many business interests allied to the livestock industry, not to mention its very great influence on the public health.

In Massachusetts, as in all other States of the Union, the Federal government is co-operating in this work under the provisions of its "accredited tuberculosis-free herd plan," instituted in 1917 by its Bureau of Animal Industry. In the seven years during which this plan has been in operation in different parts of the country in connection with local State activities, the combined service has progressed to a point where it is recognized as a public work of undoubted value. Its increasing popularity from year to year, as attested by the large number of herds voluntarily submitted for test under its regulations, and the published statistics of its practical workings both in individual herds and in defined areas such as towns or whole counties where all the cattle have been tested, would seem to indicate that this plan was well conceived, has been efficiently administered, and has accomplished wonderful results in the eradication of the disease.

The official tuberculin test under the provisions of Massachusetts laws is applied only on request of the cattle owner, and only if he agrees to comply with the rules and regulations devised for proper administration of the law. The principal provisions of these rules and regulations refer to the disposal of animals which react to the test, the cleansing, disinfection and necessary repairs of the premises where they are found, and the determination of the health conditions of the cattle to be afterwards added to these herds under official supervision.

We find the requests for this service showing a steady increase in number from month to month as cattle owners become more thoroughly informed of the opportunity which it offers for elimination of diseased animals from their herds under conditions allowing fairly liberal reimbursement for them. We also find other potent factors influencing their decisions. In many communities different civic

or welfare organizations are now discussing the desirability of regulating by municipal authority the purity of their milk supply in this particular direction by prohibiting the sale of raw milk unless produced by animals which have passed a tuberculin test. Several municipalities have already taken this action. Many milk producers have foreseen the probable establishment in the near future of regulations of this kind and have decided it to be good business policy to get their herds into a condition where they can at once comply with the new requirements when instituted.

At the end of the year, November 30, 1924, we have 195 herds comprising 6,186 cattle which have been accredited by the Federal government as tuberculosis-free.

Animals in accredited tuberculosis-free herds command an increased price when offered for sale, and their market value is bound to still further advance as testing becomes more general and the demand for clean cattle becomes greater. Dairy products from herds which can be officially certified to as healthy are already in greater demand at advanced rates than the present supply can fulfill.

There are, therefore, many reasons for the rapidly increasing number of requests for our service under the new law, and we foresee that the end of the coming year will show very many herds added to our list as tuberculosis-free. New requests for this service are constantly being presented, and on November 30 there were 157 on file, which will be complied with as soon as possible.

Following is the year's record of tuberculin tests under the provisions of chapter 353, Acts of 1922:—

Total number of herds tested: 1,383.

Total number of cattle tested: 30,174 (purebreds 11,910, grades 18,264): passed the test, 24,549: reacted, 5,625: percentage of reactions: 18.6.

*First test*, 650 herds, 11,418 cattle: passed, 6,818: reacted, 4,600: percentage of reactions: 40.2.

*Second test*, 335 herds, 4,689 cattle: passed, 4,173: reacted, 516: percentage of reactions: 11.

*Third test*, 297 herds, 10,232 cattle: passed, 9,737: reacted, 495: percentage of reactions: 4.8.

Tests made of 101 herds comprising 3,835 cattle previously accredited and due for retest, showed only 14 reactors, *i.e.*, thirty-six one hundredths of 1 per cent.

In commenting on the above statistics attention is again directed to the fact that although the percentage of reacting cattle found — all records of tests being included — is 18.6, that figure does not correctly indicate the prevalence of the disease, as the records on which it is computed comprise not only first tests of herds but also the retests subsequently made in many of the same herds after the animals reacting to previous tests had been removed. A better basis on which to estimate the percentage of tuberculous cattle in the State which the tuberculin test would disclose if applied to all herds would be the results we have obtained by first tests only. The percentage so computed from this year's records is 40.2, which figure is much higher than that of last year, showing an advance from 31 per cent. This again is not a sound basis for computation as much of our work this year has been in herds kept for dairying purposes of an intensive character, whose owners have really been forced to call for the test because of local health regulations which demand tested herds as a necessary condition for the granting of permits for the sale of raw milk.

A comparison between the number of reactors found in grade animals and those found in purebreds shows 24.5 per cent of the former and only 9 per cent of the latter.

This may be accounted for largely by the fact that many purebred herds, on account of their high values, have been kept free from the disease by constant testing by private veterinarians over a period of years, while herds of grade animals of less money value have not been given similar attention.

As clearly showing what a continuous use of the tuberculin test may be expected to accomplish, a comparison of percentages of reactors found on first, second and third tests, showing a decrease from 40.2 per cent on first tests to 11 per cent on second tests and thence to 4.8 per cent on third tests, is at once convincing. There seems to be no doubt that continued work of this kind, efficiently and faithfully carried out, with due regard for all the necessary precautions against re-infection, will result in rapid progress toward elimination of the disease.

An "accredited" herd is one which has passed three semi-annual or two annual tests without a reacting animal having been found, and our record of the retests of such herds, showing that only thirty-six one hundredths of one per cent reacted, indicates that continuous tuberculin testing with "accreditation" in view is well worth while from the standpoints both of the cattle owner and of the officials in charge of the control of this disease.

On October 15, 1923, a regulation went into effect at the Brighton stockyards, requiring that all cattle sold at those premises, unless for immediate slaughter, must have passed a tuberculin test. Formerly cattle arriving at those premises from Massachusetts farms were not tested and were sold without restriction.

The Brighton stockyards is an important distributing center for dairy cattle, and it would seem a very necessary control measure that the animals there sold to go to the farms in different parts of the State should be tuberculosis-free. The good effect of this regulation as an eradication measure has already been shown by the record of a full year's work under its provisions. During the year, 4,112 head of dairy cattle from Massachusetts farms have been received at the Brighton stockyards; 3,689 were immediately released for sale as they were accompanied by satisfactory certificates showing record of a recent tuberculin test made by an approved veterinarian; the remaining 423 were held for a test by our veterinarians. Of these latter, 4 were released for slaughter and not tested, 2 were returned to owner because not in condition to test, 314 were tested and passed as tuberculosis-free, and 103 showed a reaction to the test. Of these reactors 91 were slaughtered and 12 were returned to the premises from which they came, each animal bearing an ear tag identifying it as a reactor. Chapter 156 of the Acts of 1924 provides punishment for any person who removes the tag from a reacting animal, who in any way disposes of the animal for any purpose except slaughter, or who neglects or refuses to have slaughtered a reacting animal sold to him for that purpose. The percentage of diseased animals disclosed by the test (25 per cent) proves the value of this regulation, and points to its efficacy as a means of limiting the spread of bovine tuberculosis from farm to farm within the State.

### *Interstate Cattle*

Federal regulations applying to the shipment of dairy or breeding cattle from one State to another now require that all animals of that class of whatever age shall have passed a recent tuberculin test before the shipment takes place, an exception to this regulation being that animals from "accredited tuberculosis-free" herds may be shipped interstate without additional test.

These Federal regulations relieve us to a large extent of the former necessity of applying the tuberculin test to the majority of cattle arriving within the State, and consequently this branch of our work has been very much diminished since this Federal regulation became operative.

The legislature of 1924 passed a new law applying to cattle shipped to Massachusetts to be used for dairy purposes. Whereas, formerly they could be shipped without test to premises designated by the United States Department of Agriculture as "public stockyards" and there quarantined and tuberculin tested, the new Massachusetts law requires that they shall be inspected before shipment to this State, and passed as healthy by either a Federal or State veterinarian. The word "inspected" in this law is interpreted to mean tuberculin tested.

Our inspectors stationed at the Brighton stockyards which premises are classified by the Federal Department of Agriculture as "public stockyards" are thus relieved of a certain amount of tuberculin testing. It is necessary, however, to visé the records accompanying these cattle and identify the animals as the ones recorded; so we are not relieved to any great extent of the inspection service maintained for many years at this point. We still find it advisable to occasionally apply check tests on cattle shipped as "passed the test" to make sure that the efficiency of the testing is up to the proper standard and that dishonesty or misrepresentation has not been practiced.

The Receiving Station for cattle consigned to the Brighton market formerly maintained at Watertown has been discontinued and the only one now maintained outside of Brighton is at Somerville, where the animals are under the same quarantine regulations as at the main yards at Brighton.

During the year 11,375 interstate dairy cattle have been received at Brighton, either shipped thereto direct or through the other receiving stations mentioned. Of these, 3,746 were from New Hampshire, 4,521 from Maine, 2,760 from Vermont, 347 from New York, and 1 from Rhode Island. Of the total number received 9,917 were released for sale on approved records of tuberculin test, and 1,458 were held for test by State and Federal officials, the reactors being slaughtered.

At other points in the State there have been received 5,755 dairy or breeding cattle from other States, all tuberculin tested either before shipment or immediately after arrival in cases where interstate regulations have not been complied with through ignorance or wilful intent.

The total number of dairy or breeding cattle received from other States at all points in Massachusetts shows a grand total of 17,130, approximately the same number as in 1923, a decrease, however, of 312.

### CONTAGIOUS DISEASES OF SWINE

*Hog Cholera* is the principal disease of swine that is contagious and the one which originally directed the attention of live-stock officials to the importance of applying measures of control to diseases affecting that species. Eleven years ago when the campaign against this disease was first started in Massachusetts, it was prevailing so extensively that many whole herds were being wiped out of existence, or the deaths were so many that swine production as an industry was rapidly being abandoned on account of the financial losses sustained. A large proportion of swine raisers, who had previously been successful in the production of pork for the market by the utilization of garbage for feeding the animals, were being forced to abandon this cheap material for other of much higher cost, or go out of business. All the elements necessary to perfect nutrition and rapid growth of swine are to be found in ordinary household garbage, and the feeding of this material, which in many communities had been entirely wasted, originally promised to become not only a great community economy but also the foundation of a successful business. The venture, however, was proving disastrous on account of garbage frequently being the carrier of disease by scraps of tissue originally coming from swine slaughtered and sold after being affected with hog cholera, and not until the development of a treatment by which swine could be immunized against this infection could they be safely raised to marketable age in sufficiently large numbers to be profitable.

When this Division undertook a campaign against the prevalence of hog cholera, immunization had already been successfully developed by the United States Bureau of Animal Industry and has since been progressively improved to the point where it is now generally recognized as a safe, effective and inexpensive treatment, sure to prevent the disease if properly administered before infection takes place. We have therefore always urged all swine owners to have their herds protected by applying early to this Division for this service, which is rendered free of charge, the owner having to pay only for the materials used.

As in many other ways where people are unmindful or careless of their own best interests, swine owners often delay their requests for service until too late for complete protection against disaster, as we can only partially avert their losses if hog cholera has already broken out on their premises. However, even in such cases we are generally able to minimize losses to a degree well worth while, but always regret financial losses that were really preventable.

There can be no doubt of the great economic value of the work of the Division in the prevention of contagious diseases of swine. It is a work of real conservation, second only in importance to our work in the control and eradication of bovine tuberculosis.

When we are able to immunize swine against the ravages of *one* disease only (hog cholera) we are doing much to increase that portion of the food supply which is produced within the State and at the same time are helping to make the raising of swine a profitable industry. While hog cholera is the most disastrous of swine diseases and our work in its prevention is perhaps of more importance than in the treatment of other contagious diseases of that species, yet the occurrence of other infections in which our services are frequently sought is a matter of no small importance to the swine raiser.

Being called to immunize a herd of swine against hog cholera we frequently find some other condition as the cause of trouble and which in some instances co-exists with cholera.

The skill of a trained field veterinarian is often put to a severe test in differentiating between two diseases somewhat alike in their exhibition of symptoms, and if multiple infections are found to determine which of them is the primary cause and then use his knowledge — gained only by experience — to map out a combination treatment which will be effective in reducing the mortalities. Our veterinarians, many of whom have been engaged in this branch of our work for several years, have become very expert as diagnosticians and are rendering service which seems to be effective in control of disease and at the same time very satisfactory to swine owners. There is no other work in our Division in which correct diagnosis, arrived at promptly, means more to successful outcome of treatment than in the control of contagious diseases of swine.

During this year there have been 73,290 treatments applied to swine in the prevention or cure of hog cholera, an increase of 6,663 treatments over those applied in the previous year. The animals comprised 607 herds varying in size from one pig only to some exceeding 4,000 in number. These herds were located in 196 cities and towns and required the making of 1,628 visits by one or more field veterinarians.

Attention is directed to a graph in the appendix to this report showing the number of treatments applied year by year since the work was begun, and showing also that the present year has been our busiest one in this direction.

*Hemorrhagic Septicemia in Swine.* — This disease, otherwise known as “swine plague” has prevailed to a somewhat increased extent this year — our records showing that the number of treatments applied total 28,208, an increase of 1,668, over the previous year. It may be the case, however, that no more swine have been affected but that more owners have become convinced of the advisability of treating their swine in *prevention* of this infection as well as in immunization against hog cholera. In many instances treatment for both diseases are applied at the same time when conditions are favorable for such combination.

Private veterinarians may use without official restriction the various biological preparations manufactured for treatment of this disease, and in some sections of the State many swine are treated by them with a marked degree of success. It happens, however, that in many outbreaks of this disease the owner fears hog cholera as the cause of the sickness shown, and applies to this Division for its service; the animals involved in that way come under our supervision and we render proper service in the emergency.

Animals treated for hemorrhagic septicemia are this year three times in number of those treated two years ago — showing the increase of our work in this direction to be a rapid one.

## RABIES

From the control point of view rabies is one of the most important diseases of a specific infectious nature which affects domesticated animals. Because of its high mortality rate, its constant prevalence in practically all countries and its ready communicability to animals and man the problem of its control demands constant attention.

The disease prevails mostly among dogs and they are the means by which it is generally spread, but all animals are susceptible to it and under circumstances favorable to its communicability may become its victims. Being readily transmitted to the human subject by the medium of bites there is more or less danger to the public in a community where an unusual prevalence occurs.

The public health side of the problem of control of this disease is recognized as an important one and one which requires close co-operation on the part of Division officials with State and Municipal health authorities and with medical and veterinary practitioners who may be brought into connection with cases which involve the exposure of animals or persons to the infection.

By the use of the Pasteur treatment it has been possible for some years to prevent development of the disease in persons who have been bitten by rabid animals, and the development of the preventive treatment for animals has now been brought

to a degree of perfection where its results are comparable with those of the Pasteur treatment of the human subject.

Owners of dogs may now have their animals completely immunized against the disease so that even if exposed by the bite of a rabid animal development of the disease seldom takes place.

If the preventive inoculation of dogs against rabies, — now proven so successful — could have a country-wide application it would be a most powerful factor in the control of the disease. The fact that wild animals are often victims of this disease, and are not subject to control, may operate, however, to keep the infection alive and maintain it at a high degree of virulence. It is therefore improbable that complete extermination can be looked for in the near future.

The prevalence of rabies might be limited to an almost negligible point if the dog laws now on the Statute books were completely enforced. The compulsory licensing of dogs would first of all greatly reduce their numbers, and if stray and ownerless dogs were impounded and disposed of, and the more valuable ones immunized against the disease, a rapid disappearance of this world-wide infection would undoubtedly take place.

In 1922 the general prevalence of rabies in Massachusetts had gradually increased from the year 1918, progressively spreading from one community to another, sometimes disappearing from one section of the State only to be found breaking out in another, so that the total number of cases recorded in the State as a whole remained at a high point. In 1922, however, the disease seemed to have arrived at the peak of its prevalence; it remained nearly stationary during 1923, and the present year's record shows a decided drop in the number of positive cases. We confidently look forward to a still greater lowering of the number in 1925.

The control of rabies in any one community can generally be accomplished fairly promptly if we can get all agencies co-operating to this end. Among these agencies strict enforcement of the dog license laws is of great importance. Unfortunately, however, these laws seem to be practically ignored in many towns and cities or are only spasmodically enforced. Many dogs, especially those of low grade and value, would be destroyed if any one was obliged to pay for a license to keep them, and, as animals of this class are very potent factors in the spread of rabies, the lax enforcement of the dog license laws is an unfortunate condition, especially in communities where an outbreak of rabies has occurred and control measures of every kind are necessary to its suppression.

Selectmen, mayors and boards of aldermen have the authority to issue orders calling for the muzzling or restraining of the dogs in their municipalities whenever the same seems to be necessary. In the excitement attending a fresh outbreak of this disease, when public opinion is acutely alive to the dangers of the situation, such orders are deemed necessary and are at first generally well observed by the dog owners and well enforced by the police authorities. As soon, however, as the first excitement has subsided, we find that in many instances there is no observance of them by the public, no enforcement by the authorities, and conditions relax to the same level of non-attention as in case of the State laws regarding the licensing of dogs.

Effective control of rabies in any community is not to be gained in a short time, and how to offset the perplexing conditions of non-observance and non-enforcement of State laws and local regulations is yet a problem.

Dogs which have been exposed to a positive case of rabies are ordinarily quarantined for a period of 90 days, but if owners have them immunized we deem it safe to release them from quarantine when 21 days have elapsed following the completion of the treatment if no symptoms of rabies have developed during that time.

During the year ending November 30, 1924, 1,607 animals were reported to the Division for diagnosis, observation or quarantine on account of the prevalence of rabies, and 73 reported cases were brought forward from the year 1923. Of these 1,680 animals, 316 dogs, 7 cattle, 1 cat and 2 horses proved to be positive cases. Diagnoses were made either by clinical symptoms, or laboratory examination of brains, supplemented in many instances by the inoculation of small animals.

Comparing these statistics with our records of the year 1923 we find that there have been 139 fewer positive cases this year. This reduction in one year of approx-

imately 30 per cent in the number of positive cases augurs well for a still more satisfactory record for the coming year.

The Division received reports during the year of 1,004 persons who had been bitten by dogs, and 10 persons who were bitten by cats. In all cases reported of persons bitten, the local inspector of animals of the town or city where the animal is owned or kept is ordered to make an examination of the animal, and, even if it appears to be healthy, to have it quarantined for a period of 14 days for observation. This is a measure directly in protection of the public health. If by any chance the biting animal is affected with rabies at the time the bite is inflicted, unmistakable clinical symptoms of the disease will probably appear before the end of the quarantine period, and in such cases the bitten persons will have definite knowledge of that fact and will seek medical advice. If at the end of the 14-day period animals which are quarantined on account of biting persons have not developed symptoms of rabies, they are released from quarantine.

The majority of the animals which inflicted bites on 1,014 persons as above recorded, were released at the end of the quarantine period showing no symptoms of rabies.

Of the 1,680 animals reported for observation 89 dogs and 3 cats were — as far as could be ascertained — ownerless, and the dogs unlicensed, and 46 of these ownerless dogs proved to be positive cases of rabies.

### GLANDERS

What seems to be approximate extermination of glanders is the present situation in Massachusetts regarding that disease.

A graph in the appendix to this report of Division activities for the year, shows at a glance the rapidly decreasing prevalence of this disease for the past twelve years reaching in 1924 the lowest point ever recorded by this office during its more than thirty years experience in its work of control. The occurrence of only six cases during the twelve months and the location of one-half of them in one town and in one stable, shows that general prevalence of this disease no longer exists. All of the cases this year have occurred in a section near to the border line of an adjoining State, the capital city of which is a market for the cheaper class of horses and where auctions are held weekly. It is also the nearest horse market to this particular section of Massachusetts. As the disease has been practically exterminated in all other sections of our own State, we believe that the horse market of the neighboring State referred to is the source whence comes the majority of our cases.

While our regulations require that all horses coming into the State from that source be accompanied by a permit from this office, we are well aware that the regulations are frequently violated and surreptitious interstate movement often takes place.

The practical extermination of glanders has been due first of all to the use of modern methods of diagnosis, including in such the mallein testing of all horses exposed to the disease such as the stable mates of all positive cases; the closing of public watering troughs in towns and cities where cases have occurred has been a very potent factor in limiting the extension of local outbreaks; the decreasing number of horses now used for commercial purposes, and their better working conditions are also factors in the improving situation. The horse's work-day has been shortened and he has been largely relieved by the motor truck of the heart-breaking long hauls of heavy loads which formerly were his task. The effort of various organizations having his welfare as their principal object has done much to educate his caretaker to an understanding of his needs and to a realization of his greater usefulness if well fed, comfortably stabled and properly cared for. All of these are influences of value in the control and eradication of disease of any kind in any species of live stock.

The horse is still a necessity in many lines of commercial trade, and on the average New England farm he is still the economic power. He and his near relative, the mule, are indispensable in military operations, and as a means of healthful recreation and pleasure the horse is in much greater demand than at any time for many years. Note his continuing importance as a drawing card at all animal expositions where the different types, draft, coach, saddle or speed, still receive genuine attention of interest.

Another and one of the most important uses of the horse to-day and in which he is well-nigh indispensable is in the manufacture of various biological preparations, and this materially increases the demand for healthy horses for their manufacture. Horses must therefore still be produced in considerable numbers and maintained free from contagious disease.

There were 48 horses reported during the year as suspected of glanders, of which number 4 proved to be positive cases of the disease. Horses in any way associated with these positive cases and classified as "contacts" — 27 in number — were mallein tested, 2 positive cases being found, making a total number of 6 positive cases for the year.

Of these six cases, 4 were condemned on clinical examination, and diagnoses in the remaining 2 cases were arrived at either by use of the ophthalmic mallein test or by laboratory examination of blood samples submitted to the complement-fixation test.

Of the reported cases 1 died or was killed by owner, 66 of the total of reported and contact cases were released from observation as not diseased, and 2 await final action. In Boston, formerly the storm center of glanders, no case has occurred this year.

The laboratory work in this branch of the service is quite necessary and very important, and this year has consisted of the complement-fixation test of 90 samples of blood taken from 64 horses, for the purpose of diagnosis.

Ophthalmic mallein tests to the number of 73 have been applied to 62 horses owned in the State permanently, and 79 tests to 79 horses recently arrived from other States, a total of 152 tests to 141 animals. The results of these tests were 9 positive, 143 negative.

Under present regulations (Department Order No. 36) horses shipped to Massachusetts from New York, New Jersey, Rhode Island and Connecticut must be accompanied by a permit of the Director of Animal Industry. From these States there has been reported the arrival of 2,585 horses. Excepting those brought in illegally they have been mallein tested on arrival unless accompanied by an approved record of test, or shown to be horses of the better class which ordinarily do not become exposed to the disease.

Many of the animals from these States are of the better class referred to, used for carriage work, breeding, racing or exhibition purposes, and many of them are brought to the State for the summer season only. These of the better class do not require special attention on our part, but second-hand horses, trafficked in and sent from the markets of one State to those of another for public sale, have been specially watched on account of their being considered more liable to be subjects of contagious disease.

#### MISCELLANEOUS DISEASES

*Anthrax.* — For the past two years no positive case of anthrax has been found. In some instances this disease has been suspected and so reported, but careful laboratory examination has in every instance proven the suspicions to be not well founded.

While we have been very fortunate in recent years in our freedom from outbreaks of this disease, we are not unmindful of the great damage an outbreak may cause, and often before control measures can be set in motion. The course of the disease is generally very rapid, often ending in the death of the animal attacked before a diagnosis can be made, or even before centralized control authorities can be notified. Frequently the first incident to which attention is called is the finding of a dead animal in stable or pasture with no cause of death apparent and no history of any animal having shown symptoms of sickness of any kind. Before the true nature of the trouble can be determined the exposure of many other animals may have taken place, some of which may succumb on account of the high virulence and rapid course generally prevailing in a sudden outbreak.

Unless carcasses are promptly buried the infection may be carried in numberless ways to surrounding territory and a serious prevalence occur.

The anthrax bacillus and its spore formations are extremely resistant to conditions which ordinarily destroy germ life, and remain potent for a long time — often for many years — living in the soil and ready to infect any susceptible crea-

ture which may come in contact with them. It therefore happens that places where it has existed at any time may remain infected and subsequent outbreaks may occur even after the lapse of years. Consequently, following a positive diagnosis of anthrax it becomes necessary to at once put in operation preventive measures against its future occurrence. Deep burial or burning of infected carcasses and material with which they have been in contact, disinfection of buildings, the burning over of surface ground where carcasses are buried or over which they may have been dragged, the protective inoculation of all exposed animals and those which afterwards are to be stabled or pastured on the same premises, and a thorough investigation as to possible sources of the original outbreak are the control measures which have generally been found to be effective, and to which our present favorable situation is undoubtedly due.

On several farms which have been previously infected we take the precaution to annually treat all susceptible animals with anti-anthrax serum and spore vaccine. An occasional death from the treatment occurs, but very infrequently, and the majority of the animals are given absolute protection against the infection.

We have one horse barn in the central part of the State which has remained infected with anthrax for several years, in spite of as thorough application of disinfectants as can be devised. This building is therefore permanently quarantined and no animals are allowed to occupy it except those previously immunized against the disease.

The communicability of anthrax to the human subject is well recognized, more or less danger existing to those whose occupations require the handling of hides and wool which may have been taken from infected carcasses of cattle or sheep. The Division's work in control of this disease has therefore a public health relation of considerable importance.

Preventive treatment was applied to 19 cattle this year.

*Blackleg.* — This disease, otherwise designated as "symptomatic anthrax" is one to which much that has been said in our reference to anthrax will apply, especially its sudden development, high mortality rate, resistant powers of its causative organisms, and the precautions necessary to prevent its spread. It generally develops, however, only during the pasture season and affects only the young cattle. It is unusual to find a case in an animal over two and one-half or three years of age, adult animals for some reason not being susceptible except in very rare instances.

Preventive treatment is also available and is completely successful in nearly all cases if applied before infection has taken place. This protection is considered to be effective for a period of one year at least. We have many farms in the State where blackleg has existed at one time or another, and we recommend that all the young cattle on these places be given the protective treatment, the best time for it being just before the cattle are turned out to pasture in the Spring. This service is furnished free and we find it quite generally availed of, especially in those sections where the disease has at any time prevailed.

On the occurrence of an outbreak we advise as a precaution the immediate removal of all susceptible animals from the pasture in which the disease has developed, and their treatment in prevention of the disease.

During the year 855 animals have been given protective treatment on 111 farms located in 48 different towns. Six deaths have been reported in untreated animals on farms located in 4 different towns.

The same general recommendations as in anthrax outbreaks, as to disposal of infected carcasses by burning or deep burial, are applicable following occurrence of this disease.

*Actinomycosis.* — A few cases of this disease are recorded every year and are generally disposed of by slaughter without reimbursement to the owner. If a case is not serious we allow the owner to have it treated by a private veterinarian, and in some cases allow the animal to be held for fattening purposes, under quarantine restrictions, to be released only for slaughter.

There have been 12 cases reported this year, one each in nine different towns, and three in one town. Of these, 5 have been slaughtered, 3 have recovered and been released from quarantine, 2 proved to be cases of other diseases, and 2 are undergoing treatment under quarantine restrictions.

*Hemorrhagic Septicemia in Cattle.*—This disease, of very great importance in some sections of the country, where large numbers of cattle are received through public stockyards, does not often occur in this State in the form which is reported from those sections. Our cases are of the acute, purely septicemic type, developing very rapidly and causing sudden death. At its onset it resembles anthrax in many of its symptoms and some cases are reported as that disease, the diagnosis of hemorrhagic septicemia being arrived at only by laboratory examination of material taken from the carcasses.

Ordinarily the spread of the disease can be prevented if we have early report of its outbreak, by immediate removal of contact animals to other premises and their treatment by preventive methods. The losses are generally confined to the animals first affected, deaths occurring so suddenly that diagnosis is not made, and treatment cannot be applied early enough to save them. Our efforts are therefore in many instances effective only in saving the other members of the herd which may have been exposed to the same infection.

Our records show that outbreaks of this disease have occurred in seven towns this year, in which 7 deaths occurred. Preventive treatment was applied to 59 head of cattle.

Although the function of this Division is the control and eradication of such diseases of animals as are contagious or infectious, we naturally have many other disease conditions referred to us which are not in that category.

Infestation by parasites whose sphere of activity or cycle of existence in whole or in part may be in intimate relation to the animal body, externally or internally, is a condition often seriously interfering with normal health. As such condition may be said to be a communicable one where certain kinds of these organisms are the ones involved, the Division is frequently called upon for advice as to the best methods of extermination.

The prevalence of scabies or "mange" affecting horses, cattle or sheep is at times widespread, and when brought to our attention demands quarantine measures. Much less prevalent than formerly, we have had a relatively small number of cases to contend with. Thorough application of remedies according to directions furnished generally results in destruction of the parasites within a reasonable period and the infested animals are then released from quarantine. Unfortunately many cattle owners are not disposed to carry out the necessary treatment or to take proper precautions against a spread of the infestation from one animal to another, and in that way they lose much of the normal producing power of their animals. There have been 175 cases of mange in cattle reported this year on 13 premises in 8 towns, and only 1 infested horse.

The treatment of conditions due to internal parasites was never before given the attention by progressive livestock raisers which it now commands, and much valuable information of a scientific character is now being taken advantage of by veterinarians and livestock owners. Wonderful results are being obtained in the way of better growth of young animals and increased production by the mature ones, and larger revenue in consequence.

*Foot-and-Mouth Disease.*—Massachusetts has been fortunate in escaping an invasion of foot-and-mouth disease this year. A serious prevalence of it has occurred in two States, and although these States—California and Texas—are at a great distance from us the many ways in which this contagion is carried and the great distance it sometimes travels made the livestock officials of many other States extremely anxious until the extermination of it was finally accomplished by the prompt and thorough work of Federal and local State officials in co-operative action. The disease has actively raged in many foreign countries for some years, and the trade relations of many of them with the United States have been very intimate. The countries of Continental Europe, Great Britain and those of Central and South America have been struggling for a long time to eradicate foot-and-mouth disease without success, and an invasion of this country has therefore been greatly feared. The National government and most State governments have on that account been fairly well prepared to cope with the invasion should it take place.

Unfortunately the disease existed in California for some little time, and had spread to many premises before it was diagnosed and called to official attention. However, the immediate rally of all Federal and State veterinary forces, thorough

investigation of the extent of spread, application of strict quarantine measures, prompt killing and burial of all exposed animals followed by thorough disinfection of all infected premises, and supplemented by restriction of shipment of all material which could possibly act as carriers of the contagion finally won the fight, and at present writing it is believed that complete extermination has been accomplished and that the disease no longer exists in that State.

On learning of the California outbreak Division officials immediately made investigation as to any possible danger of its spread to Massachusetts. Within a few hours it was learned that several cargoes of alfalfa hay had left the infected port of San Francisco only shortly before the outbreak was officially determined to be foot-and-mouth disease. Six of these cargoes were consigned in whole or in part to the port of Boston via the Panama Canal. This seemed to constitute a real danger of invasion of this State, and as other cargoes were consigned to New York, Philadelphia and Baltimore it was recognized that the bringing of foot-and-mouth disease from the Pacific to the Atlantic Seaboard was perhaps imminent and if occurring would certainly be a great calamity to the livestock interests of all eastern States at least. Consequently, all arriving cargoes were held in quarantine by Federal authority until the place of origin of the hay could be located. It finally transpired that with one exception the six cargoes consigned to the port of Boston had originated outside of California in territory free of suspicion. The origin of one cargo, however, could not be satisfactorily determined, and it was deemed unsafe to allow this hay to be released for delivery to Massachusetts farms. Agreement of the Federal government to reimburse the consignee for one-half the value of the hay was sought and obtained providing the Commonwealth would make an equal reimbursement. Appeal to the Governor and Council for funds was successful and the whole cargo of 695 bales (76 tons) of alfalfa was immediately destroyed by burning.

Its appraised market value plus the expense of destruction amounted to \$2,823.16, reimbursement for which was shared equally by the United States Government and the Commonwealth of Massachusetts. If by this prompt action an invasion of foot-and-mouth disease was prevented the money was well expended.

Subsequent to the California outbreak another occurred in the State of Texas. This outbreak was quickly recognized, however, and the same forceful measures immediately instituted by Federal and State officials, resulting in its quick extermination without extensive spread. The source of this outbreak was found to be the importation of breeding cattle from a section of South America supposed to be infected. No connection with the California outbreak was found on extensive investigation in that direction.

In California the disease first appeared among swine, which species are quite as susceptible to it as are bovine animals. This fact points to the necessity of expert diagnosis in any condition of swine showing symptoms in any way suggesting this disease.

A few reports have been received this year calling attention to cases in which foot-and-mouth disease was suspected. Investigation, however, removed the suspicions in every case.

We ask for prompt reports of suspected cases in order that true conditions may be at once determined.

*Bovine Infectious Abortion.*— This disease is a specific infection existing in practically every section of the country, and for many years has been the cause of much anxiety on the part of cattle owners and livestock officials on account of the great losses in breeding efficiency and a consequent diminution in the amount of dairy products which animals may be expected to yield under normal conditions of health.

For many years its cause, means of dissemination, and possible methods of control have been subjects of study by the most eminent scientific investigators in veterinary medicine, and while as yet there is not entire agreement on many phases of the subject, yet the wide discussions of them have brought forth the great importance of many correlating pathological conditions formerly ignored and not considered to be related to the phenomenon of premature birth or to that of true abortion.

The problem of control does not seem at present to be one for the application of regulatory methods by livestock officials. It is rather to be solved in individual

herds by private veterinarians who, in addition to well known hygienic measures of value, have at hand the evidence of many as to the practicability of immunization of animals by the use of biological preparations.

One State (Georgia) is making the experiment of prohibiting the shipment to that State of animals affected with abortion disease. The difficulties attending the enforcement of regulations to accomplish control must be many, if all interests are to be considered with fairness. The result of Georgia's departure in a new direction for the protection of its cattle interests by interstate regulation will be awaited with much interest by this Division.

We render service in the way of obtaining laboratory diagnosis as to the presence of the bacillus abortus in animals. There have been received this year 150 samples of blood for this diagnosis. They were taken from animals on 10 different farms. Of these samples, 62 were diagnosed as positive, these 62 coming from 7 different farms.

*Contagious Diseases of Poultry.* — In previous reports no reference has been made to the several diseases of a contagious nature which affect poultry. In many instances they are the cause of severe losses and in emergencies of this kind poultrymen have frequently sought advice at the Agricultural College. Their departments of veterinary science and of poultry husbandry in connection with the extension service and by means of county agents and farm bureau officials, have done a large amount of work in the way of diagnoses, advice and suggestion, which has been of great relief in many trying situations.

We note this year a greatly increased interest on the part of veterinarians in the subject of poultry diseases, and especially those of a contagious nature. Fitted as they are by technical training and experience to intelligently deal with diseased conditions affecting animal life, their developing interest in this field of veterinary practice will undoubtedly result in the prevention and control of contagious disease which now decimates many flocks.

The stimulation of this interest in the subject of poultry diseases was primarily due to the matter being taken up in conference between officials of the Department of Veterinary Science and Pathology of the Massachusetts Agricultural College, the Director of Extension Service, the Massachusetts Veterinary Association and the Director of Animal Industry. Several conferences were held, and a series of lectures on Avian pathology was finally arranged under the auspices of the above mentioned officials and institutions. Great credit is due the several individuals who arranged for these lectures by prominent men connected with the College and Extension Service and others from outside the State — all prominent in their line of work. Intense interest was developed and shown by the attendance of some fifty veterinarians at the lectures.

We believe that eventually a co-operative service by all agencies will be established of great value to the poultry industry, and with relief in many instances where none has hitherto been available.

The Division will order quarantine restrictions in all reported cases where they seem to be indicated.

*Other Infectious Diseases.* — The finding of tuberculosis in swine at time of slaughter often means the presence of that disease in cattle on the same premises. Inspectors of slaughtering occasionally bring to our attention cases of swine tuberculosis, and we immediately examine all members of the herd of cattle for evidence of the disease. Only two cases have been reported this year from two different towns, but in our opinion many inspectors neglect their duty in this direction.

Among rare cases of infectious disease reported are two of nodular disease in sheep and one of adeno-carcinoma in a cow.

#### LABORATORY SERVICE

A very important auxiliary to the work of this Division is the laboratory service rendered by the bacteriological laboratory of the Department of Public Health. Positive diagnosis of disease depends in many instances on the result of laboratory examination, and there are many cases also in which laboratory confirmation of a clinical diagnosis made in the field is very desirable.

In the control of rabies it is absolutely necessary in a great majority of the cases to have laboratory examination made of the brain of the animal suspected of the

disease, or of the one known to have been exposed to it, but which exhibits no clinical symptoms. This procedure is especially important if persons have been bitten by the suspected or exposed animals.

During the year the brains of 282 dogs, 8 cats and 2 cows have been examined in the laboratory for diagnosis as to the presence of rabies infection. This number is a reduction from last year of 125 examinations, which reduction is concurrent with a lowering prevalence of the disease this year.

In the control of glanders the laboratory examination of samples of blood taken from horses suspected of or exposed to this disease is found necessary. Complement-fixation tests of 90 blood samples have been made this year.

In addition to the above, 20 specimens have been examined taken from animals suspected of the following diseases: anthrax, 1: tuberculosis, 6: actinomycosis, 5: nodular disease, 2: foot-and-mouth, 1: hemorrhagic septicemia, 5.

#### ANNUAL INSPECTION OF FARM ANIMALS AND PREMISES

Under the provisions of section 19, chapter 129 of the General Laws, an order was issued by the Director on January 15, 1924, to every inspector of animals in the cities and towns of the Commonwealth calling for an inspection of all cattle, sheep and swine and of the premises where kept.

This order called for the completion of the inspection by March 1, and for a report of the same to be promptly forwarded to the Division's office. The inspectors' reports came forward in most instances in good season and were duly examined and tabulated in minute detail.

These reports first of all constitute a "census" of the cattle, sheep and swine on the 29,519 farms or premises in the State where these species of animals are kept. From these reports the following interesting facts are gathered: —

The number of cattle of all kinds has decreased from the 1923 record of 232,090 to 219,042 — a decrease of 13,048 head which is approximately five and two-thirds per cent. In two years the decrease has been 18,144 head, which might cause some concern were it shown that the number of cows used for dairying had decreased in the same ratio.

The decrease in dairy cows, however, since the annual inspection of 1923 was made has been 5,784, but their present number — 162,577 — is still somewhat above the average computed from the records of a long period of years. It is to be regretted, however, that our number of dairy animals has not more nearly kept pace with a rapidly increasing population.

The number of swine recorded on the farms of the State at the time of the latest annual inspection shows that the gradual yearly decrease in numbers which has been shown during the past five years has not continued, but that according to inspectors' reports a total increase of about 700 head over last year's number has been found.

The number reported by local inspectors of animals in the Spring months of this year is 63,465, which is far below normal, but until market conditions improve to a considerable degree the raising of this species as an industry will undoubtedly remain at a low development.

The number of sheep found on the farms of the State still declines though at a much less rapid rate than formerly. Last year 11,633 were recorded by inspectors of animals, which number declined to 10,706 this year, a decrease of 927.

Referring to the service of local inspectors of animals in their annual examination of all cattle, sheep and swine, and the premises on which they are kept, it should be said that in the great majority of towns and cities the work has been thoroughly and faithfully attended to. It has happened that in a few towns the work has not been of a character to be commended and reports of the inspection have been very much delayed, no report being received this year from one town. It will probably be necessary, therefore, for the Director to exercise the coming year his prerogative of disapproval of the renomination of such inspectors as have not rendered satisfactory service.

Prompt and faithful service by a capable inspector of animals is of great protective value to the livestock industry of his community, and is a public health auxiliary of great importance. We find that in some communities this service is not compensated for to anywhere near its value, and in many places poor remun-

eration of this official operates to lower the standard which we would like to have maintained.

In accordance with our annual custom, meetings of local town and city inspectors were called in November for conference with Division officials.

The meetings were held in Greenfield, Pittsfield, Springfield, Worcester and Boston, and a fairly large number of inspectors attended. Matters of mutual interest to the local inspectors and the office of the Division were discussed, with satisfactory results in the way of clearing up many points of the service not well understood by the local inspectors. Bovine tuberculosis, its eradication by physical examination and by the application of the tuberculin test, was the principal subject of discussion — as usual — but the service of the inspector in the control of rabies was also one of the prominent subjects of interest.

District veterinarians have made 403 visits to premises where unsanitary conditions were reported by local inspectors, and which they had failed to induce owners to correct.

### REPORTS OF RENDERING COMPANIES

Section 154 of chapter 111 of the General Laws requires rendering companies to report to this Division every animal received by them which is found to be infected with a contagious disease, and the information thus furnished is of value in bringing to the attention of the Division occasional cases of these diseases which otherwise would not be known.

Fourteen reports covering 16 cases of contagious diseases were received from rendering companies, 3 of which had not been otherwise recorded.

### FINANCIAL STATEMENT

Appropriation for the salary of the Director, chapter 126, Acts of 1924.	\$3,500 00	
Expended during the year for the salary of the Director . . . . .	\$3,500 00	
Appropriation for personal services of clerks and stenographers, chapter 126, Acts of 1924 . . . . .	\$9,300 00	
Expended during the year for the following purposes: —		
Personal services of clerks and stenographers . . . . .	\$8,996 05	
Extra clerical and stenographic service . . . . .	23 30	
	<hr/>	
Total expenditure . . . . .	\$9,019 35	
Unexpended balance . . . . .	280 65	
	<hr/>	\$9,300 00
Appropriation for services, other than personal, including printing the annual report, traveling expenses of the Director, and office supplies and equipment, chapter 126, Acts of 1924 . . . . .	\$4,700 00	
Expended during the year for the following purposes: —		
Books and maps . . . . .	\$88 41	
Express and messenger service . . . . .	361 78	
Postage . . . . .	602 43	
Printing report . . . . .	69 99	
Other printing . . . . .	693 68	
Telephone and telegrams . . . . .	620 01	
Stationery and office supplies . . . . .	912 39	
Expenses of the Director . . . . .	180 35	
	<hr/>	
Total expenditure . . . . .	\$3,529 04	
Unexpended balance . . . . .	1,170 96	
	<hr/>	\$4,700 00
Appropriation for personal services of veterinarians and agents engaged in the work of extermination of contagious diseases among domestic animals, chapter 126, Acts of 1924 . . . . .	\$43,180 00	
Brought forward from 1923 appropriation . . . . .	20 00	
	<hr/>	
Total amount appropriated . . . . .		\$43,200 00

Expended during the year for the following purposes: —		
Services of regular agents . . . . .	\$32,935 00	
Services of per diem agents . . . . .	5,938 00	
Labor hired . . . . .	104 00	
	<hr/>	
Total expenditure . . . . .	\$38,977 00	
Unexpended balance . . . . .	4,223 00	
	<hr/>	\$43,200 00
Appropriation for the traveling expenses of veterinarians and agents, chapter 126, Acts of 1924 . . . . .		
	\$18,000 00	
Brought forward from 1923 appropriation . . . . .	29 00	
Transferred from Appropriation for Extraordinary Expenses . . . . .	276 25	
	<hr/>	
Total amount appropriated . . . . .		\$18,305 25
Expended during the year for the following purposes: —		
Traveling expenses of regular agents . . . . .	\$15,984 65	
Traveling expenses of per diem agents . . . . .	2,320 60	
	<hr/>	
Total expenditure . . . . .		\$18,305 25
Appropriation for reimbursement of owners of cattle and horses killed during the present and previous years, travel, when allowed, of inspectors of animals, incidental expenses of killing and burial, quarantine and emergency services, and for laboratory and veterinary supplies and equipment, chapter 126, Acts of 1924 . . . . .		
		\$8,400 00
Expended during the year for the following purposes: —		
34 head of cattle condemned and killed on account of tuberculosis in 1920, 1921, 1922, 1923, 1924, paid for in 1924 . . . . .	\$958 50	
6 horses condemned and killed on account of glanders . . . . .	300 00	
Supplies for veterinary inspectors . . . . .	207 31	
Laundry . . . . .	363 77	
Antiseptics, biologics and disinfectants . . . . .	210 26	
Thermometers, needles, syringes, etc. . . . .	201 17	
Ear-tags, punches, chains, etc. . . . .	2,708 55	
Expenses of killing and burial . . . . .	180 00	
Expenses of travel allowed inspectors of animals . . . . .	607 67	
Quarantine expenses . . . . .	41 00	
Rent of halls for inspectors' meetings . . . . .	29 50	
Sundries . . . . .	48 00	
	<hr/>	
Total expenditure . . . . .	\$5,855 73	
Unexpended balance . . . . .	2,544 27	
	<hr/>	\$8,400 00
Appropriation for reimbursement of owners of certain cattle killed in accordance with agreements made under authority of chapter 353, Acts of 1922 and chapter 304, Acts of 1924 . . . . .		
	\$100,000 00	
Brought forward from 1923 appropriation . . . . .	44,275 46	
Transferred from Appropriation for Extraordinary Expenses . . . . .	15,117 75	
	<hr/>	
Total amount appropriated . . . . .		\$159,393 21
Expended during the year for the following: —		
6,730 head of cattle killed in 1923 and 1924 (chapter 353, Acts of 1922) . . . . .	\$158,383 21	
42 head of cattle killed (chapter 304, Acts of 1924) . . . . .	1,010 00	
	<hr/>	
Total expenditure . . . . .		\$159,393 21

Appropriated, under the Appropriation for Extraordinary Expenses		
to pay one-half the cost of the destruction of hay shipped from		
the quarantined "foot-and-mouth disease" territory of Cali-		
fornia into Massachusetts . . . . .		\$1,500 00
Total expenditure . . . . .	\$1,411 58	
Unexpended balance . . . . .	88 42	
	<hr/>	\$1,500 00

The average amount paid for condemned tuberculous cattle for the year is \$24.52.

One hundred and sixty-nine claims for reimbursement for cattle condemned and killed as physical cases of tuberculosis during the year remain unsettled, these claims amounting to \$4,225.

One hundred and six unpaid claims covering 739 cattle, to which provisions of chapter 353, Acts of 1922, apply, remain unpaid, amounting to \$22,297.74.

There has been received during the year from the sale of hides and carcasses of condemned animals \$7.22.

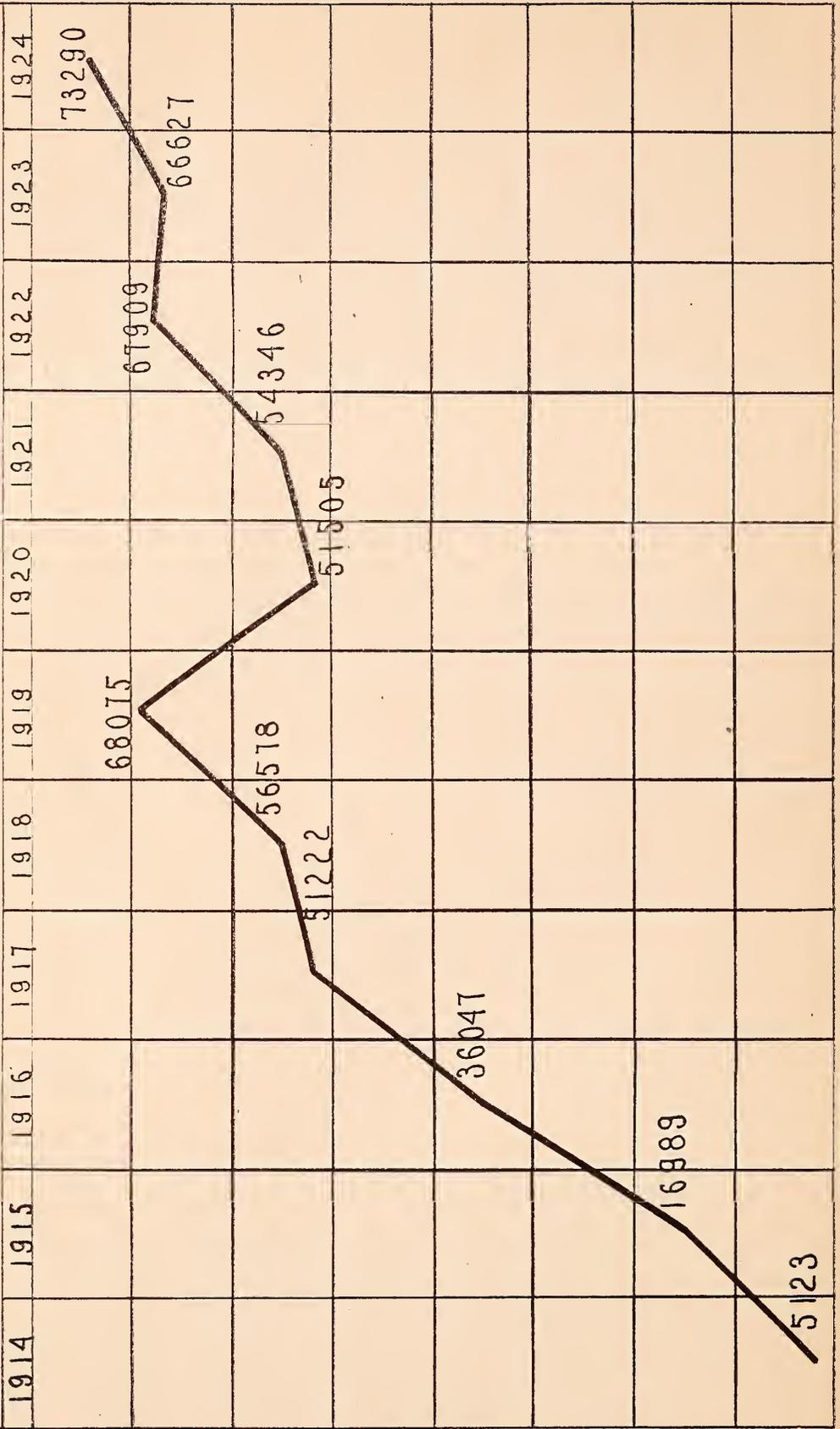
Respectfully submitted,

LESTER H. HOWARD, *Director.*

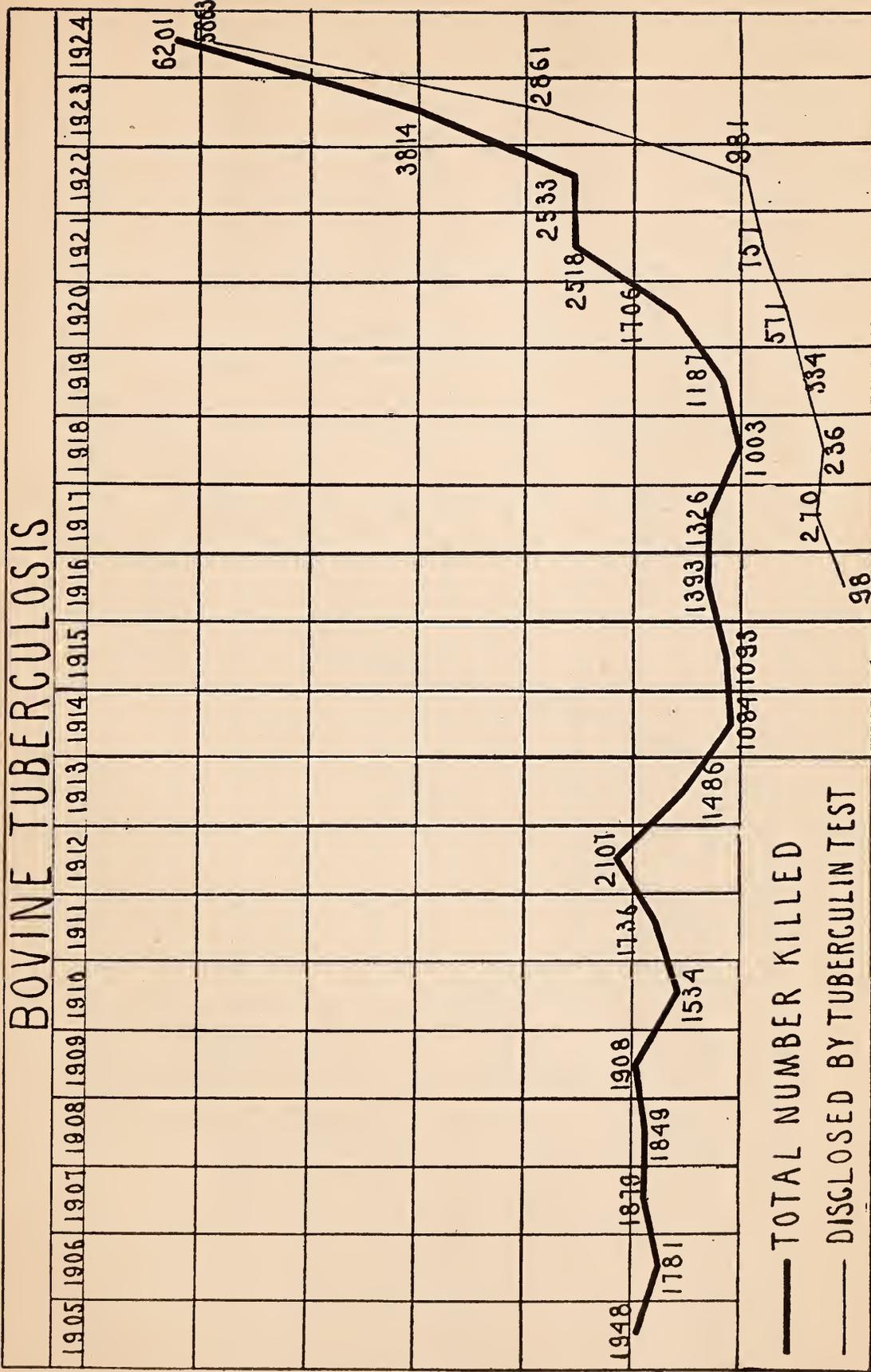
### APPENDIX

The following graphs show the work of the Division of Animal Industry in control of the principal contagious diseases of animals for a period of years.

# HOG CHOLERA CONTROL - INOCULATIONS -

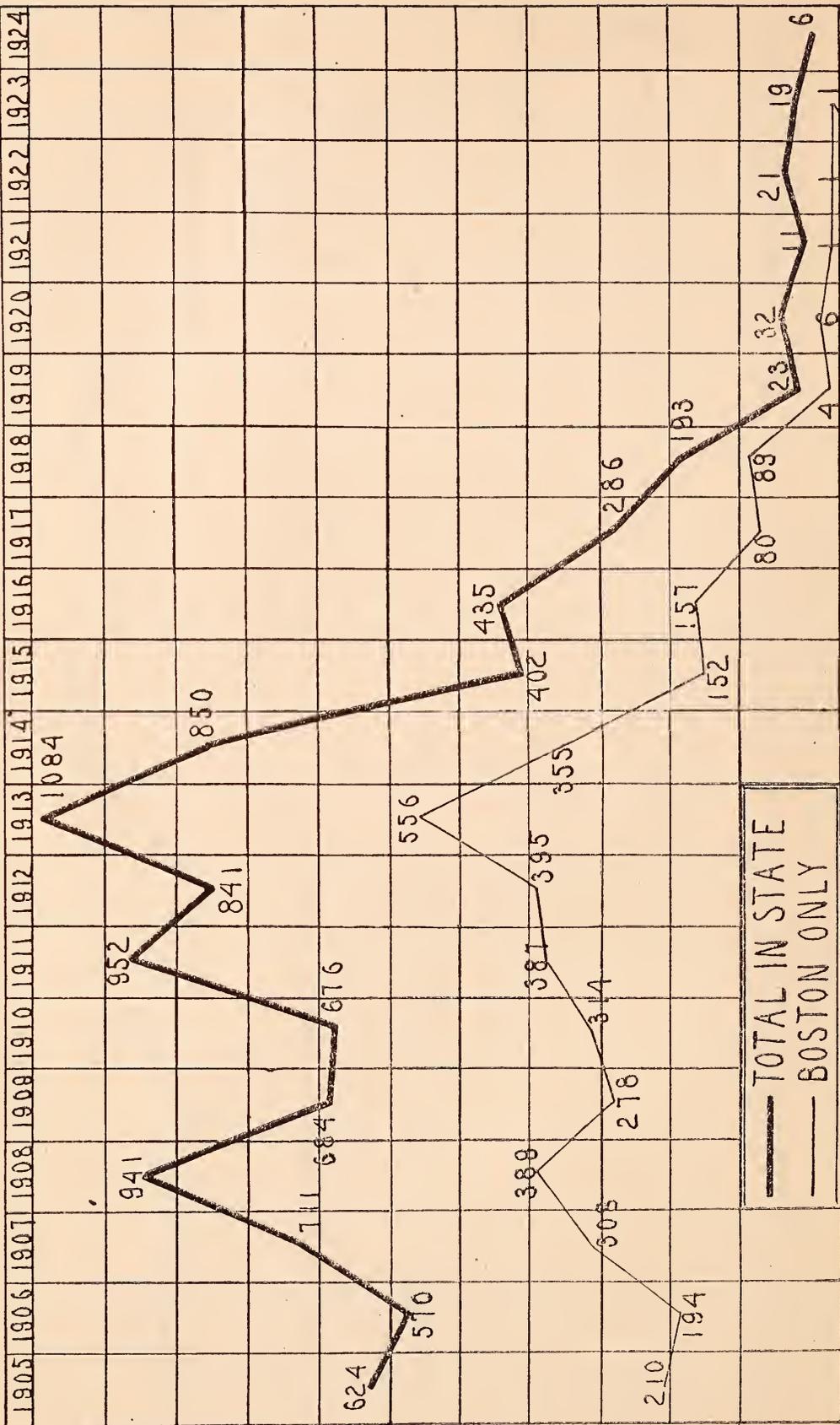


# BOVINE TUBERCULOSIS



— TOTAL NUMBER KILLED  
 - - - DISCLOSED BY TUBERCULIN TEST

# GLANDERS



TOTAL IN STATE  
 BOSTON ONLY





The Commonwealth of Massachusetts

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ANNUAL REPORT

OF THE

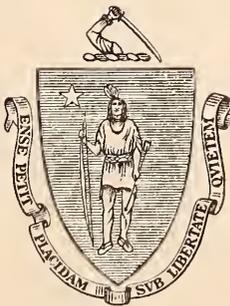
DIRECTOR OF ANIMAL INDUSTRY

FOR THE

YEAR ENDING NOVEMBER 30, 1925

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DEPARTMENT OF CONSERVATION



Publication of this Document approved by the Commission on Administration and Finance

Apr. 13, 1926.

# The Commonwealth of Massachusetts

## DEPARTMENT OF CONSERVATION

DIVISION OF ANIMAL INDUSTRY,  
BOSTON, NOVEMBER 30, 1925.

To the Commissioner of Conservation.

I have the honor to present the following report of the work of this Division for the year ending November 30, 1925.

The Division of Animal Industry has for its duty under the law the "Control and Eradication of Contagious Diseases of Animals."

Measures in *prevention* of contagious disease should however receive *first* consideration as were such 100% successful, control and eradication measures would not be called for.

While such an ideal situation can not be foreseen in the near future veterinary science recognizes that its outstanding progress at the present day is in that direction along with the other branches of medical science and at quite as rapid a pace.

The Division of Animal Industry therefore attempts first of all to prevent outbreaks of contagious disease among our livestock, and in that way assist in maintaining them in a condition of health. Such condition means that they are a source of revenue to their owners and at the same time there results a true conservation of that portion of the public food supply which is derived from their products while living and from their carcasses after slaughter.

The quantity, quality and nutritive value of this food is also found to be in direct ratio to the health of the animals which have produced it.

Large quantities and standard quality of the products of bovine animals form the basis of successful dairying, and for good volume and high quality *healthy* animals are a first necessity. Neither propagation in sufficient numbers nor satisfactory development to maturity or to the point where their products become a source of revenue can be expected from animals affected with any form of contagious disease.

In addition to the importance of healthy animals as a source of food the importance of the relation of animal disease to the public health should be referred to. Animal disease is sometimes found to be the source of contagion affecting the human subject, — tuberculosis, glanders, rabies, anthrax and many other bacterial diseases of animals are readily communicated to man and while they are fortunately of comparatively rare occurrence in man their high mortality rate calls attention to the importance of controlling these maladies at their most common source and if possible of eradicating them from the animal kingdom.

The most important work of the Division during the year has been the tuberculin testing of cattle at the request of their owners under the provisions of Chapter 353, Acts of 1922. The number of tests applied has largely increased due in part to a gradual growth of public opinion in favor of the work and in part to the increasing number of local health boards which have put into effect regulations calling for the tuberculin testing of all cattle whose products enter the local milk supply in a raw state. The progressive cattle owner who desires to maintain a healthy herd recognizes the present opportunity the Commonwealth offers him to eradicate tuberculosis under favorable conditions, and the unthinking milk producer who is influenced only by health regulations finds his business jeopardized unless he can show that his herd of cattle is under official supervision. A large proportion of the increase in our work of testing this year has been in herds of the latter class, and as additional municipalities put similar rules into effect the volume of our tuberculin testing will proportionately increase. We now have on file a large number of requests for this service which are being attended to as rapidly as our force of veterinarians can make possible, and if sufficient appropriations are provided by the incoming legislature for travel expense and for the payment of indemnities for cattle which react to the tuberculin test we expect our service to be in greater demand than at any time since the work was started.

The prevalence of rabies is at all times a condition which calls for prompt atten-

tion on the part of this Division. Although somewhat reduced from the record of recent years it is still a situation of dire importance calling for strict regulatory measures. The lax enforcement of the dog laws and the lack of co-operation on the part of the public in ordinary preventive measures are often the cause of serious outbreaks of the disease, or make their control a much more serious problem.

The prevention of contagious diseases of swine constitutes quite an important part of the work of the Division, and has increased largely during the year just closed. While our recommendations to swine owners are for them to call for our service before sickness appears in their herds so that the animals may be given the present day successful immunization against disease, nevertheless it often occurs that they wait until too late for preventive treatment to be successful.

Hog Cholera, Hemorrhagic Septicemia and various mixed infections are the contagious diseases prevalent in this species and for the control of which our service is rendered.

The regular continuous duties of inspection of horses, cattle, sheep and swine and of the sanitary conditions under which they are kept, execution of measures in prevention, cure or control of contagious diseases among all the several species of domestic animals, and the condemnation and slaughter when necessary of such as are affected with certain forms of such diseases, followed by supervision of the burial or other disposal of their carcasses, have been attended to promptly and in accordance with the methods found by many years' experience to be most effective.

The enforcement of regulations applying to the transportation of animals from other states to Massachusetts is another important duty of this Division, as by these methods we make sure that no prevalence of contagious disease shall be caused by the entry of infected animals. Mallein testing of horses from certain states in which glanders has extensively prevailed, and tuberculin testing of dairy or breeding cattle shipped from other states and not accompanied by satisfactory records of tuberculin test, are continuous activities calling for prompt determination of actual health conditions at time of entry. Although Federal regulations now require that all cattle of whatever age shipped from one state to another for any purpose except immediate slaughter shall have passed a tuberculin test applied by an approved veterinarian before the shipment takes place, and we ordinarily depend on this regulation being complied with by cattle shippers, yet we find that many cases of violation occur either intentionally or through ignorance of the existence of any regulatory measures of the United States government applying to this class of interstate commerce. In such instances official action becomes immediately necessary in protection of the livestock interests of the state, and all animals involved are immediately inspected and tuberculin tested. Failure to pass inspection and test requires condemnation and killing, without indemnity to owner unless post-mortem examination discloses no evidence of disease.

Following is a gross summary of the Division's work for the year ending November 30, 1925:—

## GENERAL SUMMARY

### CATTLE

7,696 Massachusetts cattle were physically examined by inspectors.

451 Massachusetts cattle were tuberculin tested by Division veterinarians at Brighton stockyards.

41,288 tuberculin tests of Massachusetts cattle were made by Federal and State veterinarians in co-operation.

1,561 interstate cattle were tuberculin tested by Division veterinarians.

11,725 tested interstate cattle were examined at Brighton and their test records viséed.

8,571 tested interstate cattle were inspected and identified at other points.

763 animals on 86 farms in 39 towns were given preventive treatment against blackleg.

23 animals were given preventive treatment against anthrax.

148 animals were given preventive treatment against hemorrhagic septicemia.

188 visits to unsanitary premises were made by district veterinarians.

## HORSES

121 tests for glanders were made by Division veterinarians.

1,266 interstate horses were examined by inspectors.

4 tests of whole stables were made by Division veterinarians.

## DOGS

1,642 cases of possible rabies in animals were investigated.

## SWINE

84,976 head of swine were treated in prevention or cure of hog cholera.

24,990 head of swine were treated in prevention or cure of hemorrhagic septicemia.

## MISCELLANEOUS DISEASES

189 cases of miscellaneous diseases were investigated by Division veterinarians.

## BOVINE TUBERCULOSIS

The Division has continued the past year the policies formulated under the provisions of Chapter 353, Acts of 1922, referring to the tuberculin testing of cattle under State supervision and Chapter 304, Acts of 1924, referring to the payment for cattle condemned and killed on account of physical symptoms of tuberculosis. The Board of Health regulations of a number of cities and towns requiring that raw milk offered for sale in such cities and towns must come from cattle which have been given an official tuberculin test have resulted in a considerable increase in the number of requests received by this Division for application of the tuberculin test, many owners of herds having been given the choice of submitting their herds to test, pasteurizing the milk or discontinuing in the dairy business. The increased demand for tuberculin tested cattle to replace reacting cattle in such herds has resulted in requests for tests from many persons dealing in cattle. These facts have caused a considerable increase in the percentage of cattle which have reacted to the first or original test applied under our supervision.

Co-operation under the so-called "Accredited Tuberculosis-free Herd" plan by the Federal Bureau of Animal Industry continues to prove an important factor in inducing owners of cattle to submit their herds for test, as the additional amount paid by the Federal government is an aid in lessening the monetary loss to the owner of reacting cattle. The Federal allotment became exhausted early in the year, however, which resulted in a natural slowing up in the number of requests for test received, the effects of which were felt until a new allotment was made available by the Federal government at the beginning of their fiscal year, July 1st.

An increase in the number of cattle condemned on physical symptoms from 338 in the year ending November 30, 1924, to 597 in the year ending November 30, 1925, is undoubtedly due to the fact that it has become more generally known that the law allowing reimbursement for such animals, which law was repealed in 1922, had been re-enacted and is now in effect. In cases of this kind the veterinarian under whose direction the animal is condemned is required to make a careful physical examination of all cattle on the premises. The premises must then be satisfactorily disinfected before payment is made by the Commonwealth. Three months from date of condemnation, the Inspector of Animals of the town in which the case occurred is requested to make a careful physical examination of such cattle as may then be on the premises. These precautionary measures often result in locating and condemning other infected animals and through disinfection limiting the spread of the contagion.

The testing of cattle under the provisions of Chapter 353, Acts of 1922, is in accordance with said chapter, done only on request of the cattle owner and only under agreement with him that he will comply with the rules and regulations made to govern such testing, which rules and regulations refer to the disposition of reacting cattle, the cleansing and disinfection of the premises and the class of animals which may be added to the herd.

Following is the year's record of tuberculin tests:—

Total number of herds tested: 2,093.

Total number of cattle tested: 41,288 (purebreds 14,750, grades 26,538): passed the test, 33,024: reacted, 8,264: percentage of reactions: 20.

*First test*, 882 herds, 13,792 cattle: passed, 7,508: reacted, 6,284: percentage of reactions: 45.5.

*Second test*, 505 herds, 6,765 cattle: passed, 5,878: reacted, 887: percentage of reactions: 13.1.

*Third test*, 530 herds, 14,919 cattle: passed, 13,895: reacted, 1,024: percentage of reactions: 6.8.

Tests made of 176 herds comprising 5,812 cattle previously accredited and due for retest, showed only 69 reactors, *i.e.*, one and seventeen hundredths per cent.

The tabulation above shows an increase in the testing over that of the year ending November 30, 1924, of 710 herd tests, 11,114 animals tested and 2,639 reactions to the test, and an increase of percentage of reactions from 31 per cent found to the first test in 1923 to 40.2 per cent in 1924, and 45.5 per cent this year, the cause of this increase in reactions being due to the character of the herds submitted as stated previously. The increase in the percentage of reactions found to the second, third and subsequent tests is believed to be due to lack of care by the owner in the selection of cattle purchased to replace reactors.

The percentage of reacting cattle is found in purebreds to be 8.86 per cent while in grades it is 22.44 per cent, due undoubtedly to the fact that owing to the higher cost of purebred animals, more care has been taken in selecting and purchasing them.

On November 30th there were on our records 376 herds containing 8,105 head of cattle the owners of which had received "accredited" herd certificates issued by the Federal government. In addition to this figure there were 527 herds containing 5,777 head of cattle which had passed one test without a reaction and 187 herds containing 1,002 head of cattle which had passed two clean tests making a total of 1,090 herds in which no reacting cattle were found at last test, which herds contained 14,884 head of cattle. Our records indicate that on this date there are under supervision 1,716 herds, which is 6 per cent of the herds of cattle in the State and 26,646 head of cattle, or 13 per cent of the cattle in the State.

### *Interstate Cattle*

In order that the health status of all bovine animals brought into Massachusetts from other States may be known to the Division and become a matter of record in its office, it is required (Department Order No. 35) that such animals shall be accompanied by a permit issued by the Director. This regulation is very generally observed with the result that the Division has information of interstate shipments and their destination, and calls upon the local inspectors for reports of arrival and for identification. An occasional violation of the regulation occurs, sometimes due to misinformation and in a few instances to wilful non-observance of all regulatory action by officials. Investigation in all cases of violation is immediately instigated.

Federal regulations applying to the shipment of dairy or breeding cattle from one State to another now require that all animals of that class of whatever age shall have passed a recent tuberculin test before the shipment takes place, an exception to this regulation being that animals from "accredited tuberculosis-free" herds may be shipped interstate without additional test.

These Federal regulations relieve us to a large extent of the former necessity of applying the tuberculin test to the majority of cattle arriving within the State, and consequently this branch of our work has been very much diminished since this Federal regulation became operative.

The legislature of 1924 passed a new law applying to cattle shipped to Massachusetts to be used for dairy purposes. Whereas, formerly they could be shipped without test to premises designated by the United States Department of Agriculture as "public stockyards" and there quarantined and tuberculin tested, the new Massachusetts law requires that they shall be inspected before shipment to this State, and passed as healthy by either a Federal or State veterinarian. The word "inspected" in this law is interpreted to mean tuberculin tested.

Our inspectors stationed at the Brighton stockyards which premises are classified by the Federal Department of Agriculture as "public stockyards" are thus relieved of a certain amount of tuberculin testing. It is necessary, however, to visé the records accompanying these cattle and identify the animals as the ones recorded; so we are not relieved to any great extent of the inspection service maintained for many years at this point. We still find it advisable to occasionally apply check tests on cattle shipped as "passed the test" to make sure that the efficiency of the testing is up to the proper standard and that dishonesty or misrepresentation has not been practiced.

A small number of cattle arrive each week unaccompanied by satisfactory records of tuberculin test and these are subjected to a test or retest and then released for sale or slaughter in accordance with the results obtained.

During the year 13,247 interstate dairy cattle have been received at Brighton, either shipped thereto direct or through the receiving station at Somerville where the animals are under the same quarantine regulations as at the main yards at Brighton. Of these 3,973 were from New Hampshire, 6,084 from Maine, 2,840 from Vermont, 319 (including 4 held over from 1924) from New York, 2 from Rhode Island, 24 from Ohio and 9 from Connecticut. Of the total number received 11,725 were released for sale on approved records of tuberculin test, and 1,522 were held for test by State and Federal officials, the reactors being slaughtered.

At other points in the State there have been received 8,571 dairy or breeding cattle from other States, all tuberculin tested either before shipment or immediately after arrival in cases where interstate regulations have not been complied with through ignorance or wilful intent.

The total number of dairy or breeding cattle received from other States at all points in Massachusetts shows a grand total of 21,818 — an increase of 4,688 over 1924.

#### CONTAGIOUS DISEASES OF SWINE

*Hog Cholera.* — The wisdom of directing attention to *prevention* of contagious diseases of live stock rather than *cure* is best shown by the results obtained in the treatment of swine in their protection against the ravages of hog cholera. Thousands of animals are saved each year by the so-called simultaneous treatment, the efficiency of which has long been established and is in general use wherever swine raising is an industry of importance. Before the development by the Federal Bureau of Animal Industry of a successful preventive of this disease the production of pork in large quantities was often unprofitable because of the visitation of hog cholera with its high mortality rate — in many instances when an outbreak occurred its prevalence ceased only when no animals survived.

The herds fed on garbage were particularly subject to these outbreaks because of the facility with which infection was brought to them by garbage material. Now, however, it is readily possible to immunize swine against this danger and the utilization of garbage — a cheap food containing all the elements of nutrition — is safe and has developed into an industry of no small proportions — to say nothing of the advantage it offers as a solution of the problem which confronts many communities regarding the disposal of household food waste.

There can be no doubt of the great economic value of the work of the Division in the prevention of contagious diseases of swine. It is a work of real conservation of resources — when we are able to prevent the ravages of this one principal disease only (hog cholera) we are doing much to increase that portion of the food supply which is produced within the State and at the same time are helping to maintain an industry on a profitable basis.

While it is contended by some that free service in the latter direction by agents of the Commonwealth is wrong in principle, yet from the viewpoint of the necessity of control of contagious diseases among animals, as a work of real conservation of material resources, it would seem to be justified.

It may be, however, that having taken up this work some years ago when it was not commanding any attention from swine owners or veterinarians, having supervised it by official control as deemed necessary at that time, having demonstrated the way it can be successfully accomplished, and finally having educated the swine owner as to its value to him in a business way, it is now relevant to discuss the

question of the State no longer furnishing free service or of retiring altogether from the actual field work, and depending on private veterinarians to do it under State control or supervision.

While hog cholera is the most disastrous of swine diseases and our work in its prevention is perhaps of more importance than in the treatment of other contagious diseases of that species, yet the occurrence of other infections in which our services are frequently sought is a matter of no small importance to the swine raiser.

Being called to immunize a herd of swine against hog cholera we frequently find some other condition as the cause of trouble and which in some instances co-exists with cholera.

The skill of a trained field veterinarian is often put to a severe test in differentiating between two diseases somewhat alike in their exhibition of symptoms, and if multiple infections are found, to determine which of them is the primary cause, and then use his knowledge—gained only by experience—to map out a combination treatment which will be effective in reducing the mortalities. Our veterinarians, many of whom have been engaged in this branch of our work for several years, have become very expert as diagnosticians and are rendering service which seems to be effective in control of disease and at the same time very satisfactory to swine owners. There is no other work in our Division in which correct diagnosis, arrived at promptly, means more to successful outcome of treatment than in the control of contagious diseases of swine.

During this year there have been 84,976 treatments applied to swine in the prevention or cure of hog cholera, an increase of 11,686 treatments over those applied in the previous year. The animals comprised 657 herds varying in size from one pig only to some exceeding 4,000 in number. These herds were located in 182 cities and towns and required the making of 1,918 visits by one or more field veterinarians.

Attention is directed to a graph in the appendix to this report showing the number of treatments applied year by year since the work was begun, and showing also that the present year has been our busiest one in this direction.

*Hemorrhagic Septicemia in Swine.*—This disease commonly called "swine plague" commands considerable attention on the part of our field veterinarians, although its treatment by private veterinarians is not in any way restricted by department order as in cases of hog cholera.

On the outbreak of *any* contagious disease in a herd of swine the owner always fears hog cholera and accordingly applies for the Division's service. It is in this way that our field veterinarians generally come in contact with cases of hemorrhagic septicemia, finding it prevailing as a separate infection or co-existent with hog cholera or other swine diseases. It ranks next in importance to hog cholera as a cause of death and demands the same careful observation when attempting positive diagnosis.

Its treatment in prevention or cure has rapidly developed and this branch of our work the past year has been greatly increased. It may be said that owing to the further development of biological treatment of this infection results are now eminently satisfactory.

Our records show that 24,990 treatments have been applied this year.

## RABIES

One of the most important branches of the work carried on by the Division of Animal Industry is the control of rabies.

We are glad to record that the decline from the high point of prevalence in 1922 and 1923 has continued this year. We have had 22 per cent fewer cases than in 1924 and the decline in the past two years amounts to 45 per cent.

In 1922 the general prevalence of rabies in Massachusetts had gradually increased from the year 1918, progressively spreading from one community to another, sometimes disappearing from one section of the State only to be found breaking out in another, so that the total number of cases recorded in the State as a whole remained at a high point. In 1922, however, the disease seemed to have arrived at the peak of its prevalence; it remained nearly stationary during 1923, and as above stated has declined rapidly in 1924 and 1925. We confidently expect a still further improvement of the situation this coming year.

As is well known the disease prevails mostly among dogs, but all species of domesticated animals are susceptible to it and may become infected under certain circumstances of exposure. Each year our records show a relatively small number of cattle, horses, swine and cats which have received the infection. Undoubtedly many species of wild animals are from time to time subjects of the disease, which fact escapes notice except in very rare instances. They are probably a factor in the continuing existence of this infection as dogs frequently come in contact with them.

The disease is readily transmissible to the human subject by the bite of an animal carrying the infection and therefore there exists an important public health phase of the problem of control and eradication.

Close co-operation is sought by the Division with State and Municipal health and police departments and with medical and veterinary practitioners who are brought into connection with positive cases of the disease or with persons or animals exposed thereto. Where such co-operation can be completely established, control of an outbreak of rabies in any community is a matter of a short time only.

Unfortunately however it often happens that the complete enlistment of all these agencies fails, and the disease prevails for a more or less protracted period in consequence.

If the dog laws now on the statute books were completely enforced in all sections of the State the prevalence of rabies could be brought down to an almost negligible point. Were there a general compliance even with the licensing law the number of dogs would be greatly reduced because stray, ownerless and unlicensed ones would be impounded and disposed of.

Unfortunately however the license law is practically ignored in many towns and cities or is only spasmodically enforced when an outbreak of rabies appears. The infection has then been established and a certain number of cases generally follows.

Selectmen, mayors and boards of aldermen have the authority to issue orders calling for the muzzling or restraining of the dogs in their municipalities whenever the same seems to be necessary. In the excitement attending a fresh outbreak of this disease, when public opinion is acutely alive to the dangers of the situation, such orders are deemed necessary and are at first generally well observed by the dog owners and well enforced by the police authorities. As soon, however, as the first excitement has subsided, we find that in many instances there is no observance of them by the public, no enforcement by the authorities, and conditions relax to the same level of non-attention as in case of the State laws regarding licensing.

Referring to the rabies situation in general there seems to be some promise of relief in the effective results now being obtained by the preventive inoculation of dogs against the disease. By the use of the Pasteur treatment it has been possible for some years to prevent development of the disease in persons who have been bitten by rabid animals, and the development of the preventive treatment for animals has now been brought to a degree of perfection where its results are comparable with those of the Pasteur treatment of the human subject.

Owners of dogs may now have their animals completely immunized against the disease so that even if exposed by the bite of a rabid animal development of the disease seldom takes place.

Dogs which have been exposed to a positive case of rabies are ordinarily quarantined for a period of 90 days, but if owners have them immunized we deem it safe to release them from quarantine when 21 days have elapsed following the completion of the treatment if no symptoms of rabies have developed during that time.

One town this year, through its Board of Health, provided free inoculation of all licensed dogs against rabies. We believe that if this plan were generally adopted and became country wide in its application, and were the license laws strictly enforced at the same time, rabies would cease to be the menace it now is to all species of domesticated animals and through them to the general public.

During the year ending November 30, 1925, 1,520 animals were reported to the Division for diagnosis, observation or quarantine on account of the prevalence of rabies, and 122 reported cases were brought forward from the year 1924. Of these 1,642 animals, 242 dogs, 5 cattle, 1 cat and 1 hog proved to be positive cases. Diagnoses were made either by clinical symptoms, or laboratory examination of brains, supplemented in many instances by the inoculation of small animals.

Comparing these statistics with our records of the year 1924 we find that there

have been 77 fewer positive cases this year. This reduction in one year of approximately 22 per cent and in two years of 45 per cent in the number of positive cases augurs well for a still further decline in prevalence in 1926.

The Division received reports during the year of 970 persons who had been bitten by dogs, 11 persons who were bitten by cats and 1 bitten by a monkey. In all cases reported of persons bitten, the local inspector of animals of the town or city where the animal is owned or kept is ordered to make an examination of the animal, and, even if it appears to be healthy, to have it quarantined for a period of 14 days for observation. This is a measure directly in protection of the public health. If by any chance the biting animal is affected with rabies at the time the bite is inflicted, unmistakable clinical symptoms of the disease will probably appear before the end of the quarantine period, and in such cases the bitten persons will have definite knowledge of that fact and will seek medical advice. If at the end of the 14-day period animals which are quarantined on account of biting persons have not developed symptoms of rabies, they are released from quarantine.

The majority of the animals which inflicted bites on 982 persons as above recorded were released at the end of the quarantine period showing no symptoms of rabies.

Of the 1,642 animals reported for observation 67 dogs and 1 cat were — as far as could be ascertained — ownerless, and the dogs unlicensed, and 16 of these ownerless dogs proved to be positive cases of rabies.

### GLANDERS

The prevalence of this disease during the past year has remained at the same low plane recorded for the past seven years — only eight positive cases having been found — one each in the cities of Boston, Worcester, Springfield, Chicopee and Chelsea, two in the town of Bellingham, and one in Dracut. These widely separated locations of individual cases indicate that no common source of the disease is present and therefore that proper control measures in each location will probably keep its prevalence at the same low plane in the immediate future.

We believe that the majority of the cases which we are now finding are of a latent character, as only three of the eight cases recorded this year showed symptoms of the acute form of the disease, the remaining cases being diagnosed by mallein tests or laboratory examination of blood samples.

Latent cases may exist for a long time without the animals exhibiting symptoms which would be looked upon as suspicious, and in the meantime they might or might not become a source of contagion to others. Some of the post-mortem examinations made indicated the infection to be of long standing — possibly dating from the time when glanders was so very prevalent years ago in many sections.

The mallein testing of all stable mates, and contact animals when a positive case has been found in recent years has undoubtedly disclosed many of these latent cases and that way has been a most potent factor in the record of extermination. However, glanders was so rampant for many years that there are probably yet to be found occasionally cases which have carried the infection for a long time and which will exhibit suspicious symptoms only when circumstances of age, environment, work or lack of care furnish the influence which causes such symptoms to appear.

The practical extermination of glanders has been due first of all to the use of modern methods of diagnosis, including in such the mallein testing of all horses exposed to the disease such as the stable mates of all positive cases; the closing of public watering troughs in towns and cities where cases have occurred has been another very potent factor in limiting the extension of local outbreaks; the decreasing number of horses now used for commercial purposes, and their better working conditions are also factors in the improving situation. The horse's work-day has been shortened and he has been largely relieved by the motor truck of the heart-breaking long hauls of heavy loads which formerly were his task. The efforts of various organizations having his welfare as their principal object have done much to educate his caretaker to an understanding of his needs and to a realization of his greater usefulness if well fed, comfortably stabled, and properly cared for. All of these are influences of value in the control and eradication of disease of any kind in any species of live stock.

The horse is still a necessity in many lines of commercial trade, and on the average New England farm he is still the economic power. He and his near relative, the mule, are indispensable in military operations, and as means of healthful recreation and pleasure the horse is in much greater demand than at any time for many years. Note his continuing importance as a drawing card at all animal expositions where the different types, draft, coach, saddle or speed, still receive genuine attention of interest.

Another and one of the most important uses of the horse today and in which he is well-nigh indispensable is in the manufacture of various biological preparations, and this materially increases the demand for healthy horses for their manufacture. Horses must therefore still be produced in considerable numbers and maintained free from contagious disease.

There were 26 horses reported during the year as suspected of glanders, of which number 7 proved to be positive cases of the disease. Horses in any way associated with these positive cases and classified as "contacts" — 23 in number — were mallein tested, 1 positive case being found, making a total number of 8 positive cases for the year.

Of these 8 cases, 3 were condemned on clinical examination, and diagnoses in the remaining 5 cases were arrived at either by use of the ophthalmic mallein test or by laboratory examination of blood samples submitted to the complement-fixation test.

Forty-one of the total of reported and contact cases were released from observation as not diseased.

The laboratory work in this branch of the service is quite necessary and very important, and this year has consisted of the complement-fixation test of 40 samples of blood taken from 40 horses, for the purpose of diagnosis.

Ophthalmic mallein tests to the number of 45 have been applied to 43 horses owned in the State permanently, and 36 tests to 35 horses recently arrived from other States, a total of 81 tests to 78 animals. The results of the tests were 4 positive, 77 negative.

Under present regulations (Department Order No. 36) horses shipped to Massachusetts from New York, New Jersey, Rhode Island and Connecticut must be accompanied by a permit of the Director of Animal Industry. From these States there has been reported the arrival of 1,776 horses. Excepting those brought in illegally they have been mallein tested on arrival unless accompanied by an approved record of test, or shown to be horses of the better class, which ordinarily do not become exposed to the disease.

Many of the animals from these States are of the better class referred to, used for carriage work, breeding, racing or exhibition purposes, and many of them are brought to the State for the summer season only. These of the better class do not require special attention on our part, but second-hand horses, trafficked in and sent from the markets of one State to those of another for public sale, have been specially watched on account of their being considered more liable to be subjects of contagious disease.

A graph in the appendix to this report shows at a glance the decreasing prevalence of glanders for the past thirteen years and indicates that we may reasonably expect complete eradication of it in the near future. On account of its communicability to the human subject with fatal termination in all cases the work of its control and eradication in animals is quite important from a public health standpoint.

#### MISCELLANEOUS DISEASES

*Anthrax.* — Only one positive case of anthrax in animals has been reported this year, that occurring in Worcester County. The source of this outbreak was probably the use for bedding of certain animal waste products from a foreign country where the disease exists more or less continuously. By prompt application of preventive inoculation to the exposed animals no additional deaths occurred.

While we have been very fortunate in recent years in our freedom from outbreaks of this disease we are not unmindful of the great damage an outbreak may cause, and often before control measures can be set in motion. The course of the disease is generally very rapid, often ending in the death of the animal attacked before a diagnosis can be made, or even before centralized control authorities can be notified.

Frequently the first incident to which attention is called is the finding of a dead animal in stable or pasture with no cause of death apparent and no history of any animal having shown symptoms of sickness of any kind. Before the true nature of the trouble can be determined the exposure of many other animals may have taken place, some of which may succumb on account of the high virulence and rapid course generally prevailing in a sudden outbreak.

Unless carcasses are promptly buried the infection may be carried in numberless ways to surrounding territory and a serious prevalence occur.

The anthrax bacillus and its spore formations are extremely resistant to conditions which ordinarily destroy germ life, and remain potent for a long time — often for many years — living in the soil and ready to infect any susceptible creature which may come in contact with them. It therefore happens that places where it has existed at any time may remain infected and subsequent outbreaks may occur even after the lapse of years. Consequently, following a positive diagnosis of anthrax it becomes necessary to at once put in operation preventive measures against its future occurrence. Deep burial or burning of infected carcasses and material with which they have been in contact, disinfection of buildings, the burning over of surface ground where carcasses are buried or over which they may have been dragged, the protective inoculation of all exposed animals and those which afterwards are to be stabled or pastured on the same premises, and a thorough investigation as to possible sources of the original outbreak are the control measures which have generally been found to be effective, and to which our present favorable situation is undoubtedly due.

On several farms which have been previously infected we take the precaution to annually treat all susceptible animals with anti-anthrax serum and spore vaccine. An occasional death from the treatment occurs, but very infrequently, and the majority of the animals are given absolute protection against the infection.

We have one horse barn in the central part of the State which has remained infected with anthrax for several years, in spite of as thorough application of disinfectants as can be devised. This building is therefore permanently quarantined and no animals are allowed to occupy it except those previously immunized against the disease.

The communicability of anthrax to the human subject is well recognized, more or less danger existing to those whose occupations require the handling of hides and wool which may have been taken from infected carcasses of cattle or sheep. The Division's work in control of this disease has therefore a public health relation of considerable importance.

Preventive treatment was applied to 23 cattle this year.

*Blackleg.* — This disease, otherwise designated as "symptomatic anthrax," is one to which much that has been said in our reference to anthrax will apply, especially its sudden development, high mortality rate, resistant powers of its causative organisms, and the precautions necessary to prevent its spread. It generally develops, however, only during the pasture season and affects only the young cattle. It is unusual to find a case in an animal over two and one-half or three years of age, adult animals for some reason not being susceptible except in very rare instances.

Preventive treatment is also available and is completely successful in nearly all cases if applied before infection has taken place. This protection is considered to be effective for a period of one year at least. We have many farms in the State where blackleg has existed at one time or another, and we recommend that all the young cattle on these places be given the protective treatment, the best time for it being just before the cattle are turned out to pasture in the Spring. This service is furnished free and we find it quite generally availed of, especially in those sections where the disease has at any time prevailed.

On the occurrence of an outbreak we advise as a precaution the immediate removal of all susceptible animals from the pasture in which the disease has developed, and their treatment in prevention of the disease.

During the year 763 animals have been given protective treatment on 86 farms located in 39 different towns. Four deaths have been reported in untreated animals on farms located in 2 different towns.

The same general recommendations as in anthrax outbreaks, as to disposal of infected carcasses by burning or deep burial, are applicable following occurrence of this disease.

*Actinomycosis.* — A few cases of this disease are recorded every year and are generally disposed of by slaughter without reimbursement to the owner. If a case is not serious we allow the owner to have it treated by a private veterinarian, and in some cases allow the animals to be held for fattening purposes, under quarantine restrictions, to be released only for slaughter.

There have been 15 cases reported this year distributed in twelve different towns. Of these, 12 have been slaughtered, 1 has recovered and been released from quarantine and 2 proved to be cases of other diseases.

*Hemorrhagic Septicemia in Cattle.* — This disease, although of great importance in some sections of the country, is not found to be prevalent in this State. The cases which do occur are usually of the septicemic type, which develops very rapidly, often resembling anthrax in many of its aspects. A diagnosis usually depends on laboratory examination of material taken from the carcasses of cattle in which sudden deaths occur and in which the character of the symptoms exhibited indicate contagion of some nature.

It is found that the spread of this disease can be prevented by immediate removal of contact animals to other premises and their treatment by preventive methods. Our efforts are usually confined to saving other members of the herd in which the infection has been found, affected animals ordinarily dying before a diagnosis can be made.

Our records show that outbreaks of this disease have occurred in 8 towns this year, in which 25 deaths occurred. Preventive treatment was applied to 148 head of cattle.

*Mange.* — Scabies or "mange" affecting horses, cattle or sheep, although less prevalent than in former years, demands quarantine measures when brought to our attention. Removal of affected animals, except for immediate slaughter, is forbidden. By the use of proper remedies excellent results in the destruction of the parasites are often obtained, and when the infested animals are found to be cured the quarantine is lifted. There have been 98 cases of mange in cattle reported this year on 15 premises in 11 towns.

*Foot-and-Mouth Disease.* — The prevalence of foot-and-mouth disease in the States of California and Texas which occurred in the year 1924 was apparently exterminated. One new outbreak was reported in the State of Texas during the year 1925 and is thought to be eradicated. It is now believed, therefore, that the disease does not exist in the United States. All reports resembling in any manner foot-and-mouth disease are immediately investigated by this Division.

*Bovine Infectious Abortion.* — This disease, which is found to occur in practically every section of the country, is at present given a great deal of study by investigators in veterinary science.

No action has as yet been taken by this State relative to issuing regulatory measures to prevent the spread of this infection owing to the difficulties which would naturally attend the enforcement of such regulations.

Laboratory service to aid in diagnosis as to the presence of bacillus abortus in animals is offered to veterinarians, cattle owners and other persons interested. There have been received this year 89 samples of blood and one specimen of membrane for this diagnosis. They were taken from animals on 7 different farms. Of these samples 33 were diagnosed as positive, these 33 coming from 6 different farms.

*Contagious Diseases of Poultry.* — The quarantine measures adopted by this Division and by live-stock sanitary boards of other States have resulted in the apparent eradication of the fowl plague, an outbreak of which occurred in some sections of this country during the previous year. Quarantine restrictions during the year have been imposed on all reported cases where such action seemed necessary.

A special course in poultry diseases given under the auspices of the Department of Veterinary Science and Pathology of the Massachusetts Agricultural College at Amherst was largely attended by veterinarians of not only Massachusetts but of other neighboring States and also by the veterinarians connected with this Division.

*Tuberculosis in Swine.* — Tuberculosis in swine found at time of slaughter is frequently brought to the attention of this Division and is often indicative of the presence of that disease in cattle on the same premises.

Upon receipt of a report of this condition in swine steps are immediately taken to have all cattle on the premises examined for evidence of the disease. Seven cases have been reported this year from 4 different towns.

### LABORATORY SERVICE

The bacteriological laboratory of the Department of Public Health renders important service to this Division in the diagnoses of diseases which in many instances require laboratory examination.

In the control of rabies it is found to be absolutely necessary to have laboratory examination made of the brains of suspected animals. This procedure is especially important in cases where persons have been bitten by the suspected animals. During the year the brains of 257 dogs, 13 cats, 3 cows and 1 hog have been examined in the laboratory for diagnosis as to the presence of rabies infection.

In the control of glanders the laboratory examination of samples of blood taken from horses suspected of or exposed to this disease is found necessary. Complement-fixation tests of 40 blood samples have been made this year.

In addition to the above, 120 specimens have been examined taken from animals suspected of the following diseases: anthrax, 8; tuberculosis, 6; actinomycosis, 1; hemorrhagic septicemia, 9; blackleg, 1; infectious abortion, 90; carcinoma, 1; and miscellaneous, 4.

### ANNUAL INSPECTION OF FARM ANIMALS AND PREMISES

Under the provisions of Section 19, Chapter 129 of the General Laws, an order was issued by the Director on January 18, 1925, to every inspector of animals in the cities and towns of the Commonwealth calling for an inspection of all cattle, sheep and swine and of the premises where kept.

This order called for the completion of the inspection by March 1, and for a report of the same to be promptly forwarded to the Division's office. The inspectors' reports came forward in most instances in good season and were duly examined and tabulated in minute detail.

These reports first of all constitute a "census" of the cattle, sheep and swine on 28,601 farms or premises in the State where these species of animals are kept. From these reports the following interesting facts are gathered:—

The number of cattle of all kinds has decreased from the 1924 record of 219,042 to 204,163 — a decrease of 14,879 head.

The number of swine reported by local inspectors of animals in the Spring months of this year is 61,935.

The number of sheep found on the farms of the State still declines. Last year 10,706 were recorded by inspectors of animals, which number declined to 9,540 this year, a decrease of 1,166.

Owing to the prevalence of contagious diseases in poultry inspectors were instructed to inspect and report the condition and number of poultry found at time of inspection. While it is believed that this inspection was in no manner complete there were reported 1,459,888 poultry.

In accordance with our annual custom, meetings of local town and city inspectors were called in November for conference with Division officials.

The meetings were held in Greenfield, Pittsfield, Springfield, Worcester and Boston, and a fairly large number of inspectors attended. Matters of mutual interest to the local inspectors and the office of the Division were discussed, with satisfactory results in the way of clearing up many points of the service not well understood by the local inspectors. Bovine tuberculosis, its eradication by physical examination and by the application of the tuberculin test, was the principal subject of discussion — as usual — but the service of the inspector in the control of rabies was also one of the prominent subjects of interest.

District veterinarians have made 188 visits to premises where unsanitary conditions were reported by local inspectors.

### REPORTS OF RENDERING COMPANIES

Section 154 of Chapter 111 of the General Laws requires rendering companies to report to this Division every animal received by them which is found to be infected with a contagious disease, and the information thus furnished is of value in bringing to the attention of the Division occasional cases of these diseases which otherwise would not be known.

Seven reports covering 8 cases of contagious diseases were received from rendering companies, 1 of which had not been otherwise recorded.

## FINANCIAL STATEMENT

Appropriation for the salary of the Director, chapter 211, Acts of 1925	\$3,500 00	
Expended during the year for the salary of the Director . . . . .	\$3,500 00	
Appropriation for personal services of clerks and stenographers, chapter 211, Acts of 1925 . . . . .		\$9,300 00
Expended during the year for the following purposes:—		
Personal services of clerks and stenographers . . . . .	\$9,121 58	
Unexpended balance . . . . .	178 42	
	<hr/>	\$9,300 00
Appropriation for services, other than personal, including the annual report, traveling expenses of the Director, and office supplies and equipment, chapter 211, Acts of 1925 . . . . .		\$4,370 00
Expended during the year for the following purposes:—		
Books and maps . . . . .	\$65 06	
Express and messenger service . . . . .	259 81	
Postage . . . . .	711 64	
Printing report . . . . .	59 34	
Other printing . . . . .	806 53	
Telephone and telegrams (\$647.78 less \$41.42 Refunds)	606 36	
Stationery and office supplies . . . . .	1,253 04	
Expenses of the Director . . . . .	81 06	
	<hr/>	
Total expenditure . . . . .	\$3,842 84	
Unexpended balance . . . . .	527 16	
	<hr/>	\$4,370 00
Appropriation for personal services of veterinarians and agents engaged in the work of extermination of contagious diseases among domestic animals, chapter 211, Acts of 1925 . . . . .		\$43,180 00
Expended during the year for the following purposes:—		
Services of regular agents . . . . .	\$34,740 00	
Services of per diem agents . . . . .	7,537 50	
Labor hired . . . . .	124 00	
	<hr/>	
Total expenditure . . . . .	\$42,401 50	
Unexpended balance . . . . .	778 50	
	<hr/>	\$43,180 00
Appropriation for the traveling expenses of veterinarians and agents, chapter 211, Acts of 1925 . . . . .	\$19,000 00	
Transferred from Appropriation for Extraordinary Expenses . . . . .	2,505 01	
	<hr/>	
Total amount appropriated . . . . .		\$21,505 01
Expended during the year for the following purposes:—		
Traveling expenses of regular agents . . . . .	\$18,079 10	
Traveling expenses of per diem agents . . . . .	3,424 51	
	<hr/>	
Total expenditure . . . . .	\$21,503 61	
Unexpended balance . . . . .	1 40	
	<hr/>	\$21,505 01
Appropriation for reimbursement of owners of horses killed during the present and previous years, travel, when allowed, of inspectors of animals, incidental expenses of killing and burial, quarantine and emergency services, and for laboratory and veterinary supplies and equipment, chapter 211, Acts of 1925 . . . . .		\$5,650 00

Expended during the year for the following purposes: —		
6 horses condemned and killed on account of glanders . . . . .	\$280 00	
Supplies for veterinary inspectors . . . . .	197 52	
Laundry . . . . .	388 74	
Antiseptics, biologics and disinfectants . . . . .	207 13	
Thermometers, needles, syringes, etc. . . . .	585 72	
Ear-tags, punches, chains, etc. . . . .	3,101 83	
Expenses of killing and burial . . . . .	117 00	
Expenses of travel allowed inspectors of animals . . . . .	546 67	
Quarantine expenses . . . . .	108 00	
Rent of halls for inspectors' meetings . . . . .	2 00	
Sundries . . . . .	48 00	
	<hr/>	
Total expenditure . . . . .	\$5,582 61	
Unexpended balance . . . . .	67 39	
	<hr/>	\$5,650 00

Appropriation for reimbursement of owners of cattle killed as authorized by chapter 304, Acts of 1924, and chapter 129, General Laws, as amended by chapter 353, Acts of 1922, during present and previous years, chapter 211, Acts of 1925 . . . . . \$200,000 00

Expended during the year for the following: —		
6,282 head of cattle killed in 1923, 1924 and 1925 (chapter 353, Acts of 1922) . . . . .	\$168,168 45	
709 head of cattle killed (physical cases) . . . . .	18,748 20	
	<hr/>	
Total expenditure . . . . .	\$186,916 65	
Unexpended balance . . . . .	13,083 35	
	<hr/>	\$200,000 00

The average amount paid for condemned tuberculous cattle for the year is \$23.28.

Seventy-three claims for reimbursement for cattle condemned and killed as physical cases of tuberculosis during the year remain unsettled, these claims amounting to \$1,025.

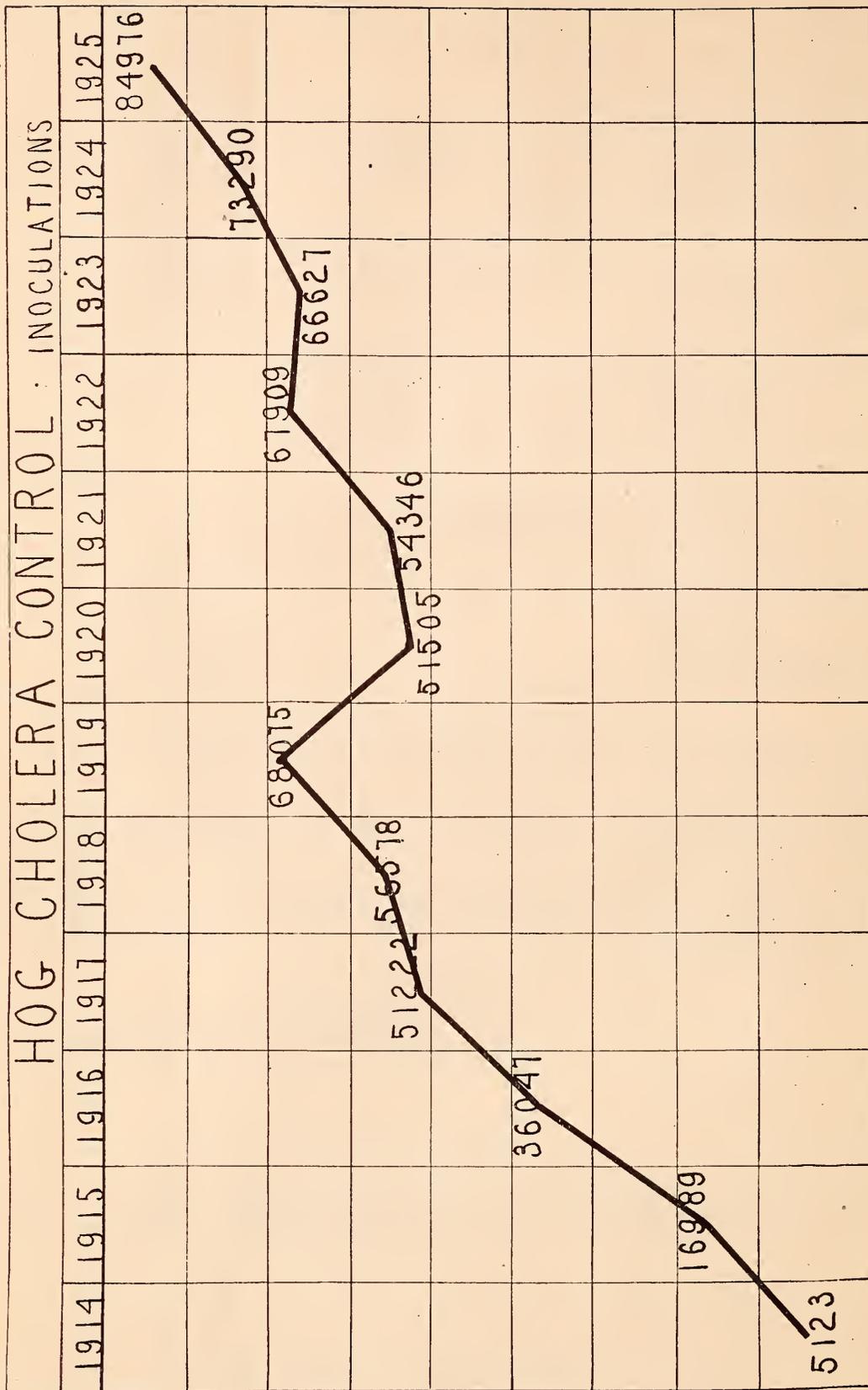
Two hundred and fifty-eight unpaid claims covering 2,597 cattle, to which provisions of chapter 353, Acts of 1922, apply, remain unpaid, amounting to \$68,895.34.

There has been received during the year from the sale of hides and carcasses of condemned animals \$10.

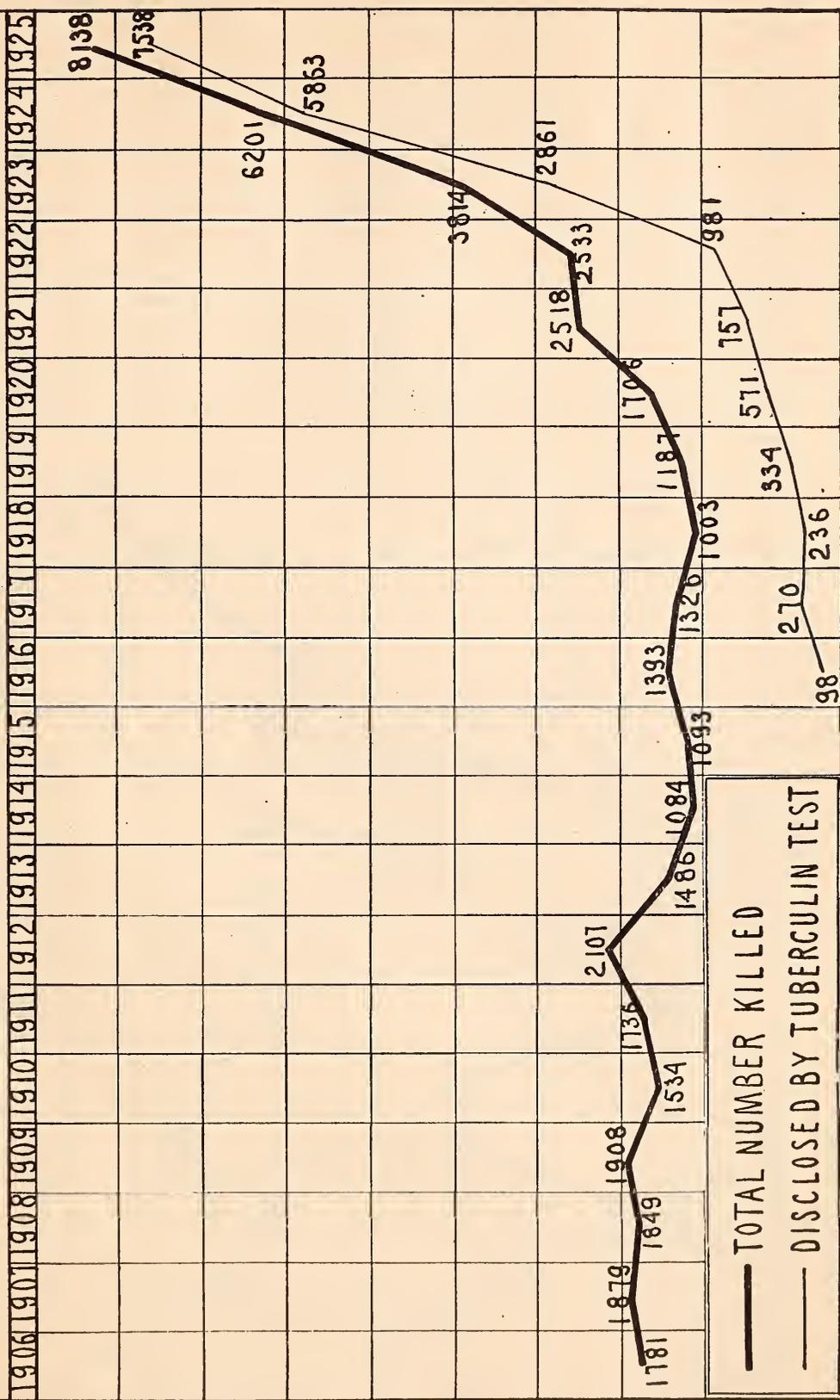
Respectfully submitted,  
LESTER H. HOWARD, *Director*.

### APPENDIX

The following graphs show the work of the Division of Animal Industry in control of the principal contagious diseases of animals for a period of years.

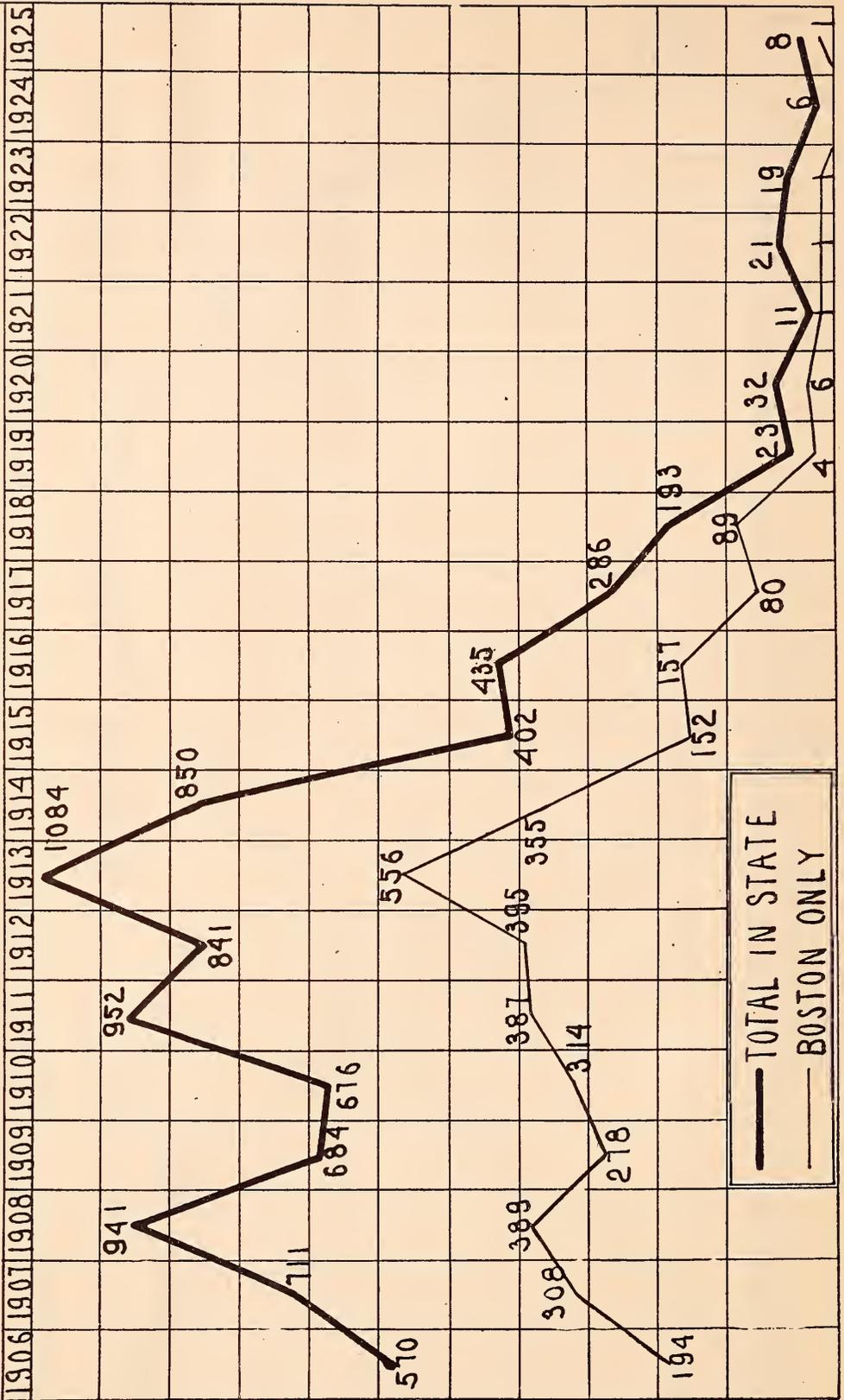


# BOVINE TUBERCULOSIS



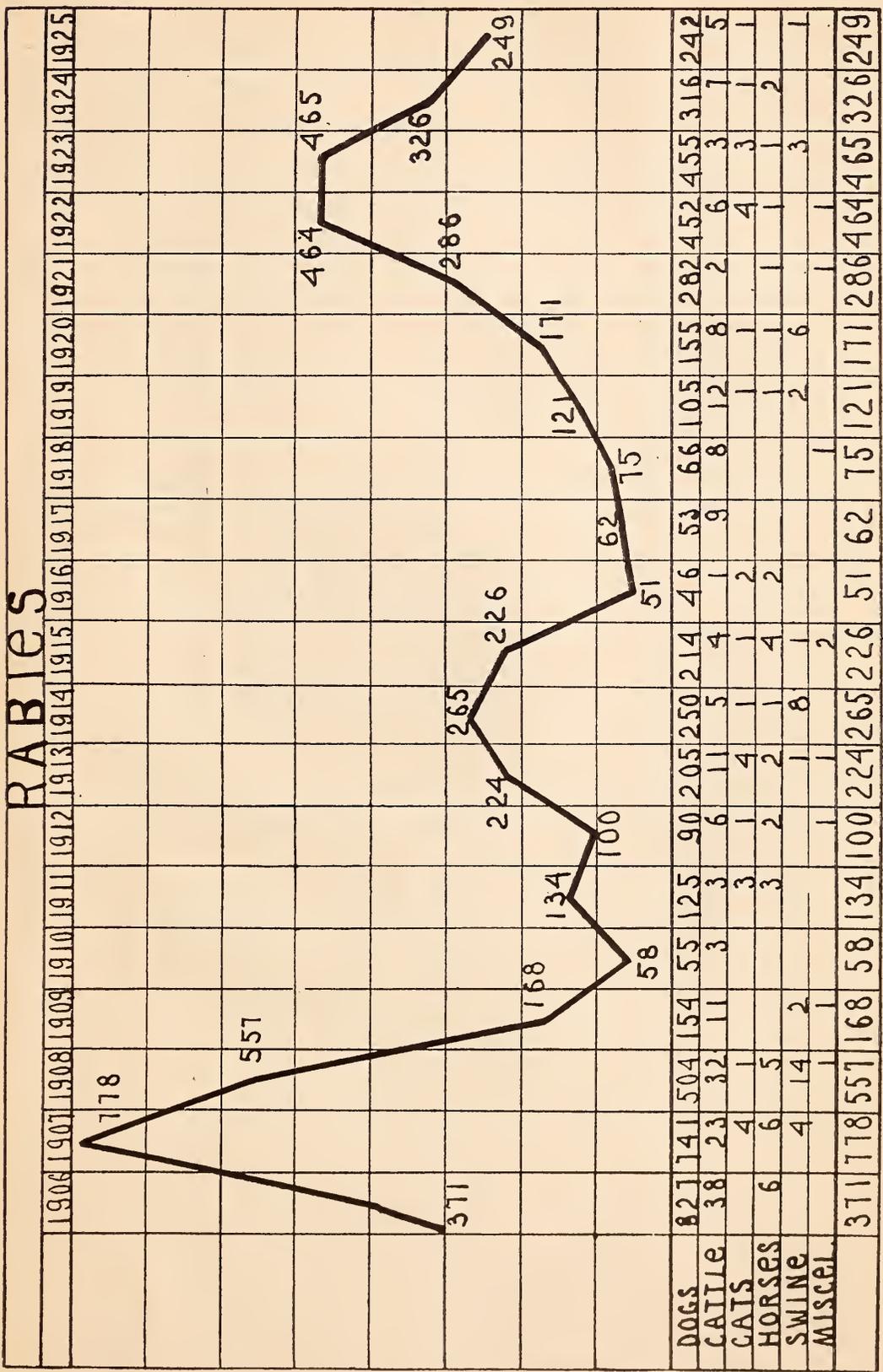
— TOTAL NUMBER KILLED  
 - - - DISCLOSED BY TUBERCULIN TEST

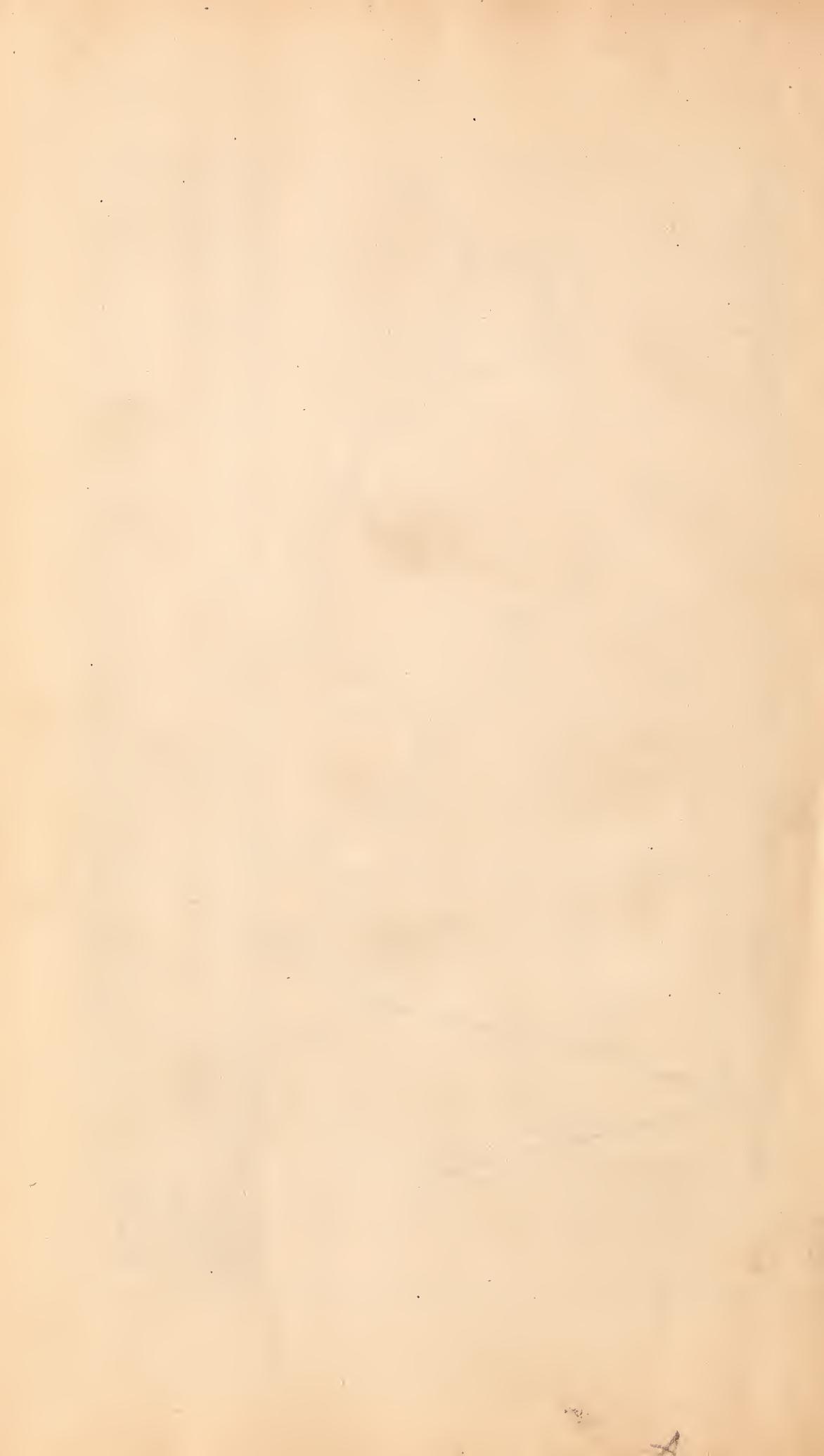
# GLANDERS



TOTAL IN STATE  
 BOSTON ONLY

# RABIES











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