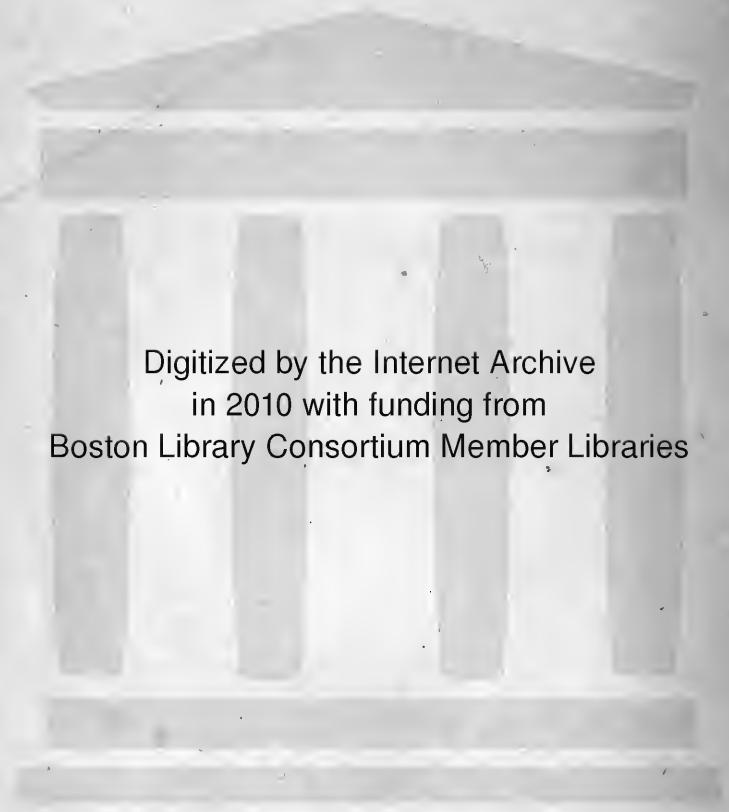
REPORT

OF THE

CATTLE COMMISSIONERS

1902



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ANNUAL REPORT

OF THE

BOARD OF CATTLE COMMISSIONERS

OF THE

COMMONWEALTH OF MASSACHUSETTS.

JANUARY 10, 1902.

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REPORT.

To the Honorable Senate and House of Representatives.

The Board of Cattle Commissioners herewith presents its annual report, as required by section 3, chapter 90 of the Revised Laws.

The Massachusetts Cattle Commission is among the more venerable of the many commissions of the Commonwealth; its establishment antedates the civil war and the various commissions and organizations that sprung into existence since that time.

The first Cattle Commission was appointed for the purpose of eradicating contagious pleuro-pneumonia among cattle, April 6, 1860, its members being Paoli Lathrop, Amasa Walker and Richard S. Fay. Two weeks later Richard S. Fay resigned and Dr. George B. Loring was appointed in his place. An extra session of the Legislature was called, May 30, 1860, for further legislation, which resulted in increasing the membership of the Board to five members for the time being. Contagious pleuro-pneumonia was introduced into Massachusetts by W. W. Chenery of Belmont, who imported two cows from Holland in June, 1859, which were suffering from this disease. As a result of sales from this herd, the disease was carried to Worcester County and also later appeared along the south shore. One of the final reports of the Cattle Commission with reference to stamping out contagious pleuro-pneumonia is dated Dec. 28, 1866, is signed by E. F. Thayer, Charles P. Preston and F. D. Lincoln, and shows the expense to the Commonwealth to have been $67,511.08. The final report, Dec. 30, 1867, says no new cases have occurred during the year.

Contagious pleuro-pneumonia was first brought into the United States in 1843, by a cow that was owned by a sea captain, and landed from the ship at Brooklyn, N. Y.,

whence it spread to New Jersey, Pennsylvania, Maryland, the District of Columbia and parts of Virginia. At length in 1884 contagious pleuro-pneumonia crossed the Alleghanies to Ohio, was taken thence to Illinois, and from there to one or two places in Missouri and to Cynthiana, Ky. It was stamped out in these places, but appeared in 1886 in the great distillery stables in Chicago, where it wrought great havoc. Finally, in about 1884 or 1885, Congress appropriated $500,000 for its eradication, and passed a bill allowing federal to co-operate with State authorities for its extinction. It was finally eradicated from the United States, it is hoped never again to obtain a foothold here, but not until the United States government assisted other States to do what Massachusetts was able and willing to do for herself in 1860 to 1866, when the country was also engaged in the great civil war, and the resources of the State were severely taxed to assist in carrying it on.

In February, 1862, an act was passed providing for the appointment of a new Cattle Commission; and Dr. E. F. Thayer of Newton, H. L. Sabin of Williamstown and James Ritchie of Roxbury were appointed on the Board. Even in 1862 we find in the annual report the statement that, if New York, New Jersey and Pennsylvania would follow the example of Massachusetts, it would be an effective mode of securing the whole community against this disease, — contagious pleuro-pneumonia.

In 1868 the appearance of Texas fever in Brighton market, whence it was carried to other points, called forth the efforts of the Cattle Commission again. This year we find still a member, Dr. E. F. Thayer of Newton, who continued on the Board until 1885, and Hon. Levi Stockbridge of Amherst, who served until 1894, and was then reappointed for three years more. Mr. Stockbridge, if he had chosen, might have served continuously for thirty years, but resigned immediately after his last appointment.

In 1869 an outbreak of what appears to have been anthrax, in the western part of the State, occupied the attention of the Board for a portion of the time.

In 1870 sporadic pneumonia, anthrax and foot and mouth

disease seems to have made a good deal of work for the commission.

The report of Jan. 10, 1871, is signed by H. W. Jordan, in addition to Messrs. Thayer and Stockbridge, and he appears to have continued as a member at times until the reorganization in 1885.

In 1871 foot and mouth disease, or epizootic aptha, again demanded attention from the Cattle Commissioners.

The report for 1872 speaks of investigating a supposed outbreak of contagious pleuro-pneumonia, which proved to be sporadic pneumonia; and also mentions the occurrence of spinal meningitis among horses, and the great equine epizootic in the fall of 1872.

In 1873 the services of the commission were not required, and in 1874 it had very little to do beyond investigating two or three outbreaks of Texas fever.

In 1875 the Board was again called upon to investigate outbreaks of Texas fever, and also recommends special legislation to prevent its entrance during the summer months.

In 1876 no Texas fever appeared, as a result of the legislation asked for in the previous year's report; two outbreaks of disease thought to be contagious pleuro-pneumonia were investigated, and found to be due to some other cause.

In 1877 Texas fever again appeared, and was combated manfully by the Cattle Commissioners.

In 1878 glanders and farcy in horses, asses and mules was placed in charge of the Cattle Commission, and has called upon it for a great deal of attention every year since. The report for 1878 advises additional legislation for dealing with this disease.

In 1879 the State adopted the policy of paying four-fifths the value of horses killed for glanders, although the commission in its report for 1878 gives it as its opinion that a horse with glanders or farcy has no value. A total of $1,668.44 was the expense of the commission for this year, calling for a deficiency appropriation of about $1,000.

In 1880 the State seems to have continued paying a small amount for glandered horses. In the report for this year the first mention is made of tuberculosis in cattle, and the

commission is uncertain of its being contagious, and therefore decides not to consider it so, and consequently not a disease with which it is called upon to deal officially. The report also mentions an outbreak of verminous bronchitis in calves, and a similar one in swine.

From the report of the commission for 1881 it appears that the State has decided that a glandered horse has no value, and has repealed the law providing for paying four-fifths of a diseased horse's apparent value. This report is also the first one to mention hog cholera.

In 1882 the work of the Board seems to have been chiefly in connection with glanders, but it speaks of the importance of keeping organized, in order to cope with any danger which may be imported from other States.

During 1883, 1884 and 1885 the commission continued in much the same way as already described. In 1885 it was reorganized, with Prof. Levi Stockbridge of Amherst, A. W. Cheever of Dedham and Dr. J. F. Winchester of Lawrence, as members, and continued to be thus organized until 1889.

In the report for 1888 there is an article by Dr. Winchester, calling attention to the importance and prevalence of tuberculosis among cattle, and mentioning the fact that Koch discovered the bacillus of tuberculosis, and believes it to be the same in man and the lower animals.

In 1889 Mr. O. B. Hadwen of Worcester was appointed in Dr. Winchester's place. The Board continued with this change in the membership until 1892. In April of this year the commission was reorganized, with Prof. Levi Stockbridge of Amherst, Dr. Charles P. Lyman of Boston and Dr. Maurice O'Connell of Holyoke as members. Tuberculosis among cattle is added to the list of contagious animal diseases, to be killed without appraisal or payment. Under this law 81 tuberculous cattle were killed.

In 1892 the law was first passed requiring the appointment of an inspector of animals and provisions in every city and town in the State.

In 1894 it was decided to increase the commission to five members, on account of the extra work tuberculosis was sup-

posed to entail. In June of that year Dr. F. H. Osgood of Brookline and Leander F. Herrick of Worcester were appointed to the Board. It was also enacted, in 1894, to pay half the appraised value of tuberculous cows killed by order of the commission. In October, 1894, Charles A. Dennen of Pepperell was appointed to succeed Prof. Levi Stockbridge, who resigned after being reappointed for another three-year term.

In 1895 compensation was increased to full appraised value, with a limit not exceeding $60 for cattle condemned and killed as tuberculous.

The more recent history of the commission is a matter within easy reach of every one's memory. The opposition of the farmers to having a compulsory tuberculin test of all the cattle in the State; the appointment of Dr. J. M. Parker, in October, 1896, to succeed Dr. C. P. Lyman; the resignation of Dr. Osgood in December, 1896, and the appointment of Dr. Austin Peters to the position; the large appropriations of $300,000 and $250,000 for the eradication of contagious diseases of animals in 1896 and 1897; the reaction in 1898, with the reduction of the appropriation to $20,000, and the attempt to legislate the Board out of existence, — are all occurrences of comparatively recent date.

In 1899 the laws relating to contagious diseases of animals were once more recodified, the commission reduced to three members again, and more conservative methods have since prevailed, with an annual expenditure of a smaller amount of money than a few years ago.

The foregoing history of the Massachusetts Cattle Commission is given to call attention to the length of time it has been in existence and the varied duties it has been called upon to perform; and to emphasize the fact that it is not a tuberculosis commission alone, but was created to protect the live stock interests of the State from the ravages of all contagious animal diseases, and incidentally to protect the public health from the dangers of disorders common to animals and man.

The invested capital in the live stock industry exceeds that of any other in the United States. It is said that the business in the Chicago stock yards during the past year

exceeded the combined other industries of Chicago by $20,000,000. While not of such vast importance in Massachusetts, yet it is of sufficient importance to be worthy of careful attention and consideration.

An intelligent and civilized community demands a suitably organized system of veterinary sanitary police, and at times it is called upon to exercise powers of the most autocratic nature. While its rules and regulations may seem unreasonable and severe to the individual on some occasions, yet they are for the public good, and call for the subordination of private pecuniary interests to the welfare of the community.

The Cattle Commission estimates that it will need $50,000 to carry out its duties during the coming year. This will be necessary to fulfil the requirements of the law. The examination of and payment for cows diseased with tuberculosis, the examination and killing of horses with glanders and farcy, investigations and control of other contagious animal diseases, and continuing quarantine regulations preventing the importation of diseased cattle from other States, are likely to require this amount. It is also suggested that an additional appropriation of $25,000 for testing herds at the request of the owner would be of great value towards diminishing the frequency of bovine tuberculosis, and making greater advances towards its suppression. Many farmers would like to have the commission test their herds, but most of them have to be refused, because the Board has not money enough to do more than its regular work. Fifty thousand dollars is a necessity; the additional $25,000 is an agricultural matter, but will tend to further decrease bovine tuberculosis.

The reports of the annual inspection of cattle made by the inspectors of animals in 1900 shows an examination of 33,000 herds, comprising 258,268 head of neat stock, of which 181,105 were cows. The number of animals quarantined by the inspectors on suspicion of being tuberculous was 3,249. Of these, 954 were released by the Board, as not showing sufficient evidence of disease to be condemned; 1,425 were killed and paid for; 43 died in quarantine, and were not paid for; and 64 were killed because the owners

were not satisfied that they were not diseased, and the hides and carcasses were given to the owners when the animals were found to be fit for beef. Dec. 1, 1900, 48 cattle were released from quarantine because there was a lack of funds to pay for them, but some of them were requarantined and killed after Jan. 1, 1901. In spite of these precautions, the expenses of the commission exceeded its appropriation by $3,408.11, and this amount was provided for by two deficiency appropriations passed by the Legislature of 1901. The appropriation in 1900 was $50,000, and in 1901 an equal amount was again appropriated. It has been the aim of the commission to keep within the limits of its appropriations, and this past year it has succeeded in doing so, and will have a margin of between $200 and $300 left to meet any unexpected incidental claims that may be made. To do this, it again refused to take any cattle after Dec. 1, 1901, but only 10 or 12 animals were quarantined after this date by the inspectors, showing a slightly improved condition in the cattle of the State in 1901, as compared with 1900. These few animals will be taken care of, if necessary, after Jan. 1, 1902.

From the work done in 1900 and 1901 it appears that about ½ per cent. of the neat cattle of the State are found to be tuberculous, on a general inspection, the diagnosis being based on a physical examination, and not on the tuberculin test. On a tuberculin test the per cent. of infected cattle would of course be much larger, — at least 10 per cent. of the bovines in the State; but most of them have not sufficient disease to be a danger either to other animals or the health of the community. The appraised value of animals killed by order of the commission has been steadily decreased from year to year for the last few years. In 1900 the average paid per head was $21.66; in 1901 it was further reduced to $20.36 per head. The average appraisals of the different agents is also much more uniform now than in the past. The reports of inspectors from various parts of the State, at the close of the 1901 inspection, shows an improved condition of the live stock over any previous year; but at present it seems that it will be necessary to

kill 1,200 or 1,300 a year; and, in justice to the farmers, it does not seem possible to lower the average price paid for each animal much below $20 each. This means that it will take about $25,000 a year, for the present, to pay for diseased cattle killed, leaving the other $25,000 for the necessary expenses in examining quarantined cattle, glandered horses, keeping up the quarantine work, paying for office and laboratory work incidental to the duties of the commission, and meeting any emergency that may occur.

The cattle killed on the annual inspection either show physical evidence of disease, or appear to have tuberculosis of the udder, and are unfit animals to furnish a public milk supply. Koch's announcement that there is no danger to the public health from tuberculous cattle has aroused much interest and comment; but his opinion was by no means acquiesced in by the majority of the members of the Congress of Tuberculosis in London, last July, and, until more is definitely known concerning the correctness of his views, no person of sound judgment cares to advocate the use of milk for human beings that will produce disease when fed to calves and swine.

Glanders is another serious problem to be dealt with. The total equine population of Massachusetts is about 75,000, according to the last United States census; yet, in 1901, 745 horses were killed in the State with some form of this disease, — that is, about 1 per cent. of the horses of the State were infected with it, — a condition of affairs to call for the gravest concern on the part of every horse owner, horse lover, or person who has the slightest regard for the health or wealth of the community.

Under its proper heading, this report gives more in detail the work done on tuberculosis and glanders, and also investigations made concerning blackleg or symptomatic anthrax, actinomycosis, and accounts of outbreaks of rabies and hog cholera.

Financial Statement.

The following financial statement gives in detail the expenditures of the Cattle Commission during the year.

Under the provisions of chapter 408, Acts of 1899, the

Cattle Commissioners have expended, during the year ending Dec. 16, 1901, as follows: —

For cattle condemned, killed and found tuberculous, 1,341 head,	$27,424 50
For cattle condemned, killed and no lesions found, 21 head,	311 00
For quarantine expenses, 7 head,	14 25
For expenses of killing and burial,	60 50
For expenses of arbitration,	7 25
For salaries of commissioners,	4,230 00
For expenses of commissioners,	1,669 05
For services of agents,	4,536 50
For expenses of agents,	1,868 57
For services of clerks and stenographers,	2,556 09
For books and blanks for annual inspection,	460 35
For blanks for quarantine stations, etc.,	175 32
For rent of office, ten months,	875 00
For postage, express, stationery and general office expenses,	780 07
For animals for investigating outbreak of symptomatic anthrax,	208 76
For care and keeping of same,	170 34
For examinations, tests and expert investigations on account of symptomatic anthrax,	212 37
For examinations and tests for rabies,	100 00
For other laboratory and experimental work,	668 15
For tuberculin, mallein and implements,	280 73
For expenses of quarantine stations, Brighton, Somerville and Watertown,	2,744 63
For expenses of work in the suppression of glanders,	3,598 87
For expenses of killing and burial of glandered horses,	297 97
Total,	$53,250 27

Of this amount, $7,857.25 was paid on account of claims outstanding at the beginning of the year, leaving $45,393.02 chargeable to the appropriation of $50,000 for 1901, and an unexpended balance of $4,606.98, which it is expected will be sufficient to meet all unsettled accounts.

The $50,000 appropriated for 1900 being insufficient to meet the expenses of that year, appropriations were made by the Legislature to supply the deficiency; $2,597.13 by chapter 122, and $810.98 by chapter 490, Acts of 1901.

The average price paid for the 1,362 condemned cattle was $20.36, and less than the previous year by $1.30 per head.

Twelve head of young stock used for experimental purposes were sold at auction for $179.25; the sales of hides and carcasses of condemned animals during the year amounted to $784.03, — a total of $963.28, which has been paid to the State Treasurer from time to time as received.

By chapter 391, Acts of 1901, entitled "An act relative to the inspection and branding of the carcasses of animals slaughtered for human food," the Board of Cattle Commissioners is required to design and furnish to the board of health of any city or town requiring the same the stamps or brands necessary for carrying out the provisions of the act. After consulting with the United States Bureau of Animal Industry, and the examination and comparison of several styles, a simple and effective design was adopted; and 282 branding stamps have been furnished to the boards of health of 222 cities and towns

Tuberculosis.

The principal item of expense in conducting the operations of the Cattle Commission is that incurred in dealing with bovine tuberculosis, because a greater number of animals are examined for this disease than any other. Animals that are condemned and killed are paid for; and it is necessary to keep up a quarantine against cattle coming from other States, in order to enforce regulations requiring all neat stock brought in for dairy or breeding purposes to be tested with tuberculin, to be sure that they are free from disease.

The management of bovine tuberculosis, as in previous years, may be divided under three general heads: —

First. — The maintenance of quarantine regulations against other States, requiring that all cattle imported into Massachusetts for dairy or breeding purposes shall be free from tuberculosis, the condition of health being based upon their being able to pass a tuberculin test.

Second. — That portion comprised in the work of the inspectors of animals, in their annual examination of herds and premises, reporting upon their condition, quarantining animals that show manifest symptoms of disease, which are

examined then by agents of the Board and appraised and killed by them if their condition demands it.

Third. — Testing with tuberculin entire herds, at the request of the owners, to determine which animals are infected and which are healthy, with a view to entirely eradicating tuberculosis from the herd.

First. — The maintenance of quarantine regulations. All persons bringing cattle into Massachusetts must have a permit from the Cattle Commissioners, except for those coming to the stock yards at Brighton, Watertown and Somerville, which are considered quarantine stations, and are in constant charge of a member of the commission.

All cattle except calves under six months old and beeves for immediate slaughter must be tested with tuberculin by a veterinarian acceptable to the Board, at the expense and risk of the owner, either before shipment or after arrival at their destination. Cattle brought to the stock yards are identified and released by the commissioner in charge, upon certificate of tuberculin test; the animals are identified by an ear tag furnished by the commission; the number on the tag must agree with the number on the certificate. Animals that have not been tested, upon arrival at the stock yards are held and tested by the Cattle Commission, and any that fail to pass the test are held for a week and retested; if an animal reacts a second time, it is deemed to be tuberculous, and is killed. Formerly, all animals that reacted the first time were killed, but some that gave an apparent reaction on the first test were found to be free from disease on post-mortem, and the State had to pay for them. Under the present system, a creature that reacts to the second test is invariably found to be tuberculous on autopsy.

Receipts of Stock at Brighton, from Dec. 15, 1900, to Dec. 15, 1901.

Maine cattle,	9,837
New Hampshire cattle,	1,987
New York cattle,	673
Rhode Island and Connecticut cattle,	229
Massachusetts cattle,	11,366
Western cattle,	79,071
Sheep,	43,763

Swine,	1,196,731
Veal,	39,229
Cattle released on certificates,	8,416
Cattle tested,	3,901
Cattle released after test,	3,888
Cattle condemned after test,	13
Cattle in stock barn,	18,682

Receipts of Stock at Somerville, from Dec. 15, 1900, to Dec. 15, 1901.

Maine cattle,	1,147
New Hampshire cattle,	5,025
Vermont cattle,	4,886
Massachusetts cattle,	3,507
New York cattle,	496
Western cattle,	29,314
Sheep,	352,766
Swine,	18,126
Veal,	55,053
Cattle released on certificates,	936

All cattle not having certificate of test have been tested at Brighton by the commission, and are included in the Brighton report.

Receipts of Stock at Watertown, from Dec. 15, 1900, to Dec. 15, 1901.

Vermont cattle,	5,404
New Hampshire cattle,	5,201
Massachusetts cattle,	2,929
New York cattle,	60
Western cattle,	51,739
Sheep,	398,032
Swine,	231,639
Veal,	59,036
Cattle released on certificates,	6,492
Cattle tested,	189
Cattle released after test,	181
Cattle condemned after test,	8

Total Stock received at the Three Stations.

Cattle,	212,871
Sheep,	794,561
Swine,	1,446,496
Veal,	153,318
Released on certificates,	15,844
Tested at stations,	4,090
Released after test,	4,069
Condemned after test,	21

The amount of stock received at the quarantine stations is larger than in 1900, not only in regard to cattle, but also sheep, swine and veal.

Of the nearly 20,000 cattle released on certificates, and after being tested at the stations, nearly all were milch cows for the local markets. In 1896, there were 501 cattle tested at the stations, of which number 18, or 3⅗ per cent., were condemned as tuberculous. In 1900, 633 were tested, of which number a little over 1 per cent. reacted. During the past year (1901) 4,090 were tested and 21 reacted, — about ½ of 1 per cent.

Since March 1, 1901, all cattle tested at the stations have been tagged, and a record kept of their test and tag numbers. Also, a copy has been sent to the Bureau of Animal Industry, Washington, in return for which it has furnished all the tuberculin used, thereby saving the State several hundred dollars. This work has been done without extra cost, being done by the commissioner in charge and his assistants.

By comparing the number of cattle tested the past year with those of previous years, it seems as if the time will soon come when *all* cattle brought to these markets will be tested *after* arrival, as this branch of the work is constantly on the increase. The figures given show a constant increase in the number tested, and also a constant decrease in the per cent. of tuberculous animals; which decrease is thought, as was said in the last annual report, to be largely due to the care exercised by the drovers in buying cattle for these markets, also to the good work done in the past few years by the Cattle Commission of Vermont.

Report of Cattle brought into State during the Year, to Points Outside the Quarantine Stations at Brighton.

During the year 1901, 614 permits were issued to bring animals into Massachusetts, 38 of which were not used. On the balance, the following cattle were brought in: —

For dairy and breeding purposes, tested before shipment, . .	3,786
For dairy and breeding purposes, tested after shipment, . .	1,761
Calves under six months old, requiring no test, ...	58

Cattle returned from out of State pastures,	599
Cattle to be pastured and returned to New Hampshire,	3
Cattle to be pastured and returned to Vermont,	9
Cattle to be pastured and returned to Rhode Island,	20
Cattle to be pastured and returned to Connecticut,	34

Sixty permits were for cattle for immediate slaughter, 18 being for a carload or more weekly, and 2 for a carload or more monthly. On these permits, a great many cattle were brought in for beef, the exact number not being recorded. Five permits gave the privilege of bringing in cattle to be fattened and sold for beef later, 2 allowed herds to be driven back and forth daily between Connecticut and Massachusetts, 3 allowed cattle to pass through the State, and 8 gave owners the privilege of taking cattle to other States for exhibition at fairs and returning them. Permission was also granted to bring in a yoke of oxen, to be driven through various cities and towns, for advertising purposes.

Besides the above, railroad agents, local inspectors and others have reported 502 cows and 3 bulls brought in without permission; but they have all been looked up and tested.

It is believed that most of the testing of veterinarians is now honestly done; but there is a temptation to fraud in carrying out these regulations, and there are probably occasional instances where cattle are not honestly tested. When a veterinarian is found to be doing dishonest or uncertain work, his tests are thenceforth refused. A few laymen also test cattle, who are proficient in the work, whose tests are accepted by the commission. In fact, an honest layman who understands applying the test is to be preferred to a dishonest veterinarian. An honest test in every instance might be obtained in one of two following ways. One is to test cattle in all cases after arrival at destination, at the cost of the State. This would add to the annual expense of maintaining the Cattle Commission, and for that reason is objectionable. The other is to arrange to have the Bureau of Animal Industry of the United States Department of Agriculture test all dairy and breeding cattle used in interstate commerce. This desirable condition of affairs may be brought about in time.

Bulletin No. 32 of the United States Department of Agriculture, Bureau of Animal Industry, by Dr. D. E. Salmon, chief of the Bureau, upon the "Tuberculin Test of Imported Cattle," is a justification of these requirements of the United States government, and emphasizes the importance of insisting that cattle imported from foreign countries into the United States shall be free from tuberculosis, in order to protect live stock in localities where the disease does not exist; not only on account of the dangers to our own population from the use of products from tuberculous animals, and the pecuniary losses to farmers occasioned by this disease, but also to protect our foreign markets for beef and pork, as it would injure the sales of these exports in the markets of the world if we had the reputation of having this scourge prevail extensively among our cattle and swine. What he says in this bulletin is as applicable to one State as to the United States; and the Massachusetts Cattle Commission feels that it is only a proper course to pursue, as part of the work in endeavoring to eradicate tuberculosis from the herds of the Commonwealth.

The second division of the work in connection with tuberculosis is that comprised in the annual inspection made by the inspectors of animals, as provided for in section 29, chapter 408, Acts of 1899. This inspection was ordered in October this year, as it was last. The following table shows the results of the examinations made by the inspectors, the number of cattle quarantined by them, and the disposition made of the animals by the commission: —

Result of Work done by Inspectors in quarantining Cattle.

CITY OR TOWN.	Number quarantined.	MASSACHUSETTS CATTLE.						CATTLE FROM OUT OF STATE.					Totals.
		Number released.	Number condemned, killed and paid for.	Permit to kill, paid for.	Permit to kill, no Award.	Died in Quarantine, no Award.	Condemned and killed, in Process of Settlement.	Number released.	Number condemned, killed and paid for.	Number condemned and killed, no Award.	Sent out of State.	In Quarantine.	
Acton,	8	–	6	–	–	–	2	–	–	–	–	–	8
Adams,	9	6	3	–	–	–	–	–	–	–	–	–	9
Agawam,	5	2	2	–	1	–	–	–	–	–	–	–	5
Alford,	3	1	2	–	–	–	–	–	–	–	–	–	3
Amesbury,	3	–	2	–	–	–	1	–	–	–	–	–	3
Amherst,	8	1	6	–	–	1	–	–	–	–	–	–	8
Andover,	22	3	18	–	–	–	1	–	–	–	–	–	22
Ashburnham,	15	5	5	–	–	2	1	2	–	–	–	–	15
Ashby,	17	4	9	–	–	–	–	4	–	–	–	–	17
Ashfield,	22	9	13	–	–	–	–	–	–	–	–	–	22
Ashland,	6	1	2	–	–	–	1	2	–	–	–	–	6
Athol,	6	3	3	–	–	–	–	–	–	–	–	–	6
Attleborough,	15	2	1	–	–	–	–	12	–	–	–	–	15
Auburn,	4	–	4	–	–	–	–	–	–	–	–	–	4
Ayer,	1	1	–	–	–	–	–	–	–	–	–	–	1
Barnstable,	2	1	1	–	–	–	–	–	–	–	–	–	2
Barre,	9	–	7	–	–	–	2	–	–	–	–	–	9
Bedford,	9	1	6	–	–	–	1	1	–	–	–	–	9

Belchertown,	20	4	15	-	-	1	-	-	-	-	-	-	20
Bellingham,	2	1	1	-	-	-	-	-	-	-	-	-	2
Berlin,	4	-	4	-	-	-	-	-	-	-	-	-	4
Bernardston,	4	-	4	-	-	-	-	-	-	-	-	-	4
Beverly,	3	1	2	-	-	-	-	-	-	-	-	-	3
Billerica,	16	6	7	-	2	1	-	-	-	-	-	-	16
Blackstone,	1	-	1	-	-	-	-	-	-	-	-	-	1
Blandford,	5	5	-	-	-	-	-	-	-	-	-	-	5
Bolton,	17	4	12	-	-	-	1	-	-	-	-	-	17
Boston,	19	2	7	-	-	1	1	8	-	-	-	-	19
Boxborough,	7	-	7	-	-	-	-	-	-	-	-	-	7
Boxford,	1	-	-	-	-	1	-	-	-	-	-	-	1
Boylston,	4	-	4	-	-	-	-	-	-	-	-	-	4
Bridgewater,	2	-	2	-	-	-	-	-	-	-	-	-	2
Brimfield,	2	2	-	-	-	-	-	-	-	-	-	-	2
Brockton,	14	5	9	-	-	-	-	-	-	-	-	-	14
Brookline,	1	1	-	-	-	-	-	-	-	-	-	-	1
Buckland,	7	2	4	-	1	-	-	-	-	-	-	-	7
Burlington,	1	-	1	-	-	-	-	-	-	-	-	-	1
Canton,	1	-	1	-	-	-	-	-	-	-	-	-	1
Carlisle,	24	5	17	-	-	1	1	-	-	-	-	-	24
Charlemont,	3	1	2	-	-	-	-	-	-	-	-	-	3
Charlton,	19	3	12	-	-	-	4	-	-	-	-	-	19
Chelmsford,	20	3	15	-	-	2	-	-	-	-	-	-	20
Chelsea,	8	1	-	-	-	-	-	7	-	-	-	-	8
Chester,	2	2	-	-	-	-	-	-	-	-	-	-	2
Chesterfield,	2	-	1	-	1	-	-	-	-	-	-	-	2
Chicopee,	1	-	-	-	-	1	-	-	-	-	-	-	1
Clinton,	1	-	-	-	-	1	-	-	-	-	-	-	1
Cohasset,	4	3	1	-	-	-	-	-	-	-	-	-	4

Result of Work done by Inspectors in quarantining Cattle — Continued.

CITY OR TOWN.	Number quarantined.	Massachusetts Cattle.						Cattle from out of State.					Totals.
		Number released.	Number condemned, killed and paid for.	Permit to kill, paid for.	Permit to kill, no Award.	Died in Quarantine, no Award.	Condemned and killed, in Process of Settlement.	Number released.	Number condemned, killed and paid for.	Number condemned and killed, no Award.	Sent out of State.	In Quarantine.	
Colrain,	13	2	8	–	–	1	1	1	–	–	–	–	13
Concord,	29	1	25	–	–	1	2	–	–	–	–	–	29
Conway,	24	4	14	–	–	–	2	3	–	1	–	–	24
Cummington,	7	2	3	–	–	1	1	–	–	–	–	–	7
Danvers,	2	–	2	–	–	–	–	–	–	–	–	–	2
Dartmouth,	8	–	7	–	–	1	–	–	–	–	–	–	8
Dedham,	3	–	3	–	–	–	–	–	–	–	–	–	3
Deerfield,	42	3	13	–	–	2	–	24	–	–	–	–	42
Dighton,	5	–	4	–	–	–	1	–	–	–	–	–	5
Douglas,	4	–	4	–	–	–	–	–	–	–	–	–	4
Dracut,	22	6	10	–	–	–	4	–	–	2	–	–	22
Dudley,	2	1	1	–	–	–	–	–	–	–	–	–	2
Dunstable,	5	1	3	–	–	1	–	–	–	–	–	–	5
Duxbury,	1	–	1	–	–	–	–	–	–	–	–	–	1
East Bridgewater,	5	–	3	–	–	–	2	–	–	–	–	–	5
East Longmeadow,	2	–	1	–	1	–	–	–	–	–	–	–	2
Easthampton,	5	–	4	–	1	–	–	–	–	–	–	–	5
Easton,	3	–	–	–	1	1	–	–	–	1	–	–	3

Enfield,	2	1	–	–	1	–	–	–	–	–	–	–	2
Essex,	1	–	–	–	–	–	1	–	–	–	–	–	1
Everett,	1	–	–	–	–	–	–	1	–	–	–	–	1
Fairhaven,	7	–	6	–	–	1	–	–	–	–	–	–	7
Fall River,	4	–	1	–	–	1	–	2	–	–	–	–	4
Fitchburg,	10	–	7	–	1	–	–	2	–	–	–	–	10
Foxborough,	3	1	2	–	–	–	–	–	–	–	–	–	3
Framingham,	8	1	6	–	–	–	1	–	–	–	–	–	8
Franklin,	13	–	13	–	–	–	–	–	–	–	–	–	13
Gardner,	14	–	13	–	1	–	–	–	–	–	–	–	14
Gill,	12	2	10	–	–	–	–	–	–	–	–	–	12
Grafton,	28	6	21	–	–	–	1	–	–	–	–	–	28
Granby,	7	1	4	–	–	1	1	–	–	–	–	–	7
Granville,	2	–	1	–	–	1	–	–	–	–	–	–	2
Great Barrington,	1	–	–	–	–	1	–	–	–	–	–	–	1
Greenfield,	39	7	25	1	4	–	2	–	–	–	–	–	39
Greenwich,	4	2	2	–	–	–	–	–	–	–	–	–	4
Groton,	22	4	8	–	–	–	10	–	–	–	–	–	22
Groveland,	2	1	1	–	–	–	–	–	–	–	–	–	2
Hadley,	5	1	3	–	–	–	–	–	–	1	–	–	5
Halifax,	1	–	1	–	–	–	–	–	–	–	–	–	1
Hamilton,	1	1	–	–	–	–	–	–	–	–	–	–	1
Hampden,	3	–	2	–	–	–	1	–	–	–	–	–	3
Hancock,	1	–	–	–	–	1	–	–	–	–	–	–	1
Hanover,	4	2	2	–	–	–	–	–	–	–	–	–	4
Hardwick,	3	1	2	–	–	–	–	–	–	–	–	–	3
Harvard,	9	3	6	–	–	–	–	–	–	–	–	–	9
Hatfield,	15	–	–	–	1	–	–	14	–	–	–	–	15
Haverhill,	21	3	11	–	–	1	5	–	–	1	–	–	21
Hingham,	5	–	5	–	–	–	–	–	–	–	–	–	5

Result of Work done by Inspectors in quarantining Cattle — Continued.

CITY OR TOWN.	Number quarantined.	Massachusetts Cattle.						Cattle from out of State.					Totals.
		Number released.	Number condemned, killed and paid for.	Permit to kill, paid for.	Permit to kill, no Award.	Died in Quarantine, no Award.	Condemned and killed, in Process of Settlement.	Number released.	Number condemned, killed and paid for.	Number condemned and killed, no Award.	Sent out of State.	In Quarantine.	
Holden,	7	1	5	–	–	–	1	–	–	–	–	–	7
Holland,	1	1	–	–	–	–	–	–	–	–	–	–	1
Holliston,	2	–	2	–	–	–	–	–	–	–	–	–	2
Holyoke,	1	–	–	–	–	1	–	–	–	–	–	–	1
Hopkinton,	41	13	26	–	–	–	2	–	–	–	–	–	41
Hubbardston,	14	2	12	–	–	–	–	–	–	–	–	–	14
Hudson,	2	–	2	–	–	–	–	–	–	–	–	–	2
Hull,	3	–	3	–	–	–	–	–	–	–	–	–	3
Huntington,	4	3	–	–	1	–	–	–	–	–	–	–	4
Hyde Park,	1	–	1	–	–	–	–	–	–	–	–	–	1
Ipswich,	13	–	6	–	–	–	1	6	–	–	–	–	13
Lakeville,	23	–	9	–	–	–	–	14	–	–	–	–	23
Lancaster,	4	2	1	–	–	1	–	–	–	–	–	–	4
Lanesborough,	1	–	–	1	–	–	–	–	–	–	–	–	1
Lawrence,	4	1	2	–	–	–	–	1	–	–	–	–	4
Lee,	4	2	2	–	–	–	–	–	–	–	–	–	4
Leicester,	2	–	–	–	–	–	2	–	–	–	–	–	2
Lenox,	1	–	1	–	–	–	–	–	–	–	–	–	1

Leominster,	21	–	18	–	–	1	1	1	–	–	–	–	21
Leverett,	1	–	–	–	1	–	–	–	–	–	–	–	1
Leyden,	8	–	8	–	–	–	–	–	–	–	–	–	8
Lincoln,	9	2	3	–	4	–	–	–	–	–	–	–	9
Littleton,	6	1	4	–	–	–	1	–	–	–	–	–	6
Longmeadow,	7	2	5	–	–	–	–	–	–	–	–	–	7
Lowell,	21	–	4	–	–	–	1	15	–	1	–	–	21
Ludlow,	11	3	7	–	1	–	–	–	–	–	–	–	11
Lunenburg,	12	6	5	–	–	–	1	–	–	–	–	–	12
Manchester,	1	–	1	–	–	–	–	–	–	–	–	–	1
Mansfield,	1	–	–	–	–	–	–	1	–	–	–	–	1
Marblehead,	1	–	–	–	–	–	–	–	–	–	–	–	1
Marlborough,	2	–	–	–	–	–	2	–	–	–	–	–	2
Marshfield,	8	2	5	–	–	–	1	–	–	–	–	–	8
Mattapoisett,	3	–	3	–	–	–	–	–	–	–	–	–	3
Maynard,	1	–	–	–	–	1	–	–	–	–	–	–	1
Medford,	12	6	–	–	–	–	–	3	–	3	–	–	12
Medway,	10	–	4	–	–	–	–	6	–	–	–	–	10
Mendon,	2	1	1	–	–	–	–	–	–	–	–	–	2
Merrimac,	2	–	2	–	–	–	–	–	–	–	–	–	2
Methuen,	11	4	7	–	–	–	–	–	–	–	–	–	11
Middleborough,	3	–	2	–	–	–	1	–	–	–	–	–	3
Middlefield,	2	1	1	–	–	–	–	–	–	–	–	–	2
Middleton,	4	–	4	–	–	–	–	–	–	–	–	–	4
Milford,	12	1	10	–	1	–	–	–	–	–	–	–	12
Millbury,	2	–	2	–	–	–	–	–	–	–	–	–	2
Millis,	8	–	7	–	–	1	–	–	–	–	–	–	8
Milton,	16	3	10	–	–	1	2	–	–	–	–	–	16
Monson,	1	1	–	–	–	–	–	–	–	–	–	–	1
Montague,	20	5	8	–	1	–	5	–	–	1	–	–	20

Result of Work done by Inspectors in quarantining Cattle — Continued.

CITY OR TOWN.	Number quarantined.	Massachusetts Cattle.						Cattle from out of State.					Totals.
		Number released.	Number condemned, killed and paid for.	Permit to kill, paid for.	Permit to kill, no Award.	Died in Quarantine, no Award.	Condemned and killed, in Process of Settlement.	Number released.	Number condemned, killed and paid for.	Number condemned and killed, no Award.	Sent out of State.	In Quarantine.	
Monterey,	1	1	–	–	–	–	–	–	–	–	–	–	1
Montgomery,	1	–	1	–	–	–	–	–	–	–	–	–	1
Natick,	3	–	3	–	–	–	–	–	–	–	–	–	3
New Braintree,	4	1	2	–	–	1	–	–	–	–	–	–	4
New Salem,	5	1	4	–	–	–	–	–	–	–	–	–	5
Newburyport,	2	1	1	–	–	–	–	–	–	–	–	–	2
Newton,	3	1	2	–	–	–	–	–	–	–	–	–	3
Norfolk,	4	2	1	–	–	–	1	–	–	–	–	–	4
North Andover,	25	5	20	–	–	–	–	–	–	–	–	–	25
North Attleborough,	2	–	2	–	–	–	–	–	–	–	–	–	2
North Brookfield,	3	–	2	–	–	1	–	–	–	–	–	–	3
North Reading,	2	–	2	–	–	–	–	–	–	–	–	–	2
Northampton,	10	–	9	–	–	–	1	–	–	–	–	–	10
Northbridge,	5	2	2	–	–	–	1	–	–	–	–	–	5
Northfield,	2	–	2	–	–	–	–	–	–	–	–	–	2
Norwell,	2	–	2	–	–	–	–	–	–	–	–	–	2
Norwood,	3	–	3	–	–	–	–	–	–	–	–	–	3
Oakham,	3	–	3	–	–	–	–	–	–	–	–	–	3

Orange,	18	5	13	–	–	–	–	–	–	–	–	–	18
Otis,	1	–	–	–	1	–	–	–	–	–	–	–	1
Oxford,	1	–	1	–	–	–	–	–	–	–	–	–	1
Palmer,	4	1	3	–	–	–	–	–	–	–	–	–	4
Paxton,	2	–	2	–	–	–	–	–	–	–	–	–	2
Pelham,	3	–	3	–	–	–	–	–	–	–	–	–	3
Pembroke,	1	–	1	–	–	–	–	–	–	–	–	–	1
Pepperell,	12	3	6	–	–	1	1	1	–	–	–	–	12
Petersham,	3	2	1	–	–	–	–	–	–	–	–	–	3
Phillipston,	5	4	1	–	–	–	–	–	–	–	–	–	5
Pittsfield,	6	–	3	–	3	–	–	–	–	–	–	–	6
Plymouth,	7	2	4	–	–	–	1	–	–	–	–	–	7
Prescott,	2	–	–	–	–	–	–	2	–	–	–	–	2
Princeton,	19	4	13	–	–	2	–	–	–	–	–	–	19
Quincy,	2	–	2	–	–	–	–	–	–	–	–	–	2
Randolph,	2	–	1	–	–	–	1	–	–	–	–	–	2
Raynham,	1	–	1	–	–	–	–	–	–	–	–	–	1
Reading,	3	–	–	–	–	–	–	2	–	1	–	–	3
Rehoboth,	2	–	2	–	–	–	–	–	–	–	–	–	2
Richmond,	32	20	2	–	10	–	–	–	–	–	–	–	32
Rockland,	1	–	–	–	1	–	–	–	–	–	–	–	1
Rowe,	2	–	–	–	–	–	–	2	–	–	–	–	2
Royalston,	10	2	7	–	1	–	–	–	–	–	–	–	10
Russell,	1	1	–	–	–	–	–	–	–	–	–	–	1
Rutland,	15	5	9	–	–	1	–	–	–	–	–	–	15
Salem,	1	–	1	–	–	–	–	–	–	–	–	–	1
Sandisfield,	7	3	1	–	3	–	–	–	–	–	–	–	7
Sandwich,	1	1	–	–	–	–	–	–	–	–	–	–	1
Saugus,	2	–	1	–	–	–	–	–	–	1	–	–	2
Scituate,	1	1	–	–	–	–	–	–	–	–	–	–	1

Result of Work done by Inspectors in quarantining Cattle — Continued.

CITY OR TOWN.	Number quarantined.	Massachusetts Cattle.						Cattle from out of State.					Totals.
		Number released.	Number condemned, killed and paid for.	Permit to kill, paid for.	Permit to kill, no Award.	Died in Quarantine, no Award.	Condemned and killed, in Process of Settlement.	Number released.	Number condemned, killed and paid for.	Number condemned and killed, no Award.	Sent out of State.	In Quarantine.	
Seekonk,	20	2	17	–	–	–	1	–	–	–	–	–	20
Sharon,	3	1	2	–	–	–	–	–	–	–	–	–	3
Sheffield,	1	–	1	–	–	–	–	–	–	–	–	–	1
Shelburne,	22	3	17	–	2	–	–	–	–	–	–	–	22
Sherborn,	8	2	5	–	–	–	1	–	–	–	–	–	8
Shirley,	4	1	3	–	–	–	–	–	–	–	–	–	4
Shrewsbury,	1	–	1	–	–	–	–	–	–	–	–	–	1
South Hadley,	8	–	7	–	1	–	–	–	–	–	–	–	8
Southampton,	20	6	13	–	–	–	1	–	–	–	–	–	20
Southborough,	3	–	3	–	–	–	–	–	–	–	–	–	3
Southbridge,	3	–	3	–	–	–	–	–	–	–	–	–	3
Southwick,	2	–	2	–	–	–	–	–	–	–	–	–	2
Spencer,	8	2	5	–	–	–	1	–	–	–	–	–	8
Springfield,	3	–	2	–	–	1	–	–	–	–	–	–	3
Sterling,	68	14	49	–	–	2	3	–	–	–	–	–	68
Stockbridge,	2	–	1	–	1	–	–	–	–	–	–	–	2
Stoughton,	6	1	3	–	–	–	–	1	–	–	1	–	6
Stow,	5	1	2	–	–	–	2	–	–	–	–	–	5

Sturbridge,	2	–	2	–	–	–	–	–	–	–	–	–	2
Sudbury,	2	–	1	–	–	–	1	–	–	–	–	–	2
Sunderland,	13	5	7	–	1	–	–	–	–	–	–	–	13
Sutton,	16	3	11	–	–	–	2	–	–	–	–	–	16
Swansea,	2	1	1	–	–	–	–	–	–	–	–	–	2
Taunton,	6	4	2	–	–	–	–	–	–	–	–	–	6
Templeton,	12	4	8	–	–	–	–	–	–	–	–	–	12
Tewksbury,	9	3	6	–	–	–	–	–	–	–	–	–	9
Townsend,	4	1	–	–	–	–	2	–	–	1	–	–	4
Tyngsborough,	22	–	1	–	1	–	–	20	–	–	–	–	22
Tyringham,	6	2	4	–	–	–	–	–	–	–	–	–	6
Upton,	3	–	1	–	–	1	1	–	–	–	–	–	3
Uxbridge,	1	–	–	–	–	–	1	–	–	–	–	–	1
Wales,	1	1	–	–	–	–	–	–	–	–	–	–	1
Walpole,	8	2	4	–	–	–	2	–	–	–	–	–	8
Waltham,	3	–	3	–	–	–	–	–	–	–	–	–	3
Ware,	5	–	5	–	–	–	–	–	–	–	–	–	5
Warren,	4	–	4	–	–	–	–	–	–	–	–	–	4
Warwick,	8	–	–	–	–	–	–	8	–	–	–	–	8
Watertown,	2	–	2	–	–	–	–	–	–	–	–	–	2
Wayland,	22	2	16	–	–	1	3	–	–	–	–	–	22
Wellesley,	1	–	1	–	–	–	–	–	–	–	–	–	1
West Bridgewater,	8	–	6	–	–	–	2	–	–	–	–	–	8
West Brookfield,	5	–	5	–	–	–	–	–	–	–	–	–	5
West Newbury,	17	4	11	–	–	1	1	–	–	–	–	–	17
West Springfield,	3	–	3	–	–	–	–	–	–	–	–	–	3
West Stockbridge,	1	–	1	–	–	–	–	–	–	–	–	–	1
Westborough,	7	4	1	–	–	1	–	–	–	1	–	–	7
Westfield,	6	3	3	–	–	–	–	–	–	–	–	–	6
Westford,	8	–	8	–	–	–	–	–	–	–	–	–	8

Result of Work done by Inspectors in quarantining Cattle— Concluded.

CITY OR TOWN.	Number quarantined.	MASSACHUSETTS CATTLE.						CATTLE FROM OUT OF STATE.					Totals.
		Number released.	Number condemned, killed and paid for.	Permit to kill, paid for.	Permit to kill, no Award.	Died in Quarantine, no Award.	Condemned and killed, in Process of Settlement.	Number released.	Number condemned, killed and paid for.	Number condemned and killed, no Award.	Sent out of State.	In Quarantine.	
Westhampton,	6	2	4	–	–	–	–	–	–	–	–	–	6
Westminster,	28	8	14	2	3	1	–	–	–	–	–	–	28
Weston,	8	4	2	–	–	–	2	–	–	–	–	–	8
Westport,	3	–	3	–	–	–	–	–	–	–	–	–	3
Westwood,	7	6	1	–	–	–	–	–	–	–	–	–	7
Weymouth,	6	–	6	–	–	–	–	–	–	–	–	–	6
Whately,	13	5	8	–	–	–	–	–	–	–	–	–	13
Whitman,	1	–	1	–	–	–	–	–	–	–	–	–	1
Wilbraham,	1	1	–	–	–	–	–	–	–	–	–	–	1
Wilmington,	10	1	9	–	–	–	–	–	–	–	–	–	10
Winchendon,	2	–	1	–	–	1	–	–	–	–	–	–	2
Winchester,	1	–	1	–	–	–	–	–	–	–	–	–	1
Woburn,	4	–	3	1	–	–	–	–	–	–	–	–	4
Worcester,	18	3	15	–	–	–	–	–	–	–	–	–	18
Worthington,	3	1	–	–	2	–	–	–	–	–	–	–	3
Wrentham,	5	–	3	–	–	1	–	1	–	–	–	–	5
Totals,	1,912	382	1,133	5	55	49	105	167	–	15	1	–	1,912

The 1,912 quarantines represent but 1,908 animals, 4 having been requarantined. On second quarantine, 2 were given permit to kill, found not to be tuberculous and no award was made; 2 were condemned, killed and paid for.

Number of cattle paid for during year, condemned in 1899,	2
Number of cattle paid for during year, condemned in 1900,	222
Number of cattle paid for during year, condemned in 1901,	1,138
Total paid for during year,	1,362

Reports have been received from renderers, butchers and inspectors, of animals (not quarantined) found to be tuberculous at time of slaughter as follows: —

Cattle,	49
Calves,	1
Swine,	1
Total,	51

Besides quarantining cattle suspected of having contagious diseases, the inspectors at the time of their annual inspection have to report upon the number of stables inspected, the number of farm animals and their condition, and the sanitary surroundings. The law requires that these reports be embodied in the annual report of the Cattle Commission to the Legislature. The reports of the inspectors are too bulky to be given in full, but are tabulated, in order to show the immense amount of work done. The following table gives a résumé of the results of the inspectors' labors: —

Report of Inspection of Animals, Stables, etc.

CITY OR TOWN.	Number of Herds inspected.	Number of Cows inspected.	Number of Bulls inspected.	Number of Oxen inspected.	Number of Young Cattle inspected.	Total Number of Cattle inspected.	Number of Sheep inspected.	Number of Swine inspected.	Number of Stables inspected.	Number of Stables improved since Last Report.
Abington,	132	271	6	–	29	306	–	91	132	3
Acton,	118	1,026	36	2	369	1,433	17	94	118	5
Acushnet,	154	399	8	–	94	501	–	312	154	4
Adams,	70	659	29	–	201	889	20	347	70	2
Agawam,	134	1,049	32	8	414	1,503	–	323	134	3
Alford,	54	294	9	–	102	405	185	127	54	1
Amesbury,	95	336	9	5	76	426	–	98	95	2
Amherst,	103	1,087	30	4	278	1,399	126	267	103	2
Andover,	134	972	27	–	286	1,285	6	725	134	1
Arlington,	101	222	1	–	12	235	5	101	101	2
Ashburnham,	127	384	22	–	346	752	45	171	127	4
Ashfield,	171	1,006	49	20	686	1,761	1,675	313	171	5
Ashby,	130	502	10	–	112	624	–	63	130	2
Ashland,	87	375	10	2	105	492	–	150	87	1
Athol,	57	321	10	2	104	437	–	6	57	1
Attleborough,	147	835	24	2	153	1,014	–	410	147	2
Avon,	51	146	4	–	22	172	–	126	51	1
Ayer,	37	609	3	–	34	124	–	79	37	–
Auburn,	59	609	20	–	142	771	7	65	59	1
Barnstable,	317	528	22	18	354	922	33	748	317	6
Barre,	99	1,435	66	21	815	2,337	56	180	99	2
Becket,	109	411	36	24	448	919	234	166	109	3

Bedford,	76	580	22	–	154	756	–	499	76	1
Belchertown,	330	1,740	83	18	635	2,476	74	229	330	7
Bellingham,	82	468	15	–	106	589	–	215	82	2
Belmont,	51	224	4	–	14	242	–	202	51	1
Berkley,	89	326	2	–	117	445	24	197	89	2
Berlin,	101	536	21	–	176	733	6	98	101	3
Bernardston,	104	588	25	2	342	957	404	208	104	5
Beverly,	60	494	9	7	64	574	–	206	60	4
Billerica,	80	688	14	–	88	790	9	99	80	2
Blackstone,	33	201	3	4	45	253	–	45	33	3
Blandford,	136	805	53	78	540	1,476	374	535	136	3
Bolton,	102	768	20	4	70	862	–	20	102	2
Boston,	53	520	9	–	53	582	–	885	53	–
Bourne,	44	89	3	1	33	126	–	12	44	1
Boxborough,	49	379	17	2	303	701	40	86	49	–
Boylston,	68	564	22	4	175	765	–	101	68	2
Boxford,	56	451	19	4	113	587	–	138	56	2
Braintree,	66	398	8	–	25	431	1	99	66	1
Brewster,	101	115	4	8	72	299	6	238	101	3
Bridgewater,	164	604	24	28	186	842	73	340	164	8
Brimfield,	114	791	46	30	292	1,159	141	206	114	7
Brockton,	124	800	18	2	75	895	1	449	124	5
Brookfield,	147	627	31	10	366	1,034	51	222	147	12
Brookline,	41	207	8	–	24	239	–	2	41	1
Buckland,	127	683	25	33	379	1,120	552	283	127	3
Burlington,	45	449	10	5	48	512	–	2,211	45	2
Cambridge,	16	109	–	–	–	109	–	–	16	–
Canton,	130	483	16	12	95	606	110	269	130	1
Carlisle,	59	504	13	–	116	633	–	195	59	2
Carver,	81	120	4	3	41	168	19	116	81	3
Charlemont,	84	557	32	2	277	868	332	194	84	5

Report of Inspection of Animals, Stables, etc. — Continued.

CITY OR TOWN.	Number of Herds inspected.	Number of Cows inspected.	Number of Bulls inspected.	Number of Oxen inspected.	Number of Young Cattle inspected.	Total Number of Cattle inspected.	Number of Sheep inspected.	Number of Swine inspected.	Number of Stables inspected.	Number of Stables improved since Last Report.
Charlton,	202	1,328	44	28	607	2,007	7	201	202	7
Chatham,	66	116	3	–	22	141	–	67	66	1
Chelmsford,	38	467	11	–	83	561	14	15	38	2
Chelsea,	25	146	1	–	2	149	–	23	25	1
Cheshire,	100	893	10	–	413	1,316	46	242	100	–
Chester,	94	448	28	20	472	968	323	197	94	1
Chesterfield,	105	559	38	24	432	1,053	115	188	105	2
Chicopee,	111	635	19	–	220	874	19	240	111	6
Chilmark,	46	107	8	2	94	211	2,016	69	46	1
Clarksburg,	84	248	16	–	128	392	–	78	84	3
Clinton,	59	89	2	–	9	90	–	26	59	2
Cohasset,	110	247	9	4	54	314	1	76	110	4
Colrain,	169	763	59	34	919	1,775	1,222	583	169	7
Concord,	134	1,405	33	–	169	1,607	–	721	134	3
Conway,	106	967	43	32	632	1,674	502	412	106	2
Cottage City,	36	103	4	–	26	133	9	103	36	2
Cummington,	98	576	27	19	225	847	84	80	98	–
Dalton,	82	493	19	2	123	637	372	210	82	1
Dana,	67	229	8	2	102	341	8	107	67	–
Danvers,	69	738	17	4	36	795	–	90	69	1
Dartmouth,	221	1,538	37	29	252	1,856	11	525	221	8
Dedham,	95	536	12	–	17	565	–	250	95	–

Deerfield,	81	506	16	–	205	727	34	284	81	3
Dennis,	112	166	2	3	36	207	1	74	112	2
Dighton,	102	363	6	4	79	452	–	319	102	–
Douglas,	106	244	11	2	86	343	–	158	106	2
Dover,	82	696	16	–	81	793	3	374	82	2
Dracut,	78	1,068	23	5	44	1,140	32	958	78	–
Dudley,	86	718	26	12	185	941	–	30	86	2
Dunstable,	66	461	15	2	183	661	25	136	66	–
Duxbury,	127	276	13	9	139	437	42	156	127	1
East Bridgewater,	186	645	15	4	91	755	3	332	186	28
East Longmeadow,	78	424	12	–	122	558	–	52	78	2
Eastham,	59	113	4	–	26	143	–	60	59	–
Easthampton,	131	735	26	6	359	1,126	1	234	131	5
Easton,	200	680	16	2	252	950	–	55	200	4
Edgartown,	88	217	10	4	93	324	1,022	173	88	2
Egremont,	80	754	26	–	189	969	262	100	80	3
Enfield,	83	404	22	22	179	627	34	143	83	2
Erving,	35	113	4	2	18	137	–	95	35	2
Essex,	48	458	10	4	75	547	–	47	48	1
Everett,	26	158	4	–	5	167	–	211	26	–
Fairhaven,	115	411	7	2	85	505	–	74	115	3
Fall River,	173	693	11	–	75	779	24	489	173	5
Falmouth,	81	156	2	–	46	204	–	106	81	2
Fitchburg,	144	692	29	10	237	968	9	284	144	4
Florida,	68	281	34	–	201	516	145	202	68	3
Foxborough,	167	380	11	–	136	527	77	279	167	6
Framingham,	189	802	25	2	191	1,020	20	274	189	2
Franklin,	159	855	19	–	150	1,024	5	152	159	–
Freetown,	129	278	9	18	180	485	5	180	129	9
Gardner,	35	558	14	6	85	663	1	554	35	–
Gay Head,	20	18	3	25	24	70	–	14	20	–

Report of Inspection of Animals, Stables, etc. — Continued.

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Georgetown,	92	226	11	8	137	382	39	152	92	2
Gill,	91	630	21	–	548	1,199	101	317	91	1
Gloucester,	130	668	14	–	135	817	–	226	130	2
Goshen,	44	221	21	7	202	451	50	85	44	1
Gosnold,	12	28	2	–	8	38	2,130	12	12	1
Grafton,	152	1,083	41	2	281	1,407	132	209	152	3
Granby,	119	1,193	35	–	102	1,330	81	342	119	1
Granville,	144	491	60	31	457	1,039	123	318	144	1
Great Barrington,	86	675	32	4	253	964	15	287	86	–
Greenfield,	76	745	11	2	332	1,090	430	401	76	–
Greenwich,	85	341	19	–	144	504	–	121	85	5
Groton,	140	681	21	8	363	1,073	54	161	140	8
Groveland,	61	271	11	–	117	399	16	96	61	1
Hadley,	197	1,000	27	–	632	1,659	3	464	197	12
Halifax,	68	134	5	9	48	196	6	136	68	2
Hamilton,	58	276	10	6	88	380	169	117	58	3
Hampden,	77	506	19	2	275	802	43	98	77	2
Hancock,	90	493	32	6	215	746	1,063	247	90	4
Hanover,	134	263	6	8	70	347	10	281	134	5
Hanson,	107	167	6	–	54	227	14	149	107	3
Hardwick,	97	1,443	66	23	526	2,058	20	118	97	1
Harvard,	138	1,119	40	–	453	1,612	63	79	138	5

Harwich,	135	192	2	12	29	235	–	109	135	7
Hatfield,	132	330	8	36	88	462	–	209	132	–
Haverhill,	150	1,022	31	4	241	1,298	–	423	150	–
Hawley,	90	555	27	24	251	857	297	203	90	–
Heath,	86	581	23	6	335	945	333	218	86	3
Hingham,	172	493	26	–	138	657	51	301	172	9
Hinsdale,	106	554	29	7	283	873	81	296	106	3
Holden,	175	918	30	2	324	1,274	35	234	175	6
Holbrook,	79	143	–	–	28	171	–	269	79	–
Holland,	35	103	9	6	86	204	38	87	35	–
Holliston,	112	635	12	–	110	757	–	74	112	4
Holyoke,	71	536	21	–	160	717	3	139	71	–
Hopedale,	30	112	–	4	14	130	1	15	30	1
Hopkinton,	120	588	26	7	162	783	–	138	120	3
Hubbardston,	70	534	23	4	179	740	13	29	70	–
Hudson,	42	250	11	–	152	413	–	110	42	2
Hull,	18	37	1	–	8	46	–	21	18	1
Huntington,	96	366	16	26	314	722	375	152	96	5
Hyde Park,	20	62	–	–	1	63	–	2	20	–
Ipswich,	144	732	22	14	214	982	4	498	144	6
Kingston,	90	187	7	17	87	298	–	238	90	5
Lakeville,	92	293	11	14	105	423	11	150	92	3
Lancaster,	90	512	24	2	214	752	4	239	90	2
Lanesborough,	110	845	46	4	374	1,269	9	223	110	–
Lawrence,	13	92	4	–	19	115	–	88	13	–
Lee,	182	624	27	16	269	936	400	242	182	–
Leicester,	115	442	14	–	138	594	1	163	115	5
Lenox,	20	244	12	–	77	333	118	95	20	1
Leominster,	96	407	23	2	190	622	12	92	96	1
Leverett,	85	338	12	8	168	526	19	203	85	1
Lexington,	57	1,028	19	–	89	1,136	12	414	57	3

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Leyden,	66	413	21	8	338	780	585	202	66	–
Lincoln,	101	783	17	–	122	922	23	681	101	6
Littleton,	100	1,253	42	–	446	1,741	9	169	100	–
Longmeadow,	44	232	4	–	60	296	–	518	44	–
Lowell,	31	280	1	2	24	307	–	225	31	–
Ludlow,	123	809	28	–	177	1,014	5	228	123	2
Lunenburg,	131	911	30	8	206	1,155	3	1,150	131	4
Lynn,	106	654	7	13	24	698	–	79	106	3
Lynnfield,	26	310	5	–	44	359	12	24	26	–
Malden,	16	117	1	–	3	121	–	–	16	–
Manchester,	19	76	2	–	10	88	9	9	19	1
Mansfield,	78	204	4	4	64	276	–	84	78	3
Marblehead,	57	356	6	2	45	409	5	186	57	2
Marion,	52	116	3	4	27	150	6	90	52	2
Marlborough,	149	885	29	–	185	1,099	–	319	149	6
Marshfield,	147	286	9	–	133	428	18	126	147	6
Mashpee,	43	19	1	–	11	31	–	76	43	1
Mattapoisett,	75	251	7	2	56	316	–	225	75	4
Maynard,*	–	–	–	–	–	–	–	–	–	–
Medfield,	50	454	10	2	82	548	–	36	50	2
Medford,	97	395	6	1	18	420	–	19	97	4
Medway,	55	318	9	–	106	433	–	40	55	2

Melrose,	17	118	2	–	1	121	–	16	17	–
Mendon,	106	456	19	6	135	616	–	161	106	5
Merrimac,	54	242	9	5	90	346	–	108	54	–
Methuen,	167	1,206	24	–	174	1,404	491	555	167	9
Middleborough,	150	491	11	20	122	644	11	48	150	3
Middlefield,	38	346	20	4	313	683	418	104	38	2
Middleton,	59	261	8	–	35	304	–	76	59	2
Milford,	131	374	13	–	84	471	–	281	131	4
Millbury,	133	682	30	–	239	951	–	206	133	6
Millis,	64	448	13	–	113	574	–	69	64	2
Milton,	108	812	15	–	27	854	–	118	108	6
Monroe,	31	131	14	2	93	240	36	–	31	–
Monson,	122	947	39	22	444	1,452	54	228	122	7
Montague,	137	631	36	36	310	1,013	30	429	137	8
Monterey,	77	441	33	10	255	739	142	179	77	3
Montgomery,	51	302	7	10	85	404	51	87	51	2
Mount Washington,	15	52	–	–	18	70	–	23	15	1
Nahant,	17	43	1	–	1	45	–	–	17	–
Nantucket,	84	400	19	4	227	650	311	206	84	3
Natick,	60	401	10	1	42	454	–	360	60	–
Needham,	43	819	14	2	47	882	28	4	43	1
New Ashford,	21	123	7	–	56	186	440	32	21	1
New Bedford,	86	522	9	9	70	610	36	198	86	2
New Braintree,	75	1,084	45	14	369	1,512	22	92	75	–
New Marlborough,	62	894	32	4	176	1,106	177	36	62	–
New Salem,	118	375	15	11	195	596	50	187	118	6
Newbury,	82	865	35	2	345	1,247	66	67	82	2
Newburyport,	117	353	8	–	111	472	–	448	117	7
Newton,	256	1,163	14	–	16	1,193	–	–	256	9
Norfolk,	66	294	6	5	103	408	4	145	66	1

* No report.

Report of Inspection of Animals, Stables, etc. — Continued.

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North Adams,	37	474	21	–	69	564	70	63	37	1
North Andover,	47	785	22	4	78	889	–	27	47	1
North Attleborough,	143	591	12	–	114	717	4	269	143	4
North Brookfield,	166	914	34	2	470	1,420	12	294	166	1
North Reading,	70	392	9	5	85	491	20	148	70	3
Northampton,	89	512	23	2	256	793	8	176	89	2
Northborough,	142	852	23	2	239	1,116	–	442	142	5
Northbridge,	65	389	15	10	100	514	5	122	65	1
Northfield,	197	805	28	11	198	1,042	152	612	197	8
Norton,	145	314	9	6	115	444	–	154	145	6
Norwell,	118	194	2	–	51	247	25	163	118	1
Norwood,	77	238	11	–	28	277	–	41	77	3
Oakham,	58	472	17	4	175	668	–	106	58	–
Orange,	201	776	38	5	305	1,124	69	470	201	7
Orleans,	95	135	3	1	38	177	–	59	95	14
Otis,	108	341	20	48	303	712	188	204	108	1
Oxford,	98	522	20	8	165	715	14	144	98	–
Palmer,	98	606	22	10	204	842	–	11	98	–
Paxton,	58	353	16	–	165	534	–	55	58	–
Peabody,	47	666	17	–	72	755	53	1,378	47	1
Pelham,	61	172	6	6	56	240	27	32	61	–
Pembroke,	98	130	4	2	70	206	60	128	98	–

Pepperell,	174	609	16	2	176	803	3	222	174	2
Peru,	54	293	20	9	225	547	77	97	54	4
Petersham,	121	548	23	22	337	930	72	311	121	4
Phillipston,	70	298	13	4	175	490	13	97	70	5
Pittsfield,	167	1,315	44	2	400	1,761	209	491	167	1
Plainfield,	66	432	35	12	250	729	144	79	66	—
Plymouth,	136	302	14	2	73	391	—	239	136	4
Plympton,	59	99	2	2	85	188	—	43	59	2
Prescott,	68	305	27	6	169	507	—	128	68	—
Princeton,	69	854	44	6	266	1,170	39	129	69	—
Provincetown,	15	64	2	—	1	67	—	—	15	—
Quincy,	48	442	8	—	21	471	—	43	48	2
Randolph,	95	287	8	—	122	417	—	1,983	95	—
Raynham,	52	266	8	6	96	376	—	96	52	—
Reading,	63	307	9	2	37	355	—	16	63	1
Rehoboth,	271	1,244	37	12	328	1,621	—	909	271	4
Revere,	59	212	2	—	12	226	—	902	59	1
Richmond,	106	374	11	—	235	620	959	147	106	2
Rochester,	64	166	5	4	84	259	—	155	64	1
Rockland,	100	199	3	—	59	261	—	83	100	—
Rockport,	35	136	2	—	13	151	—	15	35	—
Rowe,	84	392	29	24	370	815	186	352	84	2
Rowley,	71	361	12	10	223	606	6	75	71	3
Royalston,	99	483	25	14	131	653	45	153	99	—
Russell,	50	156	5	8	63	232	118	98	50	—
Rutland,	113	815	35	8	355	1,213	—	193	113	6
Salisbury,	96	289	13	16	159	477	33	132	96	4
Salem,	11	212	8	—	22	242	—	212	11	1
Sandisfield,	113	535	38	52	396	1,021	162	164	113	4
Sandwich,	87	169	8	—	80	257	16	93	87	—
Saugus,	49	798	12	—	31	841	100	221	49	1

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Savoy,	90	447	32	7	234	720	112	174	90	3
Scituate,	136	257	4	4	87	352	–	72	136	–
Seekonk,	137	1,158	34	3	243	1,438	2	1,064	137	–
Sharon,	77	308	10	–	51	369	–	39	77	5
Sheffield,	190	1,437	65	4	616	2,122	203	597	190	8
Shelburne,	103	918	50	26	544	1,538	733	155	103	5
Shutesbury,	48	133	5	10	52	200	26	66	48	2
Sherborn,	99	706	28	4	128	866	–	175	99	–
Shirley,	61	286	10	–	91	387	7	43	61	1
Shrewsbury,	150	1,173	37	2	220	1,432	43	385	150	–
Somerset,	66	460	6	4	90	560	–	193	66	4
Somerville,	60	181	1	–	5	187	1	70	60	1
South Hadley,	139	1,086	35	–	350	1,471	3	348	139	1
Southampton,	140	843	30	4	538	1,415	169	441	140	–
Southborough,	55	1,010	23	2	121	1,156	106	38	55	–
Southbridge,	70	480	20	20	232	752	6	147	70	–
Southwick,	132	765	35	4	279	1,083	307	269	132	2
Spencer,	148	1,074	54	16	632	1,776	42	420	148	1
Springfield,	151	381	11	11	66	469	40	825	151	1
Sterling,	143	1,031	36	7	326	1,400	78	104	143	–
Stockbridge,	94	614	31	–	228	873	212	381	94	3
Stoneham,	56	321	3	–	29	353	–	39	56	2

Stoughton,	86	360	8	–	76	444	–	49	86	1
Stow,	101	782	42	–	408	1,232	4	69	101	3
Sturbridge,	44	206	8	8	154	376	35	88	44	3
Sudbury,	143	1,009	31	3	256	1,299	–	253	143	–
Sunderland,	88	692	28	–	128	848	1	333	88	–
Sutton,	169	964	44	19	357	1.384	61	230	169	7
Swampscott,	29	130	2	–	21	153	3	38	29	2
Swansea,	130	919	25	4	208	1,156	–	683	130	6
Taunton,	200	881	27	7	190	1,105	–	692	200	–
Templeton,	92	400	19	2	156	577	23	281	92	2
Tewksbury,	133	627	17	10	126	780	–	625	133	2
Tisbury,	20	56	2	–	18	76	–	41	20	1
Tolland,	50	288	24	30	227	569	54	93	50	2
Topsfield,	71	621	17	4	94	736	–	45	71	2
Townsend,	132	335	11	–	137	483	–	179	132	2
Truro,	65	202	8	–	46	256	–	39	65	2
Tyngsborough,	31	366	8	9	25	408	24	–	31	–
Tyringham,	59	390	18	11	200	619	314	51	59	2
Upton,	98	405	20	9	185	619	30	293	98	2
Uxbridge,	143	595	23	16	177	811	40	231	143	3
Wakefield,	79	274	6	4	27	311	39	248	79	6
Wales,	65	217	16	6	100	339	34	74	65	2
Walpole,	119	458	7	–	93	558	3	298	119	2
Waltham,	45	770	20	4	51	845	1	–	45	–
Ware,	164	834	28	6	401	1,269	–	246	164	–
Wareham,	80	192	5	–	61	258	–	112	80	3
Warren,	138	1.376	67	33	529	2,005	20	240	138	–
Warwick,	80	233	10	3	168	414	62	122	80	1
Washington,	59	390	31	4	353	778	524	202	59	–
Watertown,	53	485	7	–	9	501	–	205	53	2
Wayland,	78	756	15	–	124	895	1	345	78	3

Report of Inspection of Animals, Stables, etc. — Concluded.

CITY OR TOWN.	Number of Herds inspected.	Number of Cows inspected.	Number of Bulls inspected.	Number of Oxen inspected.	Number of Young Cattle inspected.	Total Number of Cattle inspected.	Number of Sheep inspected.	Number of Swine inspected.	Number of Stables inspected.	Number of Stables improved since Last Report.
Webster,	50	240	3	2	48	293	–	78	50	–
Wellesley,	33	297	4	–	47	348	–	–	33	2
Wellfleet,	42	81	2	–	38	121	–	29	42	–
Wendell,	61	150	13	6	136	305	19	129	61	–
Wenham,	48	286	2	2	12	302	–	53	48	1
West Boylston,	75	589	14	–	171	774	23	145	75	–
West Bridgewater,	42	575	29	15	89	708	1	196	42	1
West Brookfield,	97	940	45	12	549	1,546	32	112	97	4
West Newbury,	92	673	22	4	290	989	39	227	92	6
West Springfield,	123	706	17	–	158	881	23	429	123	3
West Stockbridge,	120	317	11	–	138	466	405	266	120	–
West Tisbury,	73	172	5	–	85	262	1,445	209	73	2
Westborough,	138	1,182	42	4	425	1,653	–	138	138	4
Westfield,	257	1,013	31	2	449	1,495	–	607	257	9
Westford,	95	683	23	2	194	902	41	115	95	3
Westhampton,	74	452	24	12	255	743	16	141	74	2
Westminster,	73	410	13	–	22	445	1	–	73	1
Weston,	138	1,015	22	1	111	1,149	38	399	138	6
Westport,	313	1,141	48	48	297	1,534	15	505	313	2
Westwood,	46	532	17	–	39	588	–	58	46	2
Weymouth,	212	592	7	4	57	660	1	529	212	5
Whately,	113	565	22	4	348	939	12	301	113	3

Whitman,	87	340	5	–	34	379	–	170	87	6
Wilbraham,	122	648	37	4	252	941	12	172	122	2
Williamsburg,	89	487	36	9	336	868	53	114	89	2
Williamstown,	184	1,322	56	2	317	1,697	1,449	446	184	4
Wilmington,*	–	–	–	–	–	–	–	–		–
Winchendon,	152	469	7	1	146	623	50	269	152	3
Winchester,	23	218	2	2	3	225	–	–	23	1
Windsor,	99	608	49	6	457	1,120	169	165	99	3
Winthrop,	17	44	–	–	1	45	–	–	17	–
Woburn,	115	329	5	–	34	368	1	1,122	115	–
Worcester,	296	1,927	49	4	347	2,327	83	3,370	296	16
Worthington,	112	636	30	30	480	1,176	182	303	112	1
Wrentham,	174	517	12	4	209	742	4	357	174	6
Yarmouth,	72	123	7	2	41	173	1	124	72	2
Totals,	33,623	181,739	6,463	2,104	61,096	251,402	30,908	80,426	33,623	884

* No report.

Summary.

		Increase over 1900.	Decrease under 1900.
Number of herds inspected,	33,623	623	–
Number of cows inspected,	181,739	634	–
Number of bulls inspected,	6,463	–	449
Number of oxen inspected,	2,104	–	295
Number of young cattle inspected,	61,096	–	3,756
Total number of cattle inspected,	251,402	–	6,866
Number of sheep inspected,	30,908	–	1,503
Number of swine inspected,	80,426	6,395	–
Number of stables inspected,	33,623	603	–
Number of stables improved since last report,	884	–	778

The above summary gives an idea of the vast amount of work done by the inspectors in the various cities and towns, and the results accomplished. It will be noticed that the number of herds and premises inspected in 1901 exceed the number in 1900, but that there is a decrease in the number of neat cattle kept, of 6,866. This decrease is among young cattle, bulls and oxen, while there is a slight increase in milch cows. This indicates that the high price of grain and hay has caused the farmers to convert animals that are not producing anything into beef; and more cows are kept, because the higher price of milk has led to keeping more animals that produce a little revenue.

While it is more difficult for the inspectors to make a fall inspection in October and November, yet it is undoubtedly the best time to make it; as badly diseased animals are killed off in the autumn, that would otherwise contaminate many others if they were closely housed with them during the winter. While but a single inspection is made during the year, the autumn is unquestionably the best time to make it. A better idea of the premises upon which animals are kept and the sanitary surroundings could be formed if the inspection could be made at the time of year when all the cattle are housed, and it would be easier for the inspectors to make their examinations when the cattle are all in the stables than when they are running in the fields; but, as a safeguard to the health of the creatures, it is certainly best to see that only those in apparent health are allowed to go into winter quarters together.

Letters which are well worth publishing are received each year from some of the inspectors, showing an improved condition of the neat stock of the State. A few of the letters are given below: —

BRIDGEWATER, MASS., Nov. 15, 1901.

To the Honorable Board of Cattle Commissioners.

DEAR SIRS: — I received the appointment of cattle inspector for Bridgewater April 1, 1901. Received books and instructions October 19.

I have visited 188 premises, and inspected cattle and young neat stock, 687; sheep, 67; swine, 146. There are at State Farm: cows in milk, 65; bulls, 2; cows dry, not fatting, 8; cows fatting, 8; young, 23; oxen, 18.

I posted notice for the detection of glanders or farcy September 24. An epidemic of epizootic in the spring developed no report of glanders, and no case of farcy was seen or reported. We had in the spring several fatal cases of milk fever. A number of abortions were reported. I have tried to impress the fact of the contagiousness of the latter, and the importance of a thorough disinfection.

The long-continued pleasant weather has kept the pastures in good feed, and the cattle will go to barn for the winter in an exceptionally fine condition.

I have quarantined and you have killed only 2 animals for tuberculosis in the past year. Both animals were brought to us from neighboring towns after my last inspection. I have 2 animals under observation as tuberculous.

Very respectfully, CALVIN PRATT,
Inspector.

WOBURN, MASS., Nov. 16, 1901.

Dr. AUSTIN PETERS.

DEAR SIR: — Accompanying this is the report of my inspection. It gives me pleasure to state that I have found no cases of tuberculosis nor of any contagious disease, which would seem to indicate that the people are learning to co-operate with your Board of Commissioners in its good work. There has been some delay about bringing in the cattle from pasture, but they seem to be in excellent condition. There is also an improvement in the sanitary conditions existing in many of the stables.

Wishing you the success which the cause deserves,

I am very respectfully yours,

JAMES N. STUART, D.V.S.,
Inspector.

DANVERS, MASS., Nov. 11, 1901.

State Board of Cattle Commissioners, Boston, Mass.

GENTLEMEN: — I have this day returned report of yearly inspection. Wish to call your attention to the fact that I have inspected the cattle of this town since 1895. In no year have the animals been in such good physical condition.

Yours truly, C. S. MOORE, V.S.,
Inspector.

SOUTH SUDBURY, Nov. 14, 1901.

AUSTIN PETERS, *Chairman, Cattle Commissioners.*

DEAR SIR: — I have finished my examination of the cattle, sheep and swine in Sudbury. As a whole, I never knew the stock to be in so good condition as at the present time. The stables are kept clean, as a rule, and whitewash is in evidence. I return my report by same mail as this.

Yours truly, JAMES E. H. WILLIS,
Inspector.

ASHBURNHAM, MASS., Nov. 16, 1901.

State Board of Cattle Commissioners.

DEAR SIRS: — I completed my inspection the 15th. Some of the cattle in town were pastured away in other towns, and some have escaped my notice. I find the cattle in town generally thrifty, and in good order. I notice some improvement in the sanitary conditions of some of the barns, more especially among the milkmen. I found but few barns we would call filthy, and those were where they allowed poultry to remain in the barn. No barn can be kept clean, with pure air, where hens roam and roost in them, leaving their lice on the cattle, and on the inspector every time he makes a visit to the barn. I have made the most of my examinations out in the fields, and have doubtless made some mistakes, but I think the disease of tuberculosis is rapidly diminishing.

Yours respectfully, C. W. WHITNEY,
Inspector.

BARRE, MASS., Nov. 21, 1901.

Dr. PETERS.

DEAR SIR: — I forwarded by express to-day report of my inspection. I have inspected over 2,000 head; many of the young cattle it was impossible to make much of an inspection on, as they were out in pasture, and the best one could do was to go among them and look at them.

The cattle as a whole are looking finely. Having been among

the cattle and stables in this town for several years, I think, as to stabling and watering of neat cattle, they were never in as good condition as at the present time. Our inspection coming when cattle are out of course makes it harder to make reports on cleanliness than it would were they stabled; and I think the inspection of stables an important part, as it certainly has improved conditions of stables and surroundings in this town.

Yours, CHARLES H. PAQUIN,
Inspector.

DANA, Nov. 25, 1901.

The Cattle Commissioners.

GENTLEMEN: — Will send you inspection to-day. Find cattle looking finer than years before; think there is a great improvement from four years ago. Dana is rather a poor town for pasturing. A good many get their cattle pastured out of town, so I had to wait until they got them home.

Respectfully yours, A. W. DOANE,
Inspector.

LUDLOW, MASS., Nov. 15, 1901.

Dr. AUSTIN PETERS, *Chairman, Cattle Commissioners.*

DEAR SIR: — I forward to-day, by express, a report of this season's work of inspecting. I raised the standard this year for good light and ventilation, so that, in the stables fully reported, some may seem to be in not as good condition as last year. Taken altogether, there is an effort for improvement, and a desire to be rid of tuberculosis. Some bad cases have promised improvement in the future. Several animals reported as suspicious I would have quarantined if we could use tuberculin.

Yours truly, A. L. BENNETT,
Inspector.

SHATTUCKVILLE, Nov. 21, 1901.

To the Board of Cattle Commissioners.

DEAR SIRS: — I have finished my inspection of animals, and find a decided improvement in them, and also in the stables, and think you are on the right track to exterminate the dreaded tuberculosis. I have found four animals which I think have the disease tuberculosis. Please inform me what to do in this case, as you did not send any quarantine book.

Hoping you will pardon me for waiting so long before sending my report,

I remain your obedient servant,

C. WEBSTER SMITH,
Inspector of Animals, Colrain.

SOUTH EGREMONT, MASS., Nov. 12, 1901.

The Cattle Commissioners, Boston, Mass.

GENTLEMEN: — I finished the inspection the 12th, and have sent in the books. I found cattle in best condition of any year yet of my inspection. Hoping the books will meet with your approval,

I am, yours truly, WILLIAM F. CRIPPEN,
Inspector.

The third division of the work of eradicating tuberculosis is testing entire herds, at the request of the owner. Very little has been done in this direction during 1901, as the Cattle Commission felt that no expense should be indulged in that its appropriation did not warrant, and that its first obligations after attending to glanders, rabies, and investigating further symptomatic anthrax, were to owners of badly diseased cattle quarantined by the local inspectors. Only 5 herds were tested, and these on the condition that the owner accepted the hide and carcass of every reacting animal that passed as fit for beef, the State paying only for the badly diseased, and furnishing tuberculin and the agent to conduct the test. The total number of animals in the five herds was 75, of which 23 were killed; but only 7 had to be paid for by the State, as the others were so slightly infected as to pass as fit for beef. The expense of this work was not very great to the commission. Quite a number of farmers who lose an animal from time to time would like the State to assist them in eradicating tuberculosis from their herds, but most of these applications have to be denied, for lack of funds to meet any such expenditures. A special appropriation of $25,000 has been suggested for such work, as it would undoubtedly greatly assist in diminishing the amount of tuberculosis among cattle. It is possible for any farmer to test his cattle and find out the condition of his herd; but few can afford the loss that would be sustained under present farming conditions, unless the State assisted.

In previous reports of this commission attention has been called to the investigations of Dr. Langdon Frothingham, in the report of 1897, and further work on the same lines by Dr. Theobald Smith (see Appendix B of report of 1898),

showing that there was a difference between sputum tubercle bacilli and bovine tubercle bacilli. The announcement of Koch last summer, at the Congress of Tuberculosis in London, was hailed by the world as something new, whereas these facts have been called to public attention in these reports for the past five years, and it was Dr. Smith's studies that first called Koch's attention to these differences in the two forms of the bacillus, and Koch publicly acknowledges this to be the fact.

That there is no danger to human beings from uncooked products of tuberculous animals is assuming too much, until the matter has been more fully investigated. Meantime, it is only right and proper that the public should be protected from a germ of the disease that is much more dangerous to mature cattle, calves, swine and experimental animals, like rabbits and guinea pigs, than that produced by the tubercle bacillus from human sputum, in these animals.

This commission subscribed to the Congress of Tuberculosis in London, last summer; but the printed report of the transactions has not yet been received, so it is not available for this report. The chairman of the commission attended the meeting of the American Veterinary Association at Atlantic City last September; and represented the Board as a delegate to the annual meeting of the Interstate Association of Live Stock Sanitary Boards, at Buffalo, in October. Messrs. Herrick and Dennen represented the Board at the meeting of the National Live Stock Growers' Association at Chicago, in December, at which there were 1,500 delegates, from every State in the Union, representing the leading live stock interests of the country. At this meeting the following resolutions were overwhelmingly adopted: —

Whereas, There has lately developed much opposition in some quarters to the efforts of the Bureau of Animal Industry to prevent the spread of bovine tuberculosis in this country by rigid inspection and tests applied to imported cattle, especially where they are imported for breeding purposes; and

Whereas, The opposition has attempted to make use of the argument lately advanced, that bovine tuberculosis is not the same

disease as that which afflicts the human race, and is not communicable to man, as a reason why the rigid inspection and condemnation of diseased animals should cease; and

Whereas, The disease known as bovine tuberculosis is communicable and infectious among cattle, produces fatal results, and is a disease to be feared and kept out if possible; and

Whereas, The stockmen of this country are particularly anxious that their breeding stock should be physically healthy, and object to contagious disease among their cattle in any form, whether it is dangerous and communicable to man, or not; therefore, —

Resolved, By the National Live Stock Association, in convention assembled, that we most heartily endorse the work of the Bureau of Animal Industry in striving to limit and eradicate this disease from the herds of the United States; and we insist that, while the enforcement of quarantine and inspection rules may work hardship and loss upon the individual, it is simply a case where private interests must become subordinate to the public welfare.

Resolved, That the officers of this association be authorized to give all the support possible to the efforts of the government in fighting this disease; and we assure the Bureau of Animal Industry that it will receive the support of this association in all legitimate efforts to eradicate this dread disease from the live stock of this country.

At the annual meeting of the American Veterinary Association, and at the annual meeting of the Interstate Association of Live Stock Sanitary Boards, resolutions of a similar tenor were also adopted.

Glanders.

During the year 1901 glanders and farcy have continued to prevail extensively, more cases of horses suspected of having this disease having been reported to the Cattle Commission than in any year in its history. Methods of obtaining information have been perfected during the past two or three years, so that probably nearly all the cases occurring in this Commonwealth are now reported; but beside this there must be a slight increase. The efforts of the commission in obtaining as full reports as possible have resulted in its being able to present the true condition of affairs as it

is. The losses to the horse owners of Massachusetts from this cause must be very heavy every year, to say nothing of the danger to human beings who are brought in contact with animals infected with this disease, and no means should be neglected towards doing everything possible for its eradication.

The estimated value of the horses killed in Massachusetts as having glanders or farcy is $67,646, based upon the following figures: the average value of 184 horses, killed by order of the Board, as having glanders and farcy, estimated at time of condemnation by a member of the commission or an agent, was $90.80; the value of 745 horses killed as having this disease, at the same average value, would amount to $67,646. While this is a high estimate, many of the horses killed with the owner's consent, without examination by the commission, probably being worth much less than the average, yet the total loss to horse owners of the State must be nearly $60,000.

From Dec. 15, 1900, to Dec. 15, 1901, 908 cases of suspected glanders or farcy have been reported to the commission, in 129 cities and towns; of these, 745 were killed or died and 163 were found free from this malady, as compared with 849 cases in 1900, in 128 cities and towns, of which 700 were killed and 149 were found to be uninfected.

The following table shows the cases reported by towns for 1900, compared with those in 1901; it also indicates where the disease has disappeared and where new outbreaks have occurred, and the increase or decrease in various places.

CITY OR TOWN.	1900.		1901.		Increase.	Decrease.
	Killed or Died.	Negative.	Killed.	Negative.		
Abington,	1	–	–	–	–	1
Acton,	–	3	–	–	–	–
Acushnet,	1	–	–	–	–	1
Adams,	2	–	2	1	–	–
Andover,	1	–	3	–	2	–
Arlington,	8	2	8	*3	–	–

* One case undecided at time of making report.

CITY OR TOWN.	1900.		1901.		Increase.	Decrease.
	Killed or died.	Negative.	Killed.	Negative.		
Ashby,	2	2	–	3	–	2
Ashland,	–	1	–	–	–	–
Attleborough,	–	–	2	1	2	–
Auburn,	1	–	2	1	1	–
Avon,	2	–	2	–	–	–
Barnstable,	–	1	1	3	1	–
Barre,	1	–	–	–	–	1
Bedford,	4	1	–	–	–	4
Belmont,	4	1	1	–	–	3
Beverly,	1	–	1	–	–	–
Billerica,	–	1	–	–	–	–
Blackstone,	1	–	–	–	–	1
Bolton,	1	1	1	–	–	–
Boston,	192	–	197	2	5	–
Boylston,	1	1	1	–	–	–
Brockton,	6	2	14	4	8	–
Brookline,	4	1	8	5	4	–
Burlington,	1	–	1	–	–	–
Cambridge,	*50	7	43	5	–	6
Canton,	–	–	3	–	3	–
Carlisle,	–	2	2	–	2	–
Carver,	–	–	2	–	2	–
Charlton,	1	–	–	–	–	1
Chatham,	–	–	1	–	1	–
Chelmsford,	–	–	–	1	–	–
Chelsea,	24	–	12	1	–	12
Cheshire,	–	1	–	–	–	–
Chicopee,	2	1	–	3	–	2
Clinton,	7	5	4	1	–	3
Cohasset,	2	–	–	–	–	2
Concord,	1	1	–	–	–	1
Cummington,	–	–	–	†1	–	–
Danvers,	–	1	4	–	4	–
Dartmouth,	1	–	–	1	–	1
Dedham,	2	–	4	1	2	–
Deerfield,	–	–	6	–	6	–
Dennis,	–	–	–	1	–	–
Dover,	8	1	1	–	–	7
Dracut,	–	–	2	–	2	–
Dunstable,	–	–	1	–	1	–
East Bridgewater,	–	–	3	1	3	–
East Longmeadow,	1	–	–	–	–	1
Easton,	5	–	1	1	–	4
Enfield,	1	–	–	–	–	1
Erving,	1	–	–	–	–	1
Everett,	19	–	7	1	–	12
Fall River,	37	3	*35	2	–	3

* In 1900 three horses, one each in Cambridge, Natick and Salem, were found to show no evidence of glanders on autopsy, and were paid for by the State. One in Salem had cancer. In 1901 two horses, one in Fall River and one in Medfield, were found free from glanders on autopsy, and were paid for.

† Horse in Cummington had cancer.

CITY OR TOWN.	1900.		1901.		Increase.	Decrease.
	Killed or died.	Negative.	Killed.	Negative.		
Fairhaven,	–	–	1	1	1	–
Fitchburg,	24	13	5	6	–	19
Foxborough,	1	–	–	1	–	1
Framingham,	–	–	14	5	14	–
Franklin,	–	–	1	–	1	–
Gardner,	2	1	–	–	–	2
Gloucester,	1	1	–	1	–	1
Goshen,	2	–	–	–	–	2
Grafton,	2	1	3	–	1	–
Greenwich,	1	–	–	–	–	1
Groton,	–	1	–	–	–	–
Groveland,	1	–	2	2	1	–
Halifax,	–	–	3	–	3	–
Hanover,	1	3	–	2	–	1
Haverhill,	1	–	6	–	5	–
Hingham,	3	1	2	–	–	1
Holbrook,	–	–	2	1	2	–
Holden,	–	1	–	–	–	–
Holliston,	1	–	–	–	–	1
Hubbardston,	1	–	–	–	–	1
Hudson,	1	–	–	–	–	1
Hull,	–	1	–	–	–	–
Hyde Park,	1	–	8	1	7	–
Ipswich,	–	4	–	1	–	–
Lancaster,	–	–	5	–	5	–
Lawrence,	4	1	4	–	–	–
Lee,	–	1	–	–	–	–
Leicester,	3	2	–	–	–	3
Leominster,	4	1	5	1	1	–
Lexington,	7	3	5	1	–	2
Lincoln,	3	2	–	–	–	3
Littleton,	1	–	–	–	–	1
Longmeadow,	–	1	–	–	–	–
Lowell,	1	2	7	2	6	–
Lunenburg,	–	1	–	*2	–	–
Lynn,	6	3	13	4	7	–
Lynnfield,	–	–	1	–	1	–
Malden,	19	6	10	–	–	9
Mansfield,	–	1	1	1	1	–
Marblehead,	1	–	1	–	–	–
Marlborough,	–	1	1	1	1	–
Marshfield,	–	–	–	1	1	–
Medfield,	1	–	†1	–	–	1
Medford,	4	2	5	–	1	–
Medway,	–	1	1	–	1	–
Melrose,	2	1	7	2	5	–
Middleborough,	–	–	25	1	25	–
Milford,	3	–	1	2	–	2

* One case undecided at time of making report.

† In 1900 three horses, one each in Cambridge, Natick and Salem, were found to show no evidence of glanders on autopsy, and were paid for by the State. One in Salem had cancer. In 1901 two horses, one in Fall River and one in Medfield, were found free from glanders on autopsy, and were paid for.

CITY OR TOWN.	1900.		1901.		Increase.	Decrease.
	Killed or died.	Negative.	Killed.	Negative.		
Millbury,	2	–	1	1	–	1
Milton,	1	–	3	–	2	–
Nahant,	–	–	5	1	5	–
Natick,	*2	1	8	10	7	–
Needham,	6	1	11	1	5	–
New Bedford,	11	1	9	–	–	2
Newbury,	–	–	1	–	1	–
Newburyport,	–	1	–	–	–	–
Newton,	12	2	17	2	5	–
North Attleborough,	–	–	1	–	1	–
North Reading,	1	1	1	–	–	–
Norwell,	2	1	–	–	–	2
Norwood,	1	–	1	1	–	–
Oakdale,	–	–	1	–	1	–
Paxton,	–	–	2	–	2	–
Palmer,	1	–	–	–	–	1
Peabody,	2	–	–	–	–	2
Pepperell,	–	–	1	–	1	–
Pittsfield,	1	2	5	–	4	–
Plymouth,	1	–	–	–	–	1
Princeton,	–	1	1	2	1	–
Quincy,	5	–	9	–	4	–
Randolph,	–	–	3	–	3	–
Reading,	4	1	–	–	–	4
Revere,	5	–	1	–	–	4
Rochester,	–	–	2	1	2	–
Rockland,	1	1	2	–	1	–
Salem,	*1	–	2	1	2	–
Salisbury,	–	1	–	–	–	–
Sandisfield,	–	–	–	2	–	–
Saugus,	1	1	3	2	2	–
Shrewsbury,	–	–	1	1	1	–
Southborough,	–	–	–	1	–	–
Southbridge,	–	–	1	–	1	–
Somerset,	–	–	–	1	–	–
Somerville,	39	7	30	9	–	9
Springfield,	9	3	2	–	–	7
Sterling,	7	3	2	10	–	5
Stoneham,	7	–	4	–	–	3
Stow,	–	–	1	–	1	–
Stoughton,	–	–	2	1	2	–
Sudbury,	–	–	–	1	–	–
Sutton,	–	–	–	1	–	–
Swampscott,	1	–	–	–	–	1
Swansea,	3	–	–	–	–	3
Templeton,	–	1	–	–	–	–
Tisbury,	–	1	–	–	–	–
Wakefield,	3	–	4	–	1	–

* In 1900 three horses, one each in Cambridge, Natick and Salem, were found to show no evidence of glanders on autopsy, and were paid for by the State. One in Salem had cancer. In 1901 two horses, one in Fall River and one in Medfield, were found free from glanders on autopsy, and were paid for.

CITY OR TOWN.	1900.		1901.		Increase.	Decrease.
	Killed or died.	Negative.	Killed.	Negative.		
Walpole,	2	–	1	–	–	1
Waltham,	7	5	5	5	–	2
Watertown,	2	1	7	1	5	–
Webster,	–	–	–	1	–	–
Wellesley,	4	2	–	1	–	4
West Newbury,	–	–	1	–	1	–
West Springfield,	–	1	–	1	–	–
Westborough,	–	1	–	1	–	–
Westminster,	2	–	–	2	–	2
Westport,	–	1	2	–	2	–
Westwood,	4	–	1	3	–	3
Weymouth,	5	–	–	–	–	5
Whitman,	1	–	3	–	2	–
Williamstown,	–	–	1	–	1	–
Winchendon,	–	–	3	2	3	–
Winchester,	2	–	3	–	1	–
Winthrop,	3	–	5	–	2	–
Woburn,	1	–	1	1	–	–
Worcester,	37	13	55	13	18	–
Wrentham,	2	–	3	–	1	–
Yarmouth,	–	–	2	1	2	–
Unknown,	1	–	–	–	–	–
	700	149	745	163	–	–

Of the animals destroyed, 4 were mules and the rest horses.

In dealing with glanders, it seems to be much easier to eradicate it in the smaller cities and towns and in the sparsely settled rural districts than in the larger cities and their surroundings. In the former places the watering troughs are closed, the blacksmiths urged to whitewash their shops, and any diseased horses killed and their stables disinfected, and suspicious ones kept under observation. But in larger cities, such as Boston, Worcester and Fall River, it is ever present, and these places serve as centres of infection to keep the disease from disappearing entirely in surrounding cities and towns. For instance, in places adjoining Boston many of the cases occur among horses owned by teamsters and expressmen, which go back and forth over the road to the city nearly every day. Of the 17 cases in Newton during the past year, 9 of the animals killed were owned by five different express companies.

An alphabetical list of towns does not convey much of an idea of the prevalence of the disease in certain localities, but the table shows a marked decrease in Fitchburg and the adjoining towns. It also seems to have decreased very considerably in the Connecticut valley. In Berkshire County there is more than for several years; it occurred in Pittsfield, Adams and Williamstown, although all combined the cases only number 8. There seems to be a tendency toward an increase in the Merrimac valley. Worcester shows quite an increase over last year, but it does not prevail there now to the extent it did four or five years ago. In most of the cities adjoining Boston on the north there is a decrease; in Cambridge, Somerville, Chelsea, Everett and Malden it is quite apparent. Lynn shows a slight increase. South of Boston, in Watertown, Newton, Dedham and Needham, it has increased; while beyond these places, in Waltham, Wellesley, Dover, Westwood and Medfield, it shows a decrease. Along the south shore there is a marked abatement; the towns of Weymouth, Hingham, Cohasset and Hull seem to be free. The 2 cases reported from Hingham properly belong to Boston. The horses were sent there by a Charlestown firm of contractors, and were used to load gravel on scows; they were entirely by themselves, and never came in contact with Hingham horses in any way. The most serious outbreak of the year was in Middleborough and adjoining towns. There was also somewhat of an outbreak in Framingham, and a number of cases also occurred in Natick and Brookline; but in the two towns last named the disease was in each instance confined chiefly to one stable. A small outbreak also occurred in Deerfield. In connection with the Middleborough outbreak, glanders has prevailed extensively in Brockton, extending through East Bridgewater, Halifax, Middleborough, Carver and Rochester to New Bedford. Many of the infected horses in the towns between Brockton and New Bedford were owned by lumbermen and box manufacturers. It is hoped that the outbreak is now under control. Fall River shows a slight decrease, but the number of cases is practically the same as usual. A few cases occurred on Cape Cod, — more than for several years.

Some of the trouble on the Cape was called to the attention of the commission by a horse killed in Dedham. It was found that this animal had only been there a few days, and was brought up from the Cape. An agent was sent to the stable on the Cape where the diseased animal brought to Dedham had been boarded, and two horses were found there with glanders, and were killed.

In some towns where glanders and farcy have occurred many of the animals were not owned by the towns people, but by contractors engaged on public work. For example, the outbreak in Sterling in December, 1900, and January, 1901, was among horses owned by a contractor employed on the metropolitan water works. The same is true to a certain extent in Framingham, several of the animals being owned by a firm of contractors on the metropolitan water works. In Hyde Park 5 of the horses killed were owned by a contractor working on a section of the metropolitan sewerage system.

Mallein has been employed in the eradication of glanders more extensively than in any previous year. While it does not seem certain enough as a diagnostic to warrant killing animals that react but which show no physical symptoms of disease, yet it seems to be generally believed that an animal that does not react is free from glanders, and that it also has a curative effect on incipient cases, and may also act as an immunizing agent. Many of the animals coming under the head of negative cases were treated with this agent. All the horses in a stable where there was glanders in several instances have been tested with mallein; any animals that reacted were retested in a month, and if any reacted they were again tested in another month, until they ceased to react. Those that failed to react on the first test were considered healthy.

This method has been tried with apparent success in a contractor's stable in Brookline, in a stable in Natick, among the horses of the contractor spoken of in Sterling, and in a stable in Fitchburg, where 1 horse was killed and the 3 stable companions released after failing to react on the second test. It was also tried in Winchendon, where 3

horses were killed and 2 released, all owned by one firm. The stables of horses spoken of were tested early in the year, and no reports of any further trouble among them have as yet been received. The guinea pig test has also been extensively used, as in the past few years, and has continued to show its value in diagnosing doubtful cases. Male guinea pigs are inoculated into the abdominal cavity with material from discharges from the nose, or from sores on the legs or body, from horses suspected of having glanders or farcy. If the guinea pigs develop glanders, it is positive proof that the horse is suffering from some form of the disease; and many chronic cases are now killed in the early stages of the malady, that in former times might have been allowed to live for years, spreading the infection among other horses wherever they went.

Additional legislation seemed necessary in regard to renderers; and a bill was passed by the last Legislature, requiring renderers to have a license from the boards of health in the cities or towns where rendering establishments are located, and providing that they must report all cases of contagious diseases among domestic animals received at their establishments. The following cases of glanders and farcy have been reported to the commission by renderers, as given in the subjoined table: —

	Number of Reports.	Number of Cases.	Number in Boston.	Number out of Boston.	Number outside of Boston not reported previously.
Guy N. Barnes Rendering Company, Fall River.	19	32	–	32	–
Bartlett & Holmes, Springfield, . .	2	2	–	2	1
Butchers Slaughtering and Melting Association, Brighton.	42	96	17	79	35
W. C. Laurence, Brockton, . . .	8	10	–	10	5
Lavery Fertilizer Company, Amesbury.	1	2	–	2	–
Lowe Bros. & Co., Fitchburg, . .	6	7	–	7	–
Lowell Rendering Company, Lowell, .	2	2	–	2	–

	Number of Reports.	Number of Cases.	Number in Boston.	Number out of Boston.	Number outside of Boston not reported previously.
Jas. E. McGovern, Lawrence,	5	6	–	6	2
McQuade Bros., Auburn,	2	2	–	2	1
Muller Bros., North Cambridge,	22	68	–	68	23
New Bedford Product Company, New Bedford.	9	10	–	10	5
Parmenter & Polsey Fertilizer Company, Peabody.	18	25	–	25	10
N. Ward & Co., Boston,	46	162	125	37	10
E. J. Whitman Rendering Company, Dracut.	3	4	–	4	2
Totals,	185	428	142	286	94

It will be seen from the above table that reports have been made by 14 rendering companies, the total number received being 185, including 428 animals. Those in Boston number 142; as the Boston board of health has full charge of glanders and farcy in the city limits, the commission has nothing to do with these cases; the number of cases reported includes Boston simply to show the condition of affairs for the whole State. Outside of Boston, 286 cases were reported by the rendering companies; of these, 94 had not been previously reported to the Board, and most of them were not subsequently reported. In these cases the inspector of animals in the town where each such case occurs is immediately notified to see that the owner of the horse has properly disinfected his stable, and, if any horses are kept there, to examine them and see if they are healthy. This system is of great assistance in the endeavor to check the spread of the disease. The renderers' reports do not include Mr. Bartlett's establishment in Worcester, as he reports all the cases he receives directly to Mr. Herrick, and the horses condemned by order of the commission in that city are killed there.

No authentic cases of glanders in man have been called to

the attention of the Board during the past year, although the increase among horses seems to make the danger to man greater. An interesting case occurred in Middleborough. A mare with farcy was killed, having a foal a few days old at foot; the mare had farcy for some time during the latter part of her pregnancy; the foal was weaned on to cow's milk, as it showed no evidence of disease, and now, at between the ages of two and three months, appears to be perfectly healthy. Judging from this case, at the present time the old-fashioned idea that glanders and farcy is congenital seems to be erroneous.

The law provides a penalty for any one removing, transporting or selling an animal with a contagious disease, if the person knows or has reasonable cause to believe such to be the fact. Persons disposing of glandered horses always deny that they knew or suspected the existence of a contagious disease, and it is, therefore, useless to prosecute cases unless proof is forthcoming to show that there was good reason for believing the presence of glanders and farcy. Two cases have been prosecuted during the year, one in Fitchburg, where a man disposed of a horse after being informed that an agent of the commission was notified to come and see it. The case was placed on file, and costs assessed on the owner of the horse. It was not a strong case. The other prosecution was in Worcester, where two men were fined $50 each for attempting to dispose of a glandered horse.

When we consider that in 1898 only 1,380 cases of glanders were reported in Great Britain, 138 in Belgium and 17 in Denmark, it can be more readily realized what a large number 745 is for a State the size of Massachusetts, — probably more than any other State in the Union, — and how important its eradication is. It is not only a heavy tax on the horse owners of the State, but a menace to the public health, as occasionally a person becomes infected from a glandered horse, and succumbs to this loathsome disease.

Blackleg, or Symptomatic Anthrax.

(Quarter Ill of the English; Rauch-brand of the Germans; and the Charbon Symptomatique of the French.)

During the season of 1901 there has been very little trouble from blackleg reported to the Cattle Commission. In localities where it prevailed extensively in the summer of 1900 no cases occurred; the few instances where it has been found have been, as a rule, in places where it was not observed the year before.

Early in the season the Board felt that a further study of the disease which prevailed in Hubbardston and the adjoining towns during the summer of 1900 should be made, in order to ascertain as far as possible its nature, and also to determine means for its prevention if it should again appear. In the report of the Cattle Commission for 1901 (work done in 1900) it will be remembered that an inoculation experiment was tried upon a two-year-old heifer, four cubic centimeters of a three-day-old bouillon culture being injected into the connective tissue under the skin on the shoulder, with a hypodermic syringe, without producing serious results beyond causing a rise in temperature, a slight loss of appetite and a swelling at the point of inoculation, which gradually subsided. It is safe to assume that an animal thus protected would be immune if introduced into an infected pasture; but it was not fair to come to the conclusion that all animals thus treated would suffer as little inconvenience as this heifer, and in some instances such experiments might result fatally; it was, therefore, decided to continue the experiment on a larger scale, in order to decide whether young cattle could safely be inoculated with an active organism of the disease, without producing serious or fatal consequences to some. Accordingly, in the month of April a dozen young creatures were purchased, ranging in age from six months to two years old. All were tested with tuberculin at the time of purchase, in order to be sure that they were free from disease. The young animals were bought in Brighton by Mr. Dennen and sent to an empty barn at Bussey College, kindly placed at the disposal of the com-

mission by the courtesy of Dr. Theobald Smith. The bacteriological work has been done in Dr. Smith's laboratory by him, and the Board is greatly indebted to him for his advice and assistance. Much of the clinical work has been done by Dr. A. W. May of Jamaica Plain, who has been of great assistance in aiding in this portion of the experiments. The description of the animals and results of the inoculations are given in detail in the following tables: —

No. I. — Small Black and White Yearling Heifer. (Ear Tag, Vermont 3814.)

DATE.	TEMPERATURE, DEGREES F.		Remarks.
	Morning.	Evening.	
April 14,	102.2	102.8	
April 15,	105.6	–	
April 16,	103.5	104.2	
April 17,	104.9	–	Two and one half cubic centimeters of a bouillon culture three and one half days old of the Hubbardston cattle disease injected under skin on right shoulder. Slightly dull; hot, painful swelling, extending from point of inoculation to point of shoulder; animal quite lame.
April 18,	106.0	104.8	Swelling less painful than previous day; lameness less.
April 19,	103.3	–	
April 20,	102.6	–	
April 21,	103.9	–	
April 22,	103.4	–	
April 23,	102.6	–	Lameness entirely disappeared; swelling slightly larger.
April 24,	102.8	–	
April 25,	102.7	–	
April 26,	102.8	–	
April 27,	102.5	–	
April 28,	103.1	–	
April 29,	103.3	–	
April 30,	102.4	–	
May 1,	102.0	–	
May 2,	102.0	–	
May 3,	102.2	102.3	An abscess, formed at point of inoculation, was opened at lowest point; a small quantity of pus escaped; also contained a slough of connective tissue. Cover-glass preparations and cultures made, in which the bacillus of blackleg was found. Wound dressed daily with solution of fectol.
May 4,	102.4	103.9	
May 5,	102.8	–	

No. I. — Small Black and White Yearling Heifer — Concluded.

DATE.	TEMPERATURE, DEGREES F.		Remarks.
	Morning.	Evening.	
May 6,	102.2	–	
May 7,	102.5	–	
May 8,	102.6	–	
May 9,	101.9	–	
May 10,	102.8	–	Slough two by one inches discharged from wound; swelling slowly diminishing.
May 11,	102.4	–	
May 12,	102.7	–	
May 13,	102.6	–	Incision made throughout length of swelling; interior of swelling evidently a fistulous tract.
May 14,	102.5	–	
May 15,	102.6	–	Wound healing; dressed daily with fectol and dusting powder.
May 16,	102.2	–	
May 17,*	101.8	–	
May 20,	–	–	Wound healing very rapidly.
May 22,	–	–	Wound nearly closed; granulations healthy.

No. II. — Red and White Dehorned Yearling Bull. (Ear Tag, Vermont 3823.)

April 14,	101.7	101.0	
April 15,	102.8	–	
April 16,	103.6	103.4	
April 17,	103.1	–	Inoculated at 9.30 A.M. with three cubic centimeters of same culture as No. I, in same place, over scapula.
April 18,	105.5	104.4	Dull, not eating; swelling, heat and pain at point of inoculation; considerable lameness.
April 19,	104.6	–	Less pain and lameness than previous day; dull, not eating; swelling increased in size, hot and painful, extending forward on side of neck.
April 20,	103.9	–	
April 21,	103.1	–	
April 22,	101.1	–	
April 23,	101.9	–	
April 24,	101.0	–	
April 25,	101.7	–	
April 26,	102.5	–	
April 27,	101.0	–	
April 28,	101.8	–	
April 29,	101.9	–	
April 30,	101.3	–	

* Last temperature that was taken.

No. II. — Red and White Dehorned Yearling Bull — Concluded.

DATE.	Temperature, Degrees F.		Remarks.
	Morning.	Evening.	
May 1,	101.3	–	Swelling fluctuating.
May 2,	101.8	–	
May 3,	101.8	101.6	Swelling opened; slough size of palm of hand removed. Cultures and cover-glass preparations made, as in No. I.
May 4,	101.7	102.2	The pathogenic organism was found in large numbers in both slides and cultures in Dr. Smith's laboratory.
May 5,	102.8	–	
May 6,	102.9	–	
May 7,	102.0	–	
May 8,	101.7	–	
May 9,	102.3	–	
May 10,	101.2	–	Swelling has gradually returned, fluctuates, and is opened, allowing about two ounces of pus to escape; washed out with fectol solution. From May 10 to May 20 abscess gradually healed and swelling disappeared; kept clean with fectol solution.
May 11,	102.4	–	
May 12,	102.7	–	
May 13,	101.5	–	
May 14,	102.3	–	
May 15,	102.4	–	
May 16,	101.8	–	
May 17,	101.5	–	

No. III. — Grade Shorthorn Yearling Bull, with Horns. (Ear Tag, Vermont 3831.)

April 14,	102.3	101.8	
April 15,	102.1	–	
April 16,	102.5	102.7	
April 17,	102.0	–	Inoculated with three cubic centimeters of same culture as preceding animals.
April 18,	104.3	105.0	Slight swelling, considerable lameness and pain; slightly dull, but eating.
April 19,	104.9	–	
April 20,	104.7	–	
April 21,	104.0	–	
April 22,	103.3	–	
April 23,	102.5	–	Swelling increases slowly in size; less pain and lameness.
April 24,	102.3	–	
April 25,	102.0	–	
April 26,	102.5	–	
April 27,	102.2	–	

No. III. — Grade Shorthorn Yearling Bull — Concluded.

DATE.	Temperature, Degrees F.		Remarks.
	Morning.	Evening.	
April 28,	102.0	–	
April 29,	102.0	–	
April 30,	101.4	–	Swelling becoming elongated.
May 1,	102.0	–	
May 2,	101.3	–	
May 3,	101.3	102.2	
May 4,	101.1	103.0	
May 5,	102.2	–	
May 6,	102.1	–	
May 7,	101.6	–	
May 8,	102.5	–	Swelling elongated and fluctuating.
May 9,	101.9	–	
May 10,	101.7	–	
May 11,	102.3	–	
May 12,	102.2	–	Swelling burrowed to point on line with and posterior to the point of the shoulder, and fluctuating.
May 13,	101.9	–	Swelling lanced; slough size of palm of hand removed. Cover-glass preparation made by Dr. T. Smith; no bacilli of black-leg were found.
May 14,	102.0	–	Discharge from opening in swelling; dressed with fectol solution.
May 15,	102.0	–	Swelling diminishing; slight discharge.
May 16,	101.9	–	
May 17,	101.7	–	
May 18,	–	–	Swelling disappearing rapidly; wound dressed daily.
May 20,	–	–	Swelling much smaller; no discharge.
May 22,	–	–	Driven to Watertown.

No. IV. — Roan Yearling Grade Shorthorn Bull, Dehorned. (Ear Tag, Vermont 3829.)

April 14,	104.7	104.0	
April 15,	103.6	–	
April 16,	102.8	102.6	
April 17,	102.1	–	Inoculated same as No. III.
April 18,	102.8	103.5	Very slight swelling, heat or lameness; bright, eating well.
April 19,	102.2	–	
April 20,	101.9	–	
April 21,	101.9	–	Slight swelling; no lameness.
April 22,	102.5	–	
April 23,	101.8	–	
April 24,	101.3	–	
April 25,	101.4	–	

No. IV. — Roan Yearling Grade Shorthorn Bull — Concluded.

DATE.	TEMPERATURE, DEGREES F.		Remarks.
	Morning.	Evening.	
April 26,	102.0	–	
April 27,	102.4	–	
April 28,	102.0	–	
April 29,	102.6	–	
April 30,	101.6	–	Very little swelling; no heat or lameness.
May 1,	101.7	–	
May 2,	102.0	–	
May 3,	102.7	102.6	
May 4,	101.8	101.8	
May 5,	102.8	–	
May 6,	102.1	–	
May 7,	102.0	–	
May 8,	101.8	–	
May 9,	102.3	–	
May 10,	102.6	–	Swelling entirely disappeared.
May 11,	102.8	–	Normal condition.
May 12,	102.0	–	
May 13,	101.9	–	
May 14,	102.1	–	
May 15,	101.9	–	
May 16,	102.1	–	
May 17,	101.9	–	
May 22,	–	–	Driven to Watertown.

No. V. — Two-year-old Red Heifer. (*Ear Tag, Vermont 3821.*)

April 14,	102.4	102.7	
April 15,	103.2	-	
April 16,	102.8	102.7	
April 17,	102.3	-	Inoculated same as Nos. III. and IV.
April 18,	102.9	103.5	Considerable swelling; heat, pain at point of inoculation; lameness.
April 19,	102.7	–	
April 20,	102.7	–	Swelling slightly smaller; very little heat and pain; lameness entirely disappeared.
April 21,	103.2	–	
April 22,	102.8	–	
April 23,	102.1	–	
April 24,	102.0	–	
April 25,	101.6	–	
April 26,	102.4	–	
April 27,	101.7	–	
April 28,	101.5	–	
April 29,	101.8	–	
April 30,	101.5	–	
May 1,	101.7	–	Swelling small, circumscribed and firm.
May 2,	101.6	–	

No. V. — Two-year-old Red Heifer — Concluded.

DATE.	TEMPERATURE, DEGREES F.		Remarks.
	Morning.	Evening.	
May 3,	101.7	102.5	Swelling at point of inoculation; opened; very small amount of bloody discharge. Cultures and cover-glass preparations taken; negative.
May 4,	101.6	102.0	
May 5,	102.0	–	Swelling disappearing, and wound healing without dressing.
May 6,	101.5	–	
May 7,	101.7	–	
May 8,	101.3	–	
May 9,	101.1	–	
May 10,	101.7	–	
May 11,	102.0	–	
May 12,	101.7	–	Swelling at point of inoculation size of half a dollar, slightly elevated.
May 13,	101.3	–	
May 14,	101.6	–	
May 15,	101.8	–	Swelling diminishing rapidly.
May 16,	101.6	–	
May 17,	101.5	–	
May 20,	–	–	Swelling entirely gone, very small scar.
May 22,	–	–	Driven to Watertown.

No. VI. — Very Small Black Heifer, Six or Eight Months Old. (Ear Tag, Vermont 3828.)

April 14,	103.5	103.2	
April 15,	102.6	–	
April 16,	102.1	103.4	
April 17,	102.7	–	Inoculated with two cubic centimeters of same culture as preceding.
April 18,	103.5	104.3	Considerable heat and pain, lameness; large swelling. Nos. I. and VI. greatest amount of heat, pain and lameness. Animal not placing weight on lame leg.
April 19,	103.5	–	Less heat, pain and lameness; swelling continues to increase slowly.
April 20,	104.1	–	Heat and pain at point of inoculation less than April 19; lameness disappearing; swelling extending downward.
April 21,	104.5	–	
April 22,	103.6	–	
April 23,	102.9	–	
April 24,	102-5	–	
April 25,	102.5	–	
April 26,	101.7	–	Swelling remains stationary and of same size.
April 27,	101.7	–	

No. VI. — Very Small Black Heifer — Concluded.

DATE.	Temperature, Degrees F.		Remarks.
	Morning.	Evening.	
April 28,	102.1	–	
April 29,	102.3	–	
April 30,	102.2	–	
May 1,	101.9	–	
May 2,	102.0	–	
May 3,	102.6	100.2	Portion of skin size of half a dollar at lowest point of swelling sloughed off between April 26 and May 3; slough removed with forceps: slough about size one-half palm of hand.
May 4,	101.7	103.3	
May 5,	102.7	–	
May 6,	101.5	–	Wound dressed daily, gradually becoming smaller and swelling disappearing.
May 7,	101.8	–	
May 8,	102.7	–	
May 9,	102.0	–	
May 10,	102.3	–	
May 11,	101.7	–	
May 12,	102.0	–	
May 13,	102.4	–	
May 14,	101.7	–	
May 15,	101.4	–	
May 16,	101.6	–	
May 17,	102.1	–	
May 20,	–	–	Wound very small and healthy.
May 22,	–	–	Small wound. Driven to Watertown.

No. VII. — Black and White Two-year-old Heifer, with Horns. (*Ear Tag, 1444.*)

April 27,	101.9	–	
April 28,	101.9	–	
April 29,	101.9	–	
April 30,	101.7	–	
May 1,	100.6	–	
May 2,	101.3	–	Inoculated with two cubic centimeters of culture three days old, of same material as preceding culture
May 3,	102.2	101.6	Swelling at point of inoculation.
May 4,	101.4	102.3	
May 5,	101.5	–	
May 6,	101.9	–	
May 7,	101.2	–	
May 8,	101.6	–	
May 9,	101.3	–	Swelling three inches long and slightly fluctuating.

No. VII. — Black and White Two-year-old Heifer — Concluded.

DATE.	Temperature, Degrees F.		Remarks.
	Morning.	Evening.	
May 10,	101.1	–	
May 11,	101.7	–	Swelling diminishing.
May 12,	101.9	–	Swelling still smaller.
May 13,	101.8	–	
May 14,	101.8	–	
May 15,	102.6	–	
May 16,	101.2	–	Swelling very small, barely noticeable to the touch.
May 17,	102.0	–	
May 20,	–	–	Swelling entirely disappeared.
May 22,	–	–	Driven to Watertown.

No. VIII. — Two-year-old Roan Heifer. (*Ear Tag, Vermont 3879.*)

April 27,	102.2	–	
April 28,	102.3	–	
April 29,	102.4	–	
April 30,	102.5	–	
May 1,	102.3	–	
May 2,	102.2	–	Inoculated with two cubic centimeters, same as No. VII.
May 3,	102.2	102.1	
May 4,	103.1	103.2	Slight swelling at point of inoculation.
May 5,	102.5	–	Swelling slightly larger.
May 6,	102.3	–	
May 7,	102.5	–	
May 8,	102.9	–	
May 9,	102.0	–	Swelling size of palm of hand; hot and painful.
May 10,	102.5	–	
May 11,	102.6	–	
May 12,	102.6	–	Swelling increases in size; considerable heat and slightly fluctuating.
May 13,	102.7	–	Swelling lanced; small amount of pus discharged; slough present, but not separated sufficiently to remove. Cover-glass preparations made by Dr. Theobald Smith. Negative.
May 14,	102.4	–	No discharge from incision.
May 15,	102.3	–	No discharge; wound dressed.
May 16,	101.8	–	Wound healing; slight amount of discharge.
May 17,	102.0	–	
May 18,	–	–	Swelling subsiding; wound dressed.
May 20,	–	–	Healing nicely; not dressed.
May 22,	–	–	Wound smaller, and healing rapidly. Driven to Watertown.

No. IX. — Yearling Heifer, Black shading to Brown on Back. (Ear Tag, Vermont 1445.)

DATE.	Temperature, Degrees F.		Remarks.
	Morning.	Evening.	
April 27,	102.6	–	
April 28,	102.7	–	
April 29,	102.2	–	
April 30,	102.5	–	
May 1,	102.7	–	
May 2,	102.8	–	Inoculated with two cubic centimeters of culture, same as Nos. VII. and VIII.
May 3,	103.5	103.2	
May 4,	103.9	104.7	Dull, not eating; bloody mucus in fæces.
May 5,	103.5	–	Still dull; bloody mucus in fæces. Swab of bloody mucus, taken to Dr. T. Smith by Dr. Peters, contained no blackleg bacilli. Slight swelling at point of inoculation.
May 6,	103.0	–	Swelling at point of inoculation elongated (two inches long), hard, and very little pain; bloody mucus in fæces.
May 7,	102.5	–	
May 8,	103.3	–	Bloody mucus absent from fæces.
May 9,	102.4	–	Respiration accelerated; eating well.
May 10,	102.3	–	
May 11,	102.5	–	Respiration still slightly hurried.
May 12,	102.3	–	Respiration very rapid, 48 per minute; animal not ruminating; swelling is slightly smaller than on May 6.
May 13,	102.4	–	Respiration slower; animal ruminating.
May 14,	102.4	–	Swelling subsiding.
May 15,	102.4	–	
May 16,	102.2	–	Swelling remains stationary.
May 17,	102.1	–	
May 18,	–	–	Swelling much smaller.
May 20,	–	–	Swelling nil; animal in normal condition.
May 22,	–	–	Driven to Watertown.

No. X. — Red and White Yearling Heifer. (Ear Tag, 1446.)

April 27,	102.5	–	
April 28,	103.0	–	
April 29,	102.7	–	
April 30,	102.6	–	
May 1,	102.1	–	
May 2,	102.4	–	Inoculated same as Nos. VII., VIII. and IX.
May 3,	104.5	103.4	
May 4,	103.2	104.7	
May 5,	103.5	–	Slight swelling at point of inoculation.
May 6,	103.4	–	
May 7,	102.8	–	

No. X. — Red and White Yearling Heifer — Concluded.

DATE.	Temperature, Degrees F.		Remarks.
	Morning.	Evening.	
May 8,	102.6	–	
May 9,	102.2	–	
May 10,	102.0	–	Swelling gradually increased until one-half size palm of hand; hard, hot and painful.
May 11,	102.1	–	
May 12,	102.1	–	Swelling extended in twenty-four hours to point of shoulder, about one and one-half inches wide, and slightly fluctuating.
May 13,	101.9	–	Swelling opened; slight discharge; slough not detached.
May 14,	102.3	–	No discharge; wound dressed.
May 15,	102.0	–	Small portion of slough removed; wound healing; dressed.
May 16,	102.0	–	
May 18,	–	–	Small portion of slough removed; wound healing.
May 22,	–	–	Wound almost healed; swelling very small. Driven to Watertown.

No. XI. — Red and White Grade Ayrshire Two-year-old Heifer. (No Ear Tag.)

May 2,	102.5	–	Inoculated with two cubic centimeters of culture, same as preceding.
May 3,	102.6	101.0	Dull, not eating; slight swelling at point of inoculation; heat and tenderness.
May 4,	102.3	102.4	Brighter, and eating.
May 5,	102.2	–	
May 6,	101.3	–	
May 7,	101.1	–	
May 8,	102.0	–	
May 9,	101.5	–	
May 10,	101.8	–	Swelling (slight) extending on to neck, size of an English walnut.
May 11,	101.7	–	
May 12,	101.5	–	
May 13,	101.0	–	Incision made into swelling; small amount of discharge.
May 14,	101.0	–	No discharge.
May 15,	102.1	–	
May 16,	101.1	–	Small amount of pus discharged; swelling same size.
May 17,	101.7	–	
May 20,	–	–	Swelling smaller; wound healed.
May 22,	–	–	Driven to Watertown.

No. XII. — Two-year-old Brindle Heifer. (No Ear Tag.)

DATE.	Temperature, Degrees F.		Remarks.
	Morning.	Evening.	
May 2,	102.9	–	Inoculated with two cubic centimeters of culture, three days old. Hubbardston disease.
May 3,	103.0	102.3	
May 4,	101.6	102.1	Slight swelling; heat and tenderness at point of inoculation.
May 5,	102.2	–	
May 6,	102.7	–	
May 7,	101.9	–	
May 8,	102.0	–	Swelling same.
May 9,	101.4	–	
May 10,	101.7	–	Swelling circumscribed, about size of one-half dollar.
May 11,	101.9	–	
May 12,	102.0	–	
May 13,	102.0	–	Swelling smaller; incision made into swelling; no discharge.
May 14,	102.2	–	
May 15,	101.9	–	Wound dressed; no discharge.
May 18,	–	–	Swelling smaller; not dressed.
May 20,	–	–	Swelling smaller; not dressed.
May 22,	–	–	Driven to Watertown.

May 22 the cattle were driven to Watertown and shipped by freight to Hubbardston, and distributed in lots of three to four different pastures where the disease had occurred in 1900. At C. C. Colby's pasture Nos. II., VII. and XII. were turned out; to Mr. Hale's "Bennett pasture" Nos. I., IX. and X. were sent; at Mr. Newton's pasture Nos. III., V. and VI. were left; Nos. IV., VIII. and XI. were turned out at the pasture of James Leadbetter in Princeton.

These young animals did well during the season, and were sold at auction, by order of the commission, October 18, all of them apparently in perfect health. These cattle were undoubtedly protected from symptomatic anthrax; but the value of the experiment was not fully demonstrated, for the reason that the disease did not occur in these pastures during the past season, and all the young cattle in these pastures were thrifty and healthy.

By consulting the above tables in detail it will be noticed

that the first six animals received larger subcutaneous injections of the cultures than the last six (where the size of the dose among the first six is given as two cubic centimeters, it is larger in proportion to the size and age of the animal than it was for the last six), and the results were more serious to the former in producing sloughs and sores which required after treatment, while among the latter the results were practically harmless. It is probable that two cubic centimeters of a three-day-old culture of the blackleg bacillus for a two-year-old, or good-sized, strong yearling, is sufficient to protect it, and not sufficient to produce serious consequences. Small or weakly yearlings and half-grown calves should receive smaller amounts of the virus.

One reason for experimenting with the pathogenic organism of the disease found in Worcester County in the summer of 1900 was to ascertain if cultures could safely be used for protective purposes, in case the disease was not identical with blackleg. It was thought that, if the blackleg vaccine furnished by the Bureau of Animal Industry for protective inoculation was used, a disease might be introduced into the pastures of Worcester County that did not previously exist there.

Further study of the organism of the Hubbardston cattle disease, and comparison with blackleg organisms obtained from the United States Bureau of Animal Industry, and Parke, Davis & Co., of Detroit, Mich., by Dr. Theobald Smith, show that the organisms are the same; and that the trouble among the young cattle in Hubbardston and adjoining towns was undoubtedly blackleg, although the manifestation of the disease, in appearing in the digestive passages instead of in a fore or hind quarter, was somewhat different than ordinarily met with. Why blackleg should disappear one season from pastures which were infected the previous year is difficult to explain; it may be due to the difference in the two seasons. The summer of 1900 was very dry, and the cattle were undoubtedly driven by lack of forage to eat coarse grasses on low-lying swampy ground, where in a season of abundant feed they would not graze. During the summer of 1901 rains were

frequent and the pastures did not dry up, therefore the animals found sufficient food on higher ground, where the grass is sweet and fine. Another factor that undoubtedly helped to decrease the danger was the burning of the carcasses of the animals that died in 1900. The Cattle Commission insisted on this being done wherever a case was called to its attention; and where carcasses are consumed in this way, millions of spores of the blackleg bacillus are destroyed, which otherwise would infect the soil where the dead animal lay, or which might be disseminated to other localities by birds of prey or wild animals that fed upon the remains. There were a few reports of symptomatic anthrax received during the summer of 1901, but there were a very few cases in comparison with the previous year, and, with but one exception, these were in pastures in which it was not reported in 1900. There is also no proof that all suspected cases were blackleg; death may have been from another cause in several instances.

A young animal was found dead in Mrs. Woodward's pasture in Ashby near the end of May, and was examined by Dr. C. B. Shaw, inspector of animals in that town, who sent some material, consisting of swollen, blood-stained connective tissue from under the skin on one hind leg, to the office. It arrived May 24, and was taken to Dr. Theobald Smith for examination; it was so decomposed, however, that nothing definite could be decided. Dr. Smith found the bacillus of malignant œdema in the specimen, but this may have developed after death. The post-mortem appearances in the animal indicated blackleg. As far as the commission is informed, this is the only animal that died from blackleg in the Woodward pasture during the past season.

August 24 the following letter was received: —

ASHBY, Aug. 22, 1901.

DEAR DOCTOR: — I have had several cases this summer of a peculiar condition in cows, where on post-mortem the organs are in a healthy condition until we reach the small intestines, then there are signs of inflammation, and they are filled with a hard, bloody mass, with a peculiar odor which I cannot describe. On a post-mortem of a bull which I held yesterday for D. Gillis of Ashburnham, I found pericarditis also. He has another bull

which is ailing also; the symptoms are dullness, want of appetite, temperature 104°, and lame in right fore shoulder. The fæces are a dark brown, tinged with blood. I was wondering if this is the same disease that broke out last summer, where they lost so many; there were six died last summer in Mrs. Woodward's pasture, and Mr. Gillis tells me he lost seven; but all that I saw last season had a good many of the symptoms of blackleg, but they do not look the same this year.

Yours truly, Dr. C. B. Shaw.

On Thursday, August 29, Dr. Peters went to Ashby, and, accompanied by Dr. Shaw, visited the Woodward pasture, to ascertain the condition of affairs there. The farm of Daniel Gillis in Ashburnham was then visited, where two bulls had recently died; the other young cattle in the pasture did not appear to be sick, with the possible exception of a heifer which appeared dull; but the animals could not be very readily examined where they were. Dr. Shaw said he would report further if there was any more trouble. It is probable that the two young bulls died of blackleg.

In January Dr. T. J. Shinkwin of Holyoke reported four cases in his practice of what was probably symptomatic anthrax, on a farm in that city; and in August two deaths occurred in calves on the same farm; but these may have been due to some other cause than symptomatic anthrax. Specimens from the last calf to die were sent to Dr. Frothingham for an opinion; but they were so decomposed that a satisfactory examination could not be made.

June 27 the following letter was received from the inspector of animals of Westhampton: —

Westhampton, Mass., June 25, 1901.

To the Board of Cattle Commissioners.

Dear Sirs: — I am requested to write you concerning a disease that is afflicting several head of cattle in the north part of this town. When turned out to pasture they are in good flesh; after a few weeks they lie down and die without any apparent suffering; all right to-day; dead to-morrow; six died the same way last year. Now in an adjoining pasture three have dropped dead. Can you inform us what you think is the cause of all this trouble?

Yours truly, S. D. Lyman,
Inspector.

The following reply was sent: —

8 Beacon Street, Boston, June 27, 1901.

Mr. S. D. Lyman, *Box 20, Westhampton, Mass.*

Dear Sir: — Your note of June 25 duly received. We will be very glad to assist you in any way we can in investigating any outbreak of disease among cattle, if it seems to be of a contagious character. If you have any more trouble, let me know, and, if possible, in time so we can see the animals before they die; as in hot weather, where death occurs suddenly, unless the animal is killed just before it is ready to die, or examined immediately after death, it is almost impossible to tell anything, as there are post-mortem changes as the result of putrefaction. As this disease is also caused by some germ, it is necessary to get an animal that has just died, in order to isolate the germ and examine it. If you find there are to be more cases, please let us know before the animals die, if you can, and we will send some one to examine them as soon as possible. In your letter you do not say whether the disease is among mature or young cattle, or what the symptoms are like.

I think it very important, in diseases of this character, to have the carcass burned, if brush or wood is available, as fire effectually destroys all germs and stops the spread of disease. Very likely, if the carcasses of the animals that died last year had been burned at once, there would not have been any trouble of a similar character this year.

Yours truly, Austin Peters,
Chairman.

No further reports of trouble in Westhampton have been received.

August 7 the following letter was received: —

Northampton, Aug. 6, 1901.

Dr. Peters.

Dear Sir: — I was called this morning by H. O. Strong of Southampton to see some young cattle in pasture, seven of which had died within four weeks. His history of the case was that on visiting the pasture about three weeks ago he found one heifer dead; he did not think it anything strange at the time, — thought perhaps it was struck by lightning. On visiting the pasture again yesterday, found five more dead and one at the point of death; this morning we found the animal that was sick, dead. I made a

rather hasty post-mortem; found physical condition good; bloody discharge from nostrils, anus and vulva; stomach full of partly digested food; small intestines, uterus, liver, spleen and kidneys congested; hemorrhagic spots on the serous membrane of intestines and stomach, with a small amount of serous exudate in abdominal cavity; lungs normal. My diagnosis was that the disease was probably anthrax. Do you think, from my description, that I was right, and, if so, what course would you follow to stop the spread of the disease? I saved a small portion of the spleen and liver, which I could send to you for examination, if necessary.

The owner is anxious to do something, and I told him I would write you, and perhaps you would recommend anthrax vaccine. I ordered the carcass burned, if possible, which I think can be done, as there is plenty of wood near. There is plenty of feed and water in the pasture, and the remaining cattle are in good order. What would you do with them? Hoping to hear from you soon,

I am yours truly, J. H. Roberts.

Accordingly, Mr. Herrick, Dr. Peters and Dr. Frothingham visited the pasture August 15, and ascertained the following facts: —

Strong Brothers of Southampton, who own a large pasture in the towns of Southampton and Montgomery, turned twenty-four head of young cattle into the pasture, and on July 14 one was found dead, on August 4 five were found dead, and on August 11 two were found dead; one animal was not found, but was supposed to be dead. Four were taken home about August 11, and quarantined in a separate pasture on their home farm; eleven were left in the pasture.

Dr. Roberts of Northampton made a post-mortem examination on one that was found August 11, and from his report the trouble was thought to be blackleg.

Five of the dead animals belonged to Strong Brothers, two to George Douglas and two to Gibson Hall. The carcasses of eight of the dead animals were collected and burned. The eleven animals which were left in the pasture were examined August 15 by Mr. Herrick, Dr. Peters and Dr. Frothingham, and to all appearances were in good health. Instructions were left with the owners to see them Sunday,

August 18, and to immediately report any trouble. No further trouble has been reported as occurring in this pasture.

This outbreak caused a good deal of interest in Holyoke, as it was at first believed to be anthrax; and the brook running through this pasture empties a little way below into a large reservoir, which furnishes a portion of the water supply of the city of Holyoke. The disease was undoubtedly symptomatic anthrax, and not true anthrax. The carcasses of all the animals found dead were destroyed by cremation, thus consuming all germs and spores in the dead animals, and reducing the danger from putrefying animals on the watershed to a minimum.

About the time that Dr. Roberts reported the outbreak in Southampton, Dr. A. S. Cleaves of Gardner reported that he feared that there might be danger of trouble from symptomatic anthrax in his locality. On the way home from Southampton Dr. Cleaves was seen at Gardner; he said that several young cattle had died in a pasture at Rindge, N. H., recently, and also one in a pasture in Gardner, all of which he thought had a disease similar to that of the cattle that died in Hubbardston last summer. At this time he had no new cases to show; it was decided that if any more animals were infected he would report it at once; but since then no further reports of the disease have been received from him.

August 20 Dr. A. S. Clark, who had charge of Dr. Cleaves' practice while he was on his vacation, wrote as follows: —

11 Richmond Street, Gardner, Mass., Aug. 20, 1901.

Dr. Frothingham, *Cambridge, Mass.*

Dear Sir: — I sent you by express to-night some specimens taken from a cow owned in Hubbardston by Mr. Nichols. This cow was first noticed when taken from the pasture Sunday night, by her labored breathing. Monday morning she only gave one quart of milk, and seemed quite weak when turned out. Last night when taken from the pasture she was unable to walk but a short distance at a time, frothed at the mouth and gave no milk at all. She was found dead this morning, and where her head lay there were nearly two quarts of blood. I opened her this noon, and took a specimen of the lung, liver, spleen and a gland, which I

sent you. The throat, stomach, intestines and heart seemed normal; the blood left a cherry stain upon the hand.

Respectfully yours, A. S. Clark.

The specimens were received, but were so decomposed that a satisfactory examination of them could not be made. This animal seems to have been beyond the age of cattle ordinarily attacked by symptomatic anthrax, and it is not unlikely that death was due to some other cause.

Another supposed outbreak of symptomatic anthrax was investigated by Dr. Roberts, by request of the Board. His report is given as follows: —

Northampton, Sept. 5, 1901.

Mr. Herrick.

Dear Sir: — I visited Wm. Goram's place in Southampton yesterday, as you requested, and found that he had lost three head of young stock within three weeks, from what he thought was some contagious disease. They were kept in a pasture in which there was a number of apple trees, and, although Mr. G. said the fallen fruit was gathered daily, I judged from symptoms that cattle died from occult indigestion produced by eating apples, as one or two had recovered which had shown symptoms similar to those that died. About six years ago they had some trouble with stock, which was pronounced anthrax. I had the animals removed to another pasture until fruit was gathered, and asked owner to report if any further trouble occurred.

Respectfully yours, J. H. Roberts.

This concludes the list of cases supposed to be due to symptomatic anthrax, to which the attention of the commission has been called during the season of 1901. The investigations of the Board during 1900 and 1901 show that, while the losses from blackleg in Massachusetts are not at all heavy, yet it exists over quite an extensive area, extending from the north-western corner of Middlesex County out on the hills west of the Connecticut River.

Symptomatic anthrax can be prevented by protective inoculation. On large ranches in the west and south-west the losses from this disease have been very heavy. The United States Bureau of Animal Industry furnishes a vac-

cine virus, free, which has been used very extensively and successfully in the west, saving hundreds of thousands of dollars annually for the past few years to the cattle owners in those localities where the disease prevails extensively. A similar virus is also prepared for sale by several private firms; Parke, Davis & Co. of Detroit, Mich., the H. K. Mulford Company of Philadelphia and the Pasteur Company of Chicago can furnish it at any time.

The following circular, sent out by the Bureau of Animal Industry, describes the modus operandi: —

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY, WASHINGTON, D. C., April 21, 1900.

The accompanying paper, prepared by Victor A. Nörgaard, chief of the Pathological Division, entitled "Directions for the use of blackleg vaccine," is respectfully recommended for publication as Circular No. 23 (second revision) of this Bureau. Information of this character first appeared as Circular No. 21.

Very respectfully, D. E. SALMON,
Chief of Bureau.

Approved: JAMES WILSON,
Secretary of Agriculture.

DIRECTIONS FOR THE USE OF BLACKLEG VACCINE.

[By VICTOR A. NÖRGAARD, *Chief of Pathological Division, Bureau of Animal Industry.*]

The blackleg vaccine, as prepared by this Bureau, consists of a brownish powder, which is put up in packets containing either ten or twenty-five doses each. To prepare this powder in such a way that it may be injected hypodermically, it is necessary to obtain certain implements, which, together with the hypodermic syringe, are known as a vaccinating outfit. This consists of a porcelain mortar with pestle, a small glass funnel and a measuring glass. For filtering the vaccine we have found absorbent cotton to be most suitable. Fig. 1 is an illustration of the vaccinating outfit recommended by this Bureau. All of the utensils, including the hypodermic syringe and a package of absorbent cotton, are fitted in a strong polished oak box, which, by means of an adjustable wire loop, serves also as a support for the funnel when the vaccine is filtering. The syringe, two hypodermic needles and an extra glass barrel are packed in a separate metal box, which is inclosed in the oak box.

The syringe (fig. 2) has a capacity of five cubic centimeters, and the piston is graduated from one to five, each division being subdivided with half and quarter notches. The screw regulator (fig. 2, *sr*) may be placed at any mark on the piston, thus insuring that the animal to be vaccinated receives only the exact dose intended for it. The plunger (fig. 2, *pl*) is made of rubber; it should fit air-tight in the glass barrel, and still be susceptible of being moved up and down smoothly. By means of the milled head (fig. 2, *mh*) at the free end of the piston the rubber of the plunger may be expanded or contracted simply by screwing the head to the right or left. By this arrangement a close fit

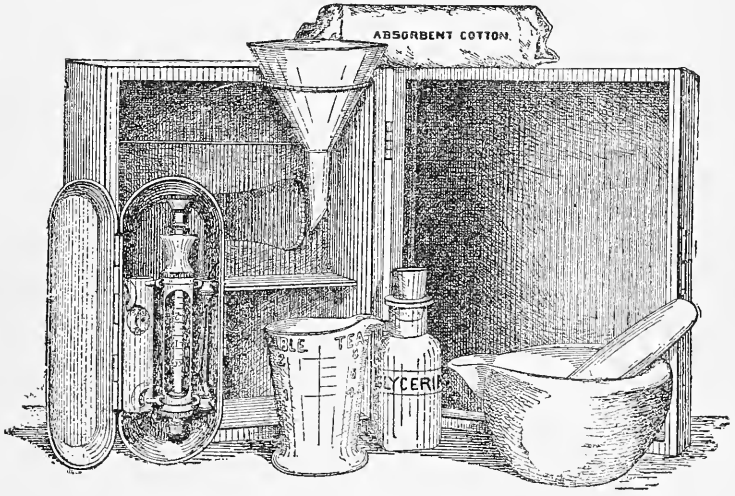

FIG. 1. — Vaccinating Outfit.*

may always be obtained without taking the syringe apart. If the plunger should become dry, or for other reasons not move smoothly up and down in the barrel, it is necessary to unscrew the milled cap *c* and pour a drop of glycerine into the barrel. For this purpose a small bottle of glycerine is furnished with each outfit; oil or grease should never be used, as these substances destroy

* A complete vaccinating outfit, including hypodermic syringe, can be obtained from Z. D. Gilman, 627 Pennsylvania Avenue, N. W., Washington, D. C., for the sum of four dollars. The outfit is prepared by the firm named in accordance with the plans of this Bureau, to meet the temporary demand that may arise in introducing this vaccine. If vaccination should be extensively adopted as a preventive of this disease, similar outfits will no doubt be for sale by other dealers furnishing this class of supplies. Until this may be the case, the unusual course of mentioning a dealer by name in a department publication is followed.

the rubber. Extra washers to be placed inside of the cap at each end of the glass barrel are also to be found in the syringe box. It is of the greatest importance that the syringe be perfectly tight, in order that not a drop of vaccine may escape except through the point of the needle. If a leak occurs, unscrew the cap of the syringe, withdraw the glass barrel and replace the old washers with new ones. In order to prevent the plungers and washers from drying out, the small loose cap *lc* should always be tightly adjusted to the peg *p* when the syringe is not in use. The hypodermic needles should be kept very sharp at the point, in order to pass easily through the skin, and when not in use should have a fine brass wire passed through each, to prevent rusting on the inside.

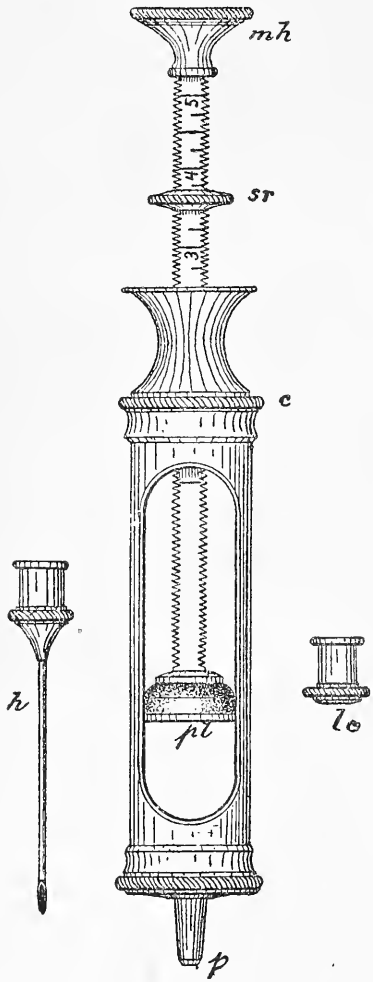

Fig. 2. — Hypodermic Syringe.

Whenever the point of the needle gets blunt, it becomes very difficult to pass it through the skin, the fingers of the operator become sore from attempting to force it through, and frequently the needle either bends or breaks. It is, therefore, of importance to have a small oilstone at hand on which to sharpen the point of the needle. Before using the syringe, it should be tested thoroughly with pure water, to ascertain that it is in perfect working order. To this end, fill the syringe slowly by withdrawing the piston. If the syringe is perfectly tight it should fill completely; if it contains air bubbles, turn it with the point upward and press the piston until the water comes out of the point, then refill. The same precaution must be taken when filling the syringe with vaccine.

Sterilization of Utensils.

Before preparing the vaccine, all the utensils, together with the syringe, must be sterilized thoroughly. This is done by putting the mortar, pestle, measuring glass, funnel and needles in a pan of cold water, placing all over the fire. After boiling for ten minutes, the pan with the contents should be allowed to cool off slowly; then remove the utensils from the water and wipe them dry with a clean linen cloth which has been previously boiled. When the vaccine has been prepared, the utensils should be cleansed thoroughly and replaced in the box. After injection, the syringe and needles must be washed with a five per cent. solution of carbolic acid, carefully wiped, and the brass wire adjusted in the needles.

Preparation of the Vaccine.

Place the contents of one packet of the vaccine in a porcelain mortar and add a few drops of boiled water. (The water must have been previously boiled and allowed to cool.) Work the powder thoroughly with the pestle, and then add, little by little, as many cubic centimeters of water as the packet contains doses. As the syringe contains exactly five cubic centimeters, it may be used for measuring the water. A packet containing ten doses of the vaccine should be dissolved in two syringes full of water, and one containing twenty-five doses in five syringes full. Care should be taken that the syringe is full every time. To filter the vaccine, place the wooden box on end, as shown in fig. 1, and adjust the wire loop in the two eyelets. Place in the funnel a small piece of absorbent cotton, and press it lightly into the upper end of the neck, sufficient to keep it in place; moisten the cotton with a few drops of boiled water, and let it drip off. Stir the mixture in the mortar thoroughly, and, before it has had time to settle, pour it into the funnel under which the measuring glass has been placed. The solution should not be perfectly clear. If this is the case, the cotton has been pressed too closely into the neck of the funnel. The straining is done simply to prevent the coarser parts of the powder, which are suspended in the solution, from clogging up the needle when the vaccine is injected; and, as the effectiveness of the vaccine depends upon the number of attenuated spores in the solution, it is obvious that a perfectly clear solution can not be as effective as one which is cloudy. It is, therefore, of the greatest importance that much time and care be spent in grinding the vaccine powder as fine as possible before the bulk of the water is added, as otherwise the greater part of the germ-carrying particles

are left on the cotton, instead of passing through it. If too much water is added at first, it is almost impossible to grind the powder, and it becomes necessary to place the mortar, with its contents, in a warm and airy place, in order to allow some of the water to evaporate. Only sufficient water should be added to the powder to make it form a paste, in which form it is easy to grind it extremely fine.

When a large number of animals are to be vaccinated at the same time, three or four packets of the vaccine may be dissolved at once, care being taken that the requisite amount of water is used, as otherwise the solution will be too strong or too weak. When the vaccine is prepared at home, a small sterilized medicine bottle may be substituted for the measuring glass under the funnel. The stopper of this bottle, if cork, must have been thoroughly soaked in boiled water. The vaccine is carried in the bottle to the place of operation, where it may be transferred, a little at a time, to the measuring glass; from this it may conveniently be drawn into the syringe. In doing this it is of importance to remember that, when standing for some time, a slight sediment will form at the bottom of the vessel or bottle, and the vaccine should therefore always be well shaken or stirred before the syringe is filled. When some time elapses between the vaccination of two animals, and the syringe still contains one or more doses of vaccine, the operator should turn the syringe up and down frequently to insure an even distribution of the germ-carrying particles throughout the vaccine.

No more vaccine should be prepared at one time than can be used the same day. While the vaccine powder will remain unchanged for some months, the solution deteriorates very quickly, and must be used within twenty-four hours after it is made.

Animals to be vaccinated.

Calves, as a rule, should not be vaccinated until they are six months old. Under this age they are practically immune from blackleg, and it has been claimed that when vaccinated before they are six months old they are liable to lose the artificial immunity induced by means of vaccination, and become susceptible again. Animals more than two years old are seldom affected, and the mortality among them is so small as to make vaccination unprofitable. It is the calves between six months and two years old which should be vaccinated. Vaccination has no ill effect on calves under six months old; but it should be a rule that when very young animals are vaccinated they should be revaccinated before the beginning of the following blackleg season.

The time to vaccinate depends largely upon circumstances. In nearly every part of the country where blackleg is known there is a distinct blackleg season, and the proper time to vaccinate is just before the arrival of this season. Every practical ranchman and farmer, as a rule, knows when to look for blackleg; and, as the disease may appear a little sooner or later, according to climatic conditions, it is always better to vaccinate two or three weeks before the beginning of the blackleg season. In some parts of the country it is not unusual that the calves commence dying when only four months old, while in others they seldom become affected until they are eight months old. It is, therefore, much a matter of judgment when to vaccinate, and what should constitute the minimum age at which the calves should be treated.

Vaccination and castration should not be performed at the same time. Castration is always a severe operation, and in some cases decreases the vitality of the animals to such an extent as to make them unable to resist the effect of the vaccination. The same principle applies to all surgical operations (castration, spaying, dehorning, etc.), as well as to those cases where the constitution of the animal has been impaired from injuries external or internal.

Ten days to two weeks should be allowed to pass after vaccination before any surgical operation is undertaken, and, if performed before vaccination, ample time should be allowed for the part to heal and for the animal to regain its lost strength.

The Dose to be injected.

Animals one year old or over are injected with a full dose of vaccine, — that is, one cubic centimeter of the solution. Under this age the dose may be reduced to one-half or three-fourths of a full dose, according to the size and development of the animal. Less than one-half a dose should never be injected. In determining the dose for each animal, more consideration should be given to the size and development of the animal than to its exact age.

How to operate.

When the animals to be vaccinated are gentle, and accustomed to being handled, vaccination may be performed on the standing animal. Range cattle or other half-wild animals must be thrown or secured, as in a dehorning chute. The most convenient place to inoculate is on the side of the neck, just in front of the shoulder, where the skin is loose and rather thin. If the animals are secured in a dehorning chute, it is easier to vaccinate them on the side of the chest, just behind the shoulder.

All animals should be vaccinated on the same side, and marked in such a way that they may be easily recognized. The best way to mark them is to use a small branding iron in the shape of a V, or to fasten a metal tag in the ear. As calves which have been vaccinated for blackleg frequently command a higher price than the unvaccinated calves, it is of importance that they be plainly marked.

When the animal is secured, fill the syringe with vaccine, and ascertain that it contains no air bubbles; then insert the needle by grasping a fold of the loose skin between the thumb and forefinger of the left hand, and pushing the needle through the skin. The operator now adjusts the peg of the syringe tightly in the cap of the needle and injects the dose, which has been previously limited by the screw regulator on the piston. The needle is then withdrawn without detaching the syringe, and, to prevent any of the vaccine from escaping through the hole of injection, the skin is pressed tightly around the receding needle. The latter is then detached, the regulator screwed back to its proper place, according to the size and age of the animal to be next vaccinated.

When a large number of cattle are to be vaccinated, it is of importance to have a sufficient number of assistants, as otherwise the process becomes exceedingly tiresome and fatiguing, both to the operator and to the assistants. The herd to be treated is confined in a pen, from which a small number, from five to ten, according to the number of assistants at hand, are driven into a smaller pen, where the assistants throw them and hold them down. Very wild range cattle must be lassoed; but graded or fine stock, being less unmanageable, should be seized by the head and thrown. The first method requires a larger pen, but when the assistants are skilful in handling the lasso, it is by far the quickest way. The animals should all be thrown on the same side. One assistant sits across the side of the thrown animal, with his face toward its head, and holding the upper fore leg pulled back and up. When secured in this way, it is almost impossible for a well-grown yearling to free itself.

With older and stronger animals it is safer to have two men to hold each, as an animal which succeeds in getting up before all have been injected and marked will frequently make things very unpleasant for the operator and assistants, chasing them from the pen, and necessitating a repetition of the whole process.

The operator should have an assistant insert the needle, while he himself adjusts the regulator. After inserting the needle, the assistant lifts the skin fold, presenting the cap of the needle so

that the operator may easily grasp it and attach the syringe. In this way from ninety to one hundred head of yearling calves may be vaccinated in one hour, with ten men to handle the animals and one assistant to insert the needle; but such a rate can only be maintained for a limited time without changing the men. With one set of men not more than four hundred or five hundred head should be vaccinated in one day, according to the age and size of the animals.

On many large ranches, where vaccination for blackleg is practised as regularly as branding, special vaccinating chutes (see fig. 3) have been constructed, which in principle resemble the ordinary squeezer, or branding chute. One side of the chute is hinged to the base, and may, by means of a block and tackle, be pulled over against the opposite side, thus squeezing the calves and preventing them from struggling while the needle is inserted and the vaccine injected. One of the planks in the movable side, at a proper

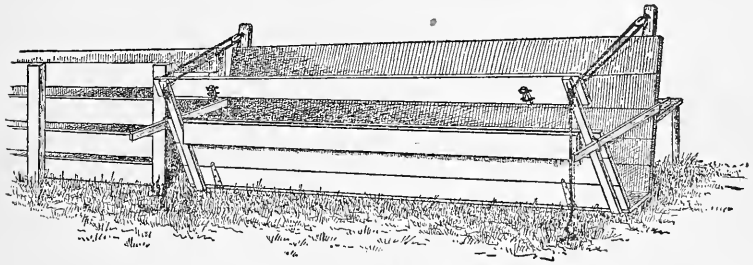

FIG. 3. — A Vaccinating Chute.

distance from the ground, is loose, and hinged to the plank below it, so that it may be opened and give the operator access to the side of the animals. The chute may be built as long or as short as desired, or may be made portable, and carried to any pasture on the ranch and connected with the stationary chutes and pens. Such a chute enables three or four men to vaccinate the same number of calves as ten to twelve men can vaccinate in the same length of time when every animal has to be lassoed or thrown.

Synopsis of Vaccination Process.

(1) Sterilize outfit by boiling.

(2) Place the contents of one packet in the mortar, and add a few drops of water.

(3) Work the mixture well with the pestle.

(4) Add two to five syringes full of water, according to the size of the packet, and stir well.

(5) Place cotton in glass funnel, and moisten with water.

(6) Filter vaccine into the glass or bottle.

(7) Secure the animal to be injected.

(8) Insert the needle through the skin.

(9) Fill the syringe, and adjust the screw regulator on the piston. If the first animal is a yearling or older, place regulator No. 1 on the syringe (fig. 2).

(10) Fit the peg of the syringe into the cap of the needle, and inject the dose.

(11) Withdraw syringe and needle together. If the syringe is removed from the needle before this has been drawn out of the skin, some of the injected vaccine will flow back through the needle, and be lost. In this case the animal does not get its full dose, and will consequently be insufficiently protected.

Attention.

(1) *Cattle owners are hereby requested to report immediately all deaths from blackleg which occur within one week after vaccination.* For this purpose a separate blank and return envelope (which requires no postage) are furnished with the vaccine.

(2) *Vaccine which for any reason is not used should be returned to this office immediately*, and in acknowledgment of the same a new application blank will be forwarded to the sender.

(3) *Do not castrate or dehorn at the time of vaccination.*

The vaccine material is made by the following method, at the Lyon's Veterinary School: "Forty grammes of infected muscle are rapidly dried at a temperature of 32° C., and are intimately mixed with eighty grammes of water. This mixture is divided into twelve equal parts, which are placed on separate flat plates. These plates are put into a thermostat for six hours to dry; six plates are exposed to a temperature of 100° C., in order to produce the weaker or first material, and the remaining plates to one of 85° C., to obtain the stronger or second material. The inoculation is made in two stages, first with the weaker and afterward with the stronger material. The dried-up brown crust on the plates is used for the inoculation, and may be kept for a moderately long period." (See Hayes' "Translation of Friedberger and Fröhner," Vol. I., page 128.)

Most of the vaccine viruses in use are prepared in this

manner, or some modification of it. Kitt's method of protective inoculation, also described in Friedberger and Fröhner's work, consists in a single inoculation with a fluid culture of the organism of symptomatic anthrax, in a similar manner to that described in the experiments with the twelve young cattle given in detail in the early part of this portion of the report.*

In localities in Massachusetts where outbreaks of symptomatic anthrax are likely to occur, it would be well for farmers to have recourse to one of these methods of protective inoculation, in order to save their young animals from the ravages of this disease.

Actinomycosis.

A few cases of actinomycosis have been reported to the commission during the past year. The most interesting of these are where the lesions occur in the udder.

Actinomycosis is caused by a fungus, the actinomyces, the name meaning ray or star-shaped fungus. It occurs in grain or its husks, said to be particularly frequent in barley, but may occur in any grain. When it finds lodgment in an abraded surface, where it is undisturbed, it grows and causes the development of a tumor composed chiefly of granulation tissue. The tumor may soften and break, discharging a purulent material, in which clumps of actinomyces may be seen with the naked eye, presenting the appearance of small specks of sand. These specks under the microscope are found to be made up of groups of actinomyces. Actinomycosis is said to be more peculiar to certain districts than others, particularly in swampy districts; it occurs frequently in the fens of Lincolnshire, and is often seen in western cattle and occasionally in the east. It is known all over Europe, and was first noticed in 1860 by two Italians, Perroncito and Rivolta. Hahn further described it in 1870, but the first exact description of the disease was furnished by Bollinger, in 1877. Harz was the first to examine the fungus botanically, and to give it the name actinomycosis

* Kitt recommends the use of but one cubic centimeter of a three days' old fluid culture of the organism.

(ray fungus). (*Vide* Hayes' "Translation of Friedberger and Fröhner.") The nomenclature, as the disease occurs in cattle, is commonly applied from the location of the lesions. If the fungus obtains access to the bones of the head, it is known as "lumpy jaw;" when it occurs in the tongue, it has been called "wooden tongue."

Actinomycosis may occur not only in cattle, but in horses, swine and man, but is very rare in the latter. In cattle, where it produces what is commonly called "lumpy jaw," the fungus first obtains entrance to the jaw bone, either upper or lower, probably when a temporary molar tooth is shed, finding lodgment in an alveolus before the permanent tooth has grown up, and in this way the tumor so well known to cattlemen originates. When the tongue is involved, it results from the actinomyces finding a resting place in a cut or scratch on this organ. Secondary growths may occur in the lungs and other localities. When the disease occurs in the udder, it must gain access to the milk duct, and finds probably an irritated surface at some point in the interior of the gland where it can develop. From time to time during the past five years the attention of the Board has been occasionally called to cows with a nodulated condition of the udder. These nodules feel like tubercles, and it is difficult to say whether the disease is tuberculosis of the udder, or not. If the cow is tested with tuberculin, and fails to react, it is certainly not tuberculosis; but she may react, and lesions of tuberculosis are found elsewhere, and the nodules in the udder are found to be actinomycotic; or in some instances, if milk from the infected quarter is examined, actinomyces may be found.

During 1901 four cases of actinomycosis of the udder in cows have come to the notice of the Board, three in Boston and one in Cohasset. One of the Boston cases was reported in April. The cow had recently calved, and otherwise was a fine animal. A tuberculin test showed her to be free from tuberculosis, and an examination of the milk revealed the presence of actinomyces in the altered material secreted by one hind quarter of the udder. The cow and calf were purchased for experimental purposes, April 23, the calf

being kept on the cow all summer. They remained at Jamaica Plain until May 22, when they were sent to Princeton and turned out with some of the young cattle used for investigating symptomatic anthrax. From May 4 to May 22 two rabbits were given some of the secretion from the actinomycotic quarter of the udder. After the cow was sent away the rabbits were killed and examined by Dr. Frothingham, but no lesions of any sort could be found on autopsy. Before the cow and calf were sent to Princeton, some of the actinomyces were separated from the milk with a centrifugalizer, mixed with distilled water, and then injected into the thoracic cavity and also into the abdominal cavity of the calf with a hypodermic syringe. The calf ran with the cow all summer in the pasture at Princeton, and thrived magnificently. In the autumn he was as large as a yearling. October 29 the cow and calf were killed at Princeton, and post-mortem examinations were made on both by Dr. Frothingham. The calf proved to be absolutely healthy; not a lesion was found in him anywhere. The cow was healthy with the exception of the udder; one hind quarter was badly diseased, the other one slightly so. From these experiments it would not appear that there was any danger from the use of milk from cows with actinomycosis of the udder.

Hayes' "Translation of Friedberger and Fröhner," page 216, says that attempts at transmitting actinomycosis from infected animals, by various European experimenters, to cattle, calves, goats, sheep, pigs, dogs, cats, rabbits and guinea pigs, have proved negative. "It is thought that the ray fungus has a pathogenic effect only in the stage of development connected with the awns of grain, and that it loses its power of transmission as soon as it has entered the animal body, on account of undergoing some form of involution (calcification, etc.). The negative results of the inoculation experiments are of great importance for elucidating the question of the transmissibility of actinomycosis from one animal to another, or from one of the lower animals to man. The foregoing considerations tend to prove that infection cannot take place in this manner."

On the other hand, secondary growths as a result of a primary infection do seem to occur in an actinomycotic animal, and cases of actinomycosis have been observed in man; therefore, until more is known, it seems only safe to forbid the use of milk from cows with actinomycosis of the udder. The occurrence of this disease in the mammary gland is an argument in favor of bedding cows with sawdust or sand in localities where the trouble is prevalent, as an infection of the udder may in time result in the ruin and loss of one or more quarters of the gland. Actinomycosis yields sometimes to treatment with iodide of potash given in the feed two or three times daily, in full-sized doses, continued for some time, and may be worthy of a trial in an attempt to cure a valuable breeding animal. It lessens the milk secretion, and causes the skin to become rough and scaly and the eyes to run. When these symptoms occur, the treatment may be suspended for a while, to be resumed later, if necessary.

Texas Fever.

There has been no Texas fever in Massachusetts during the summer of 1901, similar conditions prevailing to the summer of 1900 and for the past few years, the last outbreak of this disease being in the summer of 1897. This outbreak was due to violating the rules of the United States Bureau of Animal Industry at the stock yards in Albany, cattle from an infected territory being penned in yards which were afterwards used for northern cattle. Some of the northern cattle exposed at this time were taken to Massachusetts and Connecticut, and afterwards died, but it was too late in the season for others to become infected.

The Bureau of Animal Industry requires all cars containing cattle from infected districts to bear a placard stating the fact, and such cattle cannot be yarded in pens used for northern cattle. During the months when there is no frost the Cattle Commission will not allow any southern cattle to be brought into the State except for immediate slaughter, and they must be unloaded directly from the cars into the abattoir. With the present rules and regulations of the Bureau of Animal Industry, and the legislation of Massa-

chusetts relating to Texas fever, it seems to be almost an impossibility for this malady to be any longer a source of danger to the live stock interests of the State.

Rabies.

At the time of submitting the last annual report it was stated that no authentic cases of rabies had occurred in Massachusetts for a long time, and it was hoped that the disease had disappeared from the State altogether. The last case reported to the Board that was verified by inoculating small animals was in March, 1899; but it was feared at the time of writing the report that an outbreak was about to occur in Watertown and Waltham. This proved to be the fact.

In Watertown two cases occurred Dec. 15, 1900; both were proved to have been rabid by inoculating rabbits or guinea pigs at the medical school. A third dog which used to play with one of those killed was quarantined for ninety days; at the end of this time he was healthy, and released from quarantine. December 17 two more dogs, one in Belmont and one in Waverley, were killed as rabid. The dog in Waverley was proved to have had rabies, by inoculation experiments; the other was undoubtedly mad, but was buried without obtaining the scientific proof. These cases were all reported to the Board by Dr. E. A. Madden, inspector of animals of Watertown. Jan. 2, 1901, Dr. P. F. Wallingford, inspector of animals for Waltham, reported an outbreak, probably a continuance of the one in Watertown, as the towns join each other. Two dogs were killed on this date, and another one January 9. They all undoubtedly had rabies; it was proved in one case; the other two showed every symptom of the disease, and were ordered killed by the chairman of the Board. January 19 a Scotch terrier owned by Mrs. S. B. Samuels of Waltham was killed. He went mad and snapped at Mrs. Samuels' brother, bit her nephew, and snapped at the cat and a neighbor's dog. January 21 the head was sent to the medical school, and small animals which were inoculated showed rabies February 2. The nephew was accordingly sent to New York to undergo the Pasteur preventive treatment, which he took in part.

No bad results have since been reported as a consequence of the bite. January 28 a fox terrier bitch owned in Waltham was killed as rabid. This case was not proved by inoculation experiments, but was in the neighborhood of the others, and was no doubt rabies. Because of so much trouble, January 28 Dr. Wallingford was directed to quarantine every dog in the neighborhood, including the one Mrs. Samuels' dog was said to have bitten, and also to order Mrs. Samuels' cat quarantined. Fourteen dogs and the cat were kept under observation for ninety days. All were released as healthy April 26. This seems to have ended the outbreak in Watertown and Waltham.

Early in February the head of a dog was sent from Chelsea to Dr. Frothingham, with the history that the dog was sick and had bitten a child, and later died, and it was feared he was mad. Inoculation experiments were negative, and the child's parents were written to that they need feel no anxiety, as there was no danger of the child developing rabies. March 28 Dr. L. L. Pierce, inspector of animals in Arlington, reported killing a dog supposed to have rabies, that was bitten by a strange dog about twelve days before; was probably a case, although not proved experimentally. March 30 the head of a dog which acted peculiarly was sent in from Newton; animals inoculated did not develop rabies; the dog was therefore free from this disease. June 3 and July 2 Dr. Thomas Bryant, inspector of animals in Wayland, reported two suspected cases of rabies in dogs; neither, however, were proved by inoculation tests. The latter part of July Dr. Madden of Watertown sent in the head of a dog supposed to have been rabid. He acted so queerly that his owner shot him, thinking he was mad. Inoculations of little animals made by Dr. Frothingham proved negative, and the dog was therefore not rabid. About September 15 a dog owned at Newton Centre acted queerly, and was shot by the police, after biting two other dogs. About October 15 one of the bitten dogs appeared to be sick, and was sent to Dr. Simpson's veterinary hospital, in Malden. Dr. Simpson diagnosed rabies, and sent the head to Dr. Frothingham, who inoculated small animals which developed rabies, proving the correctness of Dr. Simpson's diagnosis. The other

dog was quarantined for ninety days; December 15 he was still healthy, and was released from quarantine. November 5 a dog owned in West Dennis was killed by his owner on suspicion of having rabies, and the head sent to Dr. Frothingham. The results of the tests are so far negative.

This makes a total of 18 cases of supposed rabies during the year: 4 were proved not to have been rabid, by inoculating rabbits or guinea pigs; 6 proved to have rabies, as the result of the laboratory tests; 8 probably had rabies; and 5 of the 8 certainly were rabid. In addition, 15 dogs and 1 cat were quarantined for ninety days, as a safeguard to prevent any further spread of the disease.

The Board wishes to reiterate what it has said in the past; that is, every case of rabies or suspected rabies should be reported by the police and others to the Cattle Commission, or the local inspector of animals. The inspectors of animals ought at once to report every case which comes to their notice to the commission, and send the head of the suspected dog at once to Dr. Langdon Frothingham, at the Harvard Medical school. If the weather is hot, the head should be sent packed in ice. If the dog in question has bitten anyone it is especially important to send the head in to use for inoculating small animals. If the tests are made at once, it can be decided whether the person bitten ought to undergo the protective inoculation. If the rabbits or guinea pigs develop rabies, the proof that the dog has rabies is certain, and any person bitten should commence the treatment at once. If the experimental animals remain healthy, the person bitten can feel sure that there is no danger of developing rabies. The experimental animals develop rabies soon enough, if the test is made at once, to give the person time to commence the treatment after hearing the result of the test, without having anything to fear from delay. It is said that rabies does not develop in rare instances for months after the bite is inflicted, but usually the symptoms appear in three or four weeks; therefore, while the Board does not feel that there is absolutely no danger from a bitten dog after ninety days, at the same time, ninety days' quarantine is all dog owners will stand, and there is comparatively little danger after that time.

Swine Diseases.

During 1901 twenty-three reports of outbreaks of disease among swine have been received. These diseases are usually grouped under the generic name hog cholera; but, when investigated, the conditions classified under this cognomen are found to be due to various causes. There is true hog cholera, characterized by the ulcerations of the Peyer's patches and solitary glands around the ileo-cæcal valve and large intestines, with or without the presence of pneumonia; then there is "swine plague," a form of swine septicæmia, which may be associated with hog cholera, or may exist as an independent disease. In the autumn, when cold weather approaches, pigs kept under barns bury themselves in the warm manure, and when called out to the trough on a frosty morning become chilled, and many in this way develop pneumonia and die. This pneumonia may be a form of the "swine plague," the burying itself in manure predisposing the pig to it. Swine may also have verminous bronchitis, due to the presence of a small, thread-like worm in the bronchial tubes. An outbreak supposed to be swine plague, investigated in Lowell, proved to be this disease.

Of the other twenty-two reports of swine disease brought to the notice of the Board, twelve proved to be hog cholera, including six herds in Gloucester, one in Westfield, two in Haverhill, one in North Grafton, one in Lancaster and one in Townsend. About all that can be done in these cases is to quarantine the swine, forbidding the sale or purchase of any until the outbreak subsides. After the sick have recovered or died, and no new cases are noticed, the owner is advised to disinfect the pens, and the quarantine is raised. Hogs ready for the market in piggeries where hog cholera appears are killed subject to the usual slaughter house inspection, if the owner wishes to market them.

Outbreaks of disease in swine may sometimes be traced to feeding city swill, particularly if it is decomposing or fermenting. All such swill is safer if cooked before using it.

Where room allows, the diseased should be separated from the healthy, and empty pens where sick pigs have been should be thoroughly disinfected before being used again.

The other ten outbreaks reported proved to be cases of swine plague, sporadic pneumonia, or ill condition due to neglect.

This concludes the report of the year's work. Some seasons miscellaneous diseases have been reported, which the Board has investigated because they were supposed to be contagious, but the year 1901 was conspicuous for the absence of any of these occurrences.

Respectfully submitted,

AUSTIN PETERS, *Chairman*,
LEANDER F. HERRICK, *Secretary*,
CHARLES A. DENNEN,
Board of Cattle Commissioners.