SEVENTH BIENNIAL REPORT

OF THE

VETERINARY SURGEON

OF THE

STATE OF IOWA

TO THE

Governor of Iowa

FOR THE PERIOD ENDING JUNE 30, 1910

DES MOINES
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LETTER OF TRANSMITTAL.

To His Excellency, B. F. Carroll, Governor of Iowa:

In compliance with the provisions of the statutes, I have the honor to present this, the seventh biennial report of the State Veterinary Surgeon of Iowa, for the term ending June 30, 1910.

Respectfully,

PAUL O. KOTO,

State Veterinary Surgeon.

INTRODUCTION.

Complying with the statutes relating to this department I submit herewith the Seventh Biennial Report covering the work done during the two years previous to June 30, 1910.

During the time stated much work has been accomplished toward the elimination of diseases of live stock throughout the state, although the department has been hampered by a lack of sufficient funds with which to promote the work which has been outlined.

Serious outbreaks of anthrax have occurred, notably in Woodbury county, which have demanded and received close and careful attention. This disease originated from stock shipped in from neighboring states. This illustrates the need of proper safeguards against infection through interstate traffic in live stock. The laws of Iowa covering this point are entirely inadequate, and should receive the attention of the Legislature at its next session. Cattle are constantly being shipped in without due precautions being observed to protect the live stock interests of Iowa against infectious diseases. Enormous losses are annually sustained by stock raisers of Iowa through this source. Much of the loss occasioned by the condemnation of diseased stock is the direct outgrowth of laxity in the oversight of the importation of stock. Stringent regulations of these shipments would result in vast savings to the stock raisers of the state, and insure greater immunity from diseases whose ravages present serious problems to the live stock interests.

Several cases of glanders developed near Cartersville, and elsewhere, which are treated at greater length in another portion of this report.

Additional legislation relating to the shipment into the State of live stock is needed covering points not already included in the statutes. The present law merely requires a health certificate for the importation of registered dairy and breeding cattle and those

eligible to registration. Stock not registered passes into the state with impunity, regardless of the condition of health in which they may be found. There is practically no restriction to the shipment into the state of horses, cattle (other than as mentioned), mules, asses, hogs and sheep. The law enacted in a number of states is recommended, such as that in force in Minnesota and other states. These laws require health certificates, in duplicate, one copy to accompany the way bill and one copy to be sent the authorities of the state to which shipment is destined. A certificate of health should be issued for all import shipments of live stock, including a record of the tuberculin test for all cattle intended for dairy or breeding purposes, and a record of the mallein test on horse stock, such certificate to be issued or approved by the authority in control of diseases of live stock in the state from which the shipment originates. This department is laboring under unnecessary handicap so long as these legal restrictions are not furnished. It is like pouring water into a bucket, the bottom of which is missing. It is evident that our efforts to stamp out disease among stock loses much of its value so long as no bars are raised to keep out infection from other states.

One notable case of tubercular infection was found in an interstate shipment of cattle near Waukon, Iowa, where seventeen registered Angus bulls had been purchased from a herd near Canton, Minn., and sold at auction near Waukon, Iowa. The herd was placed in quarantine on the day of sale, and tested with tuberculin. Eleven out of the seventeen reacted to the test, and were shipped to Cedar Rapids for immediate slaughter, subject to federal inspection.

The post mortem revealed tubercular lesions in all of the animals. That these animals were infected is further demonstrated by the fact that the herd from which they were sold was tested by the State Veterinarian of Minnesota about this time, and of the fifty-five head constituting the herd, nineteen reacted.

These diseased animals were sold to eleven different farmers in Iowa for the purpose of building up their herds, and had it not been for the intervention of this department, the disease would have been spread broadcast, infecting the herds of the unsuspecting purchasers.

In this case, our present laws covering the importation of registered cattle, or cattle eligible to registry, enabled us to protect ourselves from infection, while many similar shipments of grade cattle

coming into this state are allowed to enter without inspection, and are undoubtedly as great a menace to the live stock interests of this state as the herd above mentioned would have been had there been no restriction against their importation.

The campaign against tuberculosis has been waged with sustained vigor. Owing to the activity of the department in bringing to light a great number of cases of infection, the extent of the disease might appear to be increasing. However, it is safe to assume that the disease was prevalent in a great many places from which it had not been reported prior to the recent increased efforts towards its eradication.

The application of the tuberculin test has become general. This subject is treated somewhat exhaustively in another portion of this report.

Our efforts toward the eradication of tuberculosis has met with much opposition among those whose support we would naturally expect. Many of the prominent stock raisers and public officials have placed their own immediate personal interests in opposition to the public welfare. Consent has been withheld against the application of the tuberculin test to herds from which diseased animals have knowingly been sold to unsuspecting and innocent purchasers. Such recognition as we have finally been able to obtain, has been secured only by the greatest persistence and pursuasion. We are pleased to be able to report, however, that this opposition is diminishing, and we are gaining a readier access to suspected herds throughout the state.

There is a matter to which I desire to call your attention which demands consideration in order that the work of this department may be fully effective. The law of the state provides for reimbursement to owners on account of stock condemned because of being infected with contagious diseases in an amount not exceeding $25 per head for cattle, based on their appraised value. No appropriation has been made with which to carry out this provision, and hence it must of necessity remain a dead letter upon the statute books. The State Veterinarian cannot assume the responsibility of destroying condemned stock without being in position to assure the owners of the compensation contemplated by the law. People are loath, if not positively opposed, to permitting the killing of diseased stock of which they are the owners unless they can be remunerated in some measure for the loss involved, often failing to realize the danger incurred by permitting infected animals to continue to exist.

Such animals are a menace to the health of stock and people with which they may come in contact, in many instances. It is hoped that the requisite appropriation may be made at the forthcoming session of the Legislature. The cost of establishing this system of disposing of tuberculous cattle is not as great as is generally supposed. Owners should receive fair remuneration for stock destroyed on account of disease and in case of food animals, should be allowed the alternative of accepting the appraised value of what they will bring for food purposes at a packing house where federal inspection is maintained. The price obtained from the packing house depends on the condition in which the animals are found upon slaughter. In many cases the animals are not badly affected and the greater part of the carcass is passed for food, the owner receiving a fair price for such animals; but in case the animal is badly affected, it is condemned for offal. Hence animals slaughtered at a packing house in many cases net a sum in excess of the appraised figures. But even though in the total the returns from the sale of these animals does not equal the sums paid to the owners upon the appraisement, the balance will not be very great, and the benefits to be derived far exceed the expenditure.

Compensation for animals which may be slaughtered on account of communicable disease is provided for in about twenty-five states. In some the compensation is dependent upon the length of time the animal has been in the state, the disease for which it has been slaughtered, and the compliance of the owner with sanitary measures required. Where no compensation is allowed, food animals are in some instances slaughtered subject to the United States meat inspection regulations. This is the case in Nebraska, North Dakota and Utah, and in other states. Compensation is provided in the following named states:

Connecticut, Florida, Illinois, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, New Jersey, New Mexico, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, West Virginia, Wisconsin, and Wyoming.

Th organization of this department has been perfected so far as the limited appropriation will permit, and able and faithful assistants have rendered valuable aid in promoting the interests with which the department is associated. Competent men throughout the state have responded promptly and efficiently to the various emergencies demanding their attention which have arisen during

the last period. Sudden outbreaks of disease among stock must be met intelligently and promptly, and the necessary precaution taken to preclude serious and widespread injury and loss. The welfare of stock raisers demands reliable inspection and the enactment and enforcement of such laws as may be necessary to protect them against infection and dissemination of diseases of stock. The losses traceable to preventable diseases where insufficient regulation has prevailed so far exceeds the entire cost of this department that there is no comparison. That economy which seeks to cut down and circumscribe unduly the resources of this or similar departments is repudiated by the results, and is contrary to good business judgment and foresight. The appropriation of this state is far below that of adjoining states for similar departments. The department will be conducted to its highest efficiency possible with the available funds, but better results could be derived from a substantial increase of the appropriation. Proportionately the results would be more satisfactory and tangible. An examination of the work of the department will disclose the fact that more has been accomplished in proportion to the expenditure than was intended or expected. But much additional remains to be done, and in order to bring this department up to its greatest efficiency, and to the place to which its importance entitles it, an increased appropriation is imperative.

According to the latest available reports there are in the United States about 71,000,000 head of cattle, about 23,000,000 of which are dairy cows. There are in the United States approximately 24,000,000 head of horses, 4,000,000 mules, 58,000,000 sheep and 50,000,000 swine. There are in the state of Iowa about 1,500,000 head of horses valued at about $174,000,000. In this state there are about 47,000 mules, valued at about $5,700,000. Iowa has about 1,570,000 milch cows valued at about $57,000,000; and there are in the state about 3,600,000 head of other cattle, valued at nearly $80,200,000. In this state there are about 750,000 sheep, valued at about $4,000,000; and about 6,500,000 head of swine, valued at about $74,000,000.

It is estimated that 9¼ per cent of all milch cows, 1 per cent of all other cattle, and 2 per cent of all swine are lost from tuberculosis. Among milch cows the loss would amount to 145,225 head valued at $5,272,500; among other cattle 360,000 head, valued at $802,000; among hogs 130,000 head, valued at $1,480,000, making

a total loss from tuberculosis of 2,060,000 head, valued at $7,554,-500 in the state of Iowa.

These colossal figures enable us to form some idea of the significance of the work of this bureau which seeks to protect this vast number of domestic animals from infection and disease. It will be evident that at best we can only check and control disease among such numbers, but in the case of epidemics and diseases generally prevalent, that is of great importance. It will be evident also that in order to do even a moderate amount of inspection and regulation, the department must be placed upon a firmer foundation and given a substantial support. We again call attention to the large appropriations made by adjoining states for this work, notably in Minnesota where the work has reached a high grade of efficiency, and where the appropriation is approximately eight times that of Iowa, and where the results secured more than compensate for the expenditure. In fact, there can be no comparison between actual savings in dollars and cents to stock owners from this source, and the state appropriations made for this work.

The establishment of such a department as this is liable to prompt the thought that it is a luxury which affords no tangible returns for the money invested. This view of the matter is dispelled by an examination of the many instances of actual savings to stockmen and farmers, and the protection which prevents losses from epidemics running into thousands. An instance may be mentioned where a man near Emerson purchased a cow in Nebraska, a registered animal. Through the efforts of this department it was discovered that the animal was infected with tuberculosis. Measures were taken which resulted in the return of the purchase price, together with costs, amounting altogether to a sum of about $600. Directly, as in this and similar cases, as well as indirectly in curbing the spread of infection, this department is annually instrumental in accomplishing great savings to the state at large and to individual stock growers and farmers.

Hog cholera prevails in certain sections of the state from time to time. We have now established our own serum plant, and are in a position to meet this problem more effectively than we formerly could. Gratifying results have followed the establishment of this plant, and it is hoped that future difficulties along this line will not equal those of the past. However, cost of maintaining the plant and other expenses connected with this division of our work necessitates an increased allowance, and a larger appropriation for this

purpose is simply a necessity to the continuation of the work. The hog industry in Iowa is one which has made the state famous throughout the world, and its magnitude fully entitles it to a liberal support from the state to which it contributes such magnificent revenues. A glance at the statistics bearing on this subject is sufficient to enable any one to form some measurable conception of the size of this industry. In fact, the live stock industry generally is of such vast proportions that it is absolutely unjust to fail to throw over it the protection afforded by a well-supported live stock sanitation bureau, such as this department might be made to supply.

Co-operating with the Bureau of Animal Industry at Washington, D. C., this department is enabled to secure information relative to the locality and extent of stock diseases throughout the entire country. This information is valuable in guarding against infection through the importation of diseased stock, and in providing necessary safeguards against infection. This state also is given the benefit of experiments and observations of government experts in the Department of Agriculture, all of which tends to the betterment of sanitary measures instituted for the protection of live stock in Iowa.

The State Veterinary Surgeon has responded to calls from gatherings of stockmen and farmers, Farmers' Institutes and the like, for talks and papers on topics relating to the work of this department. He has used lantern slides and other materials illustrating specific cases which have come under his observation and treatment. However, his official duties have not permitted very extensive labor in this important field. Educational work along these lines is of great importance toward securing that interest and co-operation among farmers and stock growers that is essential in order to make effective the measures which are undertaken from time to time to control and eradicate infectious diseases among live stock. Sanitary measures always depend largely for their effectiveness upon the intelligent assistance of the people. The application of measures of disinfection and sanitation is necessary if they are to be of value, and their application is a matter of continued attention, rather than a spasmodic and irregular affair. It therefore depends to a considerable extent upon the fidelity of those who have the actual application in charge, after the instructions have been given. General rules and regulations are furnished localities according to which this department desires

any particular situation to be handled. The resources at our command do not permit of close or long continued observation of each individual case, and therefore, after having given the necessary instructions the matter must be left in the hands of others for further attention. For these reasons general discussions and readings along this line are of much importance to the live stock industry of Iowa.

AFFILIATING WITH OTHER DEPARTMENTS.

This department co-operates with the Bureau of Animal Industry, of the Department of Agriculture, at Washington, D. C. The public generally can form no adequate conception of the value of this co-operation without investigating the subject at first hand. At all of the leading packing plants and abbatoirs federal inspectors are stationed to inspect the animals slaughtered. Diseased cattle are condemned in their entirety or only partially passed on for food, according to the extent of infection. These inspections furnish protection to the public, and no doubt greatly diminish the spread of disease communicable from animal to man.

This inspection is valuable in another way. The Bureau of Animal Industry investigates the source of shipment of infected stock, ascertains the locality from which they have been shipped, and reports back to the State Veterinarian in the state from which the animals arrive, which enables him to investigate the matter, and where necessary take such measures for the eradication or control of the disease as may be found practicable and necessary. We have been able to trace many virulent infections in this way, and have thus discovered several epizootics among live stock in the state which have demanded immediate attention.

There are over two thousand federal inspectors working in the slaughter houses of the country. However, they are not able to cover the entire field, and smaller abbatoirs are not inspected by the federal government, as this would be a physical impossibility with the present force and appropriation. To meet this situation municipal slaughter houses are recommended. A multiplicity of slaughter houses means waste and often uncleanliness, as well as the absence of trained inspection to detect the presence of disease. A great saving is made in the by-products in a larger establishment, such as a municipal slaughter house. No doubt this saving will practically meet the cost of inspection. In a multitude of smaller plants facilities for noting the health of the animals are

lacking, and often also the disposition to refrain from selling diseased meat. The public is entitled to the protection afforded by municipal slaughter houses.

This department also affiliates with similar departments in other states. By this means it is enabled to secure information relative to the prevalence of contagious diseases and the localities where they exist. In this way shipments coming into the state from such localities may be scrutinized carefully, and often we are able to guard against infection wholly through the information secured in this manner.

What we now need, however, is health certificate requirements covering all shipments into the state, not only of cattle intended for breeding and dairy purposes, but also all other stock, including sheep, hogs and horses. This is essential to the accomplishment of the best results from our work along these lines.

Among the diseases which are called to our attention by our affiliation with the Bureau of Animal Industry and kindred departments in other states, are tuberculosis, scabies, mange, glanders, hog cholera and others.

TUBERCULOSIS.

No other disease named in the catalogue of human ills has attained the prominence in recent years that is accorded tuberculosis. It has spread with alarming rapidity, owing chiefly to the multiplying points of contact with humanity in general, which afford the opportunities required by an infectious disease for its dissemination.

Prior to the demonstration of its infectiousness by Villemin in 1865 and the discovery of its specific etiology as of parasitic origin by Koch in 1882, very little of value had been learned respecting the nature and cure of tuberculosis. The extensive ravages of the disease have in recent years forced the question of checking it into prominence and made it one of the leading sanitary problems of the times. It is estimated that more than five million human lives are annually destroyed by this plague.

But this report deals primarily with tuberculosis as it is manifested among live stock—cattle and hogs. It is with this phase of the subject that our department has labored during the past period, although indirectly at least, its efforts bear upon the question of public health. While it is true that the bacilli producing tuberculosis in all animals are not identical, as originally believed, yet the transmissibility of bovine tuberculosis to the human, especially to children, has been fully demonstrated. The literature on this subject contains record of more than fifty cases in which the bovine type of tubercle bacilli have been found in infants and children. Some of these were fatal, though not all of them. Several cases of direct, accidental innoculation from cattle to man, have been reported.

Some authorities hold that not more than 1 per cent of the cases reported will show bovine bacilli, and that in individuals more than twelve years of age they will be found only very rarely. These facts, however, by no means minimize the importance of protecting children using cows' milk from the dangers which lurk in this almost

indispensable liquid food. Children are the principal users of milk as a drink, and the fact that they are chiefly susceptible to the bovine type of tuberculosis, enhances the seriousness of the problem which confronts us. According to a recent report of the Secretary of Agriculture at Washington, D. C., the proportion of tuberculous cows among those tested which supplied milk to cities, was about 13 per cent. This signifies that the use of unsterilized milk by children involves a considerable risk of taking into the digestive tract the bacilli of tuberculosis, with the liability to infection.

In one of the larger cities of Iowa a philanthropic association undertook to pursue a plan for the investigation of the extent of tuberculosis among children. Up to a certain stage in the campaign, at which time a report was made, six out of every ten examined were found to have incipient symptoms, while others had the disease in a progressive form. Opon-air sanitariums were established and encouraging results followed.

The fact that the evidences of tuberculosis that may exist in milk or meats cannot be detected save by those who have special qualifications, places the consumer in a peculiarly helpless position, and emphasizes the importance of having cattle tested by capable and trained men, competent to ascertain whether or not infection is present. The cost of the tuberculin test is by no means prohibitive, and while considerable loss is involved in the condemnation of diseased stock and the sacrifice of the animals thus affected, yet it is economy in the end. No one fully realizing the risk he is taking by retaining tuberculous cattle, save those with mild forms of the disease and those under rigid care and isolation, will hesitate about taking necessary steps to protect himself and the public that may be exposed to infection through the purchase of milk or meat from his stock.

The diagnosis of tuberculosis in cattle presents no alternative save the use of tuberculin, it being recognized by the leading authorities of this and foreign countries that the positive diagnosis of tuberculosis in most living animals is impossible wthout the use of tuberculin.

Tuberculin is the boullion in which the tubercle bacillus has been grown, charged with the toxic products of its growth, but which has been raised to boiling temperature to destroy all germ life, and from which the dead germs have been removed by passing through a porcelain filter. When a physiological dose of this has

been injected, subcutum, into the suspected animal, it has no effect upon the non-tuberculous, while in the tuberculous it produces, in the course of the next twenty-four hours (usually from the eighth to the sixteenth), a steady rise of temperature by 2° F. or more, followed by a slow subsidence to the normal. This may last for from three to ten hours in different cases.

The following precautions should be observed:

1. The temperature of the animal is best taken at intervals, or at least morning, noon and night, on the day of injection to show that the animal has no habitual rise at any time of the day.

2. The subject must be in good general health. If there is present in the system any concurrent disease it may undergo an aggravation within twenty-four hours and give a rise of temperature that will be mistakenly set down for tuberculosis. At the very start, therefore, it is important that the general health of the animal should be first assured by a critical professional examination. If some other disease is present the Tuberculin test had best, as a rule, be delayed until that has subsided, while if tuberculosis is found the test will be superfluous.

3. The cows should not be tested while in advanced pregnancy or about to abort. In many cases, though not in all, as preparations are made for calving, the system becomes unduly susceptible to the presence of tuberculin and that agent will cause a rise of temperature, although no tuberculosis is present. Unless this source of error is carefully guarded against, the most valuable cows in the herd may be condemned unjustly.

4. The cow must not be within three days of the period at which "heat" would naturally occur. Under the excitement of oestrum the body temperature usually rises from two to three degrees, and if tuberculin has been used this rise may be attributed to tuberculosis and a sound animal may be condemned. Abortions sometimes take place unexpectedly and unknown to the owner. If, therefore, a cow under the test, and which is not advanced in pregnancy should show a rise of temperature, it should at once be ascertained whether or not the animal is in "heat." If symptoms of "heat" are found she should be set aside along with any calving cows to be tested again when such source of error is no longer present.

5. The tested animal should not be exposed to hot sun in a closed area. In excess this will produce heat apoplexy, and the fever heat which ushers this in may easily be mistaken for the indications of tuberculosis.

6. Cattle taken from pastures must not be enclosed in hot, stuffy stables. While they must be tied up to allow of the temperature being taken at intervals, coolness and ventilation should be secured in summer by a sufficient air space and the requisite ventilating openings.

7. Exposure to cold draughts between open doors and windows or to wet or chilly blasts out of doors should be carefully guarded against. A chill proceeding from any source and alike in the presence or absence of tuberculin causes a rise in the internal body temperature.

8. Heavy cows unaccustomed to stand on hard boards may have a rise of temperature in connection with resulting tenderness of feet. One must avoid hard floors on the day of the test, or make examination of feet and allow for attendant fever.

9. Ommission of the previous milking or a change of milker and consequent retention of part of the milk will raise the temperature of a nervous cow, and in careless hands secure an erroneous condemnation.

10. Change of food is liable to produce a slight indigestion and rise of temperature. This should be avoided as far as possible, and when the herd is taken from the pasture for the test, it should have grass, ensilage or other succulent food.

11. Cattle just arriving from a long trip by road or rail, or other causes of violent exertion are liable to have an elevated temperature from the leukomain poisoning. Such should be left at rest until the transient fever shall have subsided.

12. Violent handling of nervous cows in taking the temperature must be carefully avoided. The operator who cannot handle them gently is not fit for the work.

13. There must be evidence that the animals have not been repeatedly tested at brief intervals shortly before. In a number of instances we have found a proportion of the cattle unresponsive to tuberculin, though a post mortem proved the presence of tuberculosis. Unscrupulus men, wisning to sell on a guarantee, can avail of this in animals unaffected by the test.

14. The operator must have absolute control, even of the feeding and watering of the animals on the days of testing. Otherwise the rise of temperature may be prevented by a liberal use of antipyretics and a false guarantee may be secured.

15. An unthrifty animal, having general symptoms suggesting tuberculosis, must be subjected to the most critical examination in addition to the tuberculin which in such animals often fails to cause hyperthermia. Fortunately in such animals the tubercles are usually numerous and extensive enough to be discovered through objective symptoms.

16. Animals excluded from the test by reason of some individual unfitness at the time (parturition, oestrum, abortion or any other disease) may be marked and held for the test later after such disqualification shall have passed.

17. The operator must bear in mind the possibility of transferring other diseases from animal to animal by contact, by the use of hypodermic needle on two in succession, and above all by the clinical thermometer. Diseases like contagious abortion, which present no obvious symptoms in the intervals, are especially liable to be carried in this way, and instances of the active extension of this after a test, have come under my notice. The operator should always inquire carefully as to the existence of abortions and sterility in the herd, put the aborting animals by themselves, using a special thermometer upon them, and carefully washing the hands before going to other animals. It is well further to clean the thermometer after each animal and disinfect it with carbolic acid solution (5:100.)

Of the usual American preparation 2cc. (30 drops) is adapted to a cow or ox of 1,000 to 1,200 pounds. For larger or smaller animals a moderate increase or reduction must be made, yet a considerable latitute is allowable.

We recommend the use of tuberculin manufactured by the Bureau of Animal Industry.

Healthy herds should be protected by preventing infected animals from being brought into the herd. Animals exhibiting tuberculous udders and giving evidence of generalized tuberculosis should be eliminated. Prompt tests should be applied, and reacting animals should be at once segregated. The test should be repeated, at intervals, until all infected animals are discovered and removed.

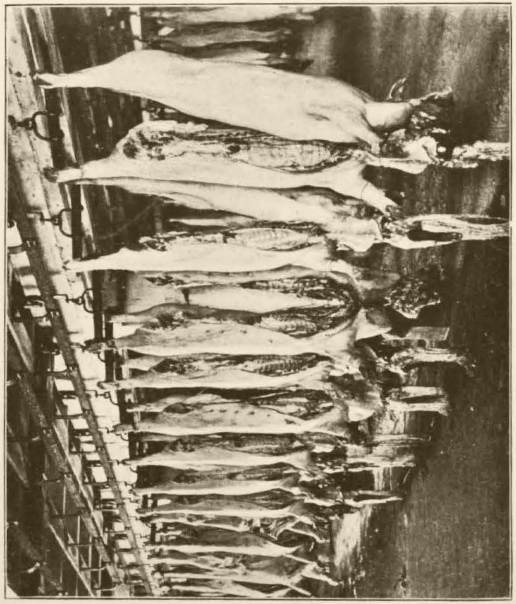
Animals that react to the tuberculin test should be disposed of in one of the following ways: Destruction, slaughter for beef under inspection, or isolation for breeding purposes according to the Bang method. No animal that has reacted to the test should ever be returned to the sound herd, even though subsequently ceasing to react and appearing to be perfectly well. Unless cows can be purchased from perfectly healthy herds, it is inadvisable to continue or establish the practice of selling cows during dry season and buying fresh cows. No cows should be bought for dairy purposes unless they pass the tuberculin test. All new animals, not reacting, should be retested at intervals.

Aside from the public health aspect of the subject, tuberculous cattle entail loss to owners in the following ways: Death from the disease after it has become established; waste in feeding, as diseased stock cannot utilize the full value of foods; heavy loss through infection of other animals, including hogs, vast numbers of which are annually made victims of tuberculosis; reduction in the market value of cattle and hogs, due to evidence of disease; impairing reputation of herd, and handicapping sales from herd in which there is disease.

A word concerning the Bang method of handling tuberculous herds is appropriate at this time. Professor Bang of the Copenhagen (Denmark) Veterinary College, has recommended this method in Denmark, where it has been placed into practice. Its purpose is to replenish a tuberculous herd without entailing unnecessary loss to the owner. It contemplates the destruction of all animals showing physical symptoms of the disease, and the isolation for breeding purposes of animals which react to the test, but which are free from physical symptoms of tuberculosis. They

are closely watched, and in case any of them develop such symptoms they are destroyed. Stables are thoroughly disinfected. Infected animals are fattened and killed for beef under inspection as the sound herd has been increased. Calves from infected cows are isolated and fed on pasteurized milk, and as tuberculosis is very rarely congenital, develop into healthy animals in most cases. There is an instance on record, reported by Professor Regner, where 36,149 cattle were tested; 33.6 per cent reacted. After from two to nine years under the Bang method in the different herds the percentage had been reduced to 4.7 per cent. Wisconsin and other states have experimented successfully with this method, and gratifying results have invariably followed. In 1901 the New York Experiment Station introduced the Bang method, as more than half of the herd was found to be tuberculous. Thirteen of the thirty animals belonging to the station were healthy and the remainder were diseased. Twenty-four desirable heifer calves were produced by this herd during the following four years, about half of which came from the tuberculous animals and in 1905 the herd contained thirty healthy animals. Non-reacting animals are tested from time to time, and individuals reacting are placed with the isolated herd. Calves raised from reacting animals that fail to respond to the test are placed with the sound herd. Observation shows that only from 1 to 6 per cent of calves raised under these conditions have reacted to tuberculin at six months of age. The Bang method has been employed with remarkable success in Hungary, where many highly infected herds have been freed from the disease in from four to six years. The chief value of the Bang method lies in the fact that through this means animals in the advanced stages of tuberculosis may be destroyed without taking away the benefits that may still be derived from the balance of the herd.

One fruitful source of infection is skimmed milk from creameries. The enactment of a law in Iowa, in accordance with the recommendations of this department, prohibiting the sale or transportation of skim milk from creameries and elsewhere without pasteurization, has protected patrons of Iowa creameries from this source of danger. Hogs are regularly infected through the feeding of skim milk containing bacilli. Hogs are highly susceptible to infection, and, while the life of the hog is shorter and the elimination of the disease through the replenishing of the herd more practicable, enormous losses are brought about through tubercular infection of hogs.



No. 1. HOGS INFECTED BY FOLLOWING TUBERCULAR CATTLE

The accompanying cut shows a number of hogs found to be tubercular on slaughter and upon investigation it was found that they had been pastured with tubercular cattle.

The two most fruitful sources of infection is the introduction into the herd of infected animals, and the feeding of milk containing tubercular bacilli. Guard these avenues well, and you will be comparatively safe, provided proper sanitary measures are taken, and no infection already exists in the herd. Every animal introduced into the herd should be submitted to the tuberculin test, and all milk secured from sources not known to be free from infection should be pasteurized.

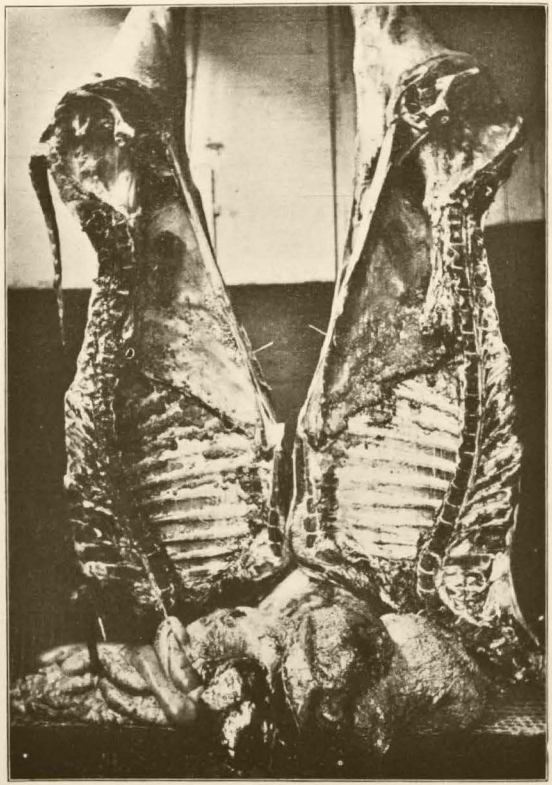
According to the report of the United States Bureau of Animal Industry, there is a general prevalence of tuberculosis among cattle throughout the country. To undertake its eradication summarily would be a hopeless task. The report mentioned sets forth a plan of small quarantine areas in localities where the disease is unusually prevalent, allowing cattle and hogs to be shipped out only when tagged for identification. It is hoped that in this way the information reported back to the localities from which the infected animals have been shipped will enable such localities to stamp out the disease, and the area may be gradually extended from time to time as the work progresses.

Much experimentation has been under way recently with a view toward the discovery of a vaccine for the immunization of cattle against tuberculosis, but as yet the method is impracticable, although hopes are entertained for its ultimate perfection to a point where it will be adapted to the conditions that prevail.

Bovovaccine by what is known as the Von Behring method is therefore in the experimental stage, so far as practical results are concerned, although some good breeders have tried it with satisfactory results. Mr. R. B. Young, of Buffalo Center, vaccinated thirty animals. None reacted to the tuberculin test. These were calves of pure-bred cows, some of which had reacted to the tuberculin test, and had been allowed to mingle with the diseased animals. Von Behring has obtained a product known as tulose from tubercle bacteria, with which he has succeeded in immunizing against living tubercle organisms. This method is known as Mithridatization. He holds that a passive immunity may be obtained from the use of serums. The principal value of immunization lies in making it possible by saving the calves to build up a sound herd from tuberculous stock.

Considerable attention has been given to the herds at the various state institutions. The appended report sheet will show the tests and the variation in the results growing out of a number of successive tests in some instances. With some few exceptions, the successive tests show a diminution of the extent of infection, and the eradication of the disease under the preventive and sanitary measures enforced. The tests were not made uniformly at all the state institutions, but were made at different times and at unequal intervals.

The state herd at Independence was tested by this department on May 28, 1909. The herd then numbered eighty-nine, out of which number fifty-one reacted. An addition of forty-four head had been made to the state herd since the preceding test, which had been bought in Binghamton, N. Y. Of these animals twenty-three reacted in the test mentioned. The attached post mortem sheet discloses the condition of the individual animals, as they were slaughtered at the packing plant. Again in December, 1909, the herd, then numbering fifty-four head, was tested, and six found to react with two suspicious. Post mortem record of these eight animals is appended to this report. The herd, forty-three in number, was once more tested in May, 1910, and no reactors found. It is therefore assumed that the disease had been stamped out in this institution, though stringent precautions are being observed to prevent a reinfection. This condition is gratifying in view of the fact that in the test made as reported in the Sixth Biennial Report of this department, when the state herd consisted of one hundred and seventy-six animals, one hundred and twenty-nine reacted. The eradication of the disease has been accomplished by relying upon the tuberculin test, and basing our action wholly upon its results. The one hundred and twenty-nine reacting in the test just referred to, all showed pronounced lesions at the post mortem examination. Of the fifty-one reacting in May, 1909, fifty were slaughtered at the T. M. Sinclair packing plant in Cedar Rapids on June 9th. Four of these were found to be so badly infected that they were consigned to the fertilizing tank. Two of them, specimens from which are shown in accompanying illustrations, were extreme cases. The remaining forty-six were used for beef, seven of them showing no visible lesions, undoubtedly due to recent infection; this number including some suspicious animals. The four consigned to the tank were all of the herd purchased in New York. It is evident that the disease was brought in by this



No. 2. CASE OF ADVANCED TUBERCULOSIS, FROM INDEPENDENCE HERD

New York shipment. It is believed that animals from this same shipment were sent to the state institutions at Mount Pleasant, Glenwood, Clarinda and Eldora. Prior to the receipt at the institutions named, of the animals referred to, tests of the state herds disclosed the presence of no tuberculous animals. Subsequent tests after the arrival of the New York cattle showed marked infection. Furthermore, the animals slaughtered from the Independence herd, out of the New York shipment, showed such advanced stages of the disease that they must have been infected prior to their arrival at Independence. Those of the condemned animals showing the most advanced lesions were from the New York shipment. These considerations overrule the suggestion that the imported animals might have become infected after reaching Independence.

FINAL POST-MORTEM EXAMINATIONS.

INDEPENDENCE HERD, DECEMBER 10, 1909.

Tag Number	Glands			Lungs	Pleura	Glands		Liver	Spleen		Disposition		
	Cervical	Bronchial	Mediastinal			Portal	Mesenteric				Food	Tallow	Offal
3929	+												
4127							+						
4857		+	+	+						†			
4387		+	•										
4080	+	+	+				+						
4098		+	+										
3857					·								
3587										‡			+

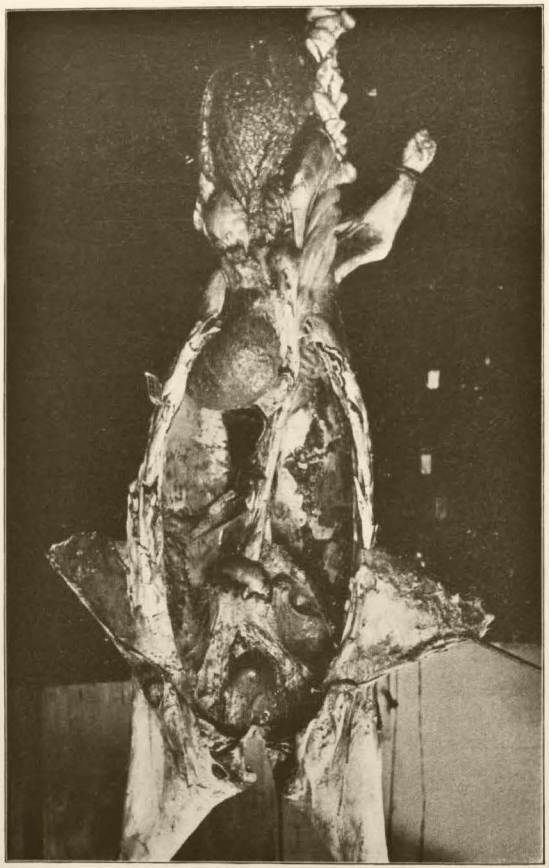
* Susp.
† Normal.
‡ Generalized.

FINAL POST-MORTEM EXAMINATIONS.

INDEPENDENCE HERD, JUNE 8, 1909.

Tag Number	Glands			Lungs	Pleura	Glands		Liver	Spleen	Prescapular	Disposition		
	Cervical	Bronchial	Mediastinal			Portal	Mesenteric				Food	Tallow	Offal
2257		+	++										
2253													
2254		+											
2144				+									
2436		++					+	+					
2005		+++											
2371		++	+	+				+					
2404		*											
2450		††											
2239		‡											
2161			+++										
2447													
2114		+	++					+					
2334	†												
2478		†											
2317							+						
2214	+												
2362		§											
2014		†											
2196	+												
2176		†											
2212		++	++										
2477		+					+						
2464							+						
2462	+												
2469							+						
2207			++										
2162													
2078		+++	+++										
2450				+++									
2149		+++								+			
2361		+++	+	+++			+				+		+
2380		+											
2476		†											
2107		+											
—							+	+					
2059		+	+	+									
2324		†											
2216	+												
2158		+	++										
2267		++											
2452	++	++					+						
2076	++	+	+										
2174							+						
2135	++												
2119	+	+		++			+						
2327		++	++										
2086		+	++										
2121	++												
2079	++	+	+			+	+	+					
2589	+												

* Generalized (cut No. 1.)
† Normal.
‡ Generalized.
§ Generalized (cut No. 2.)



No. 3. CASE OF ADVANCED TUBERCULOSIS, FROM INDEPENDENCE HERD

The herd at the State Sanatorium for the treatment of tuberculosis at Oakdale, was examined in July, 1909. The herd consisted of fifty-three head, of which nine reacted to the test and two were held as suspicious; the former year there being but one reactor in the herd which then numbered thirty-three head. Shortly prior to the test in July, 1909, a herd of twenty-five Holsteins had been purchased in Illinois, and the nine reactors were all from this herd. The two suspects had associated with this herd and were evidently infected directly from this source. Another test was made in November, 1909, and again in May, 1910, there being no reactors or suspects found on either of these tests, and it is hoped the herd will remain healthy.

The nine reactors and two suspects were slaughtered and found to be in the condition disclosed by accompanying post mortem record.

FINAL POST-MORTEM EXAMINATIONS.

OAKDALE HERD, IOWA CITY, JULY 21, 1909.

Tag Number	Glands			Lungs	Pleura	Glands		Liver	Spleen		Disposition		
	Cervical	Bronchial	Mediastinal			Portal	Mesenteric				Food	Tallow	Offal
50-6			+										
39-2		+	+	+		+	+	+					*
44-10		+				†							
27-3						+		+					
36-7		‡											
35-5			+										
46-11							+						
37-8	+	+	+				+						
39-4		+	+										
42-9		+	+										
15-1		+	+	+				+	§				

* Tank.
† Suspect.
‡ Superficial.
§ Large abscess.

The test at the Industrial School at Eldora in May, 1909, disclosed the fact that out of the herd of eighty-two animals four reacted. An examination in the previous year, when the herd numbered sixty-three, showed no reactors. The attached post mortem record shows the extent of the disease in the four cases which were found at the institution. The four cases in question were found in a herd of Holsteins which had been purchased in Illinois previous to the test. This shows the danger of infection

from the importation of cattle without proper safeguards. The four reactors were kept in quarantine for four months and then retested, all of them again showing a reaction, and in October, 1909, they were slaughtered at the Brittan & Company Packing plant at Marshalltown, showing marked lesions, two of them being condemned for offal.

The accompanying cuts show these animals to be in apparently good condition, which fact tends to support the theory that it is impossible to positively diagnose tuberculosis without the aid of tuberculin.

FINAL POST-MORTEM EXAMINATIONS.

INDUSTRIAL SCHOOL, ELDORA, IOWA, OCTOBER 13, 1909.

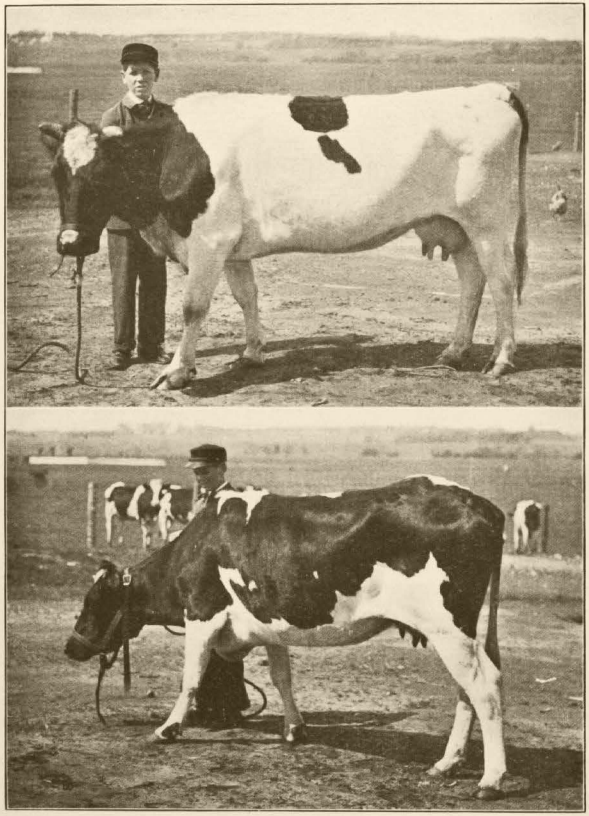
Tag Number	Glands			Lungs	Pleura	Glands		Liver	Spleen	Prescapular	Disposition		
	Cervical	Bronchial	Mediastinal			Portal	Mesenteric				Food	Tallow	Offal
2416		+	+		+	+		+		*			+
2259		++	++										
2240	+	+	+	+			+						+
2078	+												

* Prescapular.

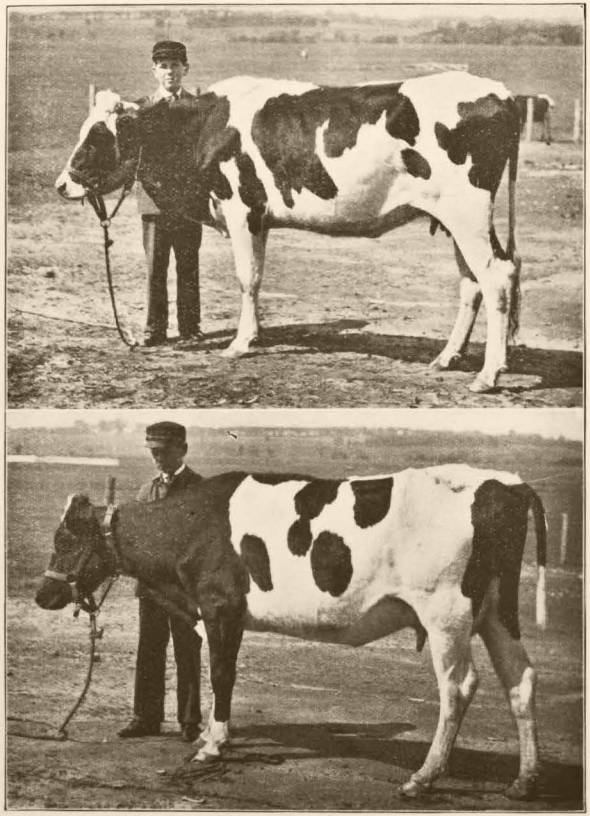
It is discouraging to endeavor to keep a clean herd when infection can be introduced without restraint by the importation of animals from other states. In this instance it was supposed that due care had been exercised to secure healthy cattle. Nevertheless it was found that the very cattle which were intended to build up the herd proved to be the means of infecting it.

An examination of the herd in May, 1910, when it numbered seventy-two head showed no infection. It is gratifying to know by the results of the test of May, 1910, that the herd had again gained the same standard of perfecton it had claimed prior to the importation of the diseased cattle.

The herd at the Soldiers' Orphans' Home at Davenport has developed serious infection during the past year. The herd was tested in 1908 and found to be free from tuberculosis and when tested in June 1909, the examination disclosed six reactors and six suspects out of the herd of fifty head. This infection was accounted for by the fact that subsequent to the test of 1908, other cattle had been purchased and brought into the herd from other states. These reacting and suspicious animals were not slaughtered but placed in quarantine, and again other animals were purchased to replenish



No. 4. TUBERCULIN REACTORS, FROM ELDORA HERD



No. 5. TUBERCULIN REACTORS, FROM ELDORA HERD

No. 6. TUBERCULAR LESION IN DAVENPORT—REACTOR WHICH FAILED TO REACT TO THIRD TEST

the herd. A third test was made in January, 1910, when there was found to be twenty-two reactors, and four suspects out of the herd of fifty-four head, this number including animals placed in quarantine after test of June, 1909. Seventeen of these animals were slaughtered with the result as shown on the accompanying post mortem record, the balance remaining in quarantine, these being animals that reacted in 1909. Out of the seventeen that were slaughtered there were two, that on post mortem showed no pronounced lesions, one of these was classed as a suspect at examination. When a fourth test was made of this herd, these quarantined reactors were included but all of them did not show a reaction, so it was decided to send one of them to slaughter with other reacting animals, as a check, and on post mortem same was found to be badly infected. It was then decided to slaughter the remainder that had been in quarantine since the test in June, 1909, with the result that all showed pronounced lesions; the accompanying cut being taken from one of the animals that had failed to respond to the final test. This would tend to show that an animal showing a typical reaction to the tuberculin test should be considered as diseased and does not require subsequent testing.

With proper care and precautions, it is thought that the disease will eventually be eradicated from this herd.

FINAL POST-MORTEM EXAMINATIONS.

ORPHAN'S HOME, DAVENPORT, FEBRUARY 2, 1909.

Tag Number	Glands			Lungs	Pleura	Glands		Liver	Spleen		Disposition		
	Cervical	Bronchial	Mediastinal			Portal	Mesenteric				Food	Tallow	Offal
3081		+											
4819				+									
3909	+												
4096			+										
3986	*												
3952													++
3245		+	+										
3450		+					++						
3389													
3548				++									
4379				+									
3189													
4859	*												
4718	+												+
S3938	†												
4319		+											
D4303	†												

* Generalized Tuberculosis.
† Normal.

The state herd at Mt. Pleasant was tested on June 2, 1909, at which test twenty-five out of the herd of one hundred and fifty-seven reacted, and eleven proved suspicious. Post mortem report attached shows result of examination at slaughter house of the twenty-five reactors.

FINAL POST-MORTEM EXAMINATIONS.

MT. PLEASANT HERD, JUNE 2, 1909.

Tag Number	Glands			Lungs	Pleura	Glands		Liver	Spleen		Disposition		
	Cervical	Bronchial	Mediastinal			Portal	Mesenteric				Food	Tallow	Offal
2367		+	+	+						*			
2233		+	+	+									
2179		+	+	+									
2725	+			+									
2229		+	+	+		+						+	
2011		+	+	+									
2164	+												
2136		+	+										
2238	+	+	+	+									
2465		+	+	+				+					
2050								+					
2417		+	+	+		+	+	+					
2410		+	+										
2067		+	+	+				+		†			+
2387								+					
2106	+	+	+	+									
2366		+	+										
2402		+		+									
2155		+						+					
2378	+	+						+					
2426		+											
2404			+				+	+					
2419	+			+			+	+					
2295		+											
2331		+	+	+				+		†			

* Superficial.
† Prescapular.

As a result of another test on December 1, 1909, it was found that forty-six of the herd were infected and nine suspicious. Both reactors and suspects were slaughtered, fifty-five in all, with the result shown.

FINAL POST-MORTEM EXAMINATIONS.

MT. PLEASANT HERD, DECEMBER 8, 1909.

Tag Number	Glands			Lungs	Pleura	Glands		Liver	Spleen		Disposition		
	Cervical	Bronchial	Mediastinal			Portal	Mesenteric				Food	Tallow	Offal
3855	+	+	+										
4570			+				+						
4217	+		+										
4384		+	+										
4487	+		+	+									
3933			+		+								
3754	+	+											
3955						+							
4431		+		+									
4507			*							**			
3290			+										
4938			+										
3879				+			+						
3443		+	+	+									
S4722						+							
4806		+	+	+			+						
3545	+												
4706		+	+				+						
3346		+					+						
3691		+		+			+						
4692		+					+						
2390		+	+	+									
4868		+				+				†			+
4056		+					+						
S3679		+	†				+	+		†			+
S3314						+		+					
4748		+											+
4346			+	+						§			
4452		+	+	+									
S3922							+						
4838		+											
4719			+	+									
S3116		+											
S4312			+										
4135			+	+									
S4340			+										
4173		+											
3441		+	+			+		+					
4915		+											
4600		+								+			
4983		+		+						**			
3989													
3021	+	+											
4500		+	+				+						
3011	+	+		+			+						
4496		+		+			+						
4589			+				+						
4503							+						
3503		+	+	+									
S3210							+						
4833	+												
4391		+	+										
S4461		+	+										
4588		+	+	+									
4532	+	+	+	+			+						

* Right hind leg.
** None.
† Peritonitis.
‡ Pleurisy.
§ Emaciation.

Again in May, 1910, the herd was tested, showing four reactors and one suspect. The four reactors were slaughtered, with result as shown.

FINAL POST-MORTEM EXAMINATIONS.

MT. PLEASANT HERD, MAY 20, 1910.

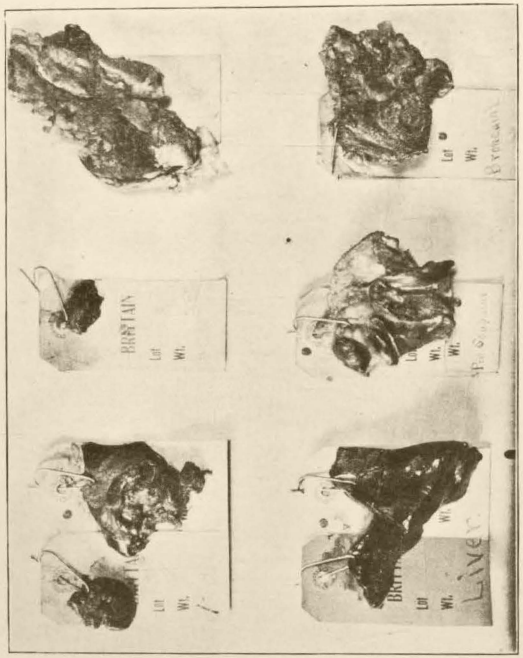
Tag number	Glands			Lungs	Pleura.	Glands		Liver	Spleen		Disposition		
	Cervical	Bronchial	Mediastinal			Portal	Mesenteric				Food	Tallow	Offal
3624			+	++						*			
4767				+++									+
4451			+	++									*
3611													

* Generalized.

It will thus be seen that the situation at this institution is or has been serious, and that the tuberculin test has been shown at the inspection to be absolutely reliable as a means of detecting the presence of infection.

Conditions at the institution were not sanitary or favorable at the time of the 1908 examination. Stables and stalls were not in desirable condition. It is believed that these conditions tended to aggravate the disease and extent of infection. Since that time the stalls and stable conditions generally, have been improved.

In January of this year a notable outbreak of tuberculosis was discovered by the United States Department of Agriculture, through the report of meat inspectors at Burlington, which was forwarded to this department for consideration and attention. The federal inspector reported to the Bureau of Animal industry of the Department of Agriculture the slaughter of two cows which had been bought from a dairy herd in Burlington, found to be in an advanced stage of tuberculous infection. The herd from which these cows had been sold supplied the milk for a large number of patrons in the city named. The result of our investigation was a test of the entire herd of twenty-eight animals. Twenty-five of them reacted. The herd was immediately placed under quarantine. The owner was disposed to disbelieve the accuracy of our test on account of the generally healthy appearance of his cows, and demanded a retest. It is the attitude of this department that an animal once unmistakably reacting to the tuberculin test is tuberculous and that subsequent tests of the same animal are unneces-



No. 7. TUBERCULAR LESIONS FOUND IN DAIRY COW PURCHASED BY A GRINNELL DAIRYMAN

sary, and unwarranted. However, in view of the insistence of the owner of this herd, it was finally agreed that they should be retested. The owner refused to accept our services in conducting the retest, being determined to have a private non-official test. Our representatives were present at the test, and reported on the proceeding. Of the twenty-five retested, nine reacted and five were regarded as suspicious. This test was not conducted to the satisfaction of the veterinarians representing this department. The results were not regarded as conclusive, and the test repudiated on the ground that the tuberculin used was unreliable, and the amount used insufficient. Futhermore the work was done too hastily, not allowing sufficient time for the development of symptoms. The quarantine regulations have, to some extent, been disregarded in this case, and an attempt made by sympathizers of the dairyman to interfere with the proceedure of this department. Our position as to the reliability of the tuberculin test is approved and sanctioned by the Bureau of Animal Industry at Washington. Experience has shown that retests of once infected animals can be of no substantial value, and that its practice, generally as a matter of policy, is unsound in theory and indefensible.

Another case from a private herd, owned by a man who has disparaged the activity of our department in insisting upon thorough tests of animals used for dairy purposes, and for sale to dairymen, was brought to light at Grinnell. A dairy cow purchased in 1909, which was sold as a healthy animal, was tested and reacted. The abnormal temperature was attributed to the food supply and overexertion, and the animal regarded as suitable for dairy purposes. A year later another test was applied to this animal, and a pronounced reaction resulted. The animal was slaughtered at a packing house under federal inspection, and disclosed typical and positive lesions of tuberculosis in the portal, mesenteric, mediastinal, liver, bronchial and prescapular glands. Many of the organs were calcified, indicating that the disease was of long standing. The animal was tanked as unfit for food. The accompanying cut (No. 7) shows portions of diseased organs.

RESULTS OF TESTS ON STATE HERDS

Postoffice	No. Tested	No. Reacted	Suspicious	Healthy
Anamosa—				
June 14, 1909	10			10
May 26, 1910	17			17
Cherokee—				
January 1, 1910	136	1	6	129
Clarinda—				
June 5, 1909	134	8	2	124
December 8, 1909	120		2	118
May 27, 1910	95			95
Council Bluffs—				
June 3, 1909	19			19
January 21, 1910	20			20
Davenport—				
June 10, 1909	50	6	6	38
January 26, 1910	54	22	4	28
Eldora—				
May 26, 1909	82	4		78
May 12, 1910	72			72
Fort Madison—				
May 19, 1910	9			9
Glenwood—				
June 2, 1909	118	15		103
December 9, 1909	106	1		105
May 28, 1910	94	1		93
Independence—				
May 28, 1909	89	51		38
December 4, 1909	54	6	2	46
May 19, 1910	43			43
Iowa City (Oakdale Sanatorium)—				
July 16, 1909	53	9	2	42
November 27, 1909	38			38
May 6, 1910	46			46
Knoxville—				
December 23, 1909	20			20
Mitchellville—				
May 4, 1909	26			26
May 13, 1910	27	3		24
Mount Pleasant—				
June 2, 1909	157	25	11	121
December 1, 1909	139	46	9	84
May 18, 1910	91	4	1	86
Marshalltown (dairies supplying Iowa Soldiers' Home)				
Loss & Sons—				
July 7, 1909	20	4		16
October 29, 1909	6			6
April 7, 1910	23			23
Darling & Wilson—				
July 7, 1909	23			23
October 28, 1909	27		1	26
E. E. Howe—				
July 7, 1909	19	6		13
October 29, 1909	5			5
April 7, 1910	18			18
Ed. Hewett—				
April 8, 1910	18			18
Vinton—				
June 5, 1909	8		1	7
December 16, 1909	8		1	7
June 15, 1910	7			7

GLANDERS.

Glanders is one of the most dangerous diseases of the horse, as well as one of the oldest. Ancient history deals with its ravages and general characteristics. In the middle ages it was recognized, and horses afflicted with the disease were considered unsound. The knowledge of the disease presents the usual steps of development. While the disease was recognized and known in a general way for centuries, it was not until 1882 that its real nature was discovered. In that year two German bacteriologists, Loeffler and Schuetz, discovered the microbe, called bacilli Mallei, which all now recognize as the cause of glanders.

A tiny rod-shaped bacterium from one to three twenty-five hundredths of an inch in length is the cause of the disease. These rods which are straight with rounded ends or slightly curved, are often found lying in couples side by side. They are easily stained by methylene blue, fuchsine or gentian-violet and other dyes. The microbe grows most luxuriently on the blood serum of horses and sheep, or beef broth and sliced potato, though it grows readily on all the ordinary media. It does not multiply in the filth of stables, though experiment has shown that it will remain alive and active in such places for three or four months. It is killed in a week by drying, but will live in putrefying material for two or three weeks. It retains its vigor in water for two or three weeks. Authorities differ as to whether or not the microbe forms spores. Those who deny it this attribute, hold that the resisting power to germicide, which the microbe possesses, would be far greater were it spore-forming. A one to one thousand solution of corrosive sublimate will kill the microbe, as will a five per cent solution of either creolin or carbolic acid.

Individual horses are not equally susceptible to the viris of glanders. Like tuberculosis, glanders has certain pre-disposing factors, among them may be mentioned over-exertion, too little food, poor ventilation, chill and disease.

The transmission of glanders may take place directly, or indirectly by means of harness, clothing, pails, stable tools, fodder, litter, grooms, etc. The bacilli of glanders cannot multiply outside the body. In nine-tenths of all cases, the lungs are the gateway of the disease, probably reaching the nasal membranes by being inhaled with the air in the form of dust; by reciprocal smelling of other animals, or by deep respiratory movements. The presence of catarrh predisposes the mambrane to the penetration of the bacilli. The skin is the second gateway for the entrance of the bacilli. Farcy, formerly regarded as a separate disease, is nothing else than glanders of the skin. As a rule the skin is primarily infected, only when it has been previously injured or abraded.

While the virus of glanders penetrates the body via the digestive tract, it is not often that this occurs. Flesh of glandered animals has not been known to infect man, though animals fed on infected matter sometimes become infected in this manner. Glanders may spread from a local center in the same manner as tuberculosis. At first it proceeds by way of the nearest lymphatics. The disease may be restricted for a long time in later stages of a chronic course, to the lymph glands. In acute glanders the bacilli is rapidly absorbed in the blood, producing a generally diseased condition.

The steps of chronic glanders are inflammatory processes accompanied by suppuration, ulceration, granulation and cicatrization. The most frequent seats of infection are the respiratory mucous membranes in the lungs, lymph glands, skin and subcutis. Occasionally other organs are invaded.

Glanders attacking the respiratory mucous membranes occurs in two forms: nodular circumscribed, with the formation of ulcers and cicatrices, and diffused or infiltrated glanders. The nodular glanders is the most ordinary kind, and is usually found in the upper portion of the nasal cavity, viz., on the nasal septum, and in the cavities of the turbinated bones. The appearance of nodules marks the commencement of the affection. They vary in size from a grain of sand to a millet seed, of glassy translucent, gelatinous condition, of a roundish oval shape, of a dirty-grey or greyish-red color. These nodules project slightly, and are surrounded by a reddish ring, and as a maximum may attain the size of a pea. They are isolated or located in groups. Microscopically, they consist of a large number of lymphoid cells, which break down in the center with the bacilli lying between them. The nodules become yellow and change into ulcers after the purulent breaking down of

their summits. The ulcers are sometimes superficial, sometimes deep and surrounded by a hard, prominent edge. They are sometimes covered by a brownish crust, and may increase in area and depth, even involving the underlying cartilage or bones, exostoses on the turbinate bones, etc. Shallow lenticular ulcers may heal without leaving visible changes; deeper ones leave a cicatrix, either smooth or horny.

Diffuse glanders manifests itself in a diffuse catarrh in the nasal cavity and neighboring cavities, with various results.

In the lungs both the nodular and diffuse forms are found. Infiltrated glanders of the lungs forms tumors from the size of a walnut to that of a child's head.

The nodules of glanders of the skin vary in size from a hemp seed to a pea. The nodules in the subcutis are inflammatory tumors the size of a pea up to that of a hen's egg. They change into a large abscess and burst outward. Of the organs, the spleen most suffers from diseased changes in glanders. At times, the following organs are affected: The liver, kidneys, testicles, brain, muscles, heart as well as the bones.

Seroulcerous disintegration of the respiratory mucous membrane is the atomical change of acute glanders. The early stages of chronic glanders usually escapes notice, as the disease usually runs a course of months and even years. The first symptom is a unilateral, or more rarely a bilateral, nasal discharge, which begins in the form of dirty white mucus.

Nodules and ulcers may not appear until a late stage of the disease. Swellings of the submaxilliary lymph glands, at first somewhat diffused, are symptoms. The state of nutrition becomes visibly impaired. The patient loses condition and becomes quickly fatigued when worked. Occasional patients suffer from irregular and intermittent fever. Glanders of the skin does not so often occur in chronic glanders as in acute glanders.

Acute glanders is comparatively rare in horses, being about 10 per cent of all the cases. It is, however, the usual form in monkeys and their hybrids.

Innoculated glanders, as a rule, assume an acute type. The affection begins with rigors and high fevers. The progress is usually severe, and has an unvariably fatal termination in from three to four teen days.

The disposition of men to the diease of glanders is fortunately small, and yet cases of human glanders are always occurring, espe-

cially among veterinary surgeons. The seat of infection is usually in the hands, the nasal mucous membrane, lips and conjunctiva. After the innoculation stage of from three to five days, the seat of infection first swells and becomes painful; then swelling of the lymphatic glands appear. Sometimes the first positive symptom is febrile disturbance. In 50 per cent of the cases, there is nasal discharge and ulcers on the nasal mucous membrane, also a characteristic swelling of the bridge of the nose. Afterwards pustules, abscesses and ulcers of the skin, ulcers in the cavity of the mouth, in the throat and larynx, and on the conjunctiva; swellings of the joints, high and continuous fever, with grave general symptoms; sometimes also intense gastrointestinal derangement. Death usually occurs in from two to four weeks, though occasionally after only a few days.

Treatment in the case of generalized glanders is usually ineffective. Only when the affection is a local one can the glanderous focus be healed by deep cauterization, excision or erasion.

One prominent authority holds that infection of horses by atmospheric infection is extremely rare. Direct or indirect contact with nasal discharge and secretions of the ulcers of horses affected with the disease, is the most common mode of infection. In acute glanders all the organs are virulent, as well as the blood. Of the membranes, the conjunctiva is especially susceptible.

Persons in attendance on glandered animals should exercise the greatest care to avoid coming into contact with the bacilli of glanders. Washing and disinfection should be done whenever there has been contact with harness, animals or other objects which may be the medium of conveying the disease.

Mallein is a preparation made from the bacilli of glanders, and was first manufactured and investigated in 1891 by Kalning and Hellmann, as a means for diagnosing glanders. It is analagous to Dr. Koch's tuberculin.

The only rational method of banishing this disease is the enforcement of severe precautionary measures.

Between the years 1876 to 1886, 20,566 horses died of glanders in Prussia. During this decennial period the disease diminished more than one-half, owing to the enforcement of regulations and laws enacted for the control of the disease. In 1890 there were 782 cases of glanders in London alone. It is estimated that there are 90,000 glandered horses in Russia.

The wide extent of this disease and its virulent nature renders it one of the grave conditions with which health departments have to deal. During the year 1906 the Minnesota Live Stock Sanitary Board tested 1,482 horses for glanders, of which 516 were killed. During the following year 513 were killed in that state on this ground. In 1909 the number was reduced to 353 owing to the vigorous and effective campaign waged by the board against the spread of the disease. In North Dakota during a period of a little more than a year over fourteen hundred horses were killed at a cost of about $70,000. The last named state has passed a law levying a tax on all horses in the state, creating what is known as the "glanders fund," out of which all claims for animals killed on account of glanders are paid. The tax is not found to be oppressive, and by equalizing the losses sustained on account of this disease furnishes an insurance against total loss, which is a source of welcome relief in many cases. More than eight hundred animals were killed on account of glanders in California during the past two years. Nearly two thousand were tested or examined with a view to determining the presence of glanders. It is, therefore, evident that this malady is one of the important problems coming within the scope of this department.

In Iowa almost invariably the source of infection can be traced to horses that are shipped, or otherwise brought into the state from western states, which fact shows the necessity of having a law passed requiring the inspection of all animals entering the state. Almost every other state has a law of this character, requiring a certificate of health from a qualified veterinarian showing freedom from infectious diseases.

One case over which there had been some controversy was taken up at Council Bluffs. An old fire horse, belonging to the city, called "Prince," was tested two years prior to the fall of 1909, by the then Assistant State Veterinarian, and declared to be infected. A member of the city council, who was chairman of the committee having the fire department in charge, demurred against the diagnosis, and employed another veterinarian, who dissented from the diagnosis of glanders and for a time treated the animal. The horse seemed to recover. Two years later, in December, 1909, there was new evidence of disease, and a veterinarian from this department tested the horse and declared him glandered. Consultation with other veterinarians from the State Veterinarian's office corroborated the diagnosis. It was recommended that "Prince" be killed.

The diagnosis disclosed a condition that caused the veterinarians in charge to think the animal had been suffering from a chronic case of glanders, continuing from the previous test referred to, and that at the time of the later examination he had developed an acute case. "Prince" was destroyed, and at the post mortem examination there were found positive lesions and a typical case. Ulcers had formed on the anterior left side of the septum; on the anterior portion of the superior turbinated on the left side, and on the anterior portion of the superior and inferior turbinated on the right side; and lesions were also noted in lung tissue. Specimens of the affected tissue were examined microscopically and disclosed the presence of bacilli mallei.

Another outbreak took place near North English. An old family driving horse was found to have a well developed case of farcy and glanders. By the consent of the owner it was killed. The septum nasi was ulcerated nearly its entire length, and at one place so nearly eaten through that a straw was forced through it. The animal had apparently previously suffered from influenza and had not fully recovered. Thorough disinfection was ordered, and the balance of the horses on the premises, twelve in number, were quarantined. Another examination about a month later resulted in the raising of the quarantine by this department.

Horses at the large transfer barn at Iowa Falls became infected recently. We recommended the destruction of two of them. On post mortem they showed pronounced lesions. The remaining twenty-nine horses on the premises were tested, a number reacting. The entire number was quarantined. Another test was made sixty days later, with the result that several horses reacted. One of them was destroyed. These horses are still in quarantine. The source of infection in this case was a horse shipped in from Dakota.

Serious infection of glanders was discovered at Gillett's Grove in Clay county, where four work horses belonging to a farmer were affected. This farmer had immigrated from South Dakota with his horses that year, one of them having slight nasal discharge at the time he was shipped in, which was then supposed to be a symptom of distemper. A considerable number of horses were exposed in this case, but fortunately outside of the man's premises, no infection developed from the exposure. One of the four horses mentioned died and the remaining three were destroyed.

A number of horses were driven through from western states and held for sale at the livery and sales stable at Harcourt in Webster county, during the winter of 1909. At the time these animals were bought, one of them had what was supposed to be distemper, but what subsequently proved to be glanders. This horse was kept in the barn mentioned during the winter of 1909. In the following spring, he was sold to a farmer. Shortly thereafter he became very sick and died. Upon investigation we found that a great many horses had been exposed to this one, as the owners of the barn bought and sold horses during the winter, besides stabling horses for others. Five of their remaining horses were tested and found to be glandered. The owners, refusing to destroy the horses, they were kept in quarantine until fall, when consent was obtained to have them destroyed. Many farm horses that had been fed in the barn contracted the disease. Twenty horses were killed as a result of this outbreak. The stables were cleaned up and disinfected.

During the summer of 1909 a farmer living near Scarville purchased a horse recently shipped into the state from the west. The animal died, supposedly from distemper. This man's neighbor came upon the premises with his horses to help put in the spring crops, thereby infecting his horses with glanders, as it proved later that the horse mentioned as having been shipped from the west, was glandered. A member of the board of trustees, who had attended a lecture at the Farmers' Institute at Lake Mills by the State Veterinarian some time previously, at which lantern slides showing specimens of the lesions of glandered animals had been exhibited, first declared the disease glanders. He called on the department for investigation, and on diagnosis we verified the opinion expressed as to the identity of the disease. Seven horses were destroyed in this locality as a result of this infection.

Cases of glanders were discovered at Rock Valley and Woodburn. The usual suppressive measures were taken, and quarantine established.

A serious outbreak of glanders occurred near Cartersville, Cerro Gordo county, the present year. A number of horses were killed by consent of owners, and many more examined and quarantined.

ANTHRAX.

On August 10, 1909, we were notified of the presence near Remsen, Plymouth county, of a disease believed to be anthrax. A representative of this department was sent to investigate the matter. He reported the purchase, by John Barnable, in Union township, of a bull from west of Le Mars. The animal died suddenly about two weeks later. The following day a cow died in an adjoining pasture, which was being rented by three men. This cow was skinned. It was thought that this cow had been struck by lightning. On the third day thereafter, several cattle died in each pasture. The disease was then diagnosed as anthrax. Vaccine was obtained and used. Sixteen cattle had died up to August 11 and later many more died. By September 1 reports were made of the deaths of several more animals. Quarantine regulations were generally establishd.

In all about twenty premises were investigated on account of anthrax, in this part of the state.

It is believed that the infection in this locality originated across the state line in South Dakota, as the disease had been prevalent there for several years.

In September several cases were reported from Leeds, in Woodbury county. In the early part of October cases were reported from Merrill and O'Leary. Numerous cases were reported from Marion township, north of O'Leary, where Thomas Nellis lost thirteen head. A young man working in this vicinity who visited occasionally at O'Leary was thought to have conveyed the infection. Quarantine at some places near Hawarden was raised in November.

Seventy-four head of cattle belonging to a farmer near Marcus, Cherokee county, were vaccinated in November. Four head belonging to this man had died, presumably of anthrax. The premises were quarantined.

The case at Moville which attracted the most attention was reported from the farm of A. L. Rawson, five miles northwest of

Moville. Dr. W. E. Miller of Cherokee, made investigations from time to time, and reported the conditions surrounding it. On December 3, 1909, Dr. Miller reported the case serious, and about that time Dr. Charles Parke, veterinarian of Kingsley, wrote concerning a case which he had discovered in a steer four miles west of Rawson's place. The Rawson place was promptly placed under quarantine, and all the customary precautions taken to prevent the spread of the disease. The quarantine was not observed in all particulars by Rawson, however, with the results which follow: On February 23, 1910, it was reported that contrary to the quarantine Rawson had bought more horses and placed them on the farm, and that he had been hauling corn over the public highway to market. He had vaccinated his stock a second time, but evidently had not succeeded in immunizing them, as eleven head had died.

By April nineteen horses out of twenty belonging to Rawson had died of anthrax, and also all of his hogs and chickens and three head of cattle.

On April 11 the Rawson place was undergoing thorough disinfection by the united efforts of representatives of the township and Rawson, under the direction of this department. All hay and litter was burned. Holes where carcasses had been buried were partly uncovered and filled with lime. Later Dr. Miller had the barn disinfected with a strong solution of corrosive sublimate, of 1-1000 strength. By June 1st, the place was thoroughly disinfected, including yard and grove in which dead animals had been buried, where fifty barrels of lime had been used. The owner had then only one horse left. He was advised to get a couple of cows and some chickens, but to keep them out of the barn. One horse purchased was placed in the orchard and died within six days. Further disinfection, including that of grain, was recommended. Dr. Miller later authorized Mr. Rawson to purchase a vaccinated horse near Kingsley. This "immune" lived seven days, dying very suddenly. Slides made from the blood of this animal were found to contain positive evidence of the disease.

An outbreak of disease appeared about eight miles from the Rawson farm, and on examination of the blood, the disease was found to be anthrax.

In February this year, Peter Miller of near Remsen, lost six cows from anthrax. These animals had been vaccinated the preceding summer by a veterinarian from Le Mars. Potency of vaccine

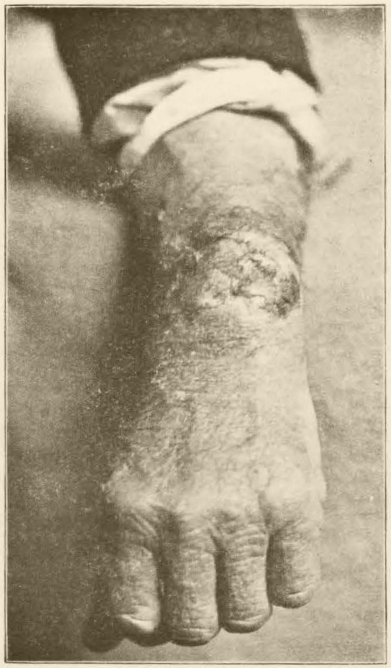
is open to question. The trouble arose from feeding animals hay from a meadow overflowed by a creek from infected premises.

During the present summer an outbreak of anthrax occurred near Mediapolis, Des Moines county. Twelve head had died when this department was notified and we immediately quarantined the premises. In all more than twenty head died. The infection in the locality was confined to the premises of Edward McDonald, except one case of human infection, that of Dr. H. M. Griffin, of Morning Sun, whose arm was in bad condition. It was thought for a time that it would be necessary to amputate the arm. However, he recovered without this drastic treatment. A son of McDonald's also was infected. The seat of his infection was on the cheek. Prompt measures were adopted for the control of this outbreak, after our department had been called upon, and the work of veterinarians in charge was very efficient and creditable.

In May a call for vaccine was received from a farmer near Kingsley, who reported the death of two heifers near his place from anthrax.

Owing to the tenacious nature of this disease its ultimate eradication from any locality is a matter of considerable time and pains. While the outbreaks are dealt with promptly and thoroughly, it is beyond our power to discover all sources of infection and close them securely. Every effort consistent with the facilities of this department is being made to control and eliminate the disease from the infected localities, and the results have in most cases been entirely satisfactory. In some instances conditions have existed which seemed to baffle the most energetic measures, but eventually the prevalence of the disease has yielded to our effort. There will be no relaxation in the war against these dangerous and insidious diseases. As the cases come under closer scrutiny and observation with increased acquaintance with the individual cases, our efforts must meet with more pronounced results.

One case of human infection of anthrax was reported from the western part of the state, in the person of Julius Rental, of Leeds, Woodbury county. Infection was communicated while he was skinning a bull. He was treated at a hospital in Sioux City, and finally recovered. The infection attacked the hand or wrist. Accompanying cut No. 8, shows somewhat the character and extent of the affection.



No. 8. ANTHRAX INFECTION

The following is an article on the subject of ANTHRAX by DR. WALTER E. MILLER, ASS'T STATE VETERINARIAN.

CHARACTERIZATION.

Anthrax is a specific infectious disease occuring sporadically and in epizootics in herbivora and omnivora, and communicable to nearly all warm blooded animals, and to man. It is characterized by the presence in the diseased tissue and liquids of Bacterium Anthracis, by an enlarged spleen, blood extravasations and by local gangrene.

HISTORY.

Anthrax is among the oldest of the known infectious diseases and descriptions of epidemics of this plague are given by Homer, Plutarch and Livy before the Christian Era. While Chabert pointed out in 1790 that the various forms of the malady, previously described as independent affections, were all one disease, Kausch gave a good description of anthrax, but denied its contagiousness. Not until 1854 did Gerlach prove its contagiousness by experimental inoculation. In 1885, Pollander announced the discovery of unbranched rod-shaped bodies in the blood of cattle dead of anthrax. After Koch's careful description of the morphology in 1876, came Pasteur's proof of the existence of spores in 1877.

GEOGRAPHICAL DISTRIBUTION.

There are very few, if any, countries where the disease has not been found. Europe has probably suffered most from its ravages. However, Northern, Eastern and Central Africa, South American Republics, England, India, Russia and Australia have frequent losses, while there have been outbreaks reported from at least twenty states in America. The methods of disposing of dead animals, isolation and disinfection, together with preventive inoculations, have placed it in the class of rare diseases, save perhaps in badly infected districts.

ETIOLOGY.

Anthrax is caused by a germ called Bacterium Anthracis. This organism is found in the diseased tissue and organs of affected animals. In form it is cylindrical or rod-shaped, measuring 1-5000 to 1-2500 in length and about 1-25,000 inch in diameter. Outside the animal body, however these organisms form small round bodies called spores, which are very resistent to the destructive agents of nature. These same bodies resist heat and cold to a remarkable degree and remain alive and capable of producing disease after years of drying, when finally placed in a favorable medium for development. Having been introduced into a locality, it tends to remain for years, causing a few losses from time to time, depending for its extent on the conditions existing in the particular locality. Improper disposal of carcasses and careless disregard of previously infected marshy land, at once presents two sources of serious proportions. Besides these dangers which are of immediate consequence to stock on pastures, the infection may be carried from place to place on hides, hair, wool and horns, and it may be carried in hay from an infected field causing virulent outbreaks far removed from the original source.

SYMPTOMS.

The symptoms of anthrax vary both in species and different individuals attacked, according to the location of the disease. Again variation exists with apparently identical lesions. Some of the characteristics noted are the suddenness of attack, serious general disturbances, high temperature, digestive disturbance, brain complications and dysponea. The manifestations may be classified as anthrax with visible localization, and anthrax without the visible localization. The former usually results from infection of the skin and mucuous membrane. These lesions are called carbuncles and are circumscribed, cutaneous swellings, which are at first hard, hot and painful. Later they become cold and painless, with a tendency to gangrene. While ordinarily not quite as fatal as internal anthrax, death may be said to occur in dogs and swine, the animals suffer from fever, dysponea, difficulty in swallowing, together with the immediate local effects. Death occurs sooner than when the lesions are found on the skin. Moore further classifies this malady according to course as peracute, acute and subacute.

Thus we have peracute anthrax or apoplectiform, when the subject dies very suddenly, as if from apoplexy. The animal, without having shown any signs of disease, suddenly drops down in the pasture and dies in convulsions, or an animal apparently well at night is found dead in the morning.

The acute form, in the absence of external swellings, is the one more often observed in cattle. The disease is ushered in with a high fever, temperature 106.7° F. Feeding and rumination are suspended, chills and tremors may appear, the subject is dull and stupid and may manifest great weakness. In this form the malady runs a somewhat slower course lasting not to exceed twenty-four hours. Either of two courses in the acute form may be observed. If the brain is affected the animal becomes restless, excited, stamps, rears and bellows, finally dying in convulsions. If the lungs are congested, there is difficulty in breathing, wheezing, groaning, palpitation of the heart, syanosis and death from suffocation.

The subacute form is known as anthrax fever. While presenting the same symptoms as the other forms, the disease lasts from one to eight days with an average of forty-eight hours. The high temperature, the congestion of the lungs or brain, together with intestinal disturbances with colic, are especially well marked.

It has been stated that milk from cows suffering from anthrax contains Bact. anthracis, this would justify the enforcement of vigorous measures to avert the danger when anthrax breaks out in a herd of dairy cows. The first symptom noticed in a cow is the absence of milkflow at milking time. In the first place it must be remembered that the question is not whether the milk present in the udder of a cow that is dying or is already dead of anthrax, contains the bacilli, but whether in the ordinary circumstances, the bacilli are likely to be present in the milk withdrawn from any of the cows. It is possible that in every fatal case of anthrax in a milch cow, the bacilli are present in the milk

at the time of death, but it is also probable that the milk invasion does not occur until the bacilli have begun to multiply in the circulating blood, and it is well known that that is an event which usually precedes death only by an hour or two. While the period of invasion may vary, and the time between the onset of the invasion and death may vary, no animal has a normal temperature after the germ begins to multiply in the blood. "It therefore appears safe to conclude that there is no danger from the milk of an infected cow prior to a distinct rise in temperature.

LESIONS.

The nature and extent of tissue changes depend upon the course of the disease, and any, or all, clinical changes may be absent. Anthrax carcasses soon loose their rigidity and become bloated. Often a blood stained fluid flows from the natural passages. The spleen is usually enlarged from three to five times, the pulp blackish and soft, and occasionally disintegrated. The blood is usually dark with a tarry consistency and varnish lustre, showing little tendency to coagulate. It does not assume its normal color when exposed to the air. Hemorrhages varying in amount from petechiae to extravasations, distended capillaries and gelatinous effusions or a simple serous oedema may occur. The lymphatic glands may be hemorrhagic, oedematous or both. Oedema of the connective tissues of the neck is often very marked. In the abdomen, the thoracic cavity and the perocardial sac more or less bloody fluid is present. In addition to these characteristic signs, the carbuncles already described, often aid in determining the true nature of the disease. While all the foregoing lesions may be absent in the very acute cases, the specific organism is always present in the cadaver.

PROGNOSIS. In most herds the mortality is nearly 100 per cent. with an average of 70 per cent. of all animals affected.

DIFFERENTIAL DIAGNOSIS.

The suddenness of attack and short duration of the disease may confuse one in differentiating cases of poisoning, heat exhaustion, cerebral apoplexy, death from lightning or pulmonary congestion. Little room for doubt, however can be left where proper bacteriological examinations have been made.

PROTECTIVE INOCULATION.

Much has been written regarding the virtue of various vaccines. And after all discussion has been gone over thoroughly, the fact remains that vaccinated animals continue to die regardless of the method of inoculation. In Germany and England, the stamping out system is considered superior to vaccination. To this end, rigid laws have been enacted as the only reliable means of suppressing the disease.

THE SIMULTANEOUS METHOD.

In the opinion of the writer the injection of anthrax antitoxin together with a small quantity of virulent anthrax bacteria, at least has the advantage of being given at one time. Such a plan should receive more attention where infected ground is available.

PREVENTION.

Having removed all well animals from the barns and yards holding the sick ones, the temperature taken night and morning will indicate any new cases. By careful isolation and safe disposition of the dead animals, the spread of the disease may be checked. Animals do not as a rule, spread the virus when the first rise of temperature can be detected. The infected stables and yards should be thoroughly disinfected.

The disposition of dead animals in an outbreak is of much importance. Failing to burn a carcass where it falls, it should be buried deeply and covered with quick lime before the dirt is replaced. Then having fenced the plot, it should be burned over frequently to destroy any spores that might be brought to the surface.

CEREBRO-SPINAL MENINGITIS.

Some cattle belonging to a party at Odebolt were pastured and fed at Pilot Mound, where the disease of cerebro-spinal meningitis appeared among them. Other cases occurred in Jefferson county, at Braddyville and Terril, Iowa, and several other points. In most of these cases the disease was attributed to the use of mouldy food. A notable case of ensilage poisoning was discovered in Story county, where a farmer lost eight head of horses within a few days. The State Veterinarian investigated this case, and located the source of the poisoning in mouldy ensilage caused by a leak in the silo. It is advisable to exercise care in the preparation of all feeds in order to avoid the development of fungi poisons.

Report on a few outbreaks of CEREBRO-SPINAL MENINGITIS, by JOHN THOMSEN, ASS'T STATE VETERINARIAN.

This rather fatal, indefinite affection of domestic animals, epizootic in nature, at times common in certain districts, attacks mainly the central nervous system, the brain and the spinal cord, and especially the meninges or coverings of those structures. Of late it has been thought by some writers to bear some relation to the disease known as Pallagra in man. It attacks horses, cattle, sheep, goats and dogs, apparently, by preference the young or those whose resisting power to the attack of the disease had not had time to develop. One attack does not give immunity as animals have been known to pass through three attacks, being affected for a week or more each time.

As to the causative agent of this disease, opinions vary greatly as do the post-mortem lesions and conditions in general in connection with the different outbreaks, and while diligent search is being made by many investigators, the theories advanced are as yet numerous. It seems, however, there is but slight divergence of opinion, and can be but little doubt, that the disease has its origin in certain foods or drink, due to certain toxic substances developing in food or drinking water under certain favorable conditions. The conditions suggest a poison introduced from without rather than an affection due to a germ propagated in the system. The fact that bacteria and cryptograms vary greatly under different conditions of life, as do their elaborated products at different stages of their growth, would tend to explain the absence and presence of the disease under seemingly identical circumstances, as also the various recognized forms of the disease.

As regards treatment, preventive measures should receive first consideration and especially where the disease appears in an enzootic form. A complete change of food and water is imperative even though the suggestion of mustiness or fermentation is slight, since the ferments and their products may be present in a dried condition. All animals should, at least temporarily, be removed to clean airy quarters, and returned to original buildings only after same had been thoroughly cleansed, disinfected and allowed to become dry. In the absence of definite knowledge as to the germ or toxin of this disease, it would seem best to place animals and premises under quarantine.

Medical treatment, owing to the great variation in the different outbreaks, would be largely symptomatic in character. In general, however, we would employ agents tending to lessen the vascular pressure within the cranium and neural canal, and causing elimination of toxic material by the way of the bowels, skin and kidneys.

During the latter part of November, 1909, the writer was requested by Dr. P. O. Koto to investigate as to an outbreak of this disease in Dickinson county. A lot of young horses, numbering nine or ten, had, up to within a week or so of this time, been apparently thrifty, had the run of a pasture with an adjoining barn to which they had free access, and in which they were fed abundant quantities of hay nights and mornings, together with a liberal supply of water from a deep well. The animal first affected, a two year old colt, was noticed by owner to be slow in his movements and have a somewhat unsteady gait, these symptoms becoming more pronounced from time to time for about two days. At the end of the second day, from time first noticed, the colt was found in the recumbent position unable to arise. No amount of help could cause it to regain its standing posture. Appetite appeared fair but mastication and deglutition were badly affected. The animal lay flat on the barn floor unable to lift its head, and after struggling, by moving its limbs violently, for five or six hours, died.

Within ten days three more had died in a very similar manner. A week or so following this, or at the time of the visit, a careful examination was made and the remaining colts, with the exception of one, appeared normal. This colt was decidedly sluggish in its movements, contrary to its usual habits as stated by owner. Mastication, as well as locomotion, was visibly impaired. Heart action and temperature varied little from normal at this stage. Attempt was made at treatment but the animal succumbed within forty-eight hours from time of attack in a similar manner as those above described.

A search was made for a probable cause of this condition, and the material most in doubt was the hay which had been cut from low lands, and was of inferior quality and poorly cured. The pasture, while of a suspicious nature, consisting largely of swampy land with a sluggish stream running through its full length, could not be depended upon entirely as harboring the cause, owing to the fact that the lateness of season, with the scarcity of feed, caused the colts to spend most of their time away from the pasture and at the racks in the barn eating hay. The colts were now barred from the pasture entirely, a change was made in the feed from hay to oats, straw and corn, and with the building well cleansed and disinfected, no further losses occurred.

Owing to the considerable similarity as regards surrounding conditions of the two, I wish in connection to mention as to a disease existing in a herd of young cattle, and which, during the latter part of December, 1909, I was asked by Dr. Koto to investigate. The herd numbered originally one hundred and thirty-five head and consisted of calves ranging in age, from seven to ten months. Up to within a month or so of this time the whole herd had a thrifty appearance, had access to water from a deep well and was fed corn fodder, wild hay and straw in liberal quantities. The first symptoms of disease noticed were a rather rapid loss of flesh, and arched back, and a somewhat stiffened gait; the weaker end of herd, or those having least resistance, being attacked first. A calf, thus affected, would continue to grow weaker, or more uncertain in its movements, for two, three or four days, and finally unable to arise for the last day or so, succumb. Appetite remained fair to the last, even after recumbent.

At the time mentioned above, thirty-three had died in this manner in spite of considerable medication by owner and others. Of the remainder of herd, forty or more were visibly affected.

Post mortem examinations of two, destroyed for that purpose, revealed nothing grossly abnormal. All of the larger organs were apparently natural. In the subcutaneous tissue, however, was seen yellow or straw-colored exudations in many different parts, with blood extravasations especially on lower part of limbs. The same straw-colored transudations, with slight blood extravasations were noticeable, also in the meningeal spaces of the cord, the peritoneal folds, and in a number of lymph glands, which were considerably enlarged.

For want of a better term, I named it Cerebro-Spinal Meningitis, though Food Poisoning or Forage Poisoning might have seemed more suitable. There was no doubt in my mind as to the causative agent being contained in the food. Suspecting the wild hay, which had been cut from land subject to overflow from a stream running through it, I advised the feeding of same discontinued. The owner, being skeptical in the matter, had a load of same hauled a distance of one and one-half miles and fed to another herd with the results that two previously healthy young cattle died in the same manner as above mentioned. The discontinuance of feeding that hay had the desired effect. No more became sick. Out of the forty or more affected, twenty-three died, which made a total of fifty-six dead. The remaining seventeen or more recovered gradually without medication of any kind.

RABIES.

Rabies is one of the oldest known diseases. It is described by Aristotle in the Fourth Century B. C. Allusions to it are found in Virgil, Ovid, Plutarch and Horace. Cornelius Celsus, first century of Christian era, was the first to employ the term "hydrophobia." No allusions are found to it in the literature of the Middle Ages. Dioscorides recommended excision of wound as protective measure, and Galen in the second century gives special remedies for rabies. Baughin in 1591 gives account of the transmission of rabies from wolves to man. In 1604 an epizootic of rabies broke out in Paris. Toward the end of the Seventeenth Century it broke out in Italy, and later in Germany and England. From 1779 to 1807 it appeared in America. At about the same time the disease spread over the whole of Europe. Chabert and Hunter conducted notable investigations into the nature of the disease at this time. Viborg, in Copenhagen, and Waldinger, in Vienna, improved methods of investigations of rabies about 1815. Delebere, Blaine and Greve in England in 1818 greatly enriched clinical knowledge of the disease. Hertwig in 1828 published a report of many experiments which were of great value. Virchow, in 1854, exposed the error of the belief that heat, passion, etc., could cause rabies. It is only in recent years that the exclusively infective nature of the disease has become recognized. In 1881 Pasteur gave his discovery of inoculative treatment to the world.

The infective matter of rabies has not yet been produced in a pure condition, though Pasteur has shown that the virus is purest in the central nervous system of infected animals, and less so in the peripheral nerves, salivary glands, lachrymal glands, aqueous humor of the eye, pancreas, mamma, testicles, kidneys and their secretions.

The nervous system offers the most favorable condition for the development of the virus. The blood does not contain the infective material, according to all experiments with the blood of infected

animals. The contagion is not volatile. Paul Bert, by filtering the saliva of rabid dogs through plaster of paris plates and proving it innocuous, showed that the infecting matter is a solid body. He did not succeed in cultivating these bodies, which he regarded as neither micrococci or bacilli. Negri has recently discovered the causative agent of rabies in the shape of a protozoa of various forms, situated in various parts of the brain. The vitality of the contagion is great. Pasteur observed the brain of rabid dogs for three weeks under very low temperature, without the infective matter losing its virulence. Galtier found that buried cadavers remained virulent from fifteen to forty-four days, despite putrefaction. Viola holds that the contagium of rabies remains active over five months when kept cool in a vacuum.

The disease is transmitted directly by the bite of rabid animals, the saliva serving as the vehicle of contagion. Absorption of contagium in the digestive tract by the consumption of the flesh, milk or saliva of infected animals, is regarded as doubtful. The injection of these substances have produced no harmful results. A fox was fed two months on the brain and spinal chord of twelve rabid dogs without any ill results. However, the intracranial innoculation of milk of rabid animals has produced rabies.

Virus injected into the body may remain dormant for a long time at the site of bite, or may enter the body via the circulation, or along nerves. The period of incubation is longer than in other infective diseases, and in dogs average from three to six weeks, with a maximum of several months, and a minimum of only a few days.

Most domestic and wild animals are subject to the disease.

Post mortem changes in rabid animals are neither constant nor specific. General, though not typical, changes are as follows: Emaciated cadavers become rapidly putrid, and in large animals the hind part becomes greatly distended by gas. The blood is thick and dark-red in color. Mucous membrane of the mouth is congested and swollen, chiefly at the base of the tongue. Muscles appear granular and affected, with fatty degeneration. The heart, liver and kidneys show parenchymatous degeneration. The tonsils are enlarged and infected. The membrane of the pharynx and larynx is reddened, swollen and studded with small hemorrhages. Foreign bodies are found in the stomach, sticks, stones, straw, hair, etc., but little or no food.

Pasteur records a few rare cases of recovery by inoculation after the commencement of the first symptoms of the disease, but only in case of slight attacks. Rabies must be regarded as an invariably fatal disease. The inoculation mortality is not so great. Hertwig found that only 37 per cent of the animals inoculated by him became infected, and Renault, 67 per cent. On an average only 20 to 30 per cent of those bitten by rabid animals become infected. The percentage in mankind is influenced by treatments. One authority says that of one hundred bitten men, only from 8 to 47 per cent became infected. Pasteur puts the per cent at 16 to 80 per cent.

Treatment is purely prophylactic. It is of no avail after the appearance of symptoms of the disease. In men the wound should always be cauterized with a hot iron, potash, sulphuric acid, corrosive sublimate, etc., or excise the bitten part, or the cicatrix. In domestic animals, only in exceptional cases, should this be done.

Pasteur, in 1884, started his experiments with inoculation for the cure of rabies. While he has greatly reduced the mortality in the cases under treatment, the treatment is not regarded as conclusive or absolute in its results.

Preventive measures, such as muzzling of dogs, dog tax, etc., are the most effective methods of controlling rabies.

Rabies runs a typical acute and fatal course in dogs. Two forms of the disease exists—furious and dumb. The furious rabies has three stages, viz. First, the premonitory or melancholy stage; second, the irritative or maniacal stage; third, the paralytic or final stage.

Dumb rabies is distinguished chiefly by the short duration or absence of the irritative or maniacal stage. Death often takes place in two and three days. This form of the disease is more frequent in America than the raging form. Diagnosis is more difficult in dumb rabies than in the other form.

About a dozen calls for investigation on account of rabies have been received during the past two years. Some of these were of several months' standing, and others were of recent origin. In each case prompt action was given, and the outbreaks have been effectively controlled.

In November, 1909, it was reported that ten or twelve dogs in Clinton, Iowa, exhibited symptoms of rabies. The brain of one of these had been sent to Chicago for laboratory examination, and the disease had been pronounced rabies. A pet spaniel which had been

kept under observation during its entire sickness, and which had later been killed, displayed the following symptoms: First, a change of disposition, becoming cross and objecting to callers at the house. The next was the loss of appetite and languor, very hot nose and cold legs, which condition continued three days. The dog then became restless and anxious. At the end of three days the dog's mouth was open and driveling, tongue protruding and dark, eyes green, set and staring, head down, ears drooping, tail down and never wagging. Dog was constantly in motion, keeping his chain tight, snapping and biting at anything within its reach.

Some horses and a dog had recently been killed in a nearby town, all suffering with violent rabies. Several dogs had been killed in the north end of town. On January 13th, it was reported that over two dozen dogs had been killed. On January 17th, the report was sent in that a mad dog had entered a stable and bitten six cows. After this time a number more dogs were killed.

A dog afflicted with rabies traveled through the country in the neighborhood of Boone, biting other dogs and hogs. Three dogs known to have been bitten were killed and five hogs belonging to three different farmers contracted the disease and were killed. The dog scattering the disease was apprehended and killed. The route covered by this dog before he was dispatched was along the border of Boone, Story and Hamilton counties.

In the early part of this year a mad dog appeared in the neighborhood of McGregor, in Clayton county, biting many head of stock. One party killed eight of his hogs on account of being bitten by this dog. One of his neighbors killed four cows and one horse. The animals that had been bitten and that were not killed immediately were quarantined and isolated. The Boards of Health of Monona, North McGregor and McGregor were instructed to muzzle or kill all dogs. The schools in some localities were almost deserted as teachers and pupils were afraid to venture out and risk attack from mad dogs. In March Dr. C. W. Anderson, assistant to State Veterinarian, visited Clayton county again, and raised the quarantine in this vicinity. Owing to the prevalence of the disease in the county for several years, however, it was recommended that great care be exercised in the restraint of dogs for some time longer. A case was reported from Elkport on February 15th.

In the fall of 1909 rabies appeared in the herd of M. C. Townswick, near Story City. Three animals were lost, and the usual

measures taken to curb the disease by the tying and muzzling of dogs, etc.

Rabies among dogs was discovered in Davenport during the month of May, 1910. As a result of this four patients had been treated for rabies at the Pasteur Institute at Iowa City up to June 19th, from Davenport alone, no fatality resulting.

Several cattle were bitten near Lawler, Chickasaw county, and some killed, in June of this year. An investigation disclosed the presence of the disease in the animals.

In May of this year a strange dog appeared at the place of Mrs. Bjorge, near Highlandsville. The dog appeared to be sick. Attempts at driving it away were unsuccessful. The next morning it was found dead in the pasture. More than a month later the cattle began to get sick and it was found that they had rabies. Four cows, one steer and one horse died. All dogs and cats on the place were destroyed and several others in the township. Those remaining were tied up or muzzled. Upon further investigation no evidence of the prevalence of rabies was found in that vicinity.

SCABIES.

One of the diseases commonly brought to our attention by the Bureau of Animal Industry is scabbies. The following is an article on the subject by DR. L. U. SHIPLEY:

Scabies, or scab, is a parasitic disease of sheep (Psoroptic Communis) commonly known as scab or itch mite, being the parasite causing the disease commonly affecting sheep.

There are three other varieties of sheep scab recognized, but of such rare occurrence that only the first mentioned will be considered in this report.

Psoroptic Communis, or common scab mite, are very small, being only about the fortieth of an inch in length in the female and one-sixtieth of an inch in breadth, the male being still smaller. The body is oval in shape, slightly rounded above and flat below, and possessed of eight short legs. The head is pointed and set close to the body, the color is reddish or yellowish grey. They are too small to be recognized by the unaided eye on the body of their host, but placed upon a dark background in strong sunlight, they may be seen to crawl.

Transmission of scabies is generally by immediate contact; contagion will especially take place, easily, when shorn mangy sheep are introduced into a healthy flock, especially in hot sheep-folds where the animals are crowded together, and during winter when the wool is long.

The symptoms are first manifest upon the croup, base of the tail, back, sides, neck and shoulders. The eruptions commence with small spots which may be isolated or in groups, according to the extent of the infection. By spreading the wool apart we observe flattened pimples, the size of a millet seed, of a pale yellow or reddish color produced by the bites of the mite. These spots become enlarged and confluent, which dry up, forming large scabs, and an abundant epidermic desquamation is produced, which forms thick crusts by becoming mixed with sebaceous matter and the contents of the pustules.

These scabs are often hard and of yellowish-brown color, under which the parasites hide and lay their eggs.

The wool becomes loosened and flaky tufts appear upon the surface and fall out, the wool loses its luster, the affected sheep rub themselves against convenient objects; also bite and tear out the wool about the affected parts. When the disease becomes generalized the affected animals become emaciated, weak and die.

Sheep scab is one of the most annoying and destructive diseases from a pecuniary standpoint, being destructive to fleece and animal, if not promptly and vigorously treated.

Scabies became so prevalent throughout the country, and especially upon the western ranges, that federal and state co-operation, along vigorous lines became necessary, and the present outlook indicates that complete success in eradicating this disease will soon be a fact.

Iowa law regarding diseased sheep will be found in Title XII, Chapter 3, of the Code, copy attached to this report.

During the past several years outbreaks of scab in sheep have been investigated in many localities in northwest Iowa. Through the co-operation of the Bureau of Animal Industry with our State Veterinary Department, these infections have been stamped out by proper dipping and hygienic measures.

The treatment of scab consists in using some external application, which by contact will destroy the parasite and eggs, and this can be effectually done only by repeated dipping.

The different dips need not be discussed in this report, sheep growers being well informed by Bureau reports upon formulas for preparing and dipping sheep.

NECROBACILLOSIS.

The disease variously known as lip and leg ulceration, foot rot, necrotic dermatitis, necrotic stomatitis, necrobacillis, etc., has in recent years been widely disseminated, especially among sheep in Wyoming and Montana, and some of the other western states.

This disease known by experienced sheepmen as sore mouth, sore lip, warty mouth, warty nose, ecthyma, stomatitis, etc., has prevailed in this country, east and west, for twenty years or more. Little effort was made to discover the causative agent or to check the disease until recently. As yet, most writers on the subject have not definitely determined the cause of the trouble, but a small number have incriminated the bacillus necrosis.

Sheepmen have customarily attributed the disease to coarse grass, shad scale, bunch grass, clover, alfalfa, beet tops, frost and other causes.

The Bureau of Animal Industry has examined numerous specimens during the past year and succeeded in isolating the necrosis germ. The inoculation of lambs and older sheep with tissue from diseased animals' mouths produced the disease. This fact alone establishes the soundness of the germ theory stated.

The disease is primarily caused by the necrosis germ. The predisposing factor is the abrasion of the skin, allowing the access of the causative organism. Prolonged drouth is often followed by outbreaks of necrobacillosis. This is due probably to the fact that the drouth necessitates closer foraging, inducing the sheep to browse on thistles and roughage. Hard, dry scabs, warty in appearance, are produced, frequently covering the entire lips, which when removed, leave a raw, granulated surface, with or without an exudate of pus. This condition may be present at any stage of the animal's growth. It is not caused, as is often supposed, by the feed or the pasture, or the fact of recent weaning, but these are predisposing causes.

The disease affects calves, pigs, goats, adult cattle, horses, deer, rabbits, dogs and chickens. It is transmissible from one species to another. The Bureau of Animal Industry has observed a number of cases of transmission from one specie of animal to another.

Vigilant preventive measures are necessary to keep a herd clean where it is at all exposed to infection. Treatment produces substantial results in diseased herds. A quarantine of two weeks is advisable before introducing new animals into a clean herd. Infected animals should be promptly isolated and treated.

Prevention should be carried out along three lines: (1) Segregation of the sick from the healthy animals; (2) Close scrutiny of animals that have been exposed to infection; (3) Complete disinfection of pens, corrals and sheds, as necrosis bacilli will retain its virulence under favorable conditions in and around sheep folds for several years.

The walls, racks and troughs should be sprinkled with a 5 per cent solution of sheep dip or similar disinfectant. The manure and a portion of the surface of the soil should be removed and the ground sprinkled with a disinfectant.

Local antiseptics are satisfactory as a treatment if begun in time and applied energetically. In mild cases of the lip and leg form, the scabs and shreds of tissue should be removed with a stick of wood, and three or four times a week a solution of cresol or coal-tar dip, or better, an emollient dressing containing five parts of one of these dips, ten parts of sublimated sulphur, and one hundred parts of mutton tallow, vaseline or lard. In progressive cases, or aggravated, chronic forms a 10 per cent solution of zinc chloride or nitric acid in the strength of one part to seven parts water. Carelessly applied caustic solutions may do more harm than good. Treatment of the venereal form especially demands careful handling.

Through notice from the inspection service at Omaha of the United States Department of Agriculture, we have learned of the presence of necrobacillosis in Pottawattamie, Shelby, Crawford and Hancock counties during the past year. A shipment of one hundred and ninety-seven animals from Crawford county was slightly infected. About four hundred and fifty animals, comprising a shipment from Pottawattamie county, was found to be infected, though not in an advanced form. Two hundred and forty sheep from Shelby county contained infection. These localities were duly visited by representatives of this department and proper investigation made as to origin and progress of the disease. So far as we have authority, quarantine and sanitary measures have been enforced.

The first outbreak occurred in Hancock county, which was personally investigated by the State Veterinarian. A number of sheep had been imported from an adjoining state. The diseased condition was at first supposed to have been caused by the use of too strong a dip, but upon further investigation, typical symptoms of necrobacillosis, or lip and leg ulceration, were discovered.

The United States Department of Agriculture, Bureau of Animal Industry, Washington, D. C., has issued the following article on lip and leg ulceration (necrobacillosis) of sheep:

As a result of several investigations of the disease affecting the mouths and legs of sheep which is more or less prevalent in certain districts of Wyoming, a diagnosis of lip and leg ulceration (necrobacillosis) has been made.

Insofar as the name applied to this affection is concerned it is quite immaterial so long as such a name is distinctive and does not confuse the disease with other affections of an entirely different nature. For instance, it is very important that the name "foot and mouth disease" should not be given to this affection, because the two diseases are totally unlike in symptoms, are caused by different specific agents and foot and mouth disease is so highly infectious that every outbreak which has appeared on American soil has been quickly stamped out before it became widespread. Furthermore, the ulcerative condition which affects the lips and legs of sheep does not spread from animal to animal in epizootic form like foot and mouth disease, but certain sheds, feed lots, corrals, or pastures become affected with the germs causing the disease, which enter the tissues when the mouth or leg is injured by briars, stubble, rough forage, etc., and set up disease. During the winter when snow is on the ground and the weather so cold that the surface of the snow becomes hard and crusted, thus making grazing very difficult, the disease may spread very rapidly and easily, owing to the numerous scratches received upon the nose and feet becoming infected with the blood and bits of scab which drop from the affected sheep.

Lip and leg ulceration is caused by the necrosis bacillus, and as the skin of the legs, muzzle and lips are involved in many cases, the name of necrotic dermatitis (necrotic inflammation of the skin) has been applied. It quite frequently happens that the ulcers and

sores on the outside of the lips extend into the mucous membrane, lining the inside of the lips, as well as to other parts of the mouth, or lesions of the mouth may occur through licking the ulcers on the legs, which accounts for the disease being also termed necrotic stomatitis (necrotic inflammation of the mouth). The important things to be recognized are the nature and cause of the disease, and in this connection it may be stated that all the differing manifestations of the infection by the necrosis bacillus are often brought together under the term necrobacillosis. Other names which have been given this disease are acute dermatitis in New Zealand; impetigo labialis in Canada; or, crusta labialis, and contagious pustular dermatitis in England and Scotland, and teigmaul and maulgrund in Germany. The disease also exists in the West Indies, New Mexico, Oregon, Kansas, Montana, Virginia, Maryland, and probably in other sections of the United States.

The lesions in the early stage usually appear as an acute inflammation of the skin on the outside of the lips. This pimple-like formation is attended with much inflammatory swelling with a decided tendency toward the formation of pustules. They dry and form crusts of a dark grayish color and of a fungoid appearance. The growths extend rapidly and become in the course of a few days confluent, forming a large diffused scab, which when removed is found to cover an ulcerative surface. Simultaneous with this the lips become tumefied, swelling to two or three times their normal thickness. The appetite usually remains good, but the animals feed with difficulty owing to the sensitiveness of the affected parts. In some cases the scab extends from the lips up over the cheeks, between the eyes, and at times a muco-purulent discharge appears, which adheres to the nostrils and together with the swollen condition of the surrounding tissues causes a more or less complete occlusion of the air passages, resulting in labored breathing upon exercise. In some cases the lesions extend into the mouth, producing erosions on the inside of the lips, on the gums, and on the dental pad or the hard palate. These lesions, which are of a spongy consistence and present a warty appearance, are especially noticed on the lambs.

Lesions on the legs as a rule co-exist with those on the lips, hence the origin of the term "lip and leg ulceration." The sheep at this time will show some lameness, especially if the ulcers appear about the coronet, in the fold of the fetlock, or in the vicinity of a joint. The progress and appearance of the ulcers upon the legs are identical with those upon the lips, and they are soon covered by a thick, dry crust which, when forcibly removed, exposes a granulating surface covered with a creamy pus.

Similar ulcers and crusts due to the necrosis bacillus are occasionally noticed on the teats, udders, and external genitals of ewes and on the sheaths of bucks. This latter condition may occur without any lesions being apparent on the lips or legs, and the disease is then known as necrotic venereal disease of sheep, or big pizzle, sometimes erroneously termed syphilis or clap. As the lambs are born to such diseased ewes they also become infected, the lesions appearing about the head and on the legs as irregular ulcers, which later form wart-like scabs projecting above the surface. If the disease is neglected these ulcers may spread over a large area and extend deep into the tissues. The general health of the animal is but little disturbed if the course of the disease is favorable, fever being absent or remaining low (104.-5 degrees Fahrenheit).

Treatment of this disease is very satisfactory if begun in time and applied energetically. It should not be deferred, as better results will be obtained by attacking the outbreak as soon as discovered than can be expected if the disease is permitted to spread among the band or penetrate deeper into the tissues of the affected parts. One of the first steps to be taken in the treatment is to separate all the sheep that are in any degree diseased from those that are healthy.

If only a few animals are affected the best results are obtained quickly to any of the common antiseptic solutions. Should the diseased areas and washing them once daily with a soluton of one of the cresol or coal-tar dips permitted in the official dipping of sheep for scabies, the dip being used at a strength one-fourth greater than that prescribed on the label for scabies. The disease responds quickly to any of the common antiseptic solutions. Should the disease attack a large number of animals the ulcers on the legs may be best treated under range conditions by causing the affected sheep to pass twice daily through a shallow trough containing a 5 per cent solution of carbolic acid or a solution of any of the above-mentioned sheep dips. The ulcers of the mouths may be treated by applying this same solution to the affected parts by means of swabs. Under favorable weather conditions the affected animals may be dipped in one of these dips on two or three occasions with very satisfactory results, provided all the diseased parts are reached by the solution. In case the lesions on the animals have become

far advanced it will be necessary to hand-treat them by applying a stronger solution of the dip, say one part to three parts water, once daily. Four or five applications of this treatment are usually sufficient to cure the vast majority of cases without complications, but those of the aggravated type must be handled for a longer period and with a more penetrating and caustic solution. For this purpose one part of nitric acid in seven parts of water, applied externally to the necrotic area only, will be found very efficacious and easily applied to the most severe cases.

Experience has shown that sound sheep may be safely pastured on land that has previously been occupied by animals suffering from lip and leg ulceration if the winter's frosts have been allowed to intervene. The germs of the disease seem to be effectively subdued by this means, and pastures which have become contaminated one season may be considered safe for their customary usage during the following season. The pens, corrals and sheds, however, must be carefully disinfected to prevent the recurrence of the disease, as these bacilli will retain their virulence under suitable conditions in and around the sheep fold for several years. The walls, racks and troughs should be sprinkled with a solution containing one pound of pure carbolic acid to four gallons of water, to which enough lime has been added to make the sprayed area conspicuous. The manure and a portion of the surface soil of the corrals should be removed and the ground sprinkled with the above solution, or a similar disinfectant.

STOMATITIS APHTHOSA—SPORADIC APTHAE OF THE ORAL MUCOUS MEMBRANE.

By Dr. F. H. Hollingsworth.

CAUSE.

In veterinary medicine, the name of aphthae is given to vesicles on the oral mucous membrane, which are produced by an accumulation of serum under the epithelium of the mucous membrane. It has been known from remote times as "Sporadic Aphthae" and its causes are most probably fungi which attacks forage, particularly those that infect clover. These and other infective fungi produce in some cases a catarrhal, in others an aphthous, and sometimes even an ulcerous or croupy stomatitis.

SYMPTOMS.

The phenomena of aphthous stomatitis consists of the formation of vesicles on the mucous membranes of the lips, cheeks, tongue and gums, which vesicles are filled with serum, and are either isolated or massed

in large numbers. They usually burst in a short time and become changed into congested sores which quickly heal. Besides these vesicles, there are usually symptoms of catarrhal stomatitis, with redness and swelling of the mucous membrane and salivation. We always notice a smacking noise during the movements of the lower jaw, similar to that which takes place in foot-and-mouth disease. After the bursting of the vesicles, the mucous membrane remains painful for some time. There is loss of appetite, rise of temperature which rapidly subsides in dairy and milking cows. Besides the inflammation of the mucous membrane, an erysipelatous dermatitis breaks out on the udder and teat.

DIAGNOSIS.

Sporadic Aphthae may be readily confounded with foot-and-mouth disease. A prompt and exact differentiation is not always possible, especially when several animals become affected at the same time, and when eating the same food. The fact that the disease produced by these fungi cannot be transmitted to healthy animals will be decisive, and consequently, in doubtful cases experiments should never be omitted. Also, the coronets of the hoofs in sporadic aphthae is free from aphthous lesions, although the animals are foot-sore, are found lying down most of the time, saliva stringing from the mouth and refuse food or drink, and consequently, great emaciation.

THERAPEUTICS.

The treatment constists of frequent rinsing out of the mouth with disinfectant and astringent lotions, such as boric acid, creolin, salicylic acid; suitable quarters and avoidance of rough forage.

Numerous cases of Stomatitis Aphthosa have occurred throughout the state, and especially in southwestern Iowa along the Missouri river. Perhaps the most serious outbreak occured in the vicinity of Council Bluffs, and at the State Institution at Glenwood, where it was at first mistaken for foot-and-mouth disease. The necessary treatment was applied and the usual sanitary measures enforced.

FOOT-AND-MOUTH DISEASE.

This disease has never occurred in Iowa, though it has appeared in the United States at intervals during the past forty years, the last being in the fall of 1908, when it was found in Pennsylvania, New York, Maryland and Michigan.

Prompt action was taken and a quarantine proclamation by the Governor of Iowa was published against the importation of cattle from localities in which the disease existed. This quarantine was raised the following year, when the disease had been thoroughly stamped out.

During the period of the quarantine, numerous calls were received at this office from points in Iowa on account of cattle supposed to be infected with foot-and-mouth disease, notably from one of the state institutions, which had recently imported cattle from one of the states mentioned. Upon investigation it was found that these animals were infected with cow pox, which yielded readily to treatment.

Circular No. 141 of the Bureau of Animal Industry contains a thorough description of this disease and methods for its treatment and eradication.

CONTAGIOUS ABORTION.

General abortion among mares was investigated in Wayne and adjoining counties.

While this disease does not appear to be prevalent in the state at the present time, there are no doubt a number of cases which have not been reported.

The following article on "CONTAGIOUS ABORTION OF CATTLE," written by DR. F. J. NEIMAN, treats of the nature of this disease:

This is quite an old disease, and while I have nothing new in particular to offer on the subject, my observation would indicate that the disease is not on the increase, only an occasional outbreak confined to a farm, or an adjoining farm being called to my attention.

No doubt, the disease is due to a micro-organism, but whether or not the bacteriologists have isolated the germ, that fulfills Kochs postulates, I am not prepared to say. According to European and American investigators, there are several species of micro-organisms that will produce the disease.

The manner of infection is usually directly due to an infected bull during copulation, although, occasionally, the infection is transmitted indirectly by the animal coming in contact with infected material, either through the digestive or respiratory tracts.

No aborting animals should be bred until after two or three oestrums. Bulls which have served cows of infected herds, should not be permitted to serve healthy cows for some time. Careful local disinfection should be carried out and the animal withdrawn from the stand. Where value is not too great, I would advise that they be isolated, fatted, and sold for slaughter. This would apply to the female as well.

Taking into consideration the long period of incubation and the resisting power of the micro-organism causing the disease, sanitary measures require time and isolation of infected animals, especially those aborting. The resisting power of the animal gradually increases until after two or three abortions, the animal becomes immune.

Some become sterile after an attack, but this is not usually the case, and the time required to establish immunity is too long, and the loss is too great. In combating the disease, bear in mind the long period of

incubation, the resisting power of the germ, and do not expect immediate eradication of the disease, as some animals will harbor the germ some time after the treatment has begun.

Therefore, I would advise the removal of the placental membrane not later than twenty-four hours after an abortion. Thoroughly irrigate the uterus with a good antiseptic solution, followed by frequent vaginal irrigations. Separate attendants would be beneficial. Occasionally, wash and disinfect the hind quarters of animals and all stalls, or materials they may come in contact with.

This should be kept up for some time, as an animal may be sterile herself, but still harbor the germ, and so be infectious to others.

COITAL EXANTHEMA.

Cases of this disease have been discovered at various points in the state. The disease is not fatal and yields readily to treatment.

The disease is characterized by vesicles and pustules on the external genitals, and attended by great local irritation. It usually runs a mild course of from seven to fifteen days.

It is known as a contagious disease. It is communicated from animal to animal by coition.

The symptoms are sometimes mistaken for those of maladie du coit.

FEDERAL MEAT INSPECTION.

The first positive step taken toward the inspection of meat in the United States was the enactment of the Federal Meat Inspection Act of March 3, 1891. That act merely authorized the certification of the absence of disease in meats inspected.

The act of June 30, 1906, extended the scope of this service.

Under the first-named act, inspection had been conducted at 163 establishments in fifty-eight towns and cities up to June 30, 1906. During the year following this date, inspection had been conducted in 708 establishments in 186 towns and cities. Since the enactment of the new act there have been 2,290 employes as against 981 under the former act. The appropriation under the first act was $771,661, and the new law provided a permanent appropriation of $3,000,000 for meat inspection.

There are three forms of slaughter: (1) Wholesale and packing; (2) Slaughter by small butchers; (3) and farm slaughter.

Government inspection covers only the first-named for interstate and foreign shipment.

During the year 1908 there were slaughtered under government inspection 7,279,271 cattle, 1,958,274 calves, 38,643,105 hogs, 10,304,662 sheep and 42,981 goats. These animals were slaughtered at 340 different abattoirs. In addition to this, government inspection is conducted in a large number of establishments where no slaughtering is done, inspection having been made during the year mentioned at 810 establishments located in 221 cities. This is an increase over the preceding year of 108 establishments and eighty-five cities.

Packing houses, in order to secure the inspection service, are required to conform to the rules and regulations of the department respecting the disposition of condemned carcasses and waste, and to observe sanitary regulations, etc.

Under the provisions of the Pure Food Law, government inspectors pursue the packing house products into the channels of trade and protect the consumer from misbranding, adulteration and unsanitary treatment generally.

Animals are examined before slaughter and after. Due precautions are observed to preclude the dissemination of germs from diseased animals.

The smaller, local slaughter houses are almost invariably unsanitary and uncleanly. It is recommended that municipal slaughter houses be established wherever practicable, subject to inspection and regulation.

In Germany the municipalities own the slaughter houses, and cleanliness and sanitation has been the result. More than six hundred cities own their slaughter houses in that country.

It is estimated that about 5,000,000 cattle, 8,000,000 sheep and 10,000,000 hogs were slaughtered in this country in 1907 without government inspection. These 26,000,000 animals were passed on to the consumer without regard to their condition with respect to disease, except such local restrictions as may prevail in certain localities.

Municipal slaughter houses not only tend to cleanliness and safety from infection, but also promote economy in the utilization of waste products. These products are utilized to far greater advantage in a large plant than in a small one. Cattle dress only about 60 per cent of live weight, sheep 50 per cent and hogs 80 per cent. The remainder is waste, unless there are facilitis for transforming it into salable commodities. In cattle, the value of the hide and offal if properly handled equals 15 per cent of live value of animals. The skillful removal of hides in the larger plants often results in an increased price for hides of about 1 cent a pound, over that paid for skins improperly removed by small butchers and farmers. Other items are correspondingly enhanced in value under systematic and economical treatment.

It will thus be seen that municipal or combined slaughter houses are advantageous both to the dealer and the consumer. A full knowledge of conditions in many of the smaller slaughter houses would cause the public to demand thorough inspection and sanitary regulation. It is possible under the present system to introduce into the markets meat fairly reeking with germs. Such meat is innocently purchased every day by patrons of the market.

In any other line of food products, this indifference is regarded as almost criminal. The meat industry owes to itself a thorough inspection of its products, and an effective system of sanitary regulation, not only of the output of the larger plants where the government inspection prevails, but of *every* establishment where animals are slaughtered for the public market.

HOG CHOLERA SERUM.

At the earnest solicitation of the chief of the Bureau of Animal Industry, the State Veterinarian in 1908 visited the Bureau's hog cholera experiment station at Ames, together with live stock sanitary boards and veterinarians from other states, in order to become familiar with the methods of manufacturing serum for the prevention of hog cholera devised by Drs. Dorset, McBride and Niles of the Bureau named.

The Thirty-third General Assembly was urged to make some provision for the manufacture of hog cholera serum under state supervision, and accordingly the present law relating to this subject was passed, which appears in full elsewhere in this report.

The following circular was issued and distributed:

HOG CHOLERA SERUM.

A vaccine for the immunization of hogs against hog cholera. Manufactured by the State of Iowa, under the direction of the State Veterinary Surgeon.

MANUFACTURED UNDER DIRECTION OF STATE VETERINARIAN.

Chapter No. 151, of the laws of the Thirty-third General Assembly of Iowa, provides for the establishment of a laboratory at or near Des Moines for the manufacture of hog cholera serum. This serum is to be manufactured under the direction of the State Veterinary Surgeon and furnished to applicants within the State of Iowa, with instructions for its use, at cost of manufacture.

LABORATORY ESTABLISHED.

The laboratory for the manufacture of this serum has now been established and the serum will be produced by the same method that is employed by the United States Bureau of Animal Industry.

VALUE OF SERUM.

It is to be understood that this is not a cure for hog cholera or swine plague, but is intended as a preventive measure in case of an outbreak or where an outbreak is threatened.

In cases where the disease has had a chance to advance, it is possible that some of the hogs will contract the disease to a fatal extent and

develop cholera and die from it before the serum has had time to take effect, so it is very important that the treatment should be applied as early as possible in case the disease makes its appearance.

SHOULD BE VACCINATED.

When the disease makes its appearance in a herd or in the neighborhood, all the well hogs should be vaccinated, and all the sick hogs should be destroyed and burned and should any of the vaccinated hogs develop cholera, they too should be destroyed and burned. This will prevent, to a certain extent, the spread of infection. Diseased hogs should be removed from the public highway and the pens and enclosures thoroughly cleaned and disinfected. Hogs should be kept in dry pens; dogs should be kept tied as they may carry the disease. Wagons or hog racks used to remove the dead hogs must not be taken onto a neighbor's premises. Only the one whose duty it is to feed and care for the diseased hogs should be allowed near the pens; this attendant to keep away from neighbor's hog pens or enclosures.

THINGS TO BE REMEMBERED.

As a preventive measure when the disease appears in the neighborhood the following precautions should be observed:

Keep your dog tied up as it might carry infection.

Do not allow your hogs to run, but keep them in small, dry pens or enclosures.

Breeding hogs shipped in from other points should be kept apart from the drove for at least two weeks before being allowed with animals of their kind.

If an outbreak of the disease has been experienced, no fresh hogs may be permitted to be brought onto the infected premises until six months after the last hog thereon has died or recovered.

Every effort should be made to carry out the above instructions as all hogs are susceptible and it should be borne in mind that "an ounce of prevention is better than a pound of cure."

PRICES.

This serum is put up in bottles of three different sizes, containing 60 c. c., 120 c. c., 240 c. c., prices of which are $1.50, $3.00 and $6.00 respectively; these prices being subject to change. The quantity of this serum necessary to immunize a hog is regulated by the weight of the hog; pigs 2 to 4 weeks old requiring 8 c. c., 4 weeks to 75 pounds 8 to 16 c. c., 75 to 125 pounds 20 c. c., 125 to 175 pounds 30 c. c., 175 to 225 pounds 40 c. c., 225 pounds and upward 60 c. c.

VETERINARIANS SHOULD BE EMPLOYED.

This serum is thoroughly tested before it is sent from the laboratory and it is advised that a veterinarian be employed to apply this treatment, as they are better acquainted with the conditions and indications, thereby assuring the best possible results from the use of serum.

This serum may be had upon application to the Director of the laboratory at prices quoted, each bottle being labeled with instructions and quantity necessary for hogs of various sizes.

Further information furnished upon application.

PAUL O. KOTO,
State Veterinary Surgeon.

Director Hog Cholera Serum Laboratory, Des Moines, Iowa.

SERUM PLANT.

In carrying out the provisions of the statute published herewith, this department has secured 114 acres of land north of the state fair grounds, and established thereon the plant described in the law which appears herewith.

More than 100,000 c. c. of serum has been manufactured and over $2,500 has been received from the sale of serum.

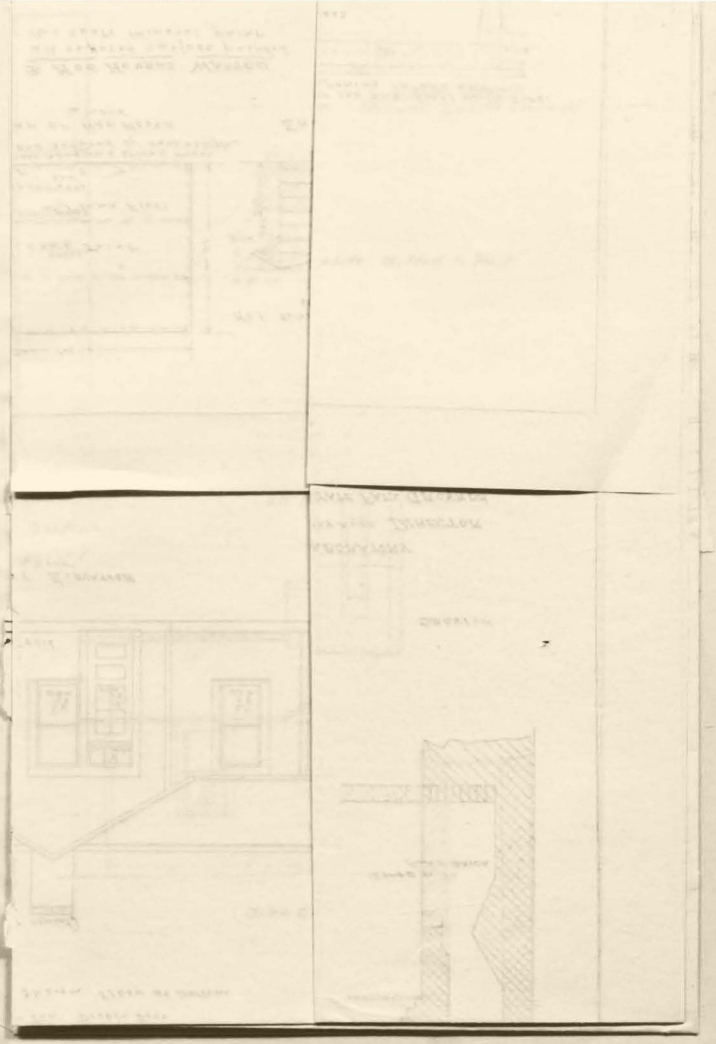
Hog raisers, by promptly notifying this department, may materially aid in eradicating the disease, as well as contributing to their own advantage. The work is much simplified and the cost greatly reduced by starting early in the spring and reporting every outbreak as soon as it appears.

Accompanying illustrations show the character of the plant used for the manufacture of serum. It consists of a laboratory as shown in cut, shelter pens, crematory and necessary buildings constructed according to plans and specifications designed with special reference to the requirements of this work.

The tract is divided into five and ten-acre lots and fenced with woven wire fencing separated by alleys for the segregation of immune and susceptible hogs.

In constructing the laboratory we have, as nearly as possible, aimed to follow the advice of Dr. W. B. Niles of the Bureau of Animal Industry. We are also under obligation to Dr. Niles and the Bureau of Animal Industry for the necessary supplies of virulent blood and immune hogs with which to start the manufacture of serum.

In view of the certainty of the results of serum inoculation, which have passed beyond the experimental stage into the realm of established fact, this establishment must be regarded as indispensable to the satisfactory regulation and treatment of cholera in hogs, as the disease occurs at various points throughout the state and is brought to our attention. The production of serum under state auspices has been generally established throughout the country



and meets the requirements as to uniformity of strength and reliability as to quality, etc. The manufacturing of serum should receive the continued support of the state, in order that the great industry of hog raising may not suffer.

HOG CHOLERA AND ITS PREVENTIVE TREATMENT.

HOG CHOLERA.

BY DR. R. E. GRAHAM.

Hog cholera or swine fever is an infectious disease characterized by its contagiousness and high death rate, attacking swine in two forms; the acute and chronic types. The former is characterized by its sudden onset and rapid course which terminates in death, while the latter or chronic form lingers for weeks and even months and generally results in death. Recovery produces a nonsusceptibility to subsequent attacks. The causative agent is supposed to be the same in both cases, the courses or type of the disease being determined by the virulency of the organism and the resisting power of the hog. The lesions of the peracute cases are not as well defined as those in subacute and chronic cases, and a carcass from the very acute type might not show sufficient lesions to diagnose the case while in the subacute or chronic cases the intestinal lesions predominate, showing circumscribed or diffused ulcers in mucosa of the stomach, button like ulcers in the colon, inflammation of the entire intestinal tract and ulcers at the ileo caecal valve, the latter being the most certain pathognomonic lesion in hog cholera. In general outbreaks the most acute types are seen at first, followed by the less acute and sometimes the chronic form. The infection on being passed from one animal to another gradually becomes weakened. Mortality varies from 70 to 100 per cent.

CAUSES.

Until recent years the bacillus cholera suis has been accepted as the specific cause of hog cholera. The work of De Schweinitz, Dorset, McBride and Niles proved the hog cholera bacillus to be a secondary invader and the ultimate primary cause was an invisible, ultramicroscopic micro-organism, a virus in the blood and excretions of the latter, the urine in particular. If the cause is a germ, it is so small, or perhaps unstainable, and the strongest microscopes will not detect it. After removing the bacillus cholera suis by passing through a porcelain filter, the filtrate when introduced subcutaneously seldom produced the disease, but on intravenous injections of the same cultures, occasionally resulted in death.

Schreiber considers the toxin formed by the hog cholera bacillus as the exciting cause or that the ultra microscopic virus is an excretion of the true bacillus of hog cholera. Hutyra considers the virus responsible not only for the so called hog cholera but for the swine plague as well. In conclusion it has been generally accepted that the ultra-microscopic micro-organism or virus is the primary cause, and the bacillus cholera suis a secondary invader.

PREDISPOSING AND ACCESSORY CAUSES.

Anything which lowers the vitality of animals renders them more susceptible to disease upon being exposed. For example, improper feed, a one-sided ration of corn, so common in corn raising districts, impure water from stagnant pools and poorly drained hog lots, unsanitary, ill-ventilated houses, filthy troughs, buckets and slop barrels. These things in themselves do not cause cholera but they render an animal less resistant and therefor an easy victim upon being exposed.

Pens and houses in which cholera hogs have died should be considered infected. The feces and urine passed by the sick animals may contain the germ and be carried to all parts of the lot on the feet of healthy hogs, or by the attendant from one pen to the others. Anything which tends to scatter dirt, manure, water or feed from infected pens as birds, rats, dogs or streams can spread the disease. Buying of hogs from recently infected herds may spread the disease and should be guarded against. Hogs which are shipped should especially be considered as a source of infection, as stock yards, highways and stock cars are often used to convey and shelter cholera hogs without a subsequent disinfection.

To avoid this, hogs received via railroads should be quarantined twenty days before being allowed to enter the herd, as they might develop cholera from exposure in cars or in stock yards. This is often times the case on returning hogs to a herd after exhibiting at stock shows or fairs, and should be remedied by quarantining upon arrival thereby insuring the remainder of the herd against exposure.

SYMPTOMS.

Probably the first thing noticed by the attendant of the herd is a partial or complete loss of appetite; at this stage the disease is often well along in the incubation period, and in peracute cases death may follow in from six to forty-eight hours, in the subacute or chronic form we observe a longer chain of symptoms; such as loss of appetite dullness, fever; the higher the temperature, the more sluggish the animal appears, and it may lay drowsily around in the shed or buried in the manure pile or straw for hours undisturbed by the surroundings. Constipation or diarrhea may be present in alternate attacks. Persistent diarrhea renders the animal very weak and artificial inoculation lengthens the incubation period. He may stagger and fall helplessly, the weakness being more apparent in the hind quarters, and the animal is often unable to raise himself to his feet, and stands with his hind legs in criss-cross fashion with the abdomen well tucked up. Breathing is labored, quickened and shortened when mucous membranes of the air passages are inflamed. Slight hemorrhages from the nostrils are sometimes observed. Short hacking cough and occasionally slight attacks of the thumps. The eyes may be swollen and inflamed and a purulent sticky discharge glues the lids together making the animal blind. One or both eyes may be affected. The skin of the abdomen, neck, thighs, coronet, nose, ears may show redness, growing darker as death approaches, until finally at the time of death the affected areas of the skin are a dark

No. 9. CREMATORY

purple. Sloughs of skin along the back are sometimes observed leaving raw sores. The skin lesions are more clearly shown in the Chester White and Yorkshire breeds.

It should be understood that all cases of hog cholera do not show all these symptoms. Some cases show one portion of the symptoms while other cases show another, and if all the described symptoms do not happen to appear we are not justified in calling it some other disease, as all cases of cholera are not typical. The outbreaks of hog cholera are comparatively easy to diagnose though in experimental inoculation of the disease at the State Laboratory we have observed very little evidence of typical cholera, and if we had not known the source of the disease, would have hardly been justified in diagnosing it hog cholera.

AUTOPSY.

Suspected cases of hog cholera should be examined after death. The person holding the post mortem should take antiseptic precautions with his hands. Thoroughly disinfecting them before and after, and if receiving any cuts or scratches during the process stronger antiseptics or mild cautery should be used on the part. Though hog cholera is not communicable to man, there is danger of anthrax, septic infection and tuberculosis.

First notice the skin, which may be red or purple, then lay the hog on its back and make an incision through the skin and muscles from the anus along the median line to the throat, laying open the thorasic and abdominal cavities for examination. In peracute cases the lesions are very similar to hemorrhagic septicaemia with hemorrhages in any or all of the tissues accompanied by inflammation of the intestinal tract. The lungs may show various stages of congestion, areas of hepitatization, and fine petechia on their surface, the latter being most characteristic lesions in the lungs of hog cholera. The heart may show hemorrhages in the pericardium, endocardium and myocardium. The lymphatics of the thorasic cavity are dark and congested. The lining membrane of the chest cavity or pleura may show petechia, and occasionally adhesions to the lungs or the walls of the chest cavity are observed. The muscles of the abdomen may show fine hemorrhages, and in subacute cases the intestinal tract shows the most pronounced lesions. The stomach is first to be examined which may show intense inflammation of its mucosa with diphtheritic or necrotic areas. The colon is generally most prominently affected, and often can be noticed through the walls without opening, and is the location of the button-like ulcers of hog cholera corresponding in their location to the solitary lymph folicles of the intestinal tract. The ileo caecal valve is generally the seat of ulcers which are considered, when found, pathognomonic of hog cholera. The mucosa of the small intestine is inflamed and may show necrotic or diphtheritic changes in its lining. The mesentary, or membrane which suspends the intestines, is congested and its lymphatic glands stand out as dark purplish nodules. The peritoneum, or lining membrane of the abdominal cavity, may show fine hemorrhages and deep seated button-like ulcers on the colon may extend to the serosa and result in septic

peritonitis. The kidneys are covered with hemorrhages varying in size after the peritoneal covering has been removed. The kidney is also darker in color than normal. The mucosa of the bladder may show petechia and intense inflammation with hemorrhages which accounts for the slightly blood stained urine, which is sometimes passed. The body lymphatics do not become affected as do the visceral but the inguinal, cervical, sublumbar are generally larger than normal and slightly congested.

IMMUNITY.

The rapid advances made in the study of immunity during the past few years render it essential that we consider a few of the basic principles upon which the serum immunization against hog cholera rests before describing the process.

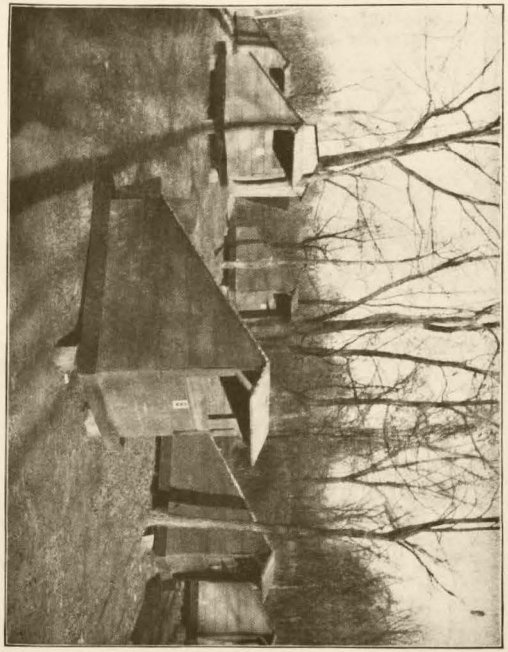
Immnuity is that condition in which an individual or species of animal exhibits unusual or complete resistance to an infection for which other individuals or species show a greater or less degree of susceptibility. Consequently it is only in connection with infectious diseases that we consider immunity. Immunity may be of various types. We have for example, natural imminity, when individuals or species possess an inherent quality which prevents them from contracting the disease to which other individuals or species are susceptible. This immunity is not brought about by any condition which occurs subsequent to birth. We have acquired immunity when an attack of a certain infectious disease brings about a change which renders the individual immune to further attacks of the same disease. Varieties of acquired immunity are active and passive. The active immunity, which is usually of a lasting nature, results from infection or intoxication and depends upon specific reaction on the part of the tissue cells in response to the injury produced by the bacteria or their toxins. We have passive immunity when an immune serum is injected and depends upon the introduction of immune bodies rather than their production through an active process on the part of the animal.

Any one of these types of immunity may be relative or absolute, antitoxic, or anti-bacteria. If absolute, infection is impossible. There are temporary conditions such as overwork, hunger or exposure when immunity is relative and infection is possible. Immunity is usually of the relative type.

The distinction between anti-bacterial and anti-toxic immunity is an important one. The serum of an animal which has acquired immunty to tetanus, neutralizes the soluble toxin, but does not necessarily injure the tetanus bacillus itself. This is anti-toxic immunity. On the other hand where the serum of the animal is able to destroy or dissolve the bacteria, as in typhoid, it is known as anti-bacterial immunnity.

ANTITOXIC IMMUNITY.

Anti-toxins are much more stable than toxins. The combination of toxin and anti-toxin is direct and follows the laws of chemical combination. The toxin is composed of two groups, a haptifore or combining



No 10. CHECK PENS

group, the other is the toxifore or poisonous group. The haptifore is quite stable while the toxifore group is destroyed at 55 degrees C. or decomposes on standing, but does not prevent the haptifore group from uniting with a suitable antitoxin. It is only when the haptifore group fits to the receptor of the body cell that the toxin can act. As a result of this injury the body cells are stimulated and receptors are given off in excess, and thrust into the circulation. These free cell receptors constitute the antitoxin. If a toxin now enters the body, similar to the one which leads to the production of antitoxin, the haptifore group of the toxin will unite with the antitoxin and prevent the poison from damaging the body cells.

ANTIBACTERIAL IMMUNITY.

In this, two constituents of the specific serum are concerned in its destructive powers, instead of one as in antitoxic immunity. One of these is able to withstand heating to 55 degrees C. and is contained only in the specific serum. The other is destroyed by heating to 55 degrees C. and is contained in the serum of normal untreated animals as well as in the specific bactericidal serum. For this reason, if bactericidal serum is rendered inactive by being warmed to 55 degrees C., it can be reactivated by serum from a normal animal. The less stable constituent of bactericidal serum which is found in normal serum is known as the complement. The other which is stable and found only in specific serum is termed amboceptor. The ferment-like action, or digestive action of the complement cannot injure the bacterial cell until the cell has been rendered suceptible to the action of the complement by the amboceptor. The complement which possesses the digestive power decomposes on standing and does not exist in immune serum unless it is perfectly fresh. This explains why bacteria are not dissolved by bactericidal serum after it has stood for some time; also why it may be reactivated by adding a little fresh normal serum, or by injecting it into the living animal. It also explains why a serum may be inactive in test tube experiments and intensely active in the living body, in which it finds the complement necessary for its action.

The amboceptor, or immune body as it is sometimes called, possesses two binding groups, one which attaches to the bacterial cell and the other to the complement of the normal serum, and it is only through the immune bodies that the complement can affect the bacterial cells. Therefore, the immune bodies or amboceptor is the exclusive factor in the specific action of the bactericidal serum.

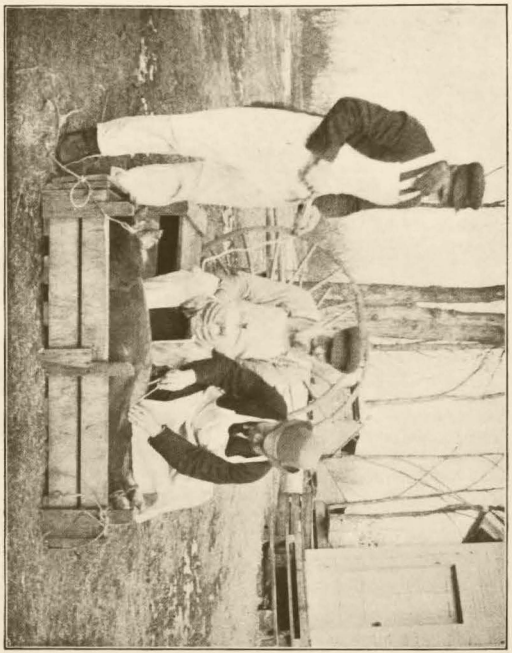
A great variety of inter-bodies are found in small amounts in normal serum, and in addition a considerable amount of complements. In immune serum, on the other hand, an enormous increase in the amount of specific inter-bodies occurs, which constitutes the immune bodies or amboceptors. The complement is not increased by the immunizing process. Only one of the necessary constitutents is therefore supplied by the injection of an immune serum, and that is the immune body. The other necessary bodies or complements are found in the animal to be treated.

When hogs have passed through an outbreak of cholera, we speak of natural acquired active immunity. When treated with serum a hog acquires artificial passive immunity. When treated by the serum simultaneous method, the hog has artificially acquired active immunity. Naturally acquired immunity is always active inasmuch as we have seen that the cells of the body must take active part in overcoming the infection.

If immunity in hog cholera is antibacterial, the following would be in harmony. When a hog recovers from infection with hog cholera virus, he will have developed during his recovery, a large number of amboceptors or immune bodies. If he is now treated with a large quantity of virulent blood, the cells of the body would be stimulated to an increased production of amboceptors which would consequently be found in large numbers in the blood; the complement would not be increased. If the serum is now drawn from the animal the complements soon decompose on account of their unstable character, but the immune bodies being quite stable, would remain in the serum indefinitely unless subjected to a high temperature. If the serum is now injected into a hog without subsequent infection, the immune bodies would, in the process of metabolism, be eliminated from the body within a few weeks or months. If the hog became exposed at about the same time by artificial inoculation, or natural infection, the immune bodies would unite with the receptors of the virus, and through the medium of these immune bodies, the complement which is found in all normal serum, would destroy the virus. If the hog had become infected sometime previous so that the virus was present in considerable quantities, the amboceptors or immune bodies which would be contained in an ordinary dose of serum would be insufficient to prepare all of the virus for the action of the complement. Consequently, the use of serum would have very little, if any, effect upon the course of the disease in already affected animals. If the serum is of low potency, that is, containing few immune bodies, and the virus very virulent in the simultaneous method, we would expect unfavorable results. The serum simultaneous method would not be indicated where the opportunities for infection in the natural way are sufficient; and when used, the resistance of the animal, the virulency of the virus, and the potency of the serum should all receive due consideration.

IMMUNE HOGS.

There are two methods by which they can be had. Firstly, by the serum alone method, and exposure to the disease by allowing the subject to associate with hogs affected with cholera after giving him the prescribed dose of serum depending upon his weight. Secondly, the serum simultaneous method. It is the same part as the serum alone method but consists in artificially exposing the subject by introducing two cubic centimeters of blood in the opposite thigh, not necessitating him to associate with cholera hogs. The latter method is faster. We aim to have a supply of immunes on hand at all times for our serum tests.



NO. 11. INTRAPERITONEAL HYPERIMUNIZATION

HYPERIMMUNING.

Hog cholera serum is nothing more or less than the defibrinated blood of hyperimmunes with proper antiseptics added for preserving it and consists of a saturated solution of antibodies to antagonize the germ of hog cholera. There are four ways or methods of transforming an immune into a hyperimmune.

1. The quick subcutaneous method.
2. The slow subcutaneous method.
3. The intraperitoneal method.
4. The intravenous method.

THE QUICK SUBCUTANEOUS METHOD.

This method is often used and consists of introducing subcutaneously in the region of the abdomen ten cubic centimeters of virulent blood to the pound of live weight of the immune. For example; an immune weighing 150 pounds should receive fifteen hundred cubic centimeters of virulent blood at one dose to hyperimmunize him by this method. This method often causes leakage through the needle wounds owing to the great pressure produced by the introduction of such great quantities of blood under the skin. Again we have experienced more abscesses from this method than any other; it is also more severe on the hog and sometimes does not seem as sturdy and rugged as when other methods are employed. Though in case of shortage of serum or larger quantities of virulent blood on hand which can be used in the slow method, it can be recommended.

THE SLOW SUBCUTANEOUS METHOD.

This method seems to have the advantage of the quick method in being easier on the hog causing less abscesses, and can be employed when a shortage of virulent blood is experienced, though it requires a longer time to produce a hyperimmune by this method than by the quick subcutaneous. It is administered in three successive doses of one, two and one-half, and five cubic centimeters per pound body weight, from seven to ten days apart. This gives the immune ample time to recover from the transitory effects produced, and he seems to thrive on this treatment. The Iowa State Laboratory has employed this method more than any other. A hog weighing one hundred and fifty pounds would require, by this method, one hundred and fifty cubic centimeters for the first dose, three hundred and seventy-five for the second, and seven hundred and fifty for the third.

INTRAPERITONEAL OR ABDOMINAL METHOD.

This consists of introducing the virulent blood directly into the peritoneal cavity. The dose is the same as that of the quick subcutaneous. It leaves no enlargements on the abdomen, but one must be cautious in this method to enter the peritoneal cavity without puncturing the bladder. This method is best employed by suspending the immune by his hind legs allowing the abdominal contents to rest on the diaphragm, then inserting the needle through the wall of the abdomen about two or three inches below the anterior border of the pubis and an inch or two to the side of the median line to avoid puncturing the bladder.

INTRAVENOUS METHOD.

The virulent blood by this method is introduced directly into the venous circulation via the ear vein at one dose. It requires five cubic centimeters per pound body weight of the immune to produce a hyperimmune and has the same advantage that the slow subcutaneous method has because it can be employed when there is a scarcity of virulent blood. We have experienced some difficulty at the Iowa State Laboratory with this method being unable, at all times, to enter the vein. The ears of some hogs are very coarse, and the vein scarcely visible. In such subjects, we advise some other method be employed, though when possible use the intravenous method as it has been said that the serum produced by this method is, if any different from that of any other methods, a trifle more potent. An immune weighing one hundred and fifty pounds should receive seven hundred and fifty cubic centimeters of virulent blood by this method.

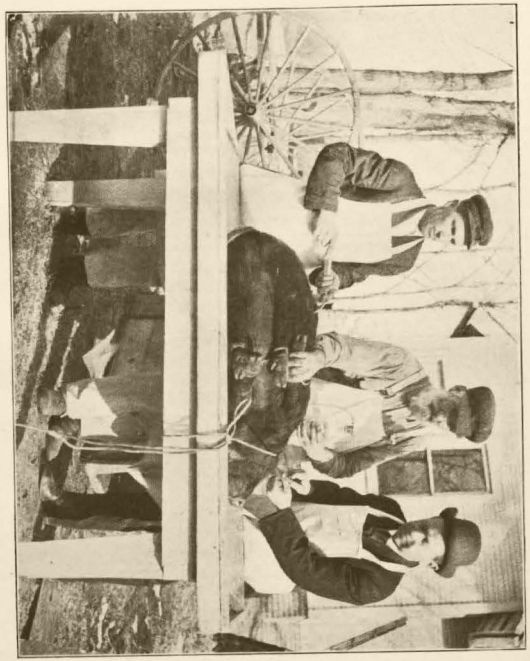
METHODS OF RESTRAINING HYPERIMMUNES:

The Iowa State Laboratory employes crates to restrain the immunes during the process of hyperimmunization for the quick and slow subcutaneous methods. Three different sized crates are used to handle hogs weighing from one hundred to three hundred pounds. For the intravenous method, we have found the crate impracticable and place them on the table. For the intraperitoneal method, we suspend them by the posterior limbs.

The crate is composed of two sections, the division line dividing the crate into upper and lower halves with a trough in the upper section which the hog rests in while being treated. The two halves of the crate are firmly coupled together by means of hooks. After crating the hog, ropes are placed on the front feet drawing the ropes up and over the outside of the upper half of the crate through the division line of the upper and lower section. The ropes are now tightened so that the front feet are drawn from the floor of the crate to the division line separating the upper and lower section, and the two ropes firmly tied together on top of the crate. The crate is now turned upside down which places the immune on his back in the upper section with his front feet firmly tied down; the lower section is now uncoupled and removed and the posterior limbs tied to the corners of the crate, and the hog is firmly held while the treatment is being administered. We have found this a most satisfactory way of handling our immunes for quick and slow subcutaneous methods of hyperimmunization.

REHYPERIMMUNIZATION:

Rehyperimmunization is often employed to save time and money in the production of serum and can be used regularly if the demand for serum does not necessitate the killing of the hyperimmune at the fourth bleeding. It consists in retreating the hyperimmune one or two days after the fourth tail drawing, with one half the amount of virulent blood primarily used to hyperimmunize him as in the quick and slow subcutaneous or peritoneal methods, it would require only five cubic centi-



No. 12 HYPERIMMUNIZING—EAR VEIN METHOD

meters per body weight. In the intravenous method, two and one-half cubic centimeters per body weight is sufficient.

The Iowa State Laboratory employes this practice of rehyperimmunizing on all fit subjects; the one requisite being length of tail. This enables us to obtain seven tail drawings, four before rehyperimmunizing and three after, beside the final carotid drawing.

BLEEDING OF HYPERIMMUNES:

Ten days after hyperimmunizing, we take the first tail drawing and repeat this every seven days for two successive times and the fourth drawing the hog is killed by bleeding from the carotid, but if we wish to rehyperimmunize, the fourth tail drawing is taken and in one or two days the hog may be rehyperimmunized. Then in ten days, the fifth tail drawing is taken and at intervals of one week the sixth and seventh are drawn, and one week later the eighth drawing is taken from the carotid artery, and the animal killed.

The amount taken at a bleeding varies as some hogs would stand the loss of blood better than others. We aim to extract five cubic centimeters per body weight at each tail drawing, though in one case we took as high as ten cubic centimeters, and have experienced difficulty in drawing five cubic centimeters per body weight in others. The hogs that are being bled for serum should receive nourishing food and good shelter. The blood as it is drawn into sterile jars is defibrinated by shaking or stirring with a sterile glass rod and one-half of one per cent. phenol added as a preservative. The serum from each hog is kept separate in a large bottle until the hog is killed, and each drawing is labeled on the bottle with date the drawing was made. This is done to avoid mixing any serum from hogs that upon post mortem show lesions of any disease, such as tuberculosis.

CRATES:

Crates are also used in bleeding hyperimmunes as well as in producing hyerimmunity at the Iowa State Laboratory; for the latter we have described the crate; for the former, the crate is of simple type, differing in no way from an ordinary hog crate. After securing the hyperimmune in the crate, the end gate is removed and the hog retained in the crate by suspending his hind quarters in a sling, thus preventing the hog from backing out of the crate. A cloth is placed over the crate with a small hole through which the tail is placed making conditions as sanitary as possible.

THE TESTING OF SERUM:

All serum before it is bottled for shipping is tested to determine its potency, waiting until we get the entire bleeding of five or six hogs, and mixing it in a five gallon sterile container. Approximately speaking, we test the serum in one thousand dose lots. From this mixture, we treat six shoats weighing one hundred pounds each, three receiving twenty cubic centimeters, and the other three receiving fifteen cubic

centimeters of the mixed serum, and at the same time in the opposite thigh, two cubic centimeters of virulent blood is introduced; also using the same virulent blood on two shoats without the preventive serum to test the virulency of the cholera blood. If the latter, or check, as they are often called, succumb to the disease, and those with the preventive serum live, we are justified in considering the serum potent, and if used under proper conditions in outbreaks of hog cholera, will aid in checking the spread of the disease. It, however, should never be used on hogs showing symptoms, as it is then too late, for it possesses no curative properties to speak of in limited doses, and therefore should be confined to hogs that have recently been exposed but which show no symptoms.

BOTTLING:

After waiting about twenty days, if our test hogs are healthy and appetite good, and the check hogs are dead, we bottle the serum.

METHODS OF IMMUNIZING AND PREVENTING OUTBREAKS OF HOG CHOLERA:

First. Serum Alone. Method. This consists of using the preventive serum alone and should be employed in outbreaks or upon exposure of the herd before they show symptoms of the disease. If the exposure is not present or subsequent to the use of the serum alone method, the immunity is only temporary or passive nature, lasting possibly two months. This method, therefore, should be employed in outbreaks upon hogs which show no symptoms. It is often used by men who ship hogs to state fairs or exhibitions to tide them over the period of travel and avoid any infection to which they might be submitted in cars or stock yards. In chronic cases of hog cholera, the serum does not give reliable results, showing again the serum is a preventive, not a curative.

Second. Serum Simultaneous Method. This method requires the same dose of serum, but in conjunction with it a small amount of virulent blood is used, being injected into the opposite side. This method is employed when the disease or exposure is not present and produces a permanent active artificial immunity. This method has been questioned by some in the past, but it seems to be coming into prominence on account of the longer period of immunity produced by this method. Some stations employ this method almost exclusively.

CHOLERA BLOOD FOR HYPERIMMUNIZING:

After years of work and experimentation, Drs. Dorset and Niles of the United States Bureau of Animal Industry put forth an anti-hog cholera serum, which proved its efficiency in preventing and controlling outbreaks of hog cholera. The state experimental station, and live stock sanitary boards have taken up this work in the different states, and are now producing hog cholera serum by the Dorset-Niles method.

The cultures of the specific organisms of hog cholera cannot be produced in the laboratory, but instead the fresh blood from cholera hog is used. This is drawn under sterile conditions a few hours before death. Shoats weighing from sixty to one hundred pounds are used for

No. 13. FINAL OR COROTID BLEEDING

No. 14. TAIL BLEEDING

this purpose. They receive five cubic centimeters of the virus subcutaneously into the muscles of the inside of the thigh. In from eight to fourteen days, providing the hog is susceptible, and the blood virulent, the hog will develop acute hog cholera. Just before death, the blood is caught in sterile jars under antiseptic precautions, by bleeding from the carotid artery. The blood so drawn is defibrinated, and used immediately for hyperimmunizing purposes after examination of the dead carcass to ascertain the lesions of cholera present.

In our work at the Iowa State Laboratory, we have carried on at times experiments with sodium citrate in the virulent blood as a defibrinator to eliminate the process of stirring and pressing out the clot. As yet, we point favorably to its use. Our work with sodium citrate was carried out in this way. To one-half of the blood drawn from a cholera shoat, we would add sodium citrate, and to the other half we would remove the clot by stirring and pressing, using a small fruit press. With this blood all from the same shoat, but one part having sodium citrate, we made eight checks and no difference could be noticed as they all became sick the same time and showed good lesions of hog cholera. The sodium citrate enables us to save between fifty and one hundred cubic centimeters in each cholera shoat by eliminating the clot, not speaking of the time saved. We used five cubic centimeters of a ten per cent solution of sodium citrate to one hundred cubic centimeters, and experienced no clotting, this was always placed in the jar before the blood was drawn, and necessitates an expert judgment as to the quantity of virulent blood the cholera shoat will produce. Several tests were made using the citrate in the virulent blood with no indications of reducing the virulency, but increased the quantity drawn and also saved time.

As yet we have seen no reason why it cannot be used to advantage in the virulent blood. The following is one of the experiments; we could quote many, but they all ran about the same and deem one sufficient to illustrate our point:

TEST ON SODIUM CITRATE IN VIRULENT BLOOD.

Hog Number	Description	Date Killed
141	Black boar, wt. 70 pounds,	Sept. 22, 1910.
150	White boar, wt. 60 pounds,	Sept. 21, 1910.

On Sept. 14, 1910, each received five cubic centimeters of virulent blood subcutaneously defibrinated with sodium citrate from cholera hogs No. 138, pen No. 2.

151	White sow, wt. 70 pounds,	Sept. 20, 1910.
146	Black sow, wt. 60 pounds,	Sept. 23, 1910.

On Sept. 14, 1910, each received five cubic centimeters of virulent blood defibrinated with sterile rods by beating and stirring from cholera hog No. 138, Pen 2.

In conclusion the results of the serum used by the hog raisers have been all that could be expected in most cases, though in one case contrary results were obtained. This does not, however, offset the successes of the serum treatment.

The appropriation has been inadequate to carry out our work completely though we have done much good. The serum at the present price of fifty cents per dose is above the reach of many farmers, and until an appropriation is made to support our work on a larger scale, the price should remain at fifty cents in order to make the laboratory self sustaining, but this deprives many hog raisers of its benefits.

PER DEIM AND EXPENSE ACCOUNT OF STATE VETERINARIAN AND ASSISTANTS.

PERIOD JUNE 30, 1908, JUNE 30, 1910.

Name	Address	No. days	Per diem	Expenses	Total
C. W. Anderson	Jewell	60	$ 300.00	$ 200.15	$ 500.15
J. A. Anstey	Massena	18	90.00	59.10	149.10
D. E. Baughman	Ft. Dodge	231	1,005.00	461.45	1,466.45
S. H. Bauman	Birmingham	44	220.00	147.20	367.20
F. E. Brazie	Harlan	63	315.00	207.02	522.02
J. W. Bunker	Winterset	29	145.00	91.87	236.87
P. G. Button	Cresco	33	165.00	72.33	237.33
E. A. Buxton	Vinton	18	90.00	27.48	117.48
T. W. Chandler	Davenport	37	185.00	127.97	312.97
N. N. Crawford	Waukon	9	45.00	30.20	75.20
N. J. Delling	Dallas Center	24	165.00	75.10	240.10
Tom Downing	Washington	91½	457.50	277.71	735.21
F. H. P. Edwards	Iowa City	126	630.00	408.39	1,038.39
W. L. Evers	Iowa Falls	42	210.00	119.54	329.54
W. J. Gooder	Osage	8	40.00	29.43	69.43
J. W. Griffith	Cedar Rapids	76	380.00	206.77	586.77
B. Harmon	Decorah	20	100.00	52.85	152.85
S. K. Hazlet	Oelwein	89	445.00	359.94	804.94
F. H. Hollingsworth	Council Bluffs	50	280.00	158.13	438.13
J. D. Inger	Waverly	42	210.00	103.91	313.91
G. A. Johnson	Sioux City	2	10.00	5.85	15.85
S. H. Johnston	Carroll	20	100.00	57.65	157.65
Paul O. Koto	Des Moines			2,464.89	2,464.89
A. Lames	Dysart	4	20.00	7.12	27.12
P. Malcolm	New Hampton	4	20.00	11.80	31.80
W. E. Miller	Cherokee	67	335.00	299.38	634.38
J. H. McLeod	Charles City	27	135.00	61.20	196.20
F. J. Nelman	Marshalltown	146	730.00	566.47	1,296.47
Carl Olson	Sac City	14	70.00	35.95	105.95
F. F. Parker	Shenandoah	7	35.00	13.66	48.66
J. G. Parslow	Oskaloosa	26	130.00	71.58	201.58
A. H. Quin	Ida Grove	4	20.00	15.53	35.53
E. G. Piper	Creston	29	145.00	72.55	217.55
R. F. Readhead	Corning	6	30.00	21.90	51.90
J. R. Saunders	Corydon	3	15.00	7.79	23.79
L. U. Shipley	Sheldon	75	375.00	246.21	629.21
H. C. Simpson	Denison	36	180.00	128.68	308.68
J. H. Spence	Clinton	33	165.00	146.77	311.77
C. E. Stewart	Charlton	27	135.00	81.86	216.86
H. E. Talbot	Des Moines	281	1,405.00	654.93	2,059.93
J. Thomsen	Armstrong	17	85.00	50.51	135.51
G. E. Uehran	Atlantic	13	65.00	38.95	103.95
R. F. Wolfe	Guthrie Center	26	130.00	65.97	195.97
A. L. Wood	Hampton	63	310.00	218.67	528.67
Total		2,024½	$10,122.50	$8,621.51	$18,744.01

ASSISTANT STATE VETERINARIANS.

LOCATION	VETERINARIANS	LOCATION	VETERINARIANS
Ames	W. B. Niles.	*Hampton	A. L. Wood.
Adair	H. A. Alcorn.	*Harlan	F. E. Brazie.
Armstrong	John Thomsen.	Ida Grove	E. G. Piper.
*Atlantic	Geo. E. Uehran.	*Iowa City	F. H. P. Edwards.
*Birmingham	S. H. Bauman.	Iowa Falls	W. L. Evers.
Carroll	S. H. Johnston.	Jewell	C. W. Anderson.
*Cedar Rapids	J. W. Griffith.	Manilla	C. L. Wilhite.
*Charles City	J. H. McLeod.	Mason City	H. M. Gillian.
*Charlton	C. E. Stewart.	*Marshalltown	F. J. Nelman.
Cherokee	W. E. Miller.	*Massena	J. A. Anstey.
*Clinton	J. H. Spence.	*New Hampton	P. Malcolm.
*Council Bluffs	F. H. Hollingsworth.	Mount Ayr	E. C. Sheumaker.
Corning	R. F. Readhead.	*Oelwein	S. K. Hazlet.
*Creston	A. H. Quin.	Osage	W. J. Gooder.
*Cresco	P. G. Button.	Oskaloosa	F. F. Parker.
*Davenport	T. W. Chandler.	Osceola	R. C. Calkins.
Dallas Center	N. J. Delling.	*Sac City	Carl Olson.
*Decorah	B. Harmon.	*Sheldon	L. U. Shipley.
*Denison	Hal. C. Simpson.	Shenondoah	J. G. Parslow.
*Des Moines	H. E. Talbot.	Vinton	A. E. Buxton.
Dysart	A. Lames.	*Waukon	N. N. Crawford.
*Fort Dodge	D. E. Baughman.	*Washington	Tom Downing.
*Dubuque	W. R. Fullarton.	Waverly	J. D. Inger.
Guthrie Center	R. F. Wolfe.	Winterset	J. W. Bunker.

*Registered with Bureau of Animal Industry to apply mallein test to horse stock intended for shipment to Canada.

VETERINARIANS, OTHER THAN DESIGNATED ASSISTANTS, REGISTERED WITH THE BUREAU OF ANIMAL INDUSTRY, TO APPLY MALLEIN TEST TO HORSE STICK INTENDED FOR SHIPMENT TO CANADA.

LOCATION	VETERINARIAN	LOCATION	VETERINARIAN
Ames	C. H. Stang.	Manchester	J. W. Scott.
Belle Plaine	Geo. W. Blanche.	Muscatine	John Tillie.
Council Bluffs	D. H. Miller	New Liberty	H. Hell.
Creston	S. H. Kingery.	Newton	W. E. Sharp.
Davenport	H. G. Thompson.	Spencer	G. G. Baker.
Des Moines	J. L. Gibson.	Waterloo	G. A. Scott.
Des Moines	E. E. Howe.		

RULES AND REGULATIONS.

OFFICE OF THE IOWA STATE VETERINARY SURGEON.

Des Moines, Iowa, July 20, 1907.

Pursuant to authority granted by chapter 14, Title XII, of the Code, section 2530, the State Veterinary Surgeon, by and with the approval of the State Board of Health and the Executive Council, does hereby make and establish the following rules and regulations for the prevention and restriction of contagious diseases among domestic animals.

Rule 1. All cattle brought within this state, from any county or parish within the United States where pleuro-pneumonia is known to exist, shall be subject to quarantine for a period of not less than sixty days.

Rule 2. No person owning or having the care or custody of any animal affected with glanders or farcy, or which there is reason to believe is affected with said disease, shall lead, drive or permit such animal to go on or over any

public grounds, unincloseed lands, street, road, public highway, lane or alley; or permit it to drink at any public water trough, pail or spring; or keep such diseased animal in any enclosure, in or from which such diseased animal may come in contact with, or close proximity to, any animal not affected with such disease.

Rule 3. Whenever notice is given to the trustees of a township, or to a local board of health, of animals suspected of being affected with glanders or farcy, said trustees shall immediately require such suspected animals to be isolated and kept separate and apart from all other animals until released by order of the State Veterinary Surgeon, or some person acting by his authority.

Rule 4. An animal must be considered as "suspected" when it has stood in a stable with or been in contact with, an animal known to have the glanders, or if placed in a stable, yard or other enclosure where a glandered animal has been kept.

Rule 5. Whenever any animal affected with anthrax, glanders, or farcy shall die, or shall be killed, the body of such animal shall be immediately burned, or shall have kerosene poured over it and buried not less than four feet deep without removal of the hide or any part of the carcass.

Reasons for Rule 5. To prevent the possibility of a recurrence of these diseases from germs existing in the grave which, if not destroyed by some powerful agent, will retain their vitality for a number of years, so as to impart the disease. As they are communicable by innoculation to human beings, great precaution should be used in handling animals affected with these diseases.

Rule 6. No animal diseased with glanders or farcy shall be deemed to have any property value whatever, and no appraisal thereof will be made.

Reason for Rule 6. Glanders is an incurable disease, and there is no warrant for expending public money in appraising property manifestly worthless, and which can be compensated for only at "its actual value in its condition when condemned," also to prevent the introduction of diseased animals into the state, and the inoculation of worthless ones for speculative purposes.

Rule 7. Whenever the owner or person having in charge any animal declared by the State Veterinary Surgeon or other authorized person to have the glanders, still neglect or refuse to destroy said animal, the premises whereon such animal is kept shall be quarantined until such animal is destroyed and the premises thoroughly disinfected.

Rule 8. The term "quarantine" shall be construed to mean the perfect isolation of all diseased or suspected animals from contact with healthy animals, as well as the exclusion of such healthy animals from the yard, stables, enclosures or grounds wherever said suspected or diseased animals are, or have been kept.

Rule 9. So-called "piggy" or pregnant sows and rejected cattle found in railway or packing-house stock yards must not be sold nor delivered to farmers, but held subject to such quarantine as may be deemed necessary to prevent the communication of any contagious disease.

Rule 10. All hogs presented for the Iowa State Fair and Sioux City Fair shall be subject to examination by the State Veterinary Surgeon before entering the fair grounds, and to daily inspection during the exhibition. Should any animal be found diseased with hog cholera or swine plague, it must be immediately removed to a place of quarantine. The show-pen must be cleaned and disinfected under the supervision of the State Veterinary Surgeon before and during the fair.

Rule 11. In suspected cases of glanders and farcy, when the symptoms do not warrant the State Veterinary Surgeon in condemning the animal, the mallein test shall be recognized as a valuable diagnostic.

Rule 12. In suspected cases of bovine tuberculosis, the tuberculin test shall be recognized as a valuable diagnostic.

Rule 13. The State Veterinary Surgeon is hereby authorized and directed to co-operate with the United States Bureau of Animal Industry and may formulate and publish printed instructions for the use of local boards of health petraining to the treatment and the prevention of the spread of contagious diseases among domestic animals.

Rule 14. It shall be the duty of local boards of health upon the appearance of contagious or infectious diseases among domestic animals, to adopt speedy measures to eradicate the same, and to co-operate with the State Veterinary Surgeon to secure such results in the shortest possible time.

Rule 15. Whenever the State Veterinary Surgeon shall have knowledge of an outbreak of any contagious disease among domestic animals, he shall take such action as he may deem necessary for the prevention of the spread of such disease or diseases, and is authorized to call any assistant veterinary surgeon or other person to aid him in the prosecution of his duties.

Rule 16. The flesh of pregnant animals shall neither be sold nor used for human food after the seventh month of pregnancy for cows and the tenth week for sows.

Rule 17. The importation of registered cattle or cattle eligible to registry for breeding and dairy purposes into this state is prohibited, except when such cattle are accompanied with a certificate from an inspector recognized by the authority charged with the control of domestic animals in the state from whence the cattle come, certifying that said cattle have been subjected to the tuberculin test within sixty days next preceding the date of such importation, and free from disease.

Rule 18. Township trustees and local health officers of towns, villages and cities are hereby authorized and instructed to seize and hold in quarantine all live stock in violation of above rule, and to notify the State Veterinary Surgeon at the Capitol Des Moines, Iowa. The expense of quarantine and examination must be paid by the owner (or agent) of the quarantined animals as prescribed by law.

Rule 19. This shall not be held to apply to cattle brought into the state from other states for the purpose of exhibition at the state, district or county fairs; provided, that in the event that sales shall be made from such exhibition herds, to remain in the State of Iowa, such cattle so sold shall be first submitted to the tuberculin test before the sale is consummated and the cattle are shipped to their destination.

Rule 20. Whenever the State Veterinary Surgeon shall have knowledge of any horses, cattle, sheep or swine affected with scabies (mange), it shall be his duty to place such animals in quarantine and require owners to dip such animals until cured from such disease.

Rule 21. It shall be the duty of any city or local board of health, or township trustees, whenever notice is given by the State Veterinary Surgeon, or person acting by his authority, of animals being affected with rabies or having been exposed to the disease, to require such animals to be isolated, tied up, and kept separate from all other animals until released by order of the State Veterinary Surgeon. It shall also be the duty of said city or local board during such outbreak, to destroy all stray dogs or dogs owned by persons violating the rules of this section.

Rule 22. Animals reacting to the tuberculin test shall be kept in strict quarantine at the expense of the owner; or destroyed on the premises; or slaughtered at a packing house where federal inspection is maintained, the owner to receive the price paid by the packing house, its actual value in its condition when destroyed.

DISINFECTION.

Among the most efficient and convenient agents for destroying disease germs are heat, solution of creolin, carbolic acid, sulphate of iron, caustic soda, or sulphate of copper, fumes of chlorine, chloride of lime, slaked lime, lime water, whitewash, and kerosene oil.

Heat. This is conveniently applied by means of boiling water or oil, and is especially recommended for disinfecting fabrics of all kinds, leather or wood. Articles of iron or other metals may be purified by heating in a fire. All bedding, litter, excrement, etc., that have accumulated about animals affected with any form of contagious disease, and the carcasses, together with all blood or other fluid elements that have escaped from such carcasses and contaminated soil, should be burned, as surest means of eradicating disease.

Dirt or earth floors of stables wherein animals affected with glanders or anthrax have been kept, should be removed to the depth of four inches and burned.

SOLUTIONS.

Creolin.—One to fifty or one hundred parts.

Carbolic Acid.—Add one part of the acid to five or ten parts of water or oil.

Whitewash.—For disinfecting interior walls of buildings, feed-boxes, mangers, yards, fences, etc., the application of a coating of whitewash prepared from lime in the ordinary way, so thoroughly done as to completely cover every part of the surface designed to be cleansed, is an economical method.

FUMIGANTS.

Chloride of Lime.—Chloride of lime and slaked lime for disinfecting floors, yards, carcasses, and grounds where dead or diseased animals have lain, in fine powder, shall be scattered over the surface of objects to be disinfected, thickly, so as to form a complete covering.

Chlorine.—To generate, take peroxide of manganese (to be obtained at any drug store), place in earthen dish, and add one pound of hydrochloric acid (sometimes called muriatic acid) to each four ounces of the peroxide of manganese. Care should be taken not to inhale the gas.

After the floors, walls, etc., of a contaminated building have been cleansed, they should be fumigated with some of the foregoing agents. The doors should be closed and the building otherwise made as tight as possible. Fumes should then be evolved in the building for not less than half a day, and the doors kept closed not less than twenty-four hours when air and sunlight should be freely admitted.

BURIALS.

Kerosene Oil.—Carcasses buried in the earth where there is danger of infection by exhumation by other animals should, previous to burial, be thoroughly covered with quicklime, or saturated with kerosene oil. This will tend to destroy the virus, and will prevent carnivorous animals disturbing the carcass and thereby spreading the disease.

Freezing.—It has been demonstrated repeatedly, in Iowa, that the frosts of winter thoroughly disinfect pasture lands that have been poisoned with the virus of Texas fever by herds of southern cattle during the summer months. From the first of April to the first of November the virus is likely to retain its vitality, and the strictest precaution is necessary to prevent communication of the disease to northern cattle. The purifying effect of frost, however, cannot be relied upon for destroying the virus of any other disease than Texas fever, liable to attack live stock in Iowa.

It is for the interest of every community, on the appearance of contagious or infectious disease among animals, to adopt speedy measures to eradicate the same, and to co-operate with the State Veterinary Surgeon in securing such result in the shortest time possible.

PAUL O. KOTO,
State Veterinary Surgeon.
J. H. SAMS,
President State Board of Health.

LOUIS A. THOMAS,
Secretary State Board of Health.
Approved September 28, 1907.

ALBERT B. CUMMINS,
WILLIAM C. HAYWARD,
BERYL F. CARROLL,
WILLISON W. MORROW,
Executive Council.

THE STATUTES.

Chapter 14, Title 12, Code.

Sec. 2529. The State Veterinary Surgeon shall be appointed by the governor subject to removal by him for cause, who shall hold office for three years. He shall be a graduate of some regularly established veterinary college, skilled in that science, and shall be by virtue of his office, a member of the State Board of Health. He shall maintain an office at the Capitol in a room assigned for his use by the Executive Council, and his postage, stationary and office supplies shall be furnished by the state.

Sec. 2530. He shall have supervision of all contagious and infectious diseases among domestic animals in, or being driven or transported through the state, and is empowered to establish quarantine against animals thus diseased, or that have been exposed to others thus diseased, whether within or without the state, and with the concurrence of the State Board of Health, may make such rules and regulations as he may regard necessary for the prevention and suppression, and against the spread of said disease, or diseases, which rules and regulations the Executive Council concurring shall be published and enforced, and in performance of his duties, he may call for the assistance of any peace officer. He may call experts to his assistance when the exigencies of any case demand such action, and may appoint a secretary, who shall receive a salary of twelve hundred dollars ($1,200.00) per annum, and he may appoint a stenographer, who shall receive a salary of nine hundred dollars ($900.00) per annum, which shall be paid from the state treasury.

Sec. 2531. Any person who wilfully hinders, obstructs, or resists said veterinary surgeon, his assistants, or any peace officer acting under him or them, when engaged in the duties or exercising the powers herein conferred, or violates any quarantine established by him or them, shall be guilty of a misdemeanor.

Sec. 2532. Said surgeon shall biennially make a full and detailed report of his doings since his last report to the governor, including his compensation and expenses, which report shall not exceed one hundred and fifty pages of printed matter.

Sec. 2533. It shall be the duty of all local boards of health in the state, upon the appearance of any contagious or infectious disease among domestic animals, to notify the State Veterinary Surgeon at once of the existence of such contagious or infectious disease; and it shall be his duty whenever notified in writing by a majority of any board of supervisors, township trustees, or of any city or town council, whether in session or not, of the existence of, or probable danger from, any contagious or infectious disease among domestic animals, to repair at once to the place designated in such notice, and make an investigation, and take such action as the exigencies of the case may demand. The governor may appoint such assistant state veterinary surgeons as may be deemed advisable, who shall act under the instruction of the State Veterinary Surgeon, and, when engaged in the discharge of their duties, shall receive the sum of five dollars ($5.00) a day and their actual expenses, which compensation and expenses shall be paid from the state treasury upon itemized and verified accounts, audited and approved by the Executive Council.

Sec. 2534. Whenever in the opinion of the State Veterinary Surgeon the public safety demands the destruction of any stock, the same may be destroyed upon the written order of such surgeon, with the consent of the owner, or upon approval of the governor, and by virtue of such order such surgeon, his deputy or assistant, or any peace officer, may destroy such diseased stock, and the owner thereof shall be entitled to receive its actual value in its condition when condemned, to be ascertained and fixed by the State Veterinary Surgeon and the nearest justice of the peace upon whom they agree as umpire, and their judgment shall be final when the value of the stock, if not diseased, would not exceed twenty-five dollars; but in all other cases either party shall have the right of appeal to the district court; but such appeal shall not delay the destruction of the animals. The Veterinary Surgeon shall file with the Executive Council his written report thereof,

who shall, if found correct, endorse their findings thereon, whereupon the Auditor of State shall issue his warrant therefore upon the Treasurer of State, who shall pay the same out of any moneys at his disposal under the provisions of this act; but no compensation shall be allowed for stock destroyed while in transit through or across the state and the word "stock" as herein used shall be held to mean cattle horses mules and asses.

Sec. 2535. The governor with the Veterinary Surgeon, may co-operate with the government of the United States for the object of this chapter, and the governor may accept and receipt for any moneys receivable by the state under the provisions of any act of Congress which may at any time be in force upon this subject and pay the same into the state treasury, to be used according to the act of congress and the provisions of this chapter as nearly as may be.

Sec. 2536. There is annually appropriated out of any moneys, not otherwise appropriated, the sum of eleven thousand dollars ($11,000.00) or so much thereof as may be necessary for the uses and purposes herein set forth; but no part of said sum shall be used for the purpose of reimbursing the owner of any stock destroyed under the provisions of this chapter.

Sec. 2537. Any person, except the Veterinary Surgeon, called upon under the provisions of this chapter, shall be allowed and receive two dollars per day while actually employed.

Sec. 2538. The State Veterinary Surgeon shall receive an annual salary of eighteen hundred dollars ($1,800.00), which shall be paid in equal monthly installments from the state treasury, and shall also receive the actual expenses incurred by him in the discharge of his official duties. All claims for expenses shall be itemized, verified and paid from the state treasury when audited and allowed by the Executive Council.

Approved April 4, A. D. 1907.

THE LAW.

CHAPTER 151.

ESTABLISHMENT OF LABORATORY FOR MANUFACTURE OF HOG CHOLERA SERUM.

An act to establish a laboratory for the manufacture of hog cholera serum at or near Des Moines under the supervision of the state veterinary surgeon and make an appropriation therefor. [Additional to chapter fourteen (14), of title twelve (XII) of the code, relating to state veterinary surgeon.]

Be it Enacted by the General Assembly of the State of Iowa:

Section 1. ***Establishment authorized—assistants—serum how sold—receipts, how expended—appropriation.*** The State Veterinary Surgeon is hereby authorized to establish a laboratory for the manufacture of hog cholera serum, and to provide the necessary equipment therefor at or near Des Moines, Iowa. The State Veterinary Surgeon shall be director of said laboratory. He shall employ such assistants as he may deem necessary to carry on said work. The director of the laboratory with the approval of the Executive Council shall fix the salaries of the employes connected with the manufacture of said serum. Upon application made to the director of the laboratory, he shall furnish said serum for use within the state of Iowa at actual cost of manufacture, and shall also furnish applicants with instructions for the use of same. If said applicant should require the services of the State Veterinary Surgeon or his assistants, the expenses for their services rendered shall be paid by the applicant to the director of the laboratory or his authorized assistant. The receipts from the sale of serum and from salvage shall be used by the director of the laboratory to promote the work, and he shall file with the Executive Council a separate official and itemized statement of all such receipts and expenditures in lieu of turning such receipts into the state treasury, as provided in section one hundred seventy-d (170-d) of the supplement to the code, 1907. The director of the laboratory shall issue receipts for all moneys received by him and shall annually file with the Executive Council a complete statement of all moneys received by him or expended in the equipping and conducting of said business. Upon passage and

publication of this act there shall be made immediately available an appropriation out of any moneys in the state treasury not otherwise appropriated, the sum of eight thousand dollars ($8,000.00) or so much thereof as may be necessary to carry out the provisions of this act. The amount above mentioned shall be paid upon the order of the director of the laboratory upon approval by the Executive Council.

Approved April 12, A. D. 1909.

CHAPTER 170.

An act to protect the public health and the health of domestic animals by providing for the inspection of registered cattle brought into the state for breeding or dairy purposes.

Section 1. *Certificate of Inspection.* That the importation of registered cattle or cattle eligible to registry for breeding and dairy purposes into this state is hereby prohibited, except when such cattle are accompanied with a certificate from an inspector whose competency and reliability are certified to by the authority charged with the control of domestic animals in the state from whence the cattle came certifying that said cattle have been examined and subjected to the tuberculin test within sixty days next preceding the date of such importation, and are free from disease.

Sec. 2. *Detention and Inspection—Quarantine.* In lieu of an inspection certificate as required in the preceding section, cattle may be detained at suitable stock yards or other enclosure within this state nearest to the state line on the railroad or highway over which they were shipped driven or hauled, and there examined at the expense of the owner, or may be shipped or driven to their destination under quarantine, there to remain quarantined until properly examined at the expense of the owner, and released by the State Veterinary Surgeon. Such expense shall be a lien upon the cattle.

Sec. 3. *Penalty.* Any person, firm, company, corporation or agent thereof, violating any of the provisions of this act, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined for each offense not more than one hundred dollars, or be imprisoned in the county jail not more than thirty days, or both fine (d) and imprisonment, at the discretion of the court. Such person, firm, company, corporation or agent, shall be liable for the full amount of damages that may result from the violation of this act. Action may be brought in any county in which said cattle are sold, offered for sale or delivered to a purchaser or in which they may be detained in transit.

Sec. 4. *Enforcement.* It shall be the duty of the State Veterinary Surgeon to enforce the provisions of this act.

CHAPTER 168, ACTS OF THE 31st G. A.

PASTEURIZATION OF SKIMMED MILK.

Section 1. *Skimmed Milk to be Pasteurized.* That every owner, manager or operator of a creamery shall before delivering to any person any skimmed milk cause the same to be pasteurized at a temperature of at least one hundred and eighty-five (185) degrees Fahrenheit.

Sec. 2. *Penalty.* Whoever violates the provisions of this act, shall upon conviction, be liable to a fine of not less than twenty-five dollars nor more than one hundred dollars.

CHAPTER X, TITLE 24, CODE.

DISEASED ANIMALS.

Sec. 5012. If the owner of sheep or any person having the same in charge, knowingly import or drive into this state sheep having any contagious disease, or knowingly turn out, or suffer any sheep having any contagious disease to run at large upon any common road or unenclosed lands; or sell or dispose of any sheep knowing the same to be so diseased; he shall be fined in any sum not less than fifty nor more than one hundred dollars.

Sec. 5013. If any person knowingly import or bring within the state any horse, mule or ass, affected by the disease known as nasal gleet, glanders, or button farcy, or suffer the same to run at large upon any common road, or unenclosed land, or use or tie the same in any public place, or off his own premises, or sell, trade, or offer for sale or trade any such animal, knowing the same to be diseased, he shall be fined not less than fifty, nor more than five hundred dollars, or be imprisoned not to exceed one year in the county jail, or both.

Sec. 5014. If any horse, mule or ass, reasonably supposed to be diseased with nasal gleet, glanders or button farcy be found running at large without any known owner, it shall be lawful for the finder thereof to take such animal so found, before some justice of the peace who shall forthwith cause the same to be examined by some veterinary surgeon, or other person skilled in such diseases, and if, on examination, it is ascertained to be so diseased, it shall be lawful for such justice of the peace to order such diseased animal to be immediately destroyed and buried, and the necessary expense accruing under the provisions of this section shall be defrayed out of the county treasury.

Sec. 5015. The owner or persons having charge of swine any of which die or are killed on account of any disease, shall upon fact coming to his knowledge, immediately burn the same.

Sec. 5016. No person shall sell or give away or offer for sale any swine that have died of any disease, or that have been killed on account of any disease.

Sec. 5017. No person shall convey upon or along any public highway or any other public ground, or any private land except that owned or leased by him, any diseased swine, or swine that have died of, or have been killed on account of any disease. Upon the trial for the violation of the provisions of this section, the proof that any person has hauled, or is hauling dead swine from a neighborhood in which swine have been dying, or are at the time dying, from any disease, shall be presumptive evidence of his guilt.

Sec. 5018. It shall be unlawful for any person negligently or wilfully to allow his hogs or those under his control, infected with any disease, to escape his control or run at large.

Sec. 5019. Any person violating or failing to comply with any provisions of the four preceding sections shall be fined not less than five nor more than one hundred dollars, or be imprisoned in the county jail not to exceed thirty days, or both.

Sec. 5020. Any person driving any cattle into this state, or any agent, servant, or employe of any railway or other corporation, who shall carry, transport or ship any cattle into this state, or any railroad company or other corporation, or person who shall carry, ship, or deliver any cattle into this state, or the owner, controller, lessee or agent, or employe of any stockyard, receiving into such stockyard, or in any other inclosure for the detention of cattle in transit or shipment, or reshipment or sale, any cattle brought or shipped, in any manner into this state, which at the time they were either driven, brought, shipped or transported into this state, were in such condition as to infect with or communicate to other cattle pleuro-pneumonia, or splenetic, or Texas fever, shall be fined not less than three hundred and not more than one thousand dollars, or be imprisoned in the county jail not exceeding six months or both.

Sec. 5021. Any person who shall be injured or damaged by any acts prohibited in the preceding section, in addition to the remedy therein provided may recover the actual damages sustained by him, from the person, agent, employe, or corporation therein mentioned, and neither said criminal proceeding nor said civil action shall be a bar to a conviction or to a recovery in the other.

TITLE 12, CHAPTER 3, CODE.

DISEASED SHEEP.

Sec. 2343. The board of supervisors of any county, when notified in writing by five or more sheep owners of such county, that sheep diseased, with scab or any other malignant contagious disease, exist in such county, shall, at any regular or special meeting, appoint a suitable person as county sheep inspector, who shall take the oath of office, whose duties shall be as hereinafter prescribed, and whose term of office shall be for two years and until his successor is appointed and qualified.

Sec. 2344. It shall be the duty of the sheep inspector upon the complaint of three or more sheep owners that any sheep within his jurisdiction have the scab or any other malignant, contagious disease, to immediately inspect and report in writing the result of his inspection to the county auditor, to be filed by him for reference by the board of supervisors or any party concerned. And, if he deem it necessary in order to prevent the spread of the disease to the sheep of the other owners, he shall cause and the owner or agent to dip or otherwise treat such diseased sheep, and shall inspect such diseased sheep every month thereafter until such disease shall be eradicated.

Sec. 2345. It shall be the duty of the sheep inspector to dip or otherwise treat such diseased sheep should the owner or agent refuse to do so, and all costs, expenses and charges, together with a per diem of three dollars per day, shall be charged against the owner of such sheep, and shall be a lien thereon, and may be recovered in an action.

Sec. 2346. Such compensation for the inspector shall be three dollars per day, and shall be paid by the owner of the sheep, or his agent, if the disease is found to exist. In case no disease is found to exist, the complainants shall pay such fee.

Sec. 2347. Upon the arrival of any flock of sheep within the state from a distance of more than twenty miles outside the boundaries of the state, the owner or agent shall notify the inspector of the county in which such sheep are being held, and he shall inspect the flock at the expense of the owner or agent, and if the sheep are found sound shall furnish the owner or agent a certificate which shall be a passport to any part of the state; but sheep in transport on board of railroad cars, or passing through the state on such cars, shall not come within the provisions of this section. Any violation of, or failure to comply with the provisions of this and the four preceding sections, by the owner of any sheep, shall subject him to forfeiture of not to exceed one hundred dollars, which shall be a lien on such sheep, and shall be recovered in an action by the county attorney in the name and for the use of the county.

OFFENSE AGAINST THE PUBLIC HEALTH.

Sec. 4979. If any person throw, or cause to be thrown, any dead animal into any river, well, spring, cistern, reservoir, stream or pond, he shall be imprisoned in the county jail not less than ten or more than thirty days, or be fined not less than five nor more than one hundred dollars.

Sec. 4981. If any person knowingly sell any kind of diseased, corrupted, or unwholesome provisions, whether for meat or drink, without making the nature and condition of the same fully known to the buyer, he shall be imprisoned in the county jail not more than thirty days, or be fined not exceeding one hundred dollars.

LAWS PERTAINING TO THE PRACTICE OF VETERINARY MEDICINE, SURGERY AND DENTISTRY.

An act to regulate the practice of veterinary medicine, surgery, and dentistry in the State of Iowa, and to provide penalties for a violation thereof. (Additional to Title XII, of the Code, relating to the policy of the state.)

Be it Enacted by the General Assembly of the State of Iowa:

Sec. 1. *Unlawful Practice.* That is shall be unlawful for any person to practice medicine, surgery, or dentistry in this state, who shall not have complied with the provisions of this act.

Sec. 2. *Existing Practitioners.* Any person of good moral character who has practiced in the profession of veterinary medicine, surgery and dentistry in this state for a period of five years immediately preceding the passage of the act of which this is an amendment shall be deemed eligible to registration as an existing practitioner upon presenting to the Board of Veterinary Medical Examiners, created by the act of which this is an amendment, satisfactory evidence that such person is of good moral character and that such person has actually practiced veterinary medicine, surgery and dentistry in the State of Iowa for a period of five years immediately preceding the passage of the act of which this is an amendment, application for such registration to be made before July 4, 1902.

Sec. 3. *Graduates.* Any person who is a graduate of a legally chartered and authorized veterinary college or veterinary department of any university or agricultural college, at the time of the passage of this act, or who shall hold a diploma from such institution prior to 1901, shall be entitled to registration as an existing practitioner upon the presentation of his diploma duly verified. All applications for such registration to be made before July 4, 1902.

Sec. 4. *State Board of Veterinary Medical Examiners—Term—Vacancies.* The governor of the state shall appoint a Board of Examiners within sixty days after the passage of this act; said board to be known as the State Board of Veterinary Medical Examiners. This board shall consist of three qualified Veterinarians, residents of the state, each of whom shall be a graduate of a legally chartered and authorized veterinary college or veterinary department of any university or agricultural college, and who shall be of good standing in the profession. One of these members shall be appointed for one year; one for two years; and each succeeding appointment shall be for three years. Each shall hold office until his successor is duly appointed and qualified. No member of any veterinary college or veterinary department of the state University or agricultural college or any person connected therewith shall be eligible to appointment upon said board. The governor shall fill any vacancy which shall occur on the board, and may remove any member of said board for continued neglect of duty, for incompetency, unprofessional, or dishonorable conduct.

Sec. 5. *Powers of Board.* This board shall have power to make all needed regulations for its government and proper discharge of its duties in accordance with this act, and shall have power to administer oaths, and take testimony concerning all matters within its jurisdiction. It shall also have the power to revoke any certificate issued by it when it is shown that such certificate was procured by false representation or where good cause for revocation of such certificate has arisen since the issuance thereof.

Sec. 6. *Meetings.* The meetings of the examining board shall be held at least once a year or at such times and places as it may elect. At any meeting of the board, a majority shall constitute a quorum to transact business, or to conduct examinations.

Sec. 7. *Certificate of Qualification.* Said board shall receive applications for registrations, according to sections two and three of this act, and shall issue a certificate of qualification to all applicants who conform to the requirements for such registration, signed by the members of the board, provided that the certificate thus granted specifically and plainly states whether or not the one to whom it was granted is a graduate or non-graduate in veterinary medicine. Such certificate shall be conclusive as to the rights of the lawful holder of the same to practice veterinary medicine, surgery, or dentistry in this state. It shall be the duty of each person registered as a practitioner under this section, to pay to the secretary of the board an annual fee of one dollar, on or before June 1st of each year, as long as he shall continue in practice in the State of Iowa.

Sec. 8. *Registration Fee.* The fee for registration shall be five dollars ($5.00), payable in advance to the secretary of the board.

Sec. 9. *Qualifications—Examinations—Fee—License.* From and after January 1, 1901, any person not authorized to practice veterinary medicine, surgery, or dentistry in this state, and desiring to enter upon such practice, shall be a graduate of a legally chartered and recognized veterinary college, or veterinary department of a university or agricultural college, and shall pass the examination required by the State Board of Veterinary Medical Examiners. The fee for such examination shall be fifteen dollars ($15.00), payable in advance to the secretary of the board. The applicant shall be at least twenty-one years of age, and of good moral character. Any person conforming to these requirements shall receive a license to practice veterinary medicine, surgery, or dentistry within the state, signed by the members of the board, which license shall be recorded in the office of the recorder of the county in which said person resides, the recording fee to be paid by holder of certificate.

Sec. 10. *Register—Treasurer to Hold Fees—Bond—Vouchers.* The board shall keep a register of all registered practitioners in the state, setting forth such facts as the board shall see fit. All fees accruing under this act shall be held by the treasurer of the board, who shall execute good and sufficient bond to said board to faithfully discharge his duties, and who shall pay out such funds only, on vouchers, certified by a majority of said board.

Sec. 11. *Compensation—Expenses.* Each member of said board shall be entitled to receive five dollars ($5.00) per diem, also actual and necessary traveling expenses, incurred while actually engaged in the discharge of his official duties provided such compensation and expenses do not exceed said income of fees accruing under this act.

Sec. 12. *Penalty.* Any person violating any of the provisions of this act shall be guilty of a misdemeanor and upon conviction shall be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars, or by imprisonment in the county jail for a period of not more than thirty days for each and every such offense. It shall be the duty of the county attorney of the county in which violation occurs to conduct all proceedings against violators of this act.

Sec. 13. *Exceptions.* Nothing in this act shall be construed to apply to commissioned veterinarians in the United States Army or to persons who dehorn cattle or castrate domestic animals or to persons who gratuitously treat diseased animals.

Sec. 14. *Further Penalty.* Any person who shall, without having been authorized so to do legally, append any veterinary title to his name, or shall assume or advertise any veterinary title in such manner as to convey the impression that he is a lawful practitioner of veterinary medicine or any of its branches, shall be guilty of a misdemeanor, and punished according to the provisions of section twelve (12) of this act.

Sec. 15. *Re-examinations.* In case the examination of any person shall prove unsatisfactory and his name be not registered he shall be permitted to present himself for re-examination within any period not exceeding twelve months next thereafter, and no charge shall be made for re-examination.

Sec. 16. *Board to Render an Account to Executive Council.* The board shall render under oath annually on January 1st to the Executive Council an account of all fees collected and per diem expenses paid, together with the necessary expenses of the board, and pay over the balance in the State treasury.

HOUSE FILE NO. 387.

An act to amend section twenty-five hundred and thirty-eight-i (2538-i) of the supplement of the Code, and provide for registering without examination veterinarians registered in other states or in foreign countries.

Be it Enacted by the General Assembly of the State of Iowa:

Section 1. That section twenty-five hundred and thirty-eight-i (2538-i) of the Supplement of the Code and provide for register amended by adding thereto the following:

(a) A certificate of registration showing that an examination has been made by the proper board of any state or foreign country, the holder thereof having been at the time of said examination a graduate of a legally chartered and authorized veterinary college, or veterinary department of any university or agricultural college, recognized as in good standing by the Iowa State Board of Veterinary Medical Examiners.

(b) A certificate of registration or license issued by the proper board of any state or foreign country, may be accepted as evidence of qualification for registration in this state, provided the holder thereof was at the time of such registration the legal possessor of a diploma issued by a legally chartered and authorized veterinary college or veterinary department of any university or agricultural college in any state or foreign country, and that the date thereof was prior to the legal requirement of the examination test in this state. The fee for such registration shall be fifty dollars ($50.00).

Sec. 2. If by the laws of any state or foreign country, or rulings of decisions of the appropriate officers of boards thereof, any burden, obligation, requirement, disqualification or disability is put upon veterinarians registered in any state or foreign country, or holding diplomas from any legally chartered and authorized veterinary college, or veterinary department of any university or agricultural college recognized as of good standing by the Iowa State Boad of Veterinary Medical Examiners, affecting the right of said veterinarians to be registered or admitted to practice in said state or foreign country, then the same and like burdens, obligations, requirements, disqualification or disability, shall be put upon the registration in this state of veterinarians registered in said state or foreign country, or holding diplomas from any legally chartered and authorized veterinary department of any university or agricultural college recognized as in good standing by the Iowa State Board of Veterinary Medical Examiners.

RECOMMENDATIONS.

The Iowa State Board of Health recommends that all dairy and breeding cattle used in the State of Iowa be tested with tuberculin at intervals of one year, until it is determined that such herds are free from tuberculosis. The board also recommends that every dairyman and breeder when purchasing cattle, be required to see that such animals are free from tuberculosis, as determined by the tuberculin test. It is recommended that the council of every city, town or village in the State of Iowa, adopt a milk and dairy ordinance similar to, or incorporate the provisions embodied in the copy for an ordinance as given below.

SUGGESTED ORDINANCE.

An ordinance providing for testing dairy herds with tuberculin and regulating the sale of milk in the city of.....

Be it ordained by the City Council of.....

Section 1. No person, firm or corporation shall sell any cream within the city limits of.....without first having obtained a license so to do, in the manner provided in Section 2 of this ordinance.

Sec. 2. Any person, firm or corporation on desiring a license or renewal of license to sell milk or cream in.....shall first make application, which application shall state explicitly the name and address of the applicant, the names and addresses of all persons from whom he purchases milk or cream to be sold, the number of cows owned by him and by each of the persons from which he purchases milk or cream and that the application to be accompanied by a certificate from an inspector whose competency and reliability are certified to by the authority charged with the control of contagious and infectious diseases among domestic animals in the State of Iowa, certifying that said cattle had been examined and subjected to the tuberculin test and found free from disease within one year from the date of filing said application, and that the premises from which the milk is obtained is kept in a sanitary condition.

Sec. 3. Additional cattle may be added to the herd or herds, at any time, provided that the holder of the license relative to such, submits to the mayor,

within one week of such addition, a written statement, indicating the exact number of cows added to such herd or herds, from whom and where they were obtained, and accompanied by a certificate from an inspector as provided for in Section 2.

Sec. 4. The expense of the inspection of the herd or herds as provided in Section 2, are to be borne by.....

Sec. 5. Every license permitting the sale of milk must be renewed at least once every year.

Sec. 6. Any person, firm, or corporation, or employee thereof, violating any provisions of this ordinance, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not exceeding $100.00, or be imprisoned in the county jail not exceeding thirty days, or both such fine and imprisonment at the discretion of the court.

Sec. 7. The city council shall have full authority to revoke any license issued under the provisions of this ordinance.

Sec. 8. This ordinance shall take effect and be in full force from and after its passage and publication, as provided by law.

.....

Mayor.

Attest:

.....

Recorder.

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