REPORT OF THE

TWENTIETH
ANNUAL MEETING

of the

UNITED STATES LIVE
STOCK ASSOCIATION

Chicago, December 5-6-7, 1916
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President.
J. G. Wills, Albany, N. Y.

Vice-Presidents.
Adolph Eichhorn, Washington, D. C.
Robert Graham, Lexington, Ky.
R. A. Archibald, Oakland, Cal.
F. A. Ingram, Hartford, Conn.
Frederick Torrance, Ottawa, Can.

Secretary-Treasurer.
S. H. Ward, St. Paul, Minn.

Finance.
W. F. Crewe, Bismarck, N. D.
V. A. Moore, Ithaca, N. Y.
S. W. Allen, Watertown, S. D.

Legislation.
John R. Mohler, Washington, D. C.
C. E. Cotton, Minneapolis, Minn.
Lester Howard, Boston, Mass.

Credentials.
P. F. Bahnsen, Atlanta, Ga.
Cassius Way, New York City.
W. J. Butler, Helena, Mont.

Resolutions.
O. E. Dyson, Chicago, Ill.
T. E. Munce, Harrisburg, Pa.

Program and Publication.
S. H. Ward, St. Paul, Minn.
John J. Ferguson, Chicago, Ill.
D. M. Campbell, Chicago, Ill.

Tick Eradication.
M. Jacob, Knoxville, Tenn.
P. F. Bahnsen, Atlanta, Ga.
C. A. Cary, Auburn, Ala.
Wm. Penn Anderson, Kansas City, Mo.
E. M. Ranck, Agricultural College, Miss.

Hog Cholera Control.
J. W. Connaway, Columbia, Mo.
Edward A. Cahill, Boston, Mass.
A. L. Hieleman, Atlanta, Ga.
J. I. Gibson, Des Moines, Iowa.
F. A. Bolser, New Castle, Ind.
A. S. Cooley, Columbus, Ohio.

Grievances.
S. F. Musselman, Frankfort, Ky.
O. H. Eliaison, Madison, Wis.
A. W. French, Cheyenne, Wyo.

Advisory Committee to Secretary.
E. Pegram Flower, Baton Rouge, La.
John J. Ferguson, Chicago, Ill.
Committee on Diseases.

H. Preston Hoskins, Detroit, Mich.

Infectious Abortion.

G. M. Potter, Washington, D. C.
CONSTITUTION.

Section 1.
This association shall be known as the "United States Live Stock Sanitary Association."

Section 2.
The purpose of this association shall be the study of sanitary science, and the dissemination of information and methods, pertaining to the control and eradication of infectious diseases amongst live stock.

Section 3.
The officers of this association shall be a President, five Vice-Presidents, and a Secretary-Treasurer.

Section 4.
The elective officers of the association shall constitute the Executive Committee.

BY-LAWS.

Section 1.
The duties of the several elective officers shall be those generally performed by such officers in similar organizations.

Section 2.
The executive committee shall select the place for the meeting of the Association and execute such other duties as the Association shall direct.

Section 3.
The several officers of the Association shall be elected by ballot at each annual meeting, and a majority of all votes cast shall be necessary to a choice.

Section 4.
The standing committee of the Association, in addition to the executive committee, shall be a committee on publication, legislation, finance, credentials, and resolutions. They shall each consist of three members who shall be appointed by the president at each annual meeting or as soon thereafter as may be practical.

Section 5.
Any person engaged in live stock sanitary work for Federal, State, Territorial, County or Municipal Governments shall be eligible to membership in this Association, and any other person interested in live stock sanitation may be elected to active membership upon the recommendation of the executive committee and a two-thirds vote of the members present.
Section 6.

Each application for membership shall be submitted in writing and shall be referred to the executive committee for consideration and recommendation of the Association.

Section 7.

The revenue of this Association shall be derived as follows: Each member shall pay an annual due of one dollar, payable in advance. By the sale of the annual reports of the Association at a price to be annually fixed by the committee on publication, said annual report to be copyrighted.

Section 8.

Order of business:
Roll call.
Reading of minutes.
Unfinished business.
President's address.
Report of Executive Committee.
Reports of Standing Committees.
Reports of Special Committees.
Report of Secretary-Treasurer.
Reading of papers, discussions, etc.
New business.
Election of officers.
Appointment of committees.
Adjournment.

Section 9.

The meetings of this Association shall be held annually at such time and place as may be designated by the executive committee.

Section 10.

A suspension of the By-Laws may be made by a two-thirds majority for the purpose of changing the order of business to facilitate important business.

Section 11.

All proposals for the alteration of the Constitution and By-Laws shall be submitted in writing, and no alteration shall be acted upon until it has been referred to the executive committee and presented anew by them at the next meeting of the Association.
REPORT OF THE PROCEEDINGS
of the
Twentieth Annual Meeting of the United States Live Stock Sanitary Association
Chicago, Dec. 5, 6, 7, 1916

The meeting was called to order December 5th, 1916, at ten o'clock a.m., at the Hotel La Salle, Chicago, by President O. E. Dyson, who said:

Gentlemen: I regret that it is necessary to advise you that Governor Dunne will be unable to deliver the address of welcome, since it was necessary for him to return to Springfield on a very urgent matter. We will not interfere with our program, but we will substitute for the address of welcome, something, perhaps, that is rather out of the usual order, by asking Dr. Rutherford to deliver the address of welcome, and to serve in a dual capacity by replying to that address of welcome. (Laughter and applause.)

Our meeting, of course, would not be complete in any sense of the word if we did not have Dr. Rutherford with us. The mere fact that it is necessary for him to travel a thousand miles coming, and a thousand miles going back home, means nothing to him. He is always here. Dr. Rutherford needs no introduction to the members of this Association. (Applause.)

DR. JOHN G. RUTHERFORD: Mr. President and Gentlemen: I have appeared before you under a great many different circumstances and conditions and in a very great many different parts of this somewhat large-sized continent of ours, but I do not know that I was ever put into quite such an extraordinary position as I find myself in today. You hear people say you can stand aside and watch yourself go by. You hear of people shaking hands with themselves, and congratulating themselves on their good fortune, when they have any. I have to give you an address of welcome to the city of Chicago, Cook county, Illinois, and then to reply to that address, and tell myself how much we appreciate the privilege of visiting this saintly city. (Laughter.)

I have had the honor of replying to a good many addresses of welcome, some of them from governors of various states in this great union, and I may say I have always looked forward with pleasurable anticipation—although I fear that ad-
vancing years and other circumstances are dooming the hope which has for many years sustained me, especially in view of that remarkable wave of prohibition which is traveling from one end of this continent to the other, up and down, east and west and north and south—I have always looked forward, as I say, with pleasurable anticipation to having an opportunity of replying to an address of welcome, no matter how short, from the Governor of South Carolina. (Laughter.) It does not look to me as if I were going to have that opportunity in the very near future, and even when the opportunity comes, if the dry wave continues to spread, that address will have lost much of its interest for me. (Laughter.)

You remember—and there things are rapidly becoming simply memories, pleasant or painful, as the case may be, according to the circumstances and the tastes of the individuals who indulge in these memories—you remember that on one great occasion some twenty-five years ago there was a convention of governors held in Philadelphia and the governors of a majority of the American states were there; and at a critical stage in the proceedings the Governor of South Carolina rose to make his time-honored remark to the Governor of North Carolina, but observing that the Governor of Massachusetts was present, he paid the following tribute to culture:

"The leaden hours on slow, unfolding wings, have dragged their weary lengths nigh halfway 'round the tiresome dial plate since last we bent the pregnant hinges of our elbows to touch with earthly nectar rare, drawn from Kentucky's copper-bottomed stills, our parched lips, and cool with gurgling dewiness our dry and whistling throats." (Applause.)

I do not know, gentlemen, after all, that I could say anything which would appeal to a majority at any rate of those present in a greater degree than to tell you that no matter whether you come from the most arid state in the union or the most arid province in the Dominion, we welcome you to Chicago, where you can have a drink. (Laughter.)

Every place, no matter how many drawbacks it may have, has one—at least one, sometimes more, advantage. I have always thought that this fair city, to which, on behalf of the Governor of the State of Illinois, it is now my most pleasant duty to welcome you (laughter)—I have always thought that this great city of Chicago, with one possible exception, that being the city of Glasgow, in my native country, was more like hell than any other place that I know of. (Laughter.)

It has been my fortune to travel more or less extensively over the face of this rapidly diminishing little world of ours,
and those two places, Chicago and Glasgow, always stand out prominently, most prominently in my mind as being the most undesirable places to live in that I know anything about.

Now, gentlemen, having welcomed you (laughter) to this fair city, I will proceed to reply to the welcome which we have received (laughter); and I will say that we, who came from many parts of this great continent, and who are more or less tinged with rural habits and customs, who are but very few of us indeed either cosmopolitan or metropolitan, appreciate very highly the opportunity of visiting this great center of industry. We feel—you know, in Scotland, that is a peculiarity, an eccentricity of the Scottish language, that we feel a smell—a Scotchman says: "I feel a smell" (laughter), and the use of that word feel over in this country, in view of the purity with which the English language is spoken in Chicago and the districts surrounding it is such that I should have been more careful. Instead of saying we feel, I should have said: "We smell Chicago with pleasure." (Laughter)

Yesterday morning Dr. Torrance and I went out to the stock yards, and I had not had any lunch, so I dropped into one of these old-time restaurants, and had some cheese and rye bread, some slight liquid refreshments, and then I bought a couple of cigars. I took my cigars into the show yard, and when I lit one of them the peculiar aroma which, through its association with that sweet-smelling neighborhood, had permeated the whole of the cigar, was so strong, so persistent, that I remarked to Dr. Torrance that it was indeed a pleasure to feel that the livestock industry was so important, giving rise, as I believe it does, to over fifty percent of the financial activity of this great center of industry—it was indeed gratifying to feel that that spirit had saturated the whole community to such an extent that even the cigars bought in the neighborhood reminded you, as you smoked them, of the great industry in which we are all so vitally interested. (Laughter)

We propose, while here to utilize the time to the best possible advantage in those pursuits which, owing to the reform movements now traveling with astonishing celerity from point to point throughout the country, are denied to us at home. I do not know that there is any place on the North American continent in which it is possible for rural cousins, friends from the country districts, as we are, to so thoroughly enjoy themselves as in this particular great city. We have had repeated demonstrations of that. I have been coming to Chicago since 1880, with mixed feelings as I have arrived, but with only one feeling when I went away, that of supreme satisfaction at being on the home trail. (Laughter)
But while I have been in this heartfelt and enthusiastic way in the first place welcoming you to our fair community, and then in the second place expressing our equally heartfelt appreciation of the kindly welcome which has been given to us here, we have a more serious matter to consider. There is no question at all that, joking aside, it is a great privilege to veterinarians, as it is to every man interested in the livestock industry, to visit Chicago. It is the greatest livestock center in the world. There has never been anything like it before, and it is very doubtful if any other point on the earth's surface will ever even equal, let alone surpass, this great city as the great center of the livestock industry of the world. No man, whether he be a veterinarian or a breeder or feeder of livestock, can come to Chicago with his eyes open and take in what he can see here from day to day, without deriving very great and very marked benefits.

Last week, when the news went out by telegraph all over this great country that owing to the suspected outbreak of foot and mouth disease in various states, the authorities had closed the yards at Chicago and East St. Louis, there was a feeling of regret, a feeling of pain, of very great disappointment that the tremendous efforts which had been made by the livestock sanitary authorities of the United States in general, and of the middle west in particular, had, after all, apparently failed, and we were once more likely to be subjected to all the annoyance and all the heavy financial loss and worry inseparable from another outbreak of foot and mouth disease. That feeling was, of course, tempered by subsequent reports and greatly relieved finally by the announcement of the fact that it was a false alarm, and that we were not apparently going to suffer as we did two years ago, and even a year ago. But we must remember that eternal vigilance is the price of safety, and the only price of safety.

When we realize what this great city of Chicago means to the livestock industry of America; when we realize that those trains of cattle and stock of other kinds coming in here as they do, day by day, from all parts of the country, cars emptied and going back, carrying stock out again in many cases, or being returned empty all over the country, we realize to what an extent under the modern conditions of livestock transportation it is possible to spread disease, as compared with what it was only a comparatively few years ago. And I may say to this audience, that whether you live in Chicago, or whether you live in the uttermost parts of the North American Continent, the work of the livestock sanitary authorities in this great center, this great livestock market, as in no other great
livestock center or livestock market on this continent, is of paramount importance to you.

The man who lives away out in Montana, or who lives where I come from, in distant Alberta—which, I may say, Mr. President, is nearer two thousand miles than one thousand miles from here—is deeply interested in what you people here are doing in Chicago in the way of better protection, not only for yourselves and the people of Cook county and the people of the state of Illinois, but the people of this whole great American union, and of the Dominion of Canada, lying to the north. It is on such people as you, sir, that the safety of the livestock industry of this whole country depends, and I cannot speak too strongly as to the urgent necessity of bringing before your authorities, both federal and state, the paramount importance of taking every possible precaution at all times, whether there is a direct reason to suspect the existence of disease here, there or yonder—to at all times take the utmost precautions, the most careful precautions to safeguard in every way this tremendous trade, because it is not you who suffer only, it is the whole country that is liable to suffer by any dereliction of duty or by the slightest carelessness in the carrying out of the necessary sanitary precautions to conserve the animal health of the whole of this continent.

You all know how in 1902 and again in the outbreak in 1908 and again in 1914, this fell disease came upon us like a thief in the night. We did not expect it in 1902. It came like a bolt from the blue. The same in 1908 and again in 1914, and we do not know, sitting here today, but what somewhere there is a little center of this disease, unsuspected, perhaps, unrecognized, as the disease in this particular instance mistaken for foot and mouth disease has been existing for some considerable time without having been properly reported, without having been properly taken care of, without its existence having been actually recognized, as it should have been. It is up to the sanitary authorities of these big market cities, particularly, such as Chicago, to see that every possible precaution is taken.

Mr. President, I am not at all pleased that Governor Dunne failed unfortunately in his appointment here this morning, because I take it that it is the duty of every veterinarian who is alive to the situation to miss no opportunity of impressing upon the constituted authorities of this country and of our country across the line the tremendous importance of giving the veterinarians and the livestock sanitary boards every opportunity of continuing this intensely necessary work for the proper safeguarding of the animal industry of our country.
Mr. President, you have a long program, and you do not want to listen to me any longer. I am very glad indeed to be here; I am very glad indeed to have had this opportunity of welcoming you all to Chicago. The mayor of San Francisco told me once, or rather told the audience, because I was only the poor individual who was picked out to reply to him, that we owned the town, and you understand now you own Chicago. We have opened all the doors of the city and we have thrown away the keys. We have instructed the police force that under no circumstances is any person attempting to rob any veterinarian or any visitor to this convention to be interfered with. (Laughter.)

I might go into further details as to the manner in which we, of Chicago, have made preparations for your entertainment. I would suggest, however, the advisability before going out on the street, especially after sundown, that those of you who have brought your wives with you should have buttons sewed on all your pockets, and those of you who have not got wives with you should invest in some safety pins, so that you may travel around in the loop district here after dark without serious danger to the little wads which it has taken you so long to accumulate, and from which you are desirous of receiving the best possible return during your stay with us here.

Mr. President, I thank you very much. (Laughter and applause.)

PRESIDENT DYSON: I am quite sure that no one has been disappointed by the address of welcome, and by the happy response to the address of welcome. I want to assume no responsibility, however, in the matter of the address of welcome. I assure you that I did no coaching in the matter of the address of welcome. Dr. Rutherford is speaking from experience, I imagine, in some cases, from his experience in Chicago, and I think perhaps that it would be well to follow his advice.

Next on the program is the report of the Secretary-Treasurer.

REPORT SECRETARY-TREASURER

Report as Secretary:

Bulletins

The only special bulletins distributed by this office since our last meeting were Bulletin No. 8, 1915 series, being resolutions adopted by this association in annual convention at Chicago, December 2, 3, 1915, and Bulletin No. 1, 1916 series, being resolutions adopted by American National Live Stock association in 19th annual convention at El Paso, Texas, January 25-27, 1916. These resolutions, which have already been distributed about the room will be embodied in our 20th Annual Report. About the
usual amount of routine correspondence and record work was handled during the year.

**Nineteenth Annual Report**

Dr. D. M. Campbell, of Chicago, and Dr. B. H. Ransom, Bureau Animal Industry, Washington, D. C., deserve the thanks of this association for work done in connection with preparation and publication of the 19th annual report. Five hundred copies of this report were printed and all except three volumes for association records were distributed.

In addition to the distribution of the 19th annual report a considerable number of the reports of earlier meetings were called for during the year by several reference libraries and institutions.

**Membership**

On the opening date of our last meeting this association had 254 members. Today we have 307 members and thirty-one applicants for membership, a most gratifying increase, but in order to extend the usefulness of this association there are still many not members who should be enrolled as members. The members should take more interest in adding to our membership at least to the extent of bringing in one new applicant each year.

In response to an invitation from Hon. Wm. Jennings Bryan, then secretary of state, dated February 12, 1915, President O. E. Dyson delegated Dr. Adolph Eichhorn and Dr. S. H. Gilliand to represent this association at the Pan American Scientific Congress, which was held at Washington, D. C., December 27, 1915, to January 8, 1916. I presume a report will be presented by these gentlemen in due course.

**Report as Treasurer:**

Balance on hand November 27, 1915..................................................$ 759.53

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<td>18th Annual Report</td>
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19th Annual Report.............................................. 497.05
20th Annual Report.............................................. 1.00

Total receipts.................................................. $2,128.94
Expenses (as per vouchers attached).......................... 769.26

Receivable from program advertising.......................... $1,356.26

Total balance Dec. 1, 1916..................................... $1,856.26

All of which is respectfully submitted.

J. J. FERGUSON,
Secretary-Treasurer.

PRESIDENT DYSON: What is your pleasure, gentlemen, regarding the report?

DR. DEVINE: Mr. President, I move it be accepted and take its regular course.

Motion duly seconded and carried.

PRESIDENT DYSON: The next is the reading of the minutes.

DR. WARD: Mr. President, I move that the Nineteenth Annual Report, as printed, be accepted as the minutes of the last meeting.

Motion duly seconded and carried.

PRESIDENT DYSON: Being next on the program, gentlemen, I will proceed without further delay.

PRESIDENT'S ADDRESS

Dr. O. E. Dyson, Springfield, Illinois

My membership in this association dates from the year 1907 at which time a meeting was held at Richmond, Virginia. Twenty-three members were present, only a few of whom are here today. Our membership has steadily increased until there are now 307 members in good standing. The increase in membership is positive evidence of the great interest now being taken in the promotion of live stock sanitation as compared with a few years ago, and the progress that is being made has been made largely through the individual efforts of members of this association.

In order to be effective live stock sanitary control must necessarily depend upon the enactment and enforcement of state and federal laws. The enactment of laws without providing means for their enforcement has been one of the principal factors conducive to the spread of infectious diseases of live stock. The offices of all state live stock sanitary officials were created by legislative enactment for the specific purpose of promoting and protecting the interests of the live stock producer. Unfortunately, the selection of such officials has been so closely allied to politics that it seems impossible for live stock producers to conceive the fact that a live stock sanitarian of an opposite political faith, could possibly be competent or honestly endeavor to promote or protect the live stock interests at large.
Live stock sanitation can and should be placed upon a business basis. The largest single interest in all of our agricultural states should not be compelled to suffer unnecessary economic losses incident to the ravages of preventable diseases of live stock, or to incompetency on the part of those officially charged with live stock sanitary control. Little progress from our present status can be made, however, except by the way of a radical change of policy with a view of completely separating live stock sanitation from the blighting influence of political control. That live stock sanitation and politics cannot be mixed except at the expense of the live stock interests has long been evident, even to the casual observer. Conclusive proof, however, was wanting until this and other states were recently called upon to contend with the widespread and devastating effects of an outbreak of foot-and-mouth disease. That eradication was accomplished in the face of many handicaps should establish confidence in official live stock sanitary control for all time to come.

Up to this time, the live stock producer has been willing to trust his legislative interests to a state or national representative of a like political faith, regardless of the fact that he may have no knowledge or inclination to gain knowledge of matters pertaining to the welfare of the live stock interests. For this condition no one is responsible except those engaged in the production of live stock. It would be a simple matter to secure the enactment and enforcement of modern live stock sanitary laws, if live stock producers could only be awakened to the fact that their interests could thereby be protected and conserved. Live stock producers should indicate to their state and national representatives in no uncertain way the manner in which they desire to be represented. This could be accomplished throughout the various states by the organization of county live stock sanitary associations, with subsidiary organizations in each and every township in which it would be possible to make the production of live stock a profitable enterprise. Live stock producers by the means of such organizations could also keep in touch with state officials charged with the enforcement of laws enacted for the protection of live stock interests against the invasion and spread of infectious diseases. All laws to govern live stock sanitation should express in no unmistakable terms the opinion of a majority of live stock producers. The personal interests of a comparative few who assume to represent the live stock producers' interests should not be permitted to stand in the way of the enforcement of any law for the betterment of live stock sanitation. In this connection I refer to those engaged in buying live stock for shipment to public markets, and live stock commission men located at public stock yards, who never
fail to vigorously and vociferously protest against the enforcement of live stock sanitary laws or regulations made in conformity therewith for the purpose of overcoming the present indiscriminate and dangerous methods of marketing live stock affected with highly infectious diseases. Regardless of the fact that enormous economic losses can be directly traced to this nefarious practice live stock producers have so far neglected to take any initiative steps in the matter of self-protection.

Our program for this year's session covers many subjects of vital interest to the live stock producer and the live stock sanitary as well. These subjects will be clearly and forcefully presented during our regular sessions from an authoritative point of view. Notwithstanding this fact, however, I will ask your indulgence in order that I may briefly express my personal opinion as to ways and means whereby the live stock interests of this and other states could be better and more advantageously served.

All progress made in matters pertaining to live stock sanitation must be based primarily upon a practical application of the fundamental principles involved with due regard to their economic relation to the live stock producers' interest, which in many instances have been sacrificed by the application of laws and regulations which when theoretically viewed would tend to serve a practical purpose, whereas in actual practice they only serve to widen the breach now existing between live stock producers and state officials charged with the enforcement of live stock sanitary laws. This of course weakens public sentiment favorable to the enforcement of such laws and any law lacking in support of public sentiment might as well be stricken from the statute books.

When economic advantages to the live stock industry far outweigh insanitary risk, live stock sanitary regulations should be made to conform to the principle of the greatest good to the greatest number. With this object in view I shall take the liberty to refer to what I consider a few inconsistencies in the matter of live stock sanitary laws and regulations made in conformity therewith.

For many years the laws of practically every state have required a certificate of health including the tuberculin test, to cover the importation of cattle for breeding or dairy purposes. That such laws serve to prevent the state from being utilized as a dumping ground for tuberculous cattle, there is no doubt. On the other hand, however, such laws and regulations tend to inspire too much confidence in the value of certificates of health representing the animals covered thereby as being free from tuberculosis. Under these conditions unscrupulous breeders and dealers are permitted to sell and ship without restriction cattle
from badly infected herds, and the purchaser has no assurance that the animal for which he holds a certificate of health will not develop tuberculosis as a result of having been exposed to infection prior to being removed from an infected herd. The value of all certificates of health, covering the tuberculin test of cattle, should be rated according to whether or not the herd from which such cattle are purchased is free from tuberculosis. Only certificates from herds entirely free from infection should be considered as being worth their face value. If ten per cent of the herd are infected the value of a certificate of health should be discounted twenty-five per cent. If twenty-five per cent of the herd are infected the value of a certificate of health should be discounted fifty per cent. If fifty per cent of the herd are infected, practically no value should be attached to a certificate of health until the animal has been subjected to and has successfully passed a tuberculin test administered not less than ninety days after being removed from an infected herd. If prospective purchasers at public sales or from farm herds would place the proper estimate upon the actual value of a certificate of health as ordinarily issued, and govern the price to be paid accordingly it would only be a question of a short time until the success of all breeders of pure-bred cattle in all states would depend upon their ownership of state accredited herds. The enactment of laws by the various states prohibiting the importation, or the sale or delivery of pure-bred cattle for breeding or dairy purposes within the state, except from herds free from tuberculosis would serve to place the pure-bred cattle breeding industry upon a sound and profitable basis by eliminating the present active competition in the sale of cattle from herds that are free from tuberculosis and herds that are badly infected with tuberculosis. Owing to the fact, however, that the owners of clean herds are largely in the minority some time must necessarily elapse before such a propaganda would be favorably looked upon by a majority of the breeders of pure-bred cattle.

The recent outbreak of foot-and-mouth disease fully disclosed the fallacy of existing state and federal laws, which specifically provide that all notices of quarantine prohibiting the movement or interstate shipment of live stock from areas infected with highly infectious diseases shall be issued by the governors of the various states or by the secretary of the United States Department of Agriculture. Inasmuch as all notices of quarantine are issued upon the recommendation of state veterinarians or the chief of the United States Bureau of Animal Industry, all such laws should be amended by providing in lieu of existing provisions that notices of quarantine shall be issued.
by state veterinarians or state boards of live stock commissioners, or by the chief of the United States Bureau of Animal Industry, and the governors of the various states or the secretary of agriculture shall have the authority to revoke such quarantines in the event of their being unwarrantably established or misapplied. Under these conditions prompt steps could be taken to prevent the spread of highly infectious diseases, whereas under existing conditions much valuable time is necessarily lost in overcoming the regular routine of red tape, complicated with inevitable and costly delays.

In my opinion this association should recommend the adoption of uniform quarantine regulations to cover: First, the area that should be covered by a quarantine established on account of an outbreak of foot-and-mouth disease. Second, to what extent and for what purposes the movement of live stock within the quarantined areas should be restricted. Third, that all states and federal government provide an emergency fund or such other means as would insure effective enforcement of all quarantine regulations—otherwise nothing can be accomplished by the issuance of a quarantine. This association should also urge the enactment of a law in every state requiring that cattle exhibited for prizes at fairs or live stock exhibitions shall be covered by a valid certificate of health including the tuberculin test, and that all hogs exhibited shall have been immunized against cholera.

The greatest problem now confronting swine breeders throughout the United States is whether or not the contagion of hog cholera can be controlled. The mere fact that annual visitations of hog cholera with its attending losses have heretofore been looked upon by the average breeder as being inevitable, should by no means be permitted to establish the mistaken belief that the contagion of hog cholera would fail to yield to modern sanitary control, the application of which would limit the movement of cholera infected swine, require the cleaning and disinfection of infected premises, railway cars, loading pens, chutes, etc. There is no more reason for permitting the unrestricted spread of the contagion of hog cholera from infected herds or premises than to ignore the fact that hog cholera is an infectious disease.

To me it seems inconsistent that any state in which traffic in live stock affected with infectious diseases is permitted practically without restriction, should enact laws requiring a certificate of health upon all incoming shipments, especially upon pure-bred sheep and swine for breeding purposes, when shipped by express in crates. The profitable production of pure-bred sheep and swine necessarily compels breeders to keep their stock
free from infectious diseases. Therefore, it would seem perfectly safe to permit such shipments upon an affidavit of the owner in lieu of adding the burdensome and paralyzing expense of inspection and certification upon the industry, especially when such regulations are of minor importance as compared with the larger problem of local live stock sanitary control.

State regulations requiring certificates of health including the mallein test to cover the importation of all horses, except from areas known to be infected, would also seem unnecessary in view of the fact that all such states permit practically an unrestricted traffic in horses within the state, also the further fact that the economic losses sustained on account of glanders are infinitesimal as compared with losses sustained on account of infectious diseases. Glanders can easily be eradicated by full payment for all infected animals. No one desires to own or traffic in glandered horses except for the purpose of economic gain. The losses sustained on account of influenza are one hundred times greater, yet there has been no concerted effort made to control the endless chain of infection in any state by restricting the movement of infected or exposed horses or by requiring the disinfection of public stables or cars utilized for the transportation of horses to and from market centers.

Ignorance and greed are the principal factors responsible for the prevalence of any infectious diseases of live stock.

Regardless of the fact that progress in live stock sanitation has been slow when considered from the standpoint of what might have been accomplished, I consider it the duty of each and every member of this association to encourage by precept and example a larger, a safer and a more profitable production of live stock, which unquestionably depends upon practical ways and means of promoting and preserving better live stock sanitary control by and through full co-operation with the live stock producing interests, which have heretofore been practically ignored, largely owing to a lack of personal interest on the part of those actively engaged in the production of live stock.

DR. MAYO: Mr. President, I move that the President's address be received and referred to the Committee on Resolutions, as it contains a number of suggestions that ought to be considered by that committee.

The motion was duly seconded and carried.

PRESIDENT DYSON: The next on the program is delayed report of the 1913 Committee on Uniform Regulations, Dr. Kiernan.

DR. KIERNAN: It is provided that whenever it comes to the knowledge of the Secretary of Agriculture, that a contagious or infectious disease exists in a certain area, that the Secretary of Agriculture shall establish a quarantine, and give notice to the people and the railroads and the newspapers that that quarantine exists. If it were not for the section that provides that the Secretary shall quarantine before the other sec-
tions of the law could be put into effect, it would be a mighty simple matter to control the interstate movement of diseased animals.

For instance, if a diseased cow were moved from Illinois into Indiana, and the officials of Indiana could obtain the evidence in co-operation with the officials of Illinois that that man knew that that animal was diseased, it would be an easy matter to go before a United States court, and have that man brought before the grand jury, indicted, prosecuted and fined. It would stop the interstate movement of diseased animals. But there it requires that quarantine notice shall be served that the disease exists in that state. Dr. Dyson, referring to that matter, said that we might establish sort of a provisional quarantine over areas, in which it was known that cholera exists, and exempt other states where it was not known to exist from these rigid quarantine restrictions, but that is a difficult matter to do.

The committee broached that subject to the chief of the Bureau, and he saw in this plan a whole lot of difficulty in establishing any provisional quarantine. Now, the point is, that the United States law does provide that diseased animals shall not be moved interstate. Take, for instance, where a herd is tested with tuberculin, and reactors are found, if that man wants to ship those reactors from one state to another state for immediate slaughter, subject to inspection, the United States law says that he cannot do that, that the Bureau and the Department has stuck to that regulation and that law for a number of years. If there is any ground for standing pat on that proposition, why isn't there good ground for standing pat on the whole proposition of shipping diseased animals interstate?

It is a matter, of course, for lawyers and the courts to decide, but it does appear that Congress in all its wisdom enacted that Act of Congress in 1884, so as to prevent the interstate shipment of diseased animals.

I respectfully submit this report.

Report of Committee on Uniform Live Stock Regulations,
United States Live Stock Sanitary Association,
for the Year 1913

Your committee for the year 1913 on uniform state regulations governing the movement of live stock, prepared a report which was agreed on by a majority of the members. It was not submitted to the Association either at the 1914 or 1915 meeting.

The report drafted in 1914 was transmitted to the chief, Bureau of Animal Industry, November 2, 1916, for his criticism. After making several changes in the report, it was returned and we have the honor to submit it now as a delayed report.

It is predicated upon acts of Congress approved May 29, 1884, February 2, 1903, March 3, 1905, and June 29, 1906, which govern the interstate movement of live stock.

Section 6, of the act of congress approved May 29, 1884, provides, That no railroad company within the United States, or the owners or masters of any steam or sailing vessel or boat, shall receive for transportation or transport, from one state or territory to another, or from any state into the District of Colum-
bia, or from the District of Columbia into any state, any live
stock affected with any contagious, infectious or communicable
disease; nor shall any person, company or corporation deliver
for such transportation to any railroad company, or corporation,
or master or owner of any boat or vessel, any live stock, knowing
them to be affected with any contagious, infectious or communi-
cable disease; nor shall any person, company, or corporation,
drive on foot or transport in private conveyance from one state
or territory to another, or from any state into the District of
Columbia, or from the District of Columbia into any state, any
live stock, knowing them to be affected with any contagious,
infectious or communicable disease.

Section 3, B. A. I. Order 245 provides: That, before offering
cattle or other live stock for interstate transportation, trans-
porting them interstate or introducing them into any stock yards
or upon routes of traffic for interstate transportation, all persons
or corporations are required to exercise reasonable diligence to
ascertain that such animals are not affected with any contagious,
infectious or communicable disease, and have not been exposed
to the contagion or infection of disease by contact with other
animals so diseased or by location in pens, cars or other vehicles
or upon premises that have contained diseased animals.

The shipment of a tuberculous cow or hog; a glandered horse,
mule or ass; a scabby sheep, horse, mule or ass; a ticky cow,
horse mule or ass or any other equine, bovine or ovine affected
with or exposed to a communicable disease from Texas into
Rhode Island or from Florida into Idaho or vice versa is a
violation of the United States laws and regulations of the secre-
tary of agriculture, punishable, on conviction, by a fine, impris-
onment, or both, providing it can be proven that the shipper
knew that the animals shipped were diseased at the time of their
delivery to the transportation company.

The adoption of federal regulations by the various states may,
at times, be found to be of material aid as they proved to be in
North Carolina as set forth by the learned Supreme Court in
the case.

State vs. Southern Railway Company, Southeastern Re-
porter, Volume 54, page 294:

"When such a regulation by the federal government operates
and takes effect in the state of North Carolina, it is in no sense
a foreign law. The laws of an American state are never consid-
ered as foreign in the federal courts and vice versa, those which
find their origin in the federal branch of the government are
treated as domestic laws in the tribunals of the different states."
PROPOSED UNIFORM STATE REGULATIONS GOV-
ERNING THE MOVEMENT OF LIVE STOCK

REGULATION 1.

SEC. 1. The regulations and amendments thereof of the
United States Department of Agriculture, concerning the inter-
state transportation of live stock are hereby adopted as a portion
of the regulations of this board during such time as said regula-
tions are in force, in so far as said regulations conform with the
live stock sanitary laws of....................... , and the regulations
of the live stock sanitary board of....................... 

SEC. 2. Whenever in these regulations or in the rules based
thereon, the word interstate is used, it shall be construed to mean
between another state or the District of Columbia and this state.
Whenever in these regulations or the rules based thereon, the
word intrastate is used it shall be construed to mean within this
state.

SEC. 3. Before offering cattle or other live stock for intra-
state transportation, or transporting them, or introducing them
into any public stock yards, or upon routes of traffic for intra-
state transportation, all persons or corporations are required to
exercise reasonable diligence to ascertain that such animals are
not affected with any communicable disease, and have not been
exposed to the contagion or infection of diseases by contact with
other animals so diseased, or by location in or upon pens, prem-
ises, cars or other vehicles that have contained diseased animals.

Disinfection of Premises, Cars, Boats, Etc.

SEC. 4. 1. Except as hereinafter provided for in these regu-
lations, premises, cars, boats, and other vehicles that have con-
tained diseased cattle or other live stock, shall not be used in the
transportation of healthy animals within this state until the said
premises, cars, boats, and other vehicles shall have been thor-
oughly cleaned of all loose litter and other material and disinf-
ceted with a solution made with six ounces of 95 per cent pure
liquefied carbolic acid to each gallon of water or a solution con-
taining four ounces of cresol compound U. S. P. to each gallon
of water. A permitted “Saponified cresol solution” at a dilu-
tion of at least four fluid ounces to one gallon of water. Chlorid
of lime (30 per cent available chlorin) at a dilution of one gallon
to three gallons of water.

2. Cars, boats, and other vehicles for use of the transporta-
tion into this state of healthy and non-exposed cattle, or other
live stock, shall first be cleaned and disinfected as provided in
paragraph 1 in this section, unless it shall be known to the satis-
faction of the.................................either that said cars or
other vehicles have been cleaned and disinfected under these
regulations and have not carried or contained diseased or exposed animals since that cleaning and disinfection or that the cars have never been used for the transportation of diseased or exposed animals.

**Disinfection of Stock Yards and Feeding Stations.**

SEC. 5. Public stock yards and feeding stations, and approaches, chutes, alleys, and pens thereof which have contained diseased or exposed animals shall, before healthy or non-exposed animals for intrastate transportation are placed therein, be cleaned and disinfected as provided in Section 4 in this regulation. Failure to clean and disinfect said premises will subject them to quarantine.

**REGULATION 2.**

To Prevent the Spread of Splenetic, Southern, or Texas Fever in Cattle.

Cattle originating in any area quarantined by the Secretary of Agriculture on account of the existence of splenetic southern, or Texas fever, outside of the state of.............................., shall not at any time be transported, driven, or allowed to drift from into any portion of this state for any purpose, except in accordance with the rules and regulations of the United States Department of Agriculture for the prevention of the spread of splenetic, southern, or Texas fever.

**REGULATION 3.**

To Prevent the Spread of Scabies in Cattle.

Cattle outside of this state shall not at any time be transported, driven, or allowed to drift from another state or the District of Columbia into any portion of this state for any purpose, except in accordance with the rules and regulations of the United States Department of Agriculture for the prevention of the spread of scabies in cattle.

**REGULATION 4.**

To Prevent the Spread of Tuberculosis in Cattle and Swine.

SEC. 1. No cattle or swine affected with tuberculosis as disclosed by a physical examination, or by the tuberculin test, or by any other means, shall be shipped, trailed, transported, or otherwise moved from any state or the District of Columbia into this state.

SEC. 2. It is hereby ordered that any firm or corporation or any common carrier wishing to import into this state bulls, work oxen, or female cattle over six months old intended for breeding or dairy purposes, other than branded range stock, must procure before shipment a health certificate and a tuberculin test chart in triplicate from the state veterinarian or assistant state
veterinarian, or a veterinarian whose competency and reliability are certified to by the authorities charged with the control of diseases of domestic animals in the state from which the cattle are to be transported or moved, or from a veterinary inspector of the Bureau of Animal Industry of the United States Department of Agriculture. The original of this health certificate and tuberculin test chart must be attached to the waybill. The duplicate health certificate and tuberculin test chart must be sent to the state veterinarian or proper official at destination in ample time to reach him before the arrival of the cattle. The triplicate health certificate and tuberculin test chart must be sent to the proper state official at place of origin. The health certificate and tuberculin test chart must show that the cattle are free from Texas fever ticks and symptoms of tuberculosis and all contagious, infectious, and communicable diseases. The tuberculin test chart must show that at least three temperatures were taken before injection of tuberculin two or three hours apart and five temperatures were taken after injection two hours apart, beginning ten hours after the tuberculin was injected.

REGULATION 5.

To Prevent the Spread of Hog Cholera and Swine Plague.

SEC. 1. Swine outside of this state shall not at any time be transported, driven, or allowed to drift from another state or the District of Columbia into any portion of this state for any purpose, except in accordance with the rules and regulations of the United States Department of Agriculture for the prevention of the spread of hog cholera and swine plague.

SEC. 2. It is hereby ordered that any person, firm, or corporation or any common carrier wishing to import swine into this state of.................................for purposes other than immediate slaughter, must procure before shipment or movement in any manner a health certificate in triplicate from the state veterinarian or assistant state veterinarian or a veterinarian whose competency and reliability are certified to by the authorities charged with the control of diseases of domestic animals in the state from which the swine are to be transported and moved, or from a veterinary inspector of the Bureau of Animal Industry of the United States Department of Agriculture. The original, duplicate, and triplicate copies of the health certificates shall be handled as certificates and tuberculin test chart as provided for in Regulation 4, Section 2. The health certificate must show that the swine are free from symptoms of all contagious and infectious diseases and have been immunized against hog cholera by the serum prepared under license from the Secretary of Agriculture not more than sixty days previous to ship-
ment. After receiving this treatment they shall be disinfected with a two per cent solution of compound solution of cresol U. S. P.

**REGULATION 6.**

*To Prevent the Spread of Dourine in Horses and Asses.*

Horses and asses outside of this state shall not at any time be transported, driven, or allowed to drift from an infected section of another state or the District of Columbia into any portion of this state, except in accordance with the rules and regulations of the United States Department of Agriculture for the prevention of the spread of dourine in horses and asses.

**REGULATION 7.**

*To Prevent the Spread of Glanders in Horses, Mules and Asses.*

SEC. 1. No horses, mules, or asses affected with glanders as disclosed by a physical examination or by the mallein test or by any other means, shall be shipped, trailed, transported, or otherwise moved from any state or the District of Columbia into this state.

SEC. 2. It is hereby ordered that any person, firm or corporation, or any common carrier wishing to import horses, mules, or asses into the state of............................................................must procure before shipment or the movement in any other manner a health certificate and a mallein test chart in triplicate from the state veterinarian or assistant state veterinarian, or a veterinarian whose competency and reliability are certified to by the authorities charged with the control of diseases of domestic animals in the state from which the horses, mules, or asses are to be transported or moved, or from a veterinary inspector of the Bureau of Animal Industry of the United States Department of Agriculture. The original, duplicate, and triplicate copies of the health certificates and mallein test charts shall be handled as certificates and tuberculin test charts as provided for in Regulation 4, Section 2. The health certificates and mallein test charts must show that horses, mules, and asses are free from any symptoms of all contagious, infectious, and communicable diseases, and the test chart must show that at least three temperatures two or three hours apart were taken before injection and five temperatures were taken after injection two hours apart, beginning ten hours after the mallein was injected.

SEC. 3. The ophthalmic mallein test for glanders has proved to be reliable and practicable. In lieu of a mallein test chart in triplicate, an ophthalmic mallein test certificate in triplicate will be accepted when certified to and handled in the same manner as provided for mallein test certificates in Regulation 7, Section 2.

SEC. 4. The ophthalmic mallein test certificate shall indicate
that the result of the test with concentrated mallein showed a negative reaction, record as follows: \( N = \text{Negative} \); eye un-
changed.

**Regulation 8.**

*To Prevent the Spread of Scabies in Sheep.*

Sec. 1. Sheep outside of this state shall not at any time be transported, driven, or allowed to drift from another state or the District of Columbia into any portion of this state for any purpose, except in accordance with the rules and regulations of the United States Department of Agriculture for the prevention of the spread of scabies in sheep.

Sec. 2. It is hereby ordered that any person, firm or corporation, or any common carrier wishing to import sheep or goats into this state for purposes other than immediate slaughter, must procure before shipment or movement in any other manner a health certificate from the state veterinarian or assistant state veterinarian of the state from which they are imported, certifying that the sheep or goats have been dipped within 10 days from the time of entry into the state in either a nicotine or lime-and-sulphur dip which has been approved by the United States Bureau of Animal Industry, or if they have passed through a public stock yards, a permit shall be obtained to bring them into the state subject to dipping on the premises of the owner at destination.

J. A. Kiernan, 
Chairman.
GANGRENOUS GLOSSITIS OF HORSES

By T. C. Teidebold, C. S. Mather, L. A. Merillat

To our knowledge gangrenous glossitis has never heretofore been described. We are therefore advisedly calling it a new disease, or more properly speaking, a disease new to American veterinarians. The African "blue tongue" of the Boer war mentioned in Dr. Eichhorn's translation of Hutrya & Marek and the so-called "mouth thrush" of the western plains have never been described with sufficient detail to satisfy us of the analogy claimed by some of our western colleagues.

The disease first made its appearance among army remounts purchased for foreign service that were congregated in large numbers at Ogden, Utah; Miles City, Montana; Grand Island, Nebraska, and Lathrop, Missouri. In these places it was evidently given but passing attention, as no official action was taken to control it until the outbreak reached the Chicago and Calumet, Illinois, yards during the first part of October. Dr. Teidebold found seven cases October 15th at the Chicago stock yards in one carload of horses that arrived from Grand Island, Nebraska. On the 18th he isolated 237 cases out of horses coming from the same place. On October 19th I* found more than 500 cases at the Calumet yards among 4,054 horses being temporarily sheltered at that point preparatory to shipment to the eastern seaboard.

As the disease seemed to be spreading with alarming rapidity and its nature seemed formidable and unlike any affliction we had ever had occasion to witness, we suggested to our state veterinarian, Dr. O. E. Dyson, that he authorize us to establish a close quarantine pending an investigation of the character of the trouble. We suggested also that he seek the co-operation of the officials of Nebraska and Missouri in order that all shipment might be suspended until the disease could be studied and if possible be controlled at the different remount stations we knew were seriously infested. During my first day at Calumet out of a shipment of about 300 horses from Grand Island, Nebraska, I counted fifty horses seriously afflicted with a profuse ptyalism that seemed to presage a very serious state of affairs. It was this incident that caused me to look with suspicion upon the seriousness of the malady.

The 4,054 horses under my charge at Calumet were so closely yarded and the accommodations to separate them so meager that the disease was given full swing to spread. During the succeeding two weeks it is safe to say that only a few escaped the disease, and those which did escape were those we were

*This paper was read by Dr. L. A. Merillat.
able to segregate. At the Chicago stock yards under the supervision of Dr. Teidebold the disease was checked more effectually because of better accommodations to carry out the plan to segregate the affected animals.

Name

We have decided that the term "gangrenous glossitis" is the best appellative, because the disease attacks the tongue of every affected subject. We insist upon the adjective "gangrene" because that word alone describes the local lesion. It is not vesicular as we at first supposed, but is pure and through and through death of the mucous membrane often in exceedingly large patches. The lip and nasal lesions are not constant and are never independent. These cutaneous lesions are very superficial and harmless but may be always taken as a sure indication that the tongue within is seriously involved. Where the tongue is only slightly affected there are no external manifestations, but on the other hand when seen externally in the form of a scalded looking labial sore the tongue will be found badly damaged. For these reasons we believe the name glossitis should be retained, unless the discovery of the causative agent suggests a better one.

Definition

We would define the disease as a systemic disorder manifested by a gangrene of the mucous membrane on the dorsal surface of the tongue that sometimes also attacks the common integument of the lips and nostrils. We classify it as a systemic rather than a local disorder because there is an initial febrile state that universally precedes the local symptoms and because in spite of numerous attempts we have been unable to cause the disease by local inoculations. We believe its etiology in this respect corresponds to that of foot-and-mouth disease.

Clinical Aspects

The subject stricken with gangrenous glossitis is very thirsty and has a good appetite, but is very languid, markedly depressed and develops a fairly uniform temperature of 102.5° to 104° Fahrenheit for three to six days. This period may be longer in some cases or it may pass unnoticed. It is very likely to pass unnoticed among the horses we have under our charge because of the prevalence of other febrile disorders for which it might at first be mistaken.

It requires an exceedingly close examination of the tongue during the febrile stage to locate the approaching lesions. They appear in the form of whitish patches that are but slightly ele-
vated. When the tongue is drawn out to make the examination the stretching makes the whole dorsum colorless and the patches may be overlooked. In the relaxed position, however, with the circulation not hindered the patches are plainly exhibited, mapping out irregular outlines here and there over the dorsal surface. We have never found lesions in the fauces, on the buccae, on the gingivae, on the palate, nor on the ventral surface of the tongue. They show a tenacious predilection for the dorsum of the tongue.

The first conspicuous symptom is ptyalism. This is either profuse or slight according to the amount of tongue surface denuded, for at this stage denudation has occurred. There is no ptyalism preceding the sloughing. The slobbering continues from five to ten days, and during that interval the subject is in a pitiful state of discomfort. It makes repeated efforts to eat only to abandon the attempt on account of the pain it suffers from the friction of harsh forage. Great wads of hay are taken in the mouth and held to soak up with saliva before the painful mastication is attempted. Patients will hold wads of hay in the mouth and carry them about for hours sucking at the juice they seem able to extract, rather than masticate them. As the healing process advances the abrasions become less sensitive and the disease passes into the slow stage of cicatrization.

The lesions now heal very slowly. The cicatrization is rapid enough when the lesions are small or narrow, but when large patches have sloughed it is unfortunately very slow, behaving as any through and through loss of a large patch of mucous membrane would.

Some of my colleagues have insisted that the nature of the causative agent may have a bearing upon this slow healing process. I am personally inclined to believe that the healing process is not thus hindered, but proceeds in strict obedience to the laws of regeneration. A through and through loss of a large zone of an epithelial paved membrane, whether traumatic, bacterial, thermic or chemical always leaves behind a slow healing wound and in this regard I believe gangrenous glossitis is not exceptional.

We have now cases under observation for five weeks still exhibiting unhealed tongues.

Convalescence from the systemic disorder is unfortunately also slow. The disease does not abort promptly by any means, as many of our patients maintain a state of ill-health week after week. Although they cat well they take on no flesh and they remain unthrifty in appearance. We believe that at least ten percent will remain invalids for a long while.
The disease is highly contagious and we believe it spreads largely through the medium of the saliva soaked hay, water, mangers and feed boxes. As stated before, we have been unable to successfully inoculate horses by smearing artificial abrasions with the saliva and scrapings from the tongues of affected animals, but we never failed to spread the disease when we brought healthy horses into direct contact with infected ones. Dr. Teidebold reports that in a herd of 333 horses all but six finally became affected, and this corroborates my observations among the 4,000 under my charge. It is therefore surely highly contagious among horses herded together and fed together in feed yards and watered from common troughs.

As to the etiology we know absolutely nothing. Dr. Mather has made a careful study of the disease and has submitted an addenda to this clinical report which may shed some light upon the nature of the causative agent. Dr. Teidebold and I are non-committal on this point, having trusted to the wisdom of our able colleagues Drs. Mather and Eichhorn in the matter of seeking out possibly a bacterium that we might incriminate.

The greatest difficulty arises in finding affected animals during the initial stage. Herded together they escape notice until ptyalism begins. Hence the sick cohabit with the well for several days unnoticed. When found slobbering we segregate them and give the mouths local antiseptic treatment. Dr. J. S. Carson of the British Remount Service, has had the best results with paintings of tincture of iodin, others have preferred methylin blue and others potassium permanganate solution. In addition to this individual treatment of the segregated animals the whole herd are made to wash their mouths in a solution of permanganate of potassium, creolin or some analagous product. This we accomplish by making a strong solution in the common watering trough in the morning when the horses are thirsty. The solution is too strong to drink but in the attempt to quench the thirst they suck up the solution and reject it repeatedly and thus effect a perfect antiseptic ablution of the mouth. Later in the day we nature the water by dilution and allow them to partake freely of this weak antiseptic solution. I am not so sure that this measure is as effectual as we had at first expected. It is likely we gave it credit belonging to the other measures taken, such as segregation and disinfection.

If an affected herd could be housed in individual stalls and
strict attention were paid to this individual isolation the disease would lose its sting very rapidly, but where it is necessary to herd horses together as may often be the case both in peace and in war it is our opinion that we have in gangrenous glossitis a very serious equine disease that should be stamped out now.

The bacteriological report on this matter from Dr. Mathers of the Memorial Institute of Infectious Diseases of Chicago.


Dr. Theo. C. Teidebold, Jr.,
Union Stock Yards,
Chicago.

Dear Sir:—

Dr. W. J. Quigley, of the Memorial Institute of Infectious Diseases, has made a bacteriological examination of the saliva and tongue scrapings of twenty-one cases of contagious glossitis in horses sick in the Union Stock Yards of Chicago.

In this work both aerobic and anaerobic cultures were made using a great variety of media. Smears of the saliva and tongue scrapings stained by Gramm's method show gram positive cocci of various sizes in pairs, chains and clumps, gram negative bacilli, large gram positive bacilli.

Culturally in all cases a gram negative spore forming bacillus was isolated. This organism grew both aerobically and anaerobically in moist slightly bluish colonies which rapidly became confluent on the surface of the media. Two of these strains were hemolytic. This organism was highly virulent for rabbits. One c.c. of a 24-hour broth culture of this organism caused death regularly when injected intravenously with no post mortem findings, but the organism could be recovered from the heart's blood in all instances. Filtrates of broth cultures of this organism were non-toxic for rabbits; 1 c.c. of a 24-hour broth culture of this gram negative bacillus when injected into submucosa of the middle third of the tongue produced a redness of the tongue, swelling of the tongue, mouth and jaws and a moderate degree of fever. The typical herpetiform lesions of the disease, however, have not been produced experimentally.

In six cases a gram positive green producing streptococcus was isolated and in three instances a gram positive diphtheroid bacillus. Other organisms, such as staphlococci, hemolytic streptococci and Bacillus subtilis were commonly found. Inoculation experiments with the green producing streptococcus gave negative results.

To determine whether a filterable virus was present or not, many filtration and cultural experiments were made with negative results.

It seems probable that the gram negative spore forming bacillus so uniformly found in these cultures may be concerned in the etiology of the disease since it is not found in the mouths of normal horses.

Yours very truly.

GEORGE MATHERS.

Remarks of Dr. Adolph Eichhorn,
Washington, D. C.

Mr. President and gentlemen: I have not prepared a paper on the subject, but intend rather to relate the results of the investigation which I have carried out in connection with the appearance of the disease in horses and cattle.
I think it would be probably of interest to go a little bit into the history of this infection, and to go back about two months ago, when the Bureau ordered an investigation of the disease in Colorado which appeared in horses and cattle on different ranges. The inspector who investigated this disease in that locality found that horses manifested an unusual form of stomatitis, indicated by lesions and ulcerations on the mucous membrane of the tongue, and the border of the lips, that however also extended to the tongue. In cattle, on the other hand, he observed the disease aside from tongue lesions, also in the other parts of the mouth, apparently in vesicular formations and extensive salivation, which persisted considerably, and also being associated with that peculiar smacking sound which we consider characteristic of foot-and-mouth disease.

The pictures which the inspector forwarded to Washington, particularly those of cattle, I think, suggested animals affected with a typical form of foot-and-mouth disease. In the horses, on the other hand, we see the denuded tongue, and outside of that, nothing could be seen.

Some weeks afterwards the Bureau received information of the existence of stomatitis in horses at different concentration camps, particularly in the Calumet yards, and also I found animals closely resembling the description as given by Dr. Merillat. However, I must say that I noticed the vesicular formation even on that occasion. I took some material and preserved it in glycerin, consisting of saliva and shreds of mucous membrane, and upon arrival in Washington tried to transmit the disease to horses, which we successfully accomplished. Two horses were given very slight scarification upon the dorsal surface of the tongue. A piece of cotton saturated in the material which contained the virus was placed upon the scarified surface. After five days, the first vesicle developed. His vesicle broke and the lesion extended to the other parts of the tongue, until finally the whole dorsal surface of the tongue was more or less affected by erosion, and from which the upper layer of the mucous membrane, as it were, sloughed off.

The material I gathered from these horses was taken and also used for the transmission of the disease to calves. This also has been successfully accomplished. Two calves which had been inoculated developed lesions, more confined to the other parts of the mucous membrane of the mouth, and only later did one of the calves develop a lesion on the surface of the tongue.

Dr. Devine: From the experimental horses?

Dr. Eichhorn: On the experimental horses and then on the experimental calves.

Dr. Devine: But the material was from the experimental horses?

Dr. Eichhorn: From the experimental horses, yes.

Dr. Devine: To the calves?

Dr. Eichhorn: To the calves. The intravenous injections which were undertaken with the material at that time, failed to develop the disease in colts which were inoculated with the same material.

Dr. Rutherford: In inoculating those calves from horses, were scarifications made on the tongue?

Dr. Eichhorn: No, scarifications were made on the dental pad, in order to determine the nature of the virus, and also to differentiate it from the foot-and-mouth disease. We have undertaken some filtration with saliva taken from these affected horses. The filtrate was given intravenously to, I think, two calves, and the result was that they did not develop the disease, the same proving that the virus is not filtered.
Soon after that the Bureau received information from Kansas and from other parts of the west that a disease existed among the live stock, particularly among cattle and horses, which closely resembles the foot-and-mouth disease. The reports from Kansas City were especially alarming, since the announcement was made that the disease was the foot-and-mouth disease. The material was sent by the inspector in charge of Kansas City which he obtained from an animal slaughtered at one of the establishments there, and upon the arrival of the material Dr. Mohler immediately prepared to send it out to the experimental station for inoculation purposes. At the same time I was directed to proceed to Kansas City, in order to investigate the disease, and to report the findings.

Upon arrival there and examining some of the animals affected with the disease, I must confess that the manifestations in the mouth resembled so closely those of the foot-and-mouth disease that differentiation was almost impossible. In some of the early cases we found typical vesicular formations, an accumulation of lymph; the upper layer of the mucous membrane was separated from the basic membrane, and the vesicle ruptured readily, leaving a surface such as we ordinarily see in foot-and-mouth disease. The lesions were not confined to any part of the mouth. The tongue was very frequently affected, I daresay in about fifty per cent of the cases. The pad was likewise quite frequently affected, more frequently than the tongue. The mucous membrane also showed lesions, with variations in frequency. The healing lesions failed also to give a distinction from those occurring in foot-and-mouth disease. The healing process progressed very rapidly, and only in the last day while I was there did I see a variation from the healing process in the foot-and-mouth disease, namely, the erosed surfaces which, particularly on the upper pad, showed a pseudo membrane, and underneath a raw surface, which developed as the result of the affection.

Of course, in these cases the healing process was somewhat retarded and slow, and in those periods three calves were inoculated by scarification, and five other calves by intravenous methods. These calves were kept in different pens. Those which received scarification developed a mouth lesion, although not in a very typical form, on the dental pads, in forty-eight hours.

On the other hand, the animals which were given intravenous injections in some instances, with the pure lymph collected from the vesicles, failed to develop any signs of the disease, even six days after the inoculation.

Hogs were given interdigital injections, but without any results. At the same time horses were inoculated by rubbing the infected material upon the tongue, but upon my arrival they failed to show any signs of the disease.

I proceeded with my scarification and applied the material collected from these recently infected animals upon different animals. One of the horses on the third day developed a vesicle on the dorsum of the tongue, and in the case in Washington, the following day we noticed vesicles on the further part of the tongue, on the solid portion, back of the transverse furrow, where there were large broken vesicles really involving the entire portion of that tongue.

The transmission of the disease to horses from cattle, and the failure to transmit it to pigs, of course, would practically eliminate the foot-and-mouth disease; but other things also substantiate that negative diagnosis as far as foot-and-mouth disease is concerned. In not a single case did we observe any foot lesions in these animals in the cattle originally infected. Besides, an observation was made in cases where the healing process was well established, and animals again developed new vesicles.
In some cases we found that the infection persisted for four or five days in those animals, and new lesions kept on developing. Also in the infected pens, there were probably in one of the pens sixty per cent of the animals not showing any lesions. In the other pens, only about forty per cent of the animals developed lesions; of course, if the infection had been true foot-and-mouth disease, it would have without doubt spread to all animals. The conditions for the development of foot lesions were very favorable there, and in spite of these favorable conditions, in not a single instance did we observe any foot lesions; but where the mouth lesions were found, they were so characteristic, as I said before, that it would be very difficult to make a differential diagnosis from a casual observation of these animals. In not a single instance were the constitutional symptoms as severe as in foot-and-mouth disease.

Temperatures were taken of hundreds of animals, and in not a single instance did we find over 103°F. We took the temperature of animals in the initial stage, and there was practically no rises of temperature, which, of course, is rather a differential point from the foot-and-mouth disease.

As far as the etiology of the disease is concerned, nothing definite has yet been developed. The healing process in the cattle which I observed at the Kansas City yard, is very similar to that observed in the foot-and-mouth disease. The lesions heal very rapidly; in fact, some of the veterinarians who have seen some of the cases thought that it was something unusual. In horses the lesions seemed to be much deeper than those in the cattle, and it may account for this rapid degeneration.

The existence of the disease, of course, is very important, because we may hear from different parts of the country of its occurrence, and it is going to be confused from time to time with foot-and-mouth disease. The fact that the country has taken such cognizance of its existence, and the interest shown is so great as the reports all over the country immediately after its report indicate, shows that people are looking out for any possible recurrence of foot-and-mouth disease. If I have stated anything that does not coincide with the views of other veterinarians, Dr. Kinsley, who is present, had an opportunity to observe the disease from its inception at Kansas City, and am sure he can tell us all about those conditions.

DR. DUNPHY: Mr. President, I would like to ask Dr. Eichhorn if he noticed any indications of it in the hogs or sheep that were in the yards at the time?

DR. EICHHORN: No, there was not a single instance in hogs. There was an experiment at Washington in my absence where they inoculated by transmission hogs and sheep.

PRESIDENT DYSON: Gentlemen, it is now a quarter to one and I would suggest that the discussion of this topic be postponed until the afternoon session, which will be at two o'clock sharp.

And thereupon a recess was taken until two o'clock P. M.

SECOND SESSION.
Tuesday, December 5, 1916.

PRESIDENT DYSON: Through an oversight on my part in failing to advise or request the gentlemen who were to present their papers on infectious stomatitis not to eat a fish dinner, we are somewhat delayed this afternoon in starting on time. Hereafter it is earnestly requested that we convene promptly. We have a very full program, and I don't think any part of that program should be neglected, especially, should
we have ample time for discussions; we will get more out of it in that way.

While we are waiting for Dr. Eichhorn and Dr. Merillat, I think we might start this discussion. Dr. Mohler, I believe is here, and I will ask him to discuss it from the standpoint of the Bureau.

DR. MOHLER: Mr. President and gentlemen: From a practical standpoint, this vesicular stomatitis of horses and cattle may be differentiated from foot-and-mouth disease on five different counts, and each of these will appeal to you as diagnosticians.

The first count is that vesicular stomatitis has not been found transmissible to hogs and sheep, while on the other hand, the foot-and-mouth disease, as you well know, is quite readily transmitted to both hogs and sheep.

The second count is, that vesicular stomatitis is readily transmissible to horses, while, on the other hand, foot-and-mouth disease in the three outbreaks of 1902, 1908 and 1914 in this country was never found in horses. Horses are very exceptionally infected with foot-and-mouth disease, but in this country in the three outbreaks of recent times they remained unaffected.

The third count is that vesicular stomatitis involves the mouth solely, while in foot-and-mouth disease there are in addition, lesions of the feet and of the udder in a large proportion of cases.

The fourth count is the character of vesicular stomatitis as a local infection in contrast to the systemic infection of foot-and-mouth disease.

The fifth point is in reference to the slow spread of vesicular stomatitis in the animals exposed, while, as you all know, foot-and-mouth disease spreads rapidly, involving 90, and sometimes 100 per cent of the herd very quickly.

Therefore from the standpoint of clinical diagnosis, you could differentiate vesicular stomatitis from foot-and-mouth disease, by these five points which I have just mentioned.

From a laboratory standpoint, there are two chief points of differentiation. The first is the virus of foot-and-mouth disease will pass through the ordinary filter and will be found in the filtrate, so that the filtrate is as infectious as the material before it passes through the filter. In other words, the cause of foot-and-mouth disease is filtrable.

On the other hand, material containing the virus of vesicular stomatitis, in the few experiments thus far conducted with emulsions of the saliva or affected tissues, fails to produce the disease in the inoculated animals after being filtered, indicating that the cause of the disease is sufficiently large to be withheld from the filtrate by the fine pores of the filter.

The second point is in reference to the microscopic examination of the desquamated mucous membrane of the tongues of these affected horses. The microscopic appearance of this tissue is quite different from that shown by this lesion in cattle with vesicular stomatitis. In horses the lesion is deeper. The vesicular fluid rises under the mucous membrane and carries with it the papillae on the horse's tongue, just as if the papillae were pulled up by the roots. In the denuded mucous membrane, you see the papillae interspersed between the swollen epithelial cells. On the other hand, in foot-and-mouth disease of cattle the papillae remain on the eroded surface of the tongue. However, when vesicular stomatitis is transmitted from horses to cattle, we have a picture of the connective tissue cones of the papillae likewise remaining on the eroded surface of the tongue, so that this lesion in cattle is much more similar to that of foot-and-mouth disease than to vesicular stomatitis in horses.
I am very sorry to note that the title of Dr. Merillat's paper in the program of the Illinois State Veterinary Association is Gangrenous Glossitis. According to our program, this Association has given it a different title, but I understand that Dr. Merillat recommends the name Gangrenous Glossitis.

As a matter of fact, in the cases I have observed, there has been a total absence of any indication of gangrene. Glossitis is present, it is true, but the mucous membrane is also occasionally involved on other portions of the mouth besides the tongue. I think we have enough names of diseases of animals in this country and I am very glad that Dr. Merillat suggested this name merely tentatively, and not definitely. We are now experiencing in this country a disease that has been known in Europe and South Africa since 1884, and I do not think we are justified in giving a new name to an old disease unless we improve on the old. The first work done on this disease was that by Hutcheon, in 1884, in South Africa. He described the symptoms of the disease along very similar lines to the statement given by Dr. Merillat this morning. Since that time the affection has been reported by Dieckerhoff, Theiler, Iwersen, Bochberg, and others. Some of these writers had the same negative results as Dr. Merillat, in trying to reproduce the disease in experimental animals and consequently they called it sporadic stomatitis. On the other hand, Theiler, Hutcheon, and others have shown it to be infectious and therefore call it infectious or vesicular stomatitis. This disease is described quite thoroughly in the excellent works of Wallis E. Hoare and Hutyra and Marek, under the name of vesicular stomatitis.

At this point I might state that tissues from several suspected cattle were shipped from Kansas City to Washington and were inoculated last week. On Thanksgiving morning I went to the experiment station at Bethesda and noted as the result of the inoculation that all three calves were infected with the disease, some with small vesicles, some with erosions that had been vesicles, but in each case confined to the mucosa of the mouth. The two horses had also developed lesions of this disease on the tongue and lips. The hogs were entirely normal, as were the sheep, although they had received intravenous injections, as well as local applications of infected material to the mouth and to the interdigital spaces.

The result of these experiments convinced me that the infection is not foot-and-mouth disease, and therefore a newspaper statement was prepared which on Friday morning was approved by Dr. Melvin and the Secretary of Agriculture, and given to the press that same day. For the benefit of those who have not seen this statement I would like to refer to it here.

DEPARTMENT OF AGRICULTURE BELIEVES NEBRASKA MALADY IS NOT FOOT-AND-MOUTH DISEASE

Bureau of Animal Industry Announces Its Belief That the Disease Among Nebraska Cattle Is Vesicular Stomatitis, A Malady Which Primarily Affects Horses—Suggestions for Disinfection of Premises and Treatment of Animals Offered

Washington, D. C.—Careful and systematic observation of the Nebraska cattle found last week in the Kansas City stockyards suffering with sore mouths has failed to reveal certain typical symptoms of foot-and-mouth disease, according to the Bureau of Animal Industry, U. S. Department of Agriculture. The specialists therefore are of the opinion that the disease is not foot-and-mouth disease but vesicular stomatitis, a mouth ailment which ordinarily affects horses and sometimes affects cattle. The most striking symptom of this disease is the occurrence of blisters and sores on the tongue and other portions of the mouth.

This disease, while undoubtedly contagious, is not of great economic im-
U. S. LIVE STOCK SANITARY ASSN.

importance, as animals ordinarily recover from it in 8 to 10 days. Vesicular stomatitis is known in Europe and South Africa and has been found occasionally in the United States. The present outbreak, however, is the most extensive of the latter country, therefore, are advising State live stock officials in whose territory the disease is found to impose local quarantines to prevent its spread. They advise all owners and handlers of horses and cattle, particularly liverymen, managers of stockyards, and breeders, to separate sick from well animals, to clean up and disinfect their premises, and to wash out the mouths of sick animals with a weak solution of permanganate of potash or picric acid.

The belief of the specialists that the malady is not foot-and-mouth disease is based upon the fact that persistent observation of sick animals and experiments in inoculating animals with the infection at Washington failed to reveal certain typical symptoms which would be expected in any case of foot-and-mouth disease. The slobbering and blisters and sores are similar in appearance to the mouth condition produced by foot-and-mouth disease, but in none of the sick animals examined there has been found any soreness of the feet, which is a common symptom of foot-and-mouth disease. Moreover, many horses have this particular ailment, and horses have not been observed to contract foot-and-mouth disease in any of the previous outbreaks in the United States. Hundreds of hogs exposed to the disease in close association with the sick animals show no signs of the malady, and this is regarded as significant because during the recent outbreaks of foot-and-mouth disease hogs were as susceptible to foot-and-mouth disease as were cattle. Exposed sheep also fail to show the disease, yet these cloven-foot animals are also susceptible to foot-and-mouth infection. This bears out the diagnosis, since vesicular stomatitis affects only horses and cattle and not hogs and sheep.

Finally, the low percentage of animals infected in each of the herds—only a small proportion out of some hundreds—would indicate that this ailment is not the highly contagious foot-and-mouth disease which, once it is introduced into a herd, quickly affects practically 100 per cent of the cattle and hogs.

Control Measures

Where vesicular stomatitis is present among cattle and horses, immediate steps should be taken to control the disease, the Federal veterinarians advise. Affected animals should be kept to themselves until the disease has run its course, and animals exposed to infection should also be kept separately for at least 8 days. Barns, premises, and other equipment with which the diseased animals have come into contact should be carefully cleaned and disinfected. Well animals should be prevented from getting at food or water mouthed over by those with sore mouths. It is a good plan first to wet down with disinfectants the portions of the premises to be cleaned so as to lessen the likelihood of spreading the disease germs in infected dust. The premises then should be thoroughly cleaned and again disinfected. Drinking troughs and feed racks should be disinfected and then rinsed with clear water. A compound cresol solution made up of 4 ounces of the chemical to each gallon of water is recommended for use in this work. A solution of carbolic acid of approximately the same strength also can be used. These solutions should be applied with a spray machine or otherwise to all portions of the masts and floors.

The Department's veterinarians will keep a careful watch to detect any evidence of foot-and-mouth disease.

DR. MERILLAT: Just a word about the nomenclature of this disease. I take a vesicle to be a lifting of the epithelium from the basement membrane, and not an undermining of a membrane. What is the best use of the word vesicle in connection with the nomenclature of this disease? An influence that causes a separation of the upper layer of the skin between it and the basement membrane, that is a pure and simple vesicle as I understand it. This is not the lesion we have here, this is a through and through death of the whole mucous membrane, and that death is gangrenous. It is not essential that gangrene should be a progressive disease. Gangrene means death of tissue, irrespective of how it is produced. This death may occur in great fields, in great zones, in large surfaces. Here we have a surgical picture which involves the mucous membrane from top to base, where the healing process is very very slow, because not only the epithelium is involved, but the whole mucous membrane, and on account of our observation of this slow healing process, there have been a number who have said that bacteria were still operating there, because it was three weeks and it wasnot
healed yet, it was in bad shape. But I have always held that it takes a long while for that great big membrane to heal, and that is practically what I think we have here.

I used the word gangrenous in my title after thinking it over a great deal. We have learned something, however, here. It seems to me, it may be more nearly vesicular in cattle than it is in horses. It is a revelation to us to know that this is a cattle disease. We have been dealing with it in horses, and of course we are very flexible in regard to what the disease should finally be named. The suggestion of naming it gangrenous is not to be taken seriously, but I do not like to be criticized for not properly naming a pathological lesion.

DR. KINSLEY: We certainly have been interested in the discussions that have been given concerning stomatitis in horses and in cattle. From the amount of the disease I have seen, I should have to take issue with Mr. Merrillat on the type of the lesion. It is vesicular so far as we have seen the disease, not gangrenous.

In reference to Dr. Eichhorn's discussion, I have just one thing, possibly two, I want to state, regarding the Kansas City situation. Since he left Kansas City one other of the three horses inoculated has developed vesicular lesions, from which we expressed, I presume, not less than ten cubic centimeters of fluid by a simple pressure of the thumb, the vesicle was ruptured and the fluid removed.

Dr. Mohler's differentiation is good, but, gentlemen, it does not amount to very much when you see cattle only in a stockyards, without any of the foregoing history or the condition of those animals, and their origin. Now, briefly, the situation at Kansas City was this: Several animals were slaughtered at a packing establishment where lesions not unlike foot-and-mouth were found. This caused the inspector in charge to look up and find whether more of the cattle were present or not, and on investigation we found fifty-seven others. We went to examine these cattle and we found smacking of the lips, and salivation. When they were examined we found vesicles on the tongue. This happened on Thursday evening. Two cases in the other fifty-seven that were examined as showing typical symptoms, were observed with the lesions, as I have mentioned. The next day there were three or four new cases, showing the same condition. At this time the inspector in charge at the station there called for help, as did the rest of us, and on the following Monday evening—this happened on Thursday, the cattle arrived in Kansas City on Tuesday, we don't know just how much territory they traveled in the yards in the meantime—we had traced them up. They were yarded in what we called Seven block. This was on Wednesday, and on Thursday they were transferred from that block, and on the following Monday, four or five days after, fifty feet across two lots.

In the second batch that I had, which were loaded at Herford, Texas, they showed the same conditions, and when Dr. Eichhorn appeared on the scene on Wednesday, sixteen of these animals were examined, and nine of them showed lesions, out of twenty-three in the lot.

Gentlemen, we are asking for a more definite, specific manner of differentiation. We carried on inoculation experiments, and we were tied up ten days, and I believe it is up to our scientists to develop an exact diagnosis for the differentiation between these diseases, otherwise we will have serious difficulty in our stockyards in Kansas City.

Concerning the retention of cattle for eight days, if you hold a bunch eight days after one has it, sometimes in two or three days there will be another, and in a few days there will be another one, and you will have to hold the cattle there the whole season before you get rid of them. We
are asking for a new rule. We are of the opinion that upon the appearance of that disease we should be given permission to slaughter that entire bunch at once. We have given orders to do that, rather than to hold them for a period beyond eight days. We do not believe this is going to facilitate the movement of cattle, because it is going to prohibit the movement of stockers in those yards in sections of the country where this disease has made its appearance. (Applause.)

DR. LAMB: I would like to ask one thing which interests me, especially, and that is interesting our stock men. Does one attack of this disease produce immunity? That is what our stock men are particularly interested in. They are more or less familiar with the disease. They realize that aside from a short period of inability to eat, there are no fatalities and no great discomfort, and only a slight loss in flesh, but they want to know whether any immunity is conferred by one attack of this disease.

DR. MERILLAT: Mr. President, in answer to Dr. Lamb's question I might report the observations of Dr. Teidebold. He has had several cases attacked the second time. These animals had been healed and interned in pens with infected animals. This is not sufficient observation to make a conclusion, but it at least partly answers the question, there does not seem to be any immunity.

PRESIDENT DYSON: Has anyone else anything to say on this subject?

DR. MOHLER: Mr. President, along the suggestions made by Dr. Kinsley, if we can get the cause of all these lesions, it will be very easy to get at the condition of that organism and probably make a prompt diagnosis.

Regarding Dr. Kinsley's suggestion it is not necessary to continue this isolation for eight days each time. The recommendation in the report as read suggested isolation of all horses as soon as they came down, and the prevention of interstate shipments of exposed horses within a period of eight days after the exposed or infected animals had been removed.

Now, if people in Kansas City want to slaughter these animals that are exposed, of course, there is no objection from the federal government, and probably no objection from the state to such slaughter; but there would be objection to moving those exposed animals interstate within a day or two, or three or four days, after contact with infected animals, and this merely suggests to hold these animals for eight days after they had been exposed before shipping interstate.

Dr. Merillat still hangs onto that description of a vesicle. What he has described as a vesicle is known in ordinary pathology as a atom. A vesicle is merely an exudation of the serum from blood vessels under the epithelium, with rising of the epithelial cells and a necrosis of the mucous membrane.

Gangrene, on the other hand is, as he well described it, a death of the tissues in a normal position, and you have accompanying it decomposition, discoloration and a fetid odor. You do have some fetid odor in this disease, but it is not from gangrene. Dr. Merillat refers to the fact that the death of tissue is gangrene; so is necrosis. There are various forms of death of tissue that do not involve a gangrenous condition, and it is very far from accurate to characterize this in that way. I do not object to glossitis. It is glossitis, but I do object to giving a new name to an old disease.

DR. MERILLAT: The only reason for taking a new name would be in case modern pathologists should happen to find that those who lived forty years ago might have been wrong. That is all.

PRESIDENT DYSON: I believe that it is generally conceded that this is not a serious disease as it affects horses, but the fact or the question
of double diagnosis between this infection and the foot-and-mouth disease is a very important matter. This scare simply calls to our attention again our absolute unpreparedness to handle foot-and-mouth disease in case we have another outbreak. I therefore desire to urge upon you again the importance of this association taking steps at this session to recommend something in the way of rules and regulations, quarantine and otherwise, to control any possible outbreak of foot-and-mouth disease in the future at its inception, if possible. But, as I say, the scare that we have had simply recalls to mind the fact that our machinery for handling another outbreak of the foot-and-mouth disease is absolutely and totally inadequate.

If there is no further discussion, we will proceed with the next on the program, “A Review of the Research Work on Hog Cholera Conducted by the Bureau of Animal Industry During the Past Year,” by Dr. Dorset (applause).

**REVIEW OF RESEARCH WORK ON HOG CHOLERA**

*By Dr. M. Dorset*

**Dr. Dorset:** Mr. President and gentlemen of the association:

The title of my paper on the program hardly describes accurately the remarks I wish to make. I do not expect to present a complete review of the research work on hog cholera during the past year, but rather a review of certain phases of that research work.

**Clear Anti-Hog Cholera Serum**

You may remember that at our meeting last year I stated that in collaboration with Dr. McBryde, Dr. Niles, and Dr. Rietz, certain investigations had been made with reference to the effect of heat on hog cholera serum and hog cholera virus. The object of the investigation was to determine whether or not it was possible to heat these products at temperatures sufficiently high to destroy the virus of foot-and-mouth disease, without at the same time destroying the commercial value of the products. At that time hog cholera serum and hog cholera virus in the form of defibrinated blood were heated at fifty degrees centigrade, fifty-five degrees centigrade and sixty degrees centigrade for different lengths of time, and it was found that this heat did not destroy the potency of either the serum or the virus. But although the potency was not materially altered, the physical changes, particularly when these products were heated at 55 degrees or above that, were such that the products were rendered unmarketable, as they thickened very much, and when heated at 60 degrees for one-half hour coagulation occurred. It was evident then, that if hog cholera serum and hog cholera virus in the form of defibrinated blood were to be heated, they would have to be heated at a temperature not much, if any, in excess of fifty degrees centigrade.

The best authorities on the subject state that twelve hours
heating at fifty degrees centigrade is required to certainly destroy the virus of foot-and-mouth disease. It seemed to us that twelve hours' heating would be too long for a firm producing hog cholera serum in large amounts. Some firms that we have in this country can produce one or two hundred liters in a day, and to heat such quantities for twelve hours would be impracticable. For this reason, we turned to the production of the serum in some other form than defibrinated blood. We already knew as a result of our own work and that of Haslam and Franklin and Reichel, that the serum and not the cells of defibrinated blood contained the anti-toxin. When the red blood cells are freed of serum they have no longer protective value. Therefore, our idea was to separate the clear serum from the red blood cells in some practical way, because such a product could be heated much higher than the defibrinated blood.

It has, of course, always been possible to separate serum from cells by the use of a centrifuge. This method will serve to separate the defibrinated blood into two parts about equal in volume; that is, about fifty per cent of serum and fifty per cent of cells. It is impossible to pour the serum off completely from the cells, and in attempting to remove it, there is always difficulty, and always a loss of a fair proportion of the serum contained in the defibrinated blood.

During the past winter Henley and myself devised a process for separating the serum from the cells, and I wish to speak of that briefly. It has long been known that certain beans contained substances that caused the red blood cells of many species of mammals to agglutinate. Some are very poisonous beans, as for example, the castor oil bean which contains ricin, an extremely poisonous substance. It was also known that some of the common edible beans, particularly the bean generally known as the "scarlet runner," likewise contained an agglutinin.

In experimenting with many species of animals, including pigs, we found that extracts from certain of these beans, although they would agglutinate blood cells very vigorously, were irritating. The common white navy bean was finally selected as most suitable, as we found that the extracts of that bean were not poisonous, and did not cause any undesirable local reactions. We also found that when a small amount of the extract of the common white navy bean was added to defibrinated immune blood, and the mixture centrifuged, we got a good separation of serum from the red blood cells. The cells all stuck together in a mass, not particularly firm, but they stuck together in a clot, and we could readily pour the serum off down to the clot. The serum yield was about fifty
per cent, and the clot was like a rather soft jelly. The clot looked like it had a good deal of serum remaining in it, and for that reason we felt we were losing considerable serum.

We added a small amount of certain chemical salts, which had the effect of contracting the clot. It was found that one per cent of common salt caused a marked contraction of the red blood cells. A mixture of defibrinated blood, bean extract, and salt was centrifuged, after which the serum could be readily poured from the tube. The serum thus obtained is quite clear, and on the average we find it represents seventy per cent of the total volume of the original defibrinated blood.

We have tested the clots obtained in this way and we find in some cases that if a sufficient amount of the clot is used, the pig may be protected. Of course, it can be seen that a very small amount of serum must be left behind, and in view of the fact that we have found some hog cholera serums which protected in three cubic centimeter doses, it can be readily seen that it would not take very much of the clot perhaps, to furnish three cubic centimeters of serum, or enough to protect. While there is some serum left in the clot, we think the amount is very small.

After the serum was secured in this way by this process, we heated it for thirty minutes at sixty degrees centigrade. Twenty-four different lots of hog cholera serum have been separated and heated in the manner described. Our yield of serum averages about seventy per cent. We have never observed any deleterious effects upon the serum as a result of the heat. There is never any coagulation. We usually get a perfectly clear serum which on test we find to be quite potent. We have tested six different lots of such serum and found that they are potent in all cases. They were tested in doses of three cubic centimeters up to twenty, most of the doses being less than ten, and they have always protected the pigs most satisfactorily.

There is one more matter with reference to this serum, and that is as to the keeping quality. I was asked as to whether this serum lost its potency after it had been heated. Of course, the process not having been in use very long, we have not been able to keep the serum over long periods, but we have kept one lot of serum eight months and another for two and a half months. The one that was kept eight months was tested originally in doses of eight and sixteen cubic centimeters, and a retest was made at the end of eight months, using the same doses. The other was originally tested in doses of seven and one-half and eleven cubic centimeters, and after two and one-half months was retested in
the same doses. In all cases the pigs were perfectly protected. So far as our data goes therefore it shows that heating to 60° C for 30 minutes does not noticeably affect the keeping quality of the serum.

Transmission of Hog Cholera

Mr. Chairman, during this past summer we have had an opportunity to carry on some experiments regarding the modes of transmission of hog cholera. It is a subject that has interested us very much, and it is one that we regard as of great importance, as we have always felt that there has been very little experimental work done along these lines. Our studies are not complete, and what I have to say I want you to understand represents merely a sort of report of progress, but the results are presented in the hope that they will perhaps induce others to take up this work that we are doing and check the results that we are getting, for it is only by a great volume of work of this sort that we can really get results that we can rely upon.

The carrying out of these experiments has been in the hands of Dr. McBryde, Dr. Niles, and Dr. Rietz, to whom belongs the fullest measure of credit, which should be given them for their work.

Excretions of Cholera Infected Hogs Infectious Before Symptoms Appear

In the first experiment, which was one to determine the infectiousness of the blood and excretions of cholera-infected hogs, a hog was injected with cholera virus, then on the first, second, third, fifth and ninth days, blood was drawn from this hog and used for the injection of susceptible pigs. On the same days, urine, and feces, and the excretions from the eye and nose were collected and likewise used for the injection of susceptible pigs. As a result of this, it was found that the blood and the urine were both infectious on the first day after injection of the hog; the feces were infectious on the second day; and the eye and nose secretions on the third day. The pig that furnished this material showed no visible symptoms whatever until the fifth day, although there was a slight increase of temperature on the fourth day. Therefore, we are probably justified in concluding that the blood, urine, feces, eye and nose secretions of cholera hogs may all be infectious before the hog exhibits any symptoms of disease. This experiment also shows that the urine of cholera hogs is infectious from the first day and at least until the ninth day, when this urine is inoculated subcutaneously.
Hog-Cholera Contagious During Incubation

The second experiment was designed to determine when an infected pig is capable of transmitting disease to others by mere contact, and was carried out as follows: Three pigs were inoculated with virus and placed in a disinfected pen. Two non-immunes were placed in the same pen on the same day and were allowed to remain there for two days, when both the inoculated and the exposed pigs were transferred to separate disinfected pens. Then two more susceptible pigs were placed with the three inoculated pigs, and allowed to remain for forty-eight hours, when the same change was made, the exposed pigs being placed in a clean pen, and the inoculated pigs in another. This was repeated at two-day intervals up to and including the tenth day. Six lots of pigs were exposed in this way by contact, and all developed cholera except those exposed on the first two days, which remained well.

There were four other experiments carried out with pigs which had been inoculated with cholera, some of which were further along in the disease. On the 10th, 12th, 14th and 21st days of the disease, susceptible pigs were exposed to pigs that were affected with cholera at the time, and all that were exposed contracted cholera.

From these experiments I believe we are justified in concluding that hog cholera is contagious at all stages, including the stage of incubation.

Not All Recovered Pigs Are Cholera Carriers

The third experiment involved only two pigs, but it had to do with the question of recovered pigs as carriers of cholera. We have endeavored for some time to secure a recovered pig in order to determine the likelihood of its spreading the disease. This year we were able to get two pigs, both of which had had an attack of cholera as a result of virus injections. There were two separate experiments with these pigs. Twenty-three days after these pigs were inoculated, they had returned to perfectly normal health and had apparently made a good recovery. During the course of the disease they exhibited typical hog-cholera symptoms, such as fever, loss of appetite, conjunctivitis, weakness, and purple ears. On the 23d day both of these pigs were first thoroughly scrubbed with soap and water, next with compound cresol solution, and again with soap and water, and placed in separate disinfected pens in contact with susceptible pigs. In both of these experiments the susceptible pigs remained well, although they
were left in contact with the recovered pigs for twenty-one days. These two observations are, of course, not sufficient to warrant any conclusions as to the danger of recovered pigs. They are simply offered for what they are worth. It seems that data of this kind is hard to secure, and I hope that some one else here may be able to add to it, in order that we may determine, if possible, the percentage of recovered hogs that may be carriers of cholera.

**Putrefaction May Destroy Cholera Virus**

The next experiments had to do with the survival of the virus of cholera in buried carcasses. These experiments were carried out in July and August when the weather was quite hot. The carcasses of virus pigs which showed acute hemorrhagic lesions were used. Four different carcasses were buried at a depth of two feet, two in sandy soil and two in clay soil. The infectiousness of the fresh carcass was determined by feeding portions of the meat to susceptible pigs before the burial of the carcass. Portions of each of the four carcasses were exhumed after seven days, fourteen days, and twenty-one days, and each time two pigs were fed with about half a pound of the exhumed meat, the meat being chopped and mixed with bran mash. Even at the end of seven days, these carcasses were very badly decomposed, and of course the putrefaction became progressively more advanced as the experiment went on. In only one of the four carcasses did the meat produce cholera after having been buried for seven days, and in none of them did the virus survive after fourteen days of burial, and there seems to be no doubt but that the early disappearance of the virus in these carcasses was due to putrefaction. Uhlenhuth stated some time ago that putrefaction quickly destroyed the virus of hog-cholera, and I believe Stockman has reported a similar result. Our experiments were conducted in warm weather and it by no means follows that the destruction of the virus would take place so quickly in cold weather, or under conditions different from those under which we worked. We have other experiments under way on this point.

**Transmission of Cholera by Attendants Not Certain**

The next experiment, which was designed to determine the transmission of virus by attendants, is not conclusive. At the same time it has interested us so much that we thought it was our duty to report the facts to you, in order that more work might be done along similar lines. This experiment was an attempt to determine the likelihood of the transmission of
virus mechanically by attendants, which is generally regarded as one of the most common sources of natural infection. On August 25th two pigs were placed in a small clean pen about 100 yards from the virus pens. There were two attendants who daily entered and walked through the virus pens, taking the temperatures of the virus pigs. After disinfecting their hands and the thermometers, these attendants then went over to the pen one hundred yards away where the exposed pigs were, climbed into the pen, and took the temperatures of these pigs. The pen in which the exposed pigs were kept was a small pen, about five by ten feet, with a concrete floor. The visits of the attendants to this pen were repeated each day for thirty-two days, when the exposed pigs, having remained well, were moved to another pen of the same character within fifty yards of the virus pens, and the men again went through this process of visiting first the virus pigs and then the healthy pigs. The healthy pigs received a daily exposure of sixty days in all. There were two other pigs that were kept in a near-by pen for controls; these were not exposed, no one being allowed to enter their pen. Both the controls and the exposed pigs remained entirely well throughout the experiment. All of the pigs were later exposed to cholera by virus injection and were found to be susceptible.

The last experiment was repeated by placing two pigs in a pen fifty yards away from the virus pens, and having the attendants go through the same daily visitations, first to the virus pigs and then to the healthy pigs. The visitations were kept up for twenty-three days in this particular experiment. There were two control pigs in a near-by pen, which no one was allowed to enter. Of course, no temperatures were taken of the control pigs, and they were not handled in any way. In this experiment, seventeen days after it began, the control pigs, whose pen was not entered, got sick and developed quite typical hog-cholera, whereas in the pen which we had been trying to infect the pigs remained perfectly sound. It was, of course, a great surprise to us when the disease was not carried promptly to the healthy pigs which the men had been visiting.

**Period of Infectivity of Premises**

As I have said, these last experiments are merely suggestive; they do not prove anything. They merely show that in these particular experiments the attendants failed to carry hog-cholera on their feet or clothing. Inasmuch as men were supposed to carry the virus on their feet very frequently, and this method of conveyance has been regarded as one of the most
prolific sources of cholera in this country, it seems to us that these experiments ought to be repeated and extensive studies should be made along this line.

In the case of the sixth experiment that we carried out, this was originally intended to answer a question that is asked very frequently, and that we have never been able to answer very satisfactorily, and that is, the question that farmers so often ask: "How soon is it safe to restock my farm after an outbreak of cholera?" These experiments are still in progress. They have been quite extensive, and I have not the time to go into details as to each one of them. The first series of these experiments were carried out in August, September and October of this year. Five different kinds of pens were used, that is, pens having concrete, wooden, sandy, sandy loam, and clay floors. Several different experiments were carried out with each kind of pen. The pens were all closed and covered, and in only one of them was there any direct sunlight, and even in that the sunlight did not reach all of the pen, but only a part of the floor for a short time during the day. The pens in which these experiments were carried out were small enclosures, varying from five feet square to the largest one, which was twelve by twenty-five feet. The smaller pens, which were five feet square, were infected by placing two sick pigs in each pen. The sick pigs were left in the pens for quite an extended period of time, so as to give ample opportunity for infection of the pen. Thirty-two inoculated pigs were placed in the largest pen, and twenty-three died in this pen. The sick and dead pigs were removed, but the pens were not cleaned or disinfected in any way, the old feed troughs and unconsumed feed being left in the pens undisturbed. In these pens, infected in this way, susceptible pigs were placed after intervals of time varying from seven minutes up to twenty-four hours. The susceptibility of all surviving pigs was proven later by exposure to disease either by association with sick pigs, or by inoculation with virus. The results of these infected pen experiments may be summarized as follows:

In no case did the susceptible pigs contract hog-cholera when placed in infected pens twenty-four hours after removal of sick pigs.

In one case disease was contracted when exposure took place six and one-half hours after the removal of the sick pigs.

In the concrete, wooden, and sandy floored pens, pigs which were exposed one hour after the sick pigs had been removed contracted the disease; while in the other two classes of pens, the pigs remained well.

Now, these experiments are still being carried on and ampli-
fied, and at the same time I wish to call attention to the fact that these experiments were carried on in the summer and fall, therefore, they cannot be regarded as conclusive evidence as to what might be expected to happen in winter. We believe that perhaps, and I might almost say it seems probable, that the rapid disappearance of the infection from these pens was due to putrefaction and fermentation of the litter in these pens. As we have stated before, these experiments were carried out in the late summer and fall, during which time the virus would seem to be very susceptible to putrefactive changes.

It seems to me from these experiments concerning the transmission of hog-cholera that there is one striking feature that stands out when the experiments are taken as a whole, and that is, that the disease is rapidly, certainly, and easily conveyed by sick pigs, that contact with a sick pig is almost sure death. But opposed to that, it has been very remarkable to see the difficulty with which the disease was transferred when the sick pig was removed. Certainly that has been true in these experiments.

**Findings of the British Board of Agriculture**

I regret very much that I have not the time to review the work that has been done by Stockman, of the British Board of Agriculture. He has carried out very interesting and I think valuable experiments which in many respects have resembled our own. Our experiments were planned and carried out without knowledge of the work of Stockman. It was only when we had our work well under way that we found that he had published his report, which is an appendix to the official report of the committee on swine fever of the British board of agriculture and fisheries. While our experiments, as I say, were arranged entirely without knowledge of Stockman’s work, it is very interesting to see that our findings in a general way are in remarkably close agreement with the observations that he has made.

In concluding my remarks, I wish to say that the work that we have done merely points out an important and desirable line of investigation. I do not, of course, believe that as a result of these experiments—this small amount of data—that anyone would be warranted in modifying or relaxing in any way the sanitary precautions and regulations that are now considered so necessary to prevent the spread of hog cholera; but I do feel that it is very desirable for us to know all that we can learn about hog cholera.

We have not been making great strides in the eradication of the disease. Perhaps there are some things about the dis-
ease and the way it spreads that we do not know, and I hope that there may be a good many of you here who are in a position to institute experiments along this line or other lines, that will serve to teach us better how hog cholera is spread. This will involve a great deal of work in the field, as well as experimental work.

President Dyson: Gentleman, Dr. Dorset's review of hog cholera is open for discussion. I think every possible advantage should be taken of this opportunity to thoroughly discuss the question.

Dr. J. W. Connaway: Mr. Chairman, I would like to supplement this with some work that we have done at the Missouri experiment station, in line with the suggestion of Dr. Dorset's paper of last year in reference to the viability of the virus in hyper-immune hogs.

I believe he found that after about the third day after injection the virulence of the organism was lost in hyper-immunes. This suggested a thing which many of us should have done a long time ago, but which we have been too busy with other things to do, that is, to determine the viability of the hog cholera germ in the simultaneously treated animals, how long does the infection persist, how long is the blood infectious, so we planned this experiment, to inoculate animals day after day with blood from simultaneously treated animals.

We took nine pigs and divided them into three groups, three pigs in a group, and gave these simultaneous treatments, gave two of them one cubic centimeter of the virus and thirty-five cubic centimeters of serum, and the other one pig of that group we gave a double dose of virus and the same amount of serum. These pigs developed some temperature, but all of them are well today, they did nicely, notwithstanding that we handled them. We divided them into these groups, so as not to disturb the animals by too much handling, and we took this large number of pigs so as to eliminate the element of greater resistance in one animal over another, so that if any one pig of that nine contained virus, why when we injected the test animals, we would find it.

This experiment has not yet been closed. It is up now to the eighteenth day, that is, we have the results now of the eighteenth day virus, that is, blood drawn from the pigs eighteen days after they have been given this simultaneous treatment, the blood is still infectious, and how much further it will continue infectious we do not know. It has this practical bearing. In some states they require isolation and quarantine of these groups of simultaneously treated animals for twenty-one days. In other places they are released and go out to the farms after fifteen days. Fortunately, though, most of these hogs that are treated in this way go out to farms that are already infected and do not do any harm. If one of those pigs dies, it is burned up, and as I say, most of them go to what might be called permanently infected premises. Probably the taking of those pigs to those particular premises has not increased the danger of spreading cholera in that particular neighborhood.

Another experiment that we have carried out is the one suggested by the requirements of the Bureau, as to the testing of these animals that are hyper-immune for tuberculosis. Some men who make serum do not believe that that is necessary. They do not think that it is probable that tuberculosis can be carried through the blood from
one of these hyper-immune animals, and I had my doubts about it myself, until we proved the possibility of it, that is, the possibility of the transmission of tuberculosis through the blood. I think there will be probably some interesting studies along this line. Dr. Ward, of the University of Michigan, has made some studies on the human blood, in which he found tuberculosis bacilli in the blood.

A few years ago some excitement was caused by one scientist who had developed a method by which you could find this germ in almost any specimen of blood, but other people trying that out failed to do it; but our experiment was this. We took some of the tubercles from an old experimental sow that we had tried to immunize against cholera by the old varying method, a sow that we had owned for about seven or eight years, one that we thought was free from disease, but here this winter we found that that animal was infected. We slaughtered her and found quite large lesions of tuberculosis in that animal, a great bunch of grapes on the inside of the ribs. We took a little emulsion of that and injected it into a rabbit and we reproduced the disease in that rabbit. We took the blood from the part of that rabbit that was infected and injected it into two other rabbits and into two guinea pigs. In one of these rabbits we developed tuberculosis with the blood of the diseased rabbit. The other three were negative, so far as we could see. We also found before killing this particular rabbit that developed the disease that it produced a beautiful case of the skin test. I took one of those rabbits and scratched a little of the tuberculin into the ear, and in a short time we found a beautiful spot there; while in the other ear where we had not infected it, there was just a little redness that showed up nicely.

I am sorry I did not bring those pictures. I intended to bring you some that show up those pigs. It shows up beautifully in the rabbits, that tuberculin test and skin test.

We took some of the material from that rabbit, injected two pigs and reproduced the disease in those pigs. When one of them was well advanced, we tested these pigs out with the usual tests, to see whether they had the disease or not, but they did not respond. On killing these pigs we found them badly infected with tuberculosis. Taking blood from those hogs and injecting it into two other hogs—more than that, into several other hogs, in one of those hogs we have produced a beautiful case of tuberculosis. I have a picture with me that will show you a typical lesion of that disease in that one case. Some of these rabbits that we have inoculated with the blood from those infected hogs show ear lesions on the test, but those have not been killed. In that particular case we injected a good large quantity of blood, I think about 2,500 cubic centimeters or more of blood into the abdominal cavity through the skin. Where we injected it on the inside of the abdominal wall, beautiful tubercles developed. On the peritoneum there were signs of it; on the mesentery and omentum, beautifully studded with tubercles, even in one of the glands we found a focus of infection.

Another experiment was this, taking the blood of an infected bull, one of our bulls which we have had there for service with our state farm, and which had been loaned out to help improve the herds of the section. That bull came back to us with a case of tuberculosis, and we have had it in quarantine several months, trying out some abortion serum on him, and some tuberculosis experiments, using him for demonstration work for students. We tried some of the
blood from that bull on several rabbits and guinea pigs, with negative results.

In that particular case we believe that probably the infection in that bull has not advanced to a stage where infection will be taken up in the blood, but certainly in an advanced stage of this disease, the blood must be very heavily loaded with tubercular bacilli, so that you could transmit the disease to other animals by intra-abdominal injections.

I thought it well to report these things at this time, because they seem to be in line with the experiments which Dr. Dorset speaks of. I am well impressed with one thing brought out by one of the experiments which the doctor reported, and that is the infectiousness of the live hog. This helps to amplify the matter of the control of hog cholera. In my educational work among the farmers, I try to direct their attention to the few essential things to look after, and not to have their attention diverted too much by the things that are not known, and by which the disease may not be easily transmitted. We usually find that farmers have come to this thought from reading so much literature. They say: "What is the use, what is the use? There are so many ways in which cholera can be distributed, how can we ever get away from it?" I try to impress upon them the fact that the sick hogs and the dead hogs and the infected hogs are the three things, and they are about all the three things that they need to worry much about, and those three things they can control. They cannot control buzzards, they are not going to kill all the dogs in the country—we love the dog. We cannot control the streams. They were here before we were, and they are going to be here after we leave; but we can prevent the contaminations of those streams if we quarantine those sick hogs, if we burn those dead hogs and if we disinfect the hog lots. The problem is not a very difficult one so far as these things are concerned. They are not very difficult, our great difficulties are those which were pointed out by Dr. Dorset in his talk, and that is the right kind of an organization for doing these things; the right kind of an organization, and the right kind of laws and the enforcing of those laws.

I think that is the big problem for this Association to solve, is how to co-ordinate those forces which can eradicate hog cholera. I believe that this disease can be practically eradicated, not absolutely; it can be so controlled that the great expense that we are now put to will be greatly reduced. I feel every year I come back here that we are making great progress along these lines; but as I have a report to make later for a committee, I will not make it all at one time. (Applause.)

Dr. E. M. Ranck: Mr. President, we have a problem in Mississippi to contend with. A few years ago when we had a meeting here in Chicago of the federal and state officials, looking to the control of hog cholera, Dr. Dorset suggested that owing to the fact that anthrax could be transmitted by turkey buzzards, that some of us in the south should do some work along these same lines with hog cholera. We started a number of experiments there at the Mississippi experiment station. I was never able to catch any healthy turkey buzzards. Those that I got died pretty soon after I got them in captivity, so I was never able to determine exactly whether or not turkey buzzards would carry this disease; but the thought occurred to me that there were
migratory birds that might possibly convey this disease, and that the air itself might possibly convey it.

Owing to the fact that we were working with something that we did not know all about, I built some pens five feet square and lined them with tin. I took some hogs that I thought were free from disease, or susceptible, rather, and afterwards we found it to be true that they were susceptible. I used cow birds, sparrows, blackbirds and pigeons. I had these boxes about five feet square, and I put two sick pigs in one of the pens and at the same time we put two other pigs that were of the same litter that had not been exposed to the disease in another of these pens, and I had a big pipe through which there was an opportunity for those birds to go from one side to the other. These pigs were fed in such a manner that it was impossible to convey the disease by the boys that attended them, and in every instance we were able to convey the disease from the sick to the well pigs by these migratory birds.

From those experiments of ours we positively proved that those migratory birds and our sparrows would transmit this disease. We tried to transmit that disease by the method of lice. I tried that four or five different times. In one instance one of the susceptible pigs contracted hog cholera, but the test was not accurate, and I could never prove it absolutely. I did this, I combed a number of lice off of a sick pig and put those lice on a susceptible pig; and after they were on there several days, I took the temperature of that pig, and I could not convey the disease by that method. In one instance I even injected some of the material. I mashed these lice up and diluted them in a salt solution and could not convey the disease.

Then I conducted several experiments with air alone. I built two kinds of pens, both of them five feet square, and put a well pig in the upper story and a sick pig underneath and then the sick pig underneath would die, and I had this open so that the air could be all around the sides of the box. Above it was really a false crate inside, with a tin lining, and through which no contamination could possibly get to the pig in the upper story; and I killed three or four pigs—I forget just now the number—underneath, and I let that pig stay up there several weeks after the last pig had died, and it did not contract the disease.

I thought that the practical application of that experiment was not worth anything, because if I had proven the fact that that hog on the upper story would have contracted the disease from air alone it would have been of no practical application to the farmer or hog dealer, because you do not find those conditions on the farm; and so I built another kind of an air pen, two pens, one alongside of the other. Through our state chemist there I had arrangements made so that the air would be taken in at a certain level, and the air would go at a certain level, so that we would have a natural circulation of air, on account of the one pig being on one side and the other on the other, on account of the difference in the weight of the atmosphere, and I could not convey the disease by air alone.

I believe that there are some other things just like Dr. Dorset has spoken of, that we ought to work up, and I believe that these are along the lines of practical application; but to my mind there isn't any doubt but what birds will convey this disease. As to the lice, I am not sure. I am almost sure they will not. As to the air, I was unable to produce it. (Applause.)

DR. CONNAWAY: Mr. Chairman, I wish to add to Dr. Ranck's state-
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ment that I tried that experiment several times with the lice from a naturally infected pig, without being able to transmit it with the lice.

Dr. V. A. Moore: Mr. Chairman, I notice by our program here that we have a number of gentlemen who are expected to contribute to this subject. I was wondering if we could not hear from all of them, and then have a discussion of the subject afterwards?

President Dyson: We will proceed with the next number of our program: "Regulations to Prevent Spread of Cholera Applying to Shipments of Swine Moving Intrastate and Interstate." Dr. John I. Gibson of Iowa.

Regulations to Prevent Spread of Hog Cholera

Dr. John I. Gibson: Mr. President, that is a big topic. Of course, the part of the program that just preceded gives me an excuse to say that we do not know exactly what these regulations should be, because we do not know exactly how the disease is transmitted, and in how many ways it is transmitted.

To talk about controlling hog cholera as conditions exist now in my state, and I presume in many other states, is simply an absurdity. We are keeping up an everlasting train of infection all over the country. To legislate to prohibit the movement of infected and exposed hogs to market might be a difficult problem. The feeder, when his hogs are about ready for the market and he sees some indication of cholera, thinks that he should be permitted to ship, and I am not sure but he is right in his contention. It would be easy, however, to control hog cholera, if we prohibited all movements of infected hogs; but it seems to me that for the present we will have to be content with reasonable regulations in moving these infected hogs to market in a proper way.

We are coming up to another important problem in the transportation of hogs, not live hogs, but dead hogs. There is going to be an attempt at legislation in Iowa to utilize the carcasses of the cholera hogs. I wonder what Dr. Luckey is laughing at. You know our dead hogs now are worth a lot more money than the live hogs in some other states. (Laughter.)

That is a problem that will require careful regulation, the rendering of the carcasses of hogs. This is an age of conservation, and I believe that we have been foolish in wasting a valuable product. The iniquitous practice that really is accountable for the spread of cholera more than anything else, is the fact that the farmer or feeder seeing indications of cholera in his herd, will call upon his neighbors to come and help him haul his hogs to market. He forgets or neglects to say to those neighbors: "I suspect cholera in my herd." The neighbors always help each other in hauling their hogs, so the wagons from the immediate neighborhood are all brought there to haul Jones' infected hogs to market, and they go home with those wagons and there is not a word said about cholera.

Next day the same wagons may be used to haul hogs from town out to Smith's farm, a bunch of feeders he is shipping in, or some of the men who helped haul those infected hogs may be breeders of pure-bred hogs. They may use the same infected wagons to haul some of their boars and gilts to town to ship to an ambitious breeder, so to begin with, publicity is needed. If this man has infected hogs that are fit to go to market, we had better face the situation as it is. Instead of secretly putting it over the community, we had better face the situation; we had better have regulations that those hogs shall be
moved in a sanitary way, in tight wagons, and those wagons disinfected, and the local railroad yards disinfected; or, to save that trouble, probably we might get along with a double set of yards, import and export yards and chutes.

Then we come to the infected car, and I surely believe we have learned the importance of car disinfection. Personally, I favor the disinfection of every stock car at destination, and especially when any infection is known to have been in the car.

My subject mentions interstate and intrastate shipments. From a control point of view, I see no difference between interstate and intrastate. There are three classes of hogs you may say, to deal with, three classes of shipments. There are hogs for slaughter, stocker and feeder hogs, and the breeding animals.

I think it would be more practicable to move the infected exposed hogs to market than to make regulations prohibiting such movement.

The most important shipments or class of shipments to handle, I believe, are the hogs shipped in for breeding purposes. We have an imperative requirement in Iowa that all hogs coming into the state, except for immediate slaughter, shall be immunized. Last season the state of Iowa was surrounded on three sides practically with a drouth; and the farmers in that district found they could not develop hogs for market; and there being plenty of feed in Iowa, our people looked out in all three directions and stocked up with hogs, and we had some serious results. In many instances hogs originated in cholera free areas, and in areas where they were not resorting to the treatment of hogs to any extent. In those cases we issued permits, allowing them when coming to destinations in Iowa to remain in quarantine thirty days after arrival at destination. But we found a number of shippers, when they got their hogs home, did not care to treat them, and all we could do was to hold them in quarantine thirty days.

We had one shipment of hogs brought into Dallas County, Iowa, that started cholera immediately on seventeen farms; so in order to be sure of our ground, I believe we should all require every shipment of stock hogs to be immunized. Then they will not be a source of the spread of cholera, and they will prove a good investment for the feeder if the market is right.

I have always advocated the immunization of pure-bred hogs for breeding purposes, and I think every breeder who keeps and sells breeding animals should immunize the entire herd. This immunization, I believe, can be carried out without any danger to the community if done under proper restrictions.

To summarize what might be necessary in the regulation and governing of shipments of hogs, and preventing the spread of cholera by such shipments, if there was any known infection in a shipment of fat hogs, a sanitary officer should certainly supervise the movement of that shipment of hogs to market, and supervise the disinfection. I meant to say, too, that every farmer ought to have a loading chute where his neighbors coming to haul his hogs away would never go onto the hog lots at all, but where they would draw up to the chute, and the hogs be loaded into the wagons without going into the hog lots. That in general use would be beneficial.

The car should be placarded "cholera exposed," and the car should be disinfected at destination. Shipments of feeders should be loaded in clean disinfected cars direct from wagons, if possible, or through a special open chute, and they should not be unloaded in transit in any public yard. At destination they should be loaded direct into wagons, or through a special chute, and in this way it might be pos-
sible to bring non-immune hogs into a community to feed, and not contract cholera; but I would still recommend in the future to put your money in immunized hogs, not to take a chance of shipping, as conditions now exist—I mean of shipping susceptible hogs.

Breeding animals are generally shipped by express, and if crated in a clean disinfected crate, the crate is more or less of a protection. If there is a good floor in the crate, it may protect against any infection that might exist in the express car, although I believe express cars should be disinfected quite often, perhaps not every time they ship hogs in them, but they certainly need disinfection at various intervals.

I hope these experiments will go on as to the transmission of hog cholera. When we settle how it is transmitted, we can then make regulations to prevent its spread, and to protect hogs in shipment.

I mentioned this salvage of dead hogs this afternoon, just thinking that there might be some discussion on the matter. There is a bill drafted now, I understand, for the next session of the legislature in Iowa. I am to look it over after I get home and approve or condemn it; but I seriously hope there is a chance to utilize dead hogs. This is the age of utilization of all waste products. I will be glad to have the opinion of some of the gentlemen here as to whether or not we can safely haul and carry the carcasses some distances to the rendering establishments. (Applause.)

PRESIDENT DYSON: Dr. Luckey, you are next on the program.

DR. D. F. LUCKEY: Mr. President, my report, for which I am down on the program, is limited to one short page, and I am going to impose upon you for a minute to discuss Dr. Gibson’s remarks. He insinuates that Iowa hogs have something over Missouri hogs. Well, not long ago a friend of mine went up into northern Missouri and paid $1,250 for a pig that was raised up there, and if that does not prove that Missouri hogs are better, if he can find where one of his pigs has sold for any more money, I will acknowledge that Iowa hogs are better; but I never will acknowledge but what Missouri farmers have got more sense than to go around hauling cholera hogs for their neighbors, and then taking those wagons back home. I think these Iowa farmers ought to lose their dead hogs, because I think a man is more or less guilty of carelessness who allows his hogs to be exposed without having them vaccinated.

I was greatly interested in Dr. Dorset’s paper. It covered a very practical subject, one which all of us in official positions must solve. The question of moving hogs is a very important one, and the regulations governing the movement of hogs so as to prevent the spread of hog cholera are very important, and I will say that I believe that the general principles governing their regulation have practically been established in the rules governing the shipment of hogs from public markets. We know that public markets are considered thoroughly infected with hog cholera infection. We know further that now for over three years stock hogs have been purchased and taken from these public markets to all sorts of places in all these central hog-feeding stations, and up to the present time we have not found where any shipment of hogs from a public market has caused an outbreak of hog cholera. I have known of cases from five or six different states of hogs having been vaccinated and held twenty-one days, dipped and sent to the country, and the federal officials have kept track of these as far as possible, and report that in no case have they caused an outbreak.

I hardly know on what investigation we could base the assertion
that all or practically all these hogs were moved to permanently infected premises. I do not believe there is any information at hand that would justify a statement of that kind. After the twenty-one day period was tried for some three years, you probably know that at the St. Joseph stock yards the period of quarantine was cut down to fourteen days after the simultaneous method had been used, and the rule was applied to all of the stockyards in the country as far as the Bureau of Animal Industry was concerned.

In addition thereto it was provided that healthy hogs might be purchased, given serum alone, held six hours, dipped and sent to the country, and so far we have not had any bad reports; but owing to the fact that hogs might possibly be infected with cholera and show no symptoms after having been vaccinated, I think they ought to be retained four or five days, at least. But I think that to try to prevent the spread of hog cholera by preventing shipments of hogs to public markets, will not prevent the spread of hog cholera, as hogs are shipped from one point in the state to another, or into another state.

Those requirements are not prohibitive, they are practical. They are not expensive. The average feeder who has had experience with hog cholera and uses good judgment, will have his hogs immunized anyway. I do not believe it is practical to require all breeders of pure-bred hogs to immunize their hogs regularly.

I have never seen the necessity of so much discussion of theories, and treating hog cholera as thought it was a different disease, materially different from others, as far as methods of control are concerned. We have simply gone to work and dealt with situations as they arose, and our results have been quite encouraging. (Applause.)

HOG CHOLERA CONTROL IN MISSOURI

By Dr. D. F. Luckey, State Veterinarian

Hog cholera eradication work was carried on in fourteen counties in Missouri during the past year. In thirteen of these the federal Bureau of Animal Industry and the state board of agriculture co-operated. In one county, the state board of agriculture managed the work alone.

In twelve of the counties the district school boards were used as the nucleus of an organization for promptly detecting and reporting all outbreaks of disease among hogs. The district clerk was constituted the official correspondent. In two counties letters were sent to the district clerk to be read at the annual school meeting whereby a large majority of the people could be informed on the plans of work in a single day. Later, the plans were explained at the annual convention of county school boards in nine counties. In this way, we have a permanent organization for the detection and reporting of outbreaks of diseases among hogs which is effective and which does not cost the state anything at all.

Competent graduate veterinarians in all sections of the state, regardless of politics, are appointed as deputy state veterinarians. The people in each district, through the district clerk, and ordi-
narily at the annual school meeting, are kept informed as to the
proper deputy state veterinarian to call when sick hogs are dis-
covered. This afforded an opportunity to get to all outbreaks
of cholera before the disease became widespread. The deputies
draw no pay except when on duty. Therefore, the organization
for the control of hog cholera costs the state nothing except when
the disease breaks out. As soon as the work of controlling an
outbreak is over, the expense stops. When there is no hog
cholera, there is no expense whatsoever. Up to December 1st,
outbreaks of hog cholera were controlled on 199 different farms
in the fourteen counties. As a rule, these outbreaks were fairly
well distributed over the county. The number of outbreaks ran
from none in one county to forty-five in another county. As far
as we are able to learn, the disease was never allowed to spread
to the second farm.

This work covered nearly all conditions found in the state.
Three of the counties are among the fertile, thickly-settled, corn
and hog raising counties. Some are largely a prairie soil with
less corn and hog raising. Our operations also covered a lot of
wild range country without any stock law. In this latter type of
country, we had quite a number of scattered outbreaks of cholera
which, to our own surprise, we were able to control.

The results from the work were far better and the costs thereof
were far less than expected. The plan of this work appeared to
appeal to the average farmer and degree of co-operation on their
part was highly satisfactory.

PRESIDENT DYSON: We will hear from Dr. Koen, of Iowa.

HOG CHOLERA CONTROL IN IOWA
By J. S. Koen, Inspector in Charge of B. A. I. Hog Cholera Control
Work in Iowa

When, in 1913, the national congress heard the Macedonian
cry "Come over and help us," of the national swine industry, and
responded to the call by appropriating $75,000 and directing the
B. A. I. to place a force of inspectors in the field to demonstrate
that cholera losses could be reduced and the disease controlled,
it opened a new field for the veterinary profession, placed swine
raising on a safe basis, and marked a new epoch during which
another dreaded disease was to be conquered and another great
industry revived and assured further development.

Iowa, with a hog population greater than that of any other
two states, was the first selected and Dallas county the first ex-
perimental area decided upon in which the demonstration was to
be made. To Dr. M. Dorset and Dr. W. B. Niles, the originators
of the preventive serum treatment for hog cholera, was given the
direction of the work and the manufacture of the serum to be used. Under the direction of these men Dr. O. B. Hess inaugurated and began the work July 1st, 1913. So well did the plans carry that only three short years were required to demonstrate conclusively that the control of hog cholera was not only a possibility, but had become an established fact.

The Bureau was fortunate in this great undertaking, that the state of Iowa had men in charge of state departments who were willing to give their hearty co-operation to the work. I refer to Dr. J. I. Gibson, state veterinarian, and President R. A. Pearson of the state college, together with their forces. Not only was there close and effective co-operation between federal and state authorities, but after the people of Dallas county became acquainted with us and our work and understood our purpose they gave their loyal support and co-operation, without which the control of the disease in the county never could have been accomplished.

As in the case of all new undertakings, many difficulties confronted us when we first entered the county. These difficulties in the control of cholera increase in proportion to the number of farms and the hog population in a given territory. Dallas county comprises an area of six hundred square miles, over which are located twenty-five hundred farms, affording twenty-five hundred or more places where cholera might exist or make its appearance, with twenty-five hundred owners, each of whom had his own ideas and his own pet theories regarding the treatment and control of the disease. It also has an average annual hog population of approximately 120,000; thus offering 120,000 opportunities each year for the appearance of cholera. The hog population of Dallas county is greater than that of any of the following states: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, Delaware, Wyoming, New Mexico, Arizona, Utah or Nevada.

Perhaps no disease of this or any other time has received more earnest, honest and intelligent consideration than has hog cholera. Long before Bryan began running for President, courageous and competent scientists had given years of effort and study in the endeavor to find a cure for the disease, only to have their efforts fail and their labors in vain. Through the untiring efforts of Drs. Dorset, Niles and McBryde, a serum was discovered that when properly used will positively protect susceptible hogs against cholera, and cure as great a per cent of affected hogs, as diphtheria anti-toxin will cure human beings in the same stage of disease.

This treatment was at once attacked by the vendors of so-called cholera "cures" who could foresee an end to their dishonest but profitable business. While honest effort was being made
by capable men to protect the swine industry, efforts were being exerted by other men, probably just as able, but unscrupulous and dishonest to prey upon the unfortunate victims of the disease. As vultures prey upon unfortunate and helpless creatures, so did these human vultures prey upon the helpless victims of cholera, until the swine raising public began to look upon any and all who offered a remedy that would either prevent or combat the disease, as a new form of graft.

So after the discovery of serum, and after years of experimentation to prove its efficiency in preventing and combating the disease, it was presented to a public that had been faked and swindled and humbugged until it was unwilling to accept, even free of charge, a positive preventive approved by the United States Government.

To overcome this sentiment as readily as possible, and bring about the general use of serum where needed, and believing that its citizens would recognize that their government was not trying to fake or impose a fraud upon them, the federal government undertook a demonstration that cholera losses could be reduced and the disease controlled by a judicious use of the serum treatment, supported by proper quarantine and sanitary measures. The government was convinced that an intelligent use of the serum treatment would control cholera and prevent the annual loss of millions of dollars occasioned by it.

A conservative estimate of this loss covering a period of the last forty years approximates $1,600,000,000. This enormous sum is inconceivable to the average mind and can be better understood when expressed in concrete terms. With this amount the United States Government could have paid for the construction of the Panama Canal thirteen times; it could have built and equipped approximately 133 first class battleships; it would have built two transcontinental railroads; this amount of money would be sufficient to build two hundred state capitolts; and the pity of it is that for the past ten years much of this loss could have been prevented. Instead of preventing it, the loss increased until it reached the enormous sum of $60,000,000 in a single year. It was imperative then that the government give not only its moral support to the treatment that could prevent this loss but that it should take the active lead in the fight against cholera. The mere fact that cholera had been uncontrolled these many years and this vast loss suffered filled the minds of hog raisers with skepticism most difficult to overcome.

So strong was the sentiment against all hog cholera remedies when we began work in Dallas County that fully nine-tenths of the farmers were either actively opposed to the treatment or indifferent. Some even seemed to doubt our sanity when told we
were there to help them control cholera. The idea that a force of three inspectors equipped with a "jitney" and some dope in bottles should undertake such a venture was to them ridiculous to say the least. They had been trying for years to control it and had failed. They knew the disease had baffled all attempts at control in the past. They said, "It can't be done." They were right in concluding it could not be done by the use of the methods they had employed. *Individual effort* and the so-called "cures" will fail in the future the same as it has in the past. But the judicious use of the preventive serum treatment supported by a *systematic, organized and co-operative effort* on the part of the *hogs raisers* will control cholera.

In some way or other the impression had been formed that we were being sent there to experiment on their hogs at their expense. They thought they were to furnish the hogs while we were to furnish the serum. If the hogs lived they were lucky; if not, well they would lose their hogs and we would lose nothing. It required considerable time, effort, patience and tact to bring them to an understanding, that there was no longer any experiment so far as the serum was concerned, but that the experimental features of the work was in procuring their proper co-operation in order that the serum treatment might be supported in a way that success would be certain.

Aside from the difficulties experienced in winning public confidence and support, we were laboring under greater difficulties because of our limited knowledge of the disease. For example, we do not know the cause of cholera. While we know it is a virus contained in the blood of the sick hog, we are unable to determine the degree of its virulence in any outbreak with certainty. We know that frequently the virulence varies greatly in different animals of the same herd; also that the disease will begin with a low virulence and continue so for some time, but later it is apparently increased and rapid progress is made through the remainder of the herd. We know that although the virulence differs in nearly every outbreak, the result of its action is practically the same in all, it kills.

 Neither do we know the *susceptibility* of the individual hog or of the herd. The variation here is as great and as unaccountable as the virulence of the virus. While we are unable to determine the susceptibility of the hog, we do know that good serum will protect the most susceptible animal against the most virulent virus. But here again we are confronted with a difficulty no less than the others mentioned. We do not know the degree of potency of the serum. It would seem the potency should not be subject to variation and that any serum properly produced should be potent and protect, yet experience has taught us there is a wide
variation in the potency of different batches of serum. Therefore, while we have an agent that is known to be able to prevent and combat cholera, we are confronted with an indefinite knowledge of three conditions relative to its use that impede our progress; viz: the virulence of the virus, the susceptibility of the hog, and the potency of the serum. The uncertainties presented by these conditions have been largely overcome by giving much larger doses of serum than is ordinarily necessary. In spite of all these difficulties the control of cholera has actually been accomplished for during the last eighteen months of our stay in Dallas County there was no spread of cholera from any original outbreak to other herds excepting in cases where the infection had been carried to other premises before the original outbreak had been reported.

The Original Plan.

The original plan for the work in Dallas county contemplated the free treatment of the infected herd and the adjacent or neighboring herds surrounding it in the belief that this method would limit the disease to the original center of infection and thus control the outbreak in the community. This plan was never given a fair test in Dallas county for the reason that cholera was so wide spread, our supply of serum limited, and the force of inspectors too small to cope with the situation at that time. Iowa was in the grip of the worst outbreak of cholera in her history when the work was begun there. Because of this we were forced to trail along after the disease, treating infected herds as fast as we could reach them, and a few well herds surrounding the outbreaks where time and the supply of serum would permit. While we were unable to demonstrate the control of cholera during this first season, we did demonstrate beyond question of doubt the efficiency of the serum treatment in combating the disease in infected herds, for in these herds we were able to save eighty-five percent of all hogs treated while in infected herds not treated with serum eighty-five per cent of all hogs died. The establishment of this fact was in itself a great victory. We were also able to show the efficiency of the serum treatment in protecting well, exposed herds and thus preventing outbreaks of cholera, another most important factor for if cholera is to be controlled all herds actually exposed should be treated before the disease develops.

We were also able to demonstrate the fallacy of the theory of natural or pen exposure in connection with serum alone treatment for the production of lasting immunity. The superiority of the simultaneous method of treatment over the serum alone method was also demonstrated. We were using the simultaneous method of treating infected herds generally but occasionally the serum alone method was used when our supply of virus would
run short. For infected herds we would use a combination method, using the serum and virus upon hogs that appeared well at time of treatment and serum alone on those showing evidence of infection by high temperatures or clinical symptoms. The percentage of loss following either method was practically the same, the difference no doubt being due to the condition of the animals at the time of treatment and not to the method used. Wherever there was a recurrence of the disease it was invariably noticed to be among hogs that had received serum alone treatment, indicating there was not sufficient exposure by natural means even in the presence of high temperatures to produce a lasting immunity. It was further shown by giving serum and virus to hogs showing temperatures above 104 deg. F. that the death rate was not increased. In all hogs so treated there was no recurrence of the disease, thus proving that if lasting immunity was to be obtained it could be accomplished best by the use of the simultaneous method.

How Hog Cholera is Spread

Under the original plan the surrounding or adjacent herds were considered exposed. All surrounding herds could not be so considered and in executing the plan it was our duty to decide which of the adjacent or surrounding herds were to be considered exposed. This duty led us to a very careful study of the ways and means by which the infection was carried from one farm to another. After considering all known circumstances surrounding each outbreak, not only during the first season, but covering the entire three years of our stay in Dallas county we found the following table sets forth quite accurately the factors which are accountable for the spread of the disease.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Cases</th>
<th>Per Cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Exchanging labor and visitation</td>
<td>162</td>
<td>.323</td>
</tr>
<tr>
<td>2. Carried by dogs</td>
<td>85</td>
<td>.167</td>
</tr>
<tr>
<td>3. Carried by birds</td>
<td>45</td>
<td>.09</td>
</tr>
<tr>
<td>4. Infection harbored on premises</td>
<td>43</td>
<td>.086</td>
</tr>
<tr>
<td>5. Contaminated streams</td>
<td>32</td>
<td>.064</td>
</tr>
<tr>
<td>6. Purchase of new stock</td>
<td>19</td>
<td>.036</td>
</tr>
<tr>
<td>7. Exposure to sick hogs in adjoining pastures</td>
<td>19</td>
<td>.038</td>
</tr>
<tr>
<td>8. Vaccination</td>
<td>2</td>
<td>.004</td>
</tr>
<tr>
<td>10. Recrudescence</td>
<td>1</td>
<td>.002</td>
</tr>
<tr>
<td>11. Indefinite</td>
<td>92</td>
<td>.183</td>
</tr>
<tr>
<td></td>
<td>501</td>
<td>.997</td>
</tr>
</tbody>
</table>

These factors indicate clearly that cholera is not an air borne disease but that the dissemination of it depends upon physical or mechanical means. Therefore, it is quite evident that proximity of susceptible animals to infected animals does not necessarily
constitute exposure but rather that these factors are the means by which the infection is carried from one farm to another, making the virus of the infected farm accessible to the susceptible hogs on other farms. A susceptible animal is not exposed to cholera until the virus has been made accessible to it. This is usually accomplished by contamination of the food and drink of the susceptible animal. If the food and drink of well hogs are kept free of contamination by the virus of cholera there is little likelihood of their coming down with the disease. It is possible for a well, susceptible hog to sleep in the pen with a sick hog and not contract the disease. It must come into actual contact with the virus and in such manner that it will be absorbed. I believe virus can be rubbed onto the unbroken skin of a susceptible hog without producing the disease. He must get it into his system.

The circumstances frequently indicated there was no known opportunity for the disease to escape from the original farm and to reach the farm adjacent or other surrounding farms, hence no evidence of exposure of the herds thereon. On the other hand there was evidence that a relative living some distance had been visiting or exchanging labor on the infected farm and had been in or about the infected pens, thus furnishing direct evidence of exposure.

We found during the first six months of 1914 that it was unnecessary to treat any adjacent or surrounding herds in order to control the disease. During this time of the year there was little exchange of labor or visitation to and from infected premises. This experience proved to us that the treatment of the well herds surrounding an infected herd was unnecessary if precautions were taken to prevent the carrying of the infection from the one herd to the other.

However, with the coming of the harvest season the disease began to spread in spite of all our warnings and efforts. We would make a house to house canvass in the neighborhood of an outbreak explaining to the owners of well herds the ways by which infection was spread and urge them to observe all precautions. But the “don’ts” and the “ten commandments” for cholera control didn’t appeal very strongly to the busy farmer. They would say “Why should we be careful? If our herds stay well we are alright, and if they get sick you government men will have to come out and treat them free.”

So they continued their careless practices and the free treatment of their herds only placed a premium on their carelessness.

Because our experience had shown the adjacent or surrounding herds were not necessarily exposed and the treatment of them unnecessary to control the disease; and to overcome this careless-
ness just described and place the responsibility of keeping the herd well upon the owner of that well herd, we abandoned the original plan and confined our efforts to the treatment and control of infected herds only.

We found we were unable to overcome the carelessness of owners of well herds by quarantining the infected premises. As long as their herds were well their actions could not be controlled, so we were compelled to inaugurate a new plan that would overcome their carelessness in spite of themselves.

This we did by abandoning the many "don'ts" and the "ten commandments" and substituting for them the new "commandment," "Thou shalt confine all thy sick hogs under cover and destroy all thy dead hogs by burning." And in order to secure obedience to the commandment the following reward was offered them. "By so doing thou shalt control all cholera on thy farm and be a respectable and desirable citizen in thy community."

The confinement of the sick hogs under cover was begun September 1, 1914, and it was noticed from that time until we left the county, that whenever cholera made its appearance in a new community and this plan was faithfully adhered to there was no further spread of the disease. In other parts of the county where the sick hogs had not been confined and the disease had spread to several herds in these communities the same showing of control could not be made.

There are several ways whereby cholera can be controlled. The early slaughter of the infected herd; absolute quarantine during the course of the disease; or the vaccination of all susceptible hogs each year. Either or all of these methods will control the disease. Yet neither method would be practical, and it was a practical method that we were to demonstrate.

There are three fundamental principles that enter into the practical control of hog cholera:

I. Vaccination.
II. Quarantine.
III. Sanitation.

I. VACCINATION. By vaccination I mean the administration of the preventive serum and virus treatment. For successful vaccination, three things are necessary: (1) proper serum and virus, (2) proper administration, and (3) proper condition and care of hogs before and after treatment.

1. Proper serum. The serum must be pure and potent. The virus must be virulent and free of contamination. The securing of these will depend largely upon the honesty and competency of the manufacturer. The method of producing pure potent serum is not a secret, but an intelligent and careful application of the process of its manufacture must be adhered to. The serum pro-
ducer must be willing to discard even at financial loss all serum that is not of high potency. *The practice of raising the potency of weak serum by mixing it with other serum of known higher potency should be abandoned.* The standard of potency for all serum should be so high it would be impossible to raise weak serum to it. The greatest care must also be exercised in the production of virus. Serum producers are the ones to whom we must look for these proper products.

2. **Proper administration.** The best serum made may not produce favorable results unless it be placed in competent hands and properly administered. No person should be permitted to administer the serum preventive treatment, either in the use of the serum alone or the simultaneous method, except he be a qualified veterinarian. The preventive serum treatment is indicated in combating hog cholera *only* and it requires scientific training to enable one to make a differential diagnosis and to know whether or not the serum treatment is indicated. Only veterinarians have been so trained and many of them need a post graduate course on the subject of hog cholera and the serum treatment for same before they can actually be called competent. An intelligent layman may be trained to fill syringes and inject serum and virus into hogs but “shooting serum” is not properly treating hogs for cholera. The proper treatment of an infected herd requires the treatment of each individual animal in the herd. It requires the temperature of each animal shall be taken, the weight carefully estimated, the physical conditions carefully observed and the proper dose of serum and virus administered.

The technic for the administration of the serum treatment is also important. The seat of injection should be thoroughly cleansed and disinfected and care should be exercised to administer the serum in a manner and in such places as absorption will be readily accomplished. It should be unnecessary to state to veterinarians that they should observe all sanitary precautions in the treatment of hogs.

3. **Proper Condition and Care of Hogs, Before and After Treatment.** The condition of the hogs at time of treatment frequently accounts for unfavorable results even where good serum has been properly administered. It must be such that the treated animal can and will respond favorably to the treatment. Notwithstanding the oft repeated warning of those best informed regarding it, that serum is not to be used as a cure, many veterinarians and others have abused it by treating herds hopelessly sick or in the advanced stage of the disease and giving hope to the owner of these herds that recovery might be expected. As a result of such abuses the serum treatment occasionally has been brought into disrepute because of the lack of understanding of
its proper use and what should be expected of it. Again, the serum treatment should be used to combat hog cholera only. Many instances are known where serum has been used to overcome conditions other than cholera but with disastrous results. Perhaps the condition most frequently confused with cholera, especially chronic cholera, and against which the serum treatment fails to protect, is that of necrobacillosis. In order that the true condition may be determined and that it may be known whether the serum treatment is indicated or not, the services of a competent and conscientious veterinarian are required. No veterinarian should recommend the use of the serum treatment for a sick herd until after a positive diagnosis of cholera has been made and usually this can be determined only by a post-mortem examination.

Many have been led to believe that all that is necessary in combating hog cholera is the administration of the serum, but experience has taught us that for the best results to be obtained the hogs must be prepared for the treatment as a patient is prepared for an operation and receive proper care after treatment in the matter of housing and feeding.

II. Quarantine. This provides (1) for the control of the virus or infection; (2) for the prevention of its spread to other premises; and (3) for the proper destruction of all dead animals.

Probably one of the most abused terms in the English language is "quarantine." The mere mentioning of the term often arouses sentiments of fear, antagonism or rebellion. For the most part it has been considered a curtailment of personal liberty and an affront to the party against whom it is imposed. The true meaning of quarantine is protection, just the opposite of this. Quarantine measures are absolutely essential for the control of any contagious disease. The control of diseases that endanger the public health such as small pox, diphtheria, etc., has been forwarded by wise and proper quarantine measures. Likewise the animal health must be protected against contagions, such as glanders, foot-and-mouth disease and hog cholera. Notwithstanding the general knowledge that determines the necessity for quarantine, experience has shown that it is seldom popular with those against whom it becomes necessary to impose it, and stranger than this is the fact that oftentimes the sentiment of the community supports the quarantined one in his opposition to it and disrespect for it.

Until communities support the quarantine measures both by sentiment and co-operative effort, contagious diseases will continue to rage and exact their toll of life and property. All quarantine measures have for their object the control of the infection of the particular disease against which the fight is being directed and include the proper care of the infected and exposed animals.
U. S. LIVE STOCK SANITARY ASSN.

and the proper disposition of the dead that the disease may not be transferred to other premises.

1. The Control of the Virus or Infection. A quarantine against hog cholera should provide that all sick hogs shall be confined under cover. The body discharges of the hog sick with cholera are known to contain the virus. Cholera usually manifests its appearance in a herd first by one or two animals showing signs of sickness. They hang back or stay in the nest and do not come out for feed with the balance of the herd. If these first sick hogs are taken out of the herd immediately and placed in a covered enclosure or retention hospital pen it is evident that their body discharges will be controlled. This method will prevent the contamination of the food and drink for the remainder of the herd by the discharges of these sick hogs. This retention hospital pen should be disinfected each morning and evening with a three percent solution of compound cresol and should these hogs fail to return to feed in two or three days, but show evidence of progress of the disease, a competent veterinarian should be called and a careful post-mortem examination made. Usually the trouble can thus be determined. Should a diagnosis of cholera be made the remainder of the herd should be treated immediately with serum and virus. All hogs showing visible evidences of disease at time of treatment should be separated from the herd and confined in the retention hospital pen and all others that later develop visible evidences of the disease should be isolated after the same manner. The yards, sheds, hog houses, around the straw stack or other sheltered places of the farm, should be immediately cleaned and disinfected. It is a serious mistake to delay the general cleaning and disinfecting of the premises until after the disease has run its course in the herd. All places where the sick hogs have been running or nesting should be cleaned and disinfected immediately following the treatment of the herd and the isolation of the sick hogs. By following this method the premises can be considered safe excepting the retention hospital pen which is under cover and is disinfected daily. By the isolation of the sick hogs, the infection can be controlled on the farm and confined to very limited quarters under cover, thus protecting the remainder of the herd and practically eliminating the danger of infection being carried elsewhere by any means.

2. Prevention of Spread of Disease to Other Premises. The quarantine provides further against the spread of infection to other premises by avoiding visitation to and from the infected hog lots; by controlling the dog, and warning neighbors by phone and placarding of premises. The placarding of premises with a warning card has proven most helpful in the control of cholera in Iowa. In former times it was considered a disgrace to get
cholera but now it is considered a misfortune. It is no more a
disgrace to get cholera than it is to get bed bugs. The disgrace
lies in harboring either.

3. The Proper Destruction of Dead Animals. The quarantine
further provides for the destruction of all dead hogs by burning.
Fire completely destroys all infection contained in the carcass of
a dead hog.

If all sick hogs were properly confined under cover and all
dead hogs are properly destroyed by burning there is little likeli-
hood that infection will be carried by any person, animal or thing
from one place to another.

I suppose I have talked and written as much against the dog
as a carrier of cholera as any other person, yet I do not blame
the dog. It is his nature to roam and run about. He also likes
to feast upon fresh pork and prefers it rare. The neighbor’s dog
is more dangerous than the dog on the infected farm. During
his nocturnal visitations he finds the partially burned carcass of
a cholera hog. He takes his fill and then takes a portion of it
home to bury for future feast. It frequently happens that this
“future feast” causes considerable damage for the owner of the
dog. Yet the dog should not be condemned. His owner should
have confined him so he couldn’t run about. Perhaps his owner
had the same habit of running around at night (although he knew
better) and felt it would be a restriction of the “personal liberty”
of the dog should he be confined.

But neither the neighbor nor his dog are as responsible for the
damage thus done as is the owner of the dead hog.

Had it been completely destroyed the dog would not have had
the opportunity to take a portion of the carcass and with it the
trouble home, nor would it have been a dangerous factor in the
spreading of the disease in the community.

There are two kinds of quarantine: (a) voluntary and (b)
involuntary.

(a) Voluntary Quarantine. The voluntary quarantine is the
one that is self-imposed. The owner of the infected herd isolates
his sick hogs and confines them to limited quarters under cover.
He cleans and disinfects his premises that the danger to his neigh-
borhood may be removed. He warns his neighbors and placards
his infected hog yards. He keeps his dog at home. He does not
go from his infected lots to the public highway or to a neighbor
without first disinfecting his shoes, horse’s feet and wagon. He
destroys his dead hogs completely by burning.

When he does these things, he is protecting himself, and his
neighbors. That is all there is to quarantine—protection. When
this is understood it makes quarantine popular.

(b) Involuntary Quarantine. The involuntary quarantine is
the one the state or federal authorities must impose against the
careless farmer who will not protect his neighbors voluntarily.

We use this latter form in hog cholera control work only as a
last resort. It should be unnecessary, but occasionally there is
nothing else that can be done. Whenever it is used the com-

munity should support it and see that it is respected.

III. SANITATION. Vaccination and quarantine control cholera
on the farm and in the herd during the course of the disease. I
mention vaccination first, for the reason that unless cholera is
present there is nothing to control, and because there is no agent
known that will either prevent or control cholera other than anti-
hog-cholera serum. Also for the reason that as soon as the
serum has been administered it immediately begins to combat the
cholera in the herd. The serum is supported in the control work
by quarantine measures. After the disease has run its course and
all hogs are either dead or well, we are not yet masters of the
situation for the infection may still be present on the premises
and in order to complete our control work we must free them of
it. Nature's disinfectants, sunshine and drying, will take care
of all infection that can be reached by them but there are parts of
the premises that cannot be so reached. The manure and ac-
cumulation in the yard must be removed; the straw around the
stack where the sick hogs made their nest must be burned, the
sheds and hog houses must be thoroughly cleaned. After a
thorough cleaning has been accomplished, all parts that cannot be
reached by direct sunlight should be disinfected with compound
cresol. We mention compound cresol because we know its effi-
ciency. For more than three years we have gone from infected
farms to free farms and the only means used to prevent the carry-
ing of infection from the one to the other was the disinfecting
of our shoes or rubbers in a three to five percent solution of com-
pound cresol and in no instance has there ever been even a suspi-
cion that we carried cholera from one place to another. Some
may claim that sanitation has little to do with the control of
cholera. I think the following experience will help to support my
contention that it has much to do with its control.

During 1914, of the fifty-one outbreaks of cholera prior to
July 1st, twenty were the result of infection harbored on the
premises. Nineteen of these occurred before May 1st. We were
endeavoring at that time to have all the farms on which cholera
had existed the previous year thoroughly cleaned and disinfected
before the new crop of pigs should come on to be exposed to
harbored infection. The fact that nineteen outbreaks occurred
prior to May 1st on farms that had not been cleaned and disin-
fected and that only twelve outbreaks, having a like source of
infection occurred after that time, and ten of these twelve re-
sulted from a lack of thorough cleaning and disinfection, indicates clearly that the thorough cleaning and disinfection of premises are essential features in the control of hog cholera. That we had such a limited number of outbreaks (in fact only two where the work was properly done) after our clean-up campaign of the spring, culminating in a "clean-up week" the last of May, is further evidence that many reappearances of cholera on the infected farms of the previous year were prevented in this way.

Thus it will be seen that as vaccination and quarantine get rid of cholera in the herd, so will sanitation get rid of it on the farm.

This briefly outlines the control of cholera on a farm. To insure the control of cholera in a community or over a large territory co-operation and organization are necessary. As soon as the men who raise the hogs and are directly benefited by the saving of them really desire the control of cholera and are willing to cooperate in an organized systematic effort for its control, just that soon will it be controlled.

**Co-operation.** This co-operation should include, and in Iowa does include, the active co-operation of (1) the hog raisers, (2) the local veterinarians, and (3) the authorities—(state and federal).

(1) The hog raiser must guard against the introduction of the disease into his herd. In case it reaches his herd he must establish and maintain his own voluntary quarantine, and obtain an early diagnosis and treatment of his herd. He must then care for his herd as the circumstances indicate.

(2) The local veterinarians are the ones to whom eventually should come the treatment of all infected herds. It is necessary that they shall be competent to properly and judiciously administer the serum treatment and be willing to accept for such services a reasonable remuneration that will make the general use of serum practical. This has been accomplished in Iowa by the 200 local veterinarians in the territory in which we are now working. They have agreed upon a uniform price for the treatment of herds which is an earnest of their co-operation in the control work.

(3) The authorities (state and federal) are united in their efforts to direct the work in such a manner that the control of the disease may be accomplished as readily as possible.

This co-operation is being brought about by means of an organized effort.

**Organization.** The organization includes (1) Township, (2) County, and (3) State.

(1) The township organization or club is made up of a representative from each school district.
(2) The county organization is composed of a representative from each township.

(3) The state organization will be made up of one or more representatives from each county.

We are now working in twenty-eight counties. A federal inspector is so located that he can supervise the work over four counties. The plan of work this year has been to go first into those townships of each county where cholera was known to exist and secure a meeting of the farmers of the township that they might plan together for the control work. At these meetings the methods outlined in this paper were explained to them that they may have a better understanding of the control measures, and that a township organization may be formed. The school district representatives select one of their number as chairman of the township club. Their duties are to keep the inspector for their county informed at all times as to the conditions prevailing in their district. Following the meeting the inspector visits the infected premises, securing the confinement of the sick hogs under cover, placarding the premises and advising the owner regarding the care of the herd and the methods for cleaning and disinfecting his premises. After all townships have been organized in this manner, a county meeting is called at which a county organization is effected. The county organization is composed usually of the chairmen of the various township organizations, and a president and secretary. By the first of July, 1917, we expect to have at least a third of the counties in the state of Iowa well organized for a systematic fight for the control of cholera. When we have been able to extend the work over the entire state and have it supported by an active organization in each county, it should not be long and will not be long until hog cholera will be completely under control, and the situation at a stage when eradication may be considered.

No doubt the question that most of you would like to ask at this time is, "Has there been a demonstration in any of the twenty-eight counties to show the plan outlined is effective and practical?" I will give you our experience in the control of one of the worst, if indeed not the worst, outbreak in Iowa this year. Boone county was not included in the original territory decided upon over which the control work for 1916 was to be started. During the latter part of July cholera made its appearance near Luther in Boone County, a small town near the corners of four townships. The disease was raging on one farm at the time of threshing thereon. Within six weeks of this date every man in this threshing crew, save one, had either lost or was losing his hogs. Unfortunately for this community a quantity of impotent serum was administered to a well herd with disastrous results.
When our attention was called to the seriousness of the outbreak there, we met with the farmers of the four townships and they asked our assistance in undertaking the control of the outbreak. The seriousness of the outbreak is shown by the fact that one day between the hours of 9 a. m. and 5 p. m. we traveled twenty-two miles and visited twenty-nine farms on which the disease was present or had run its course. We found seventy-five infected farms over a territory no larger than a township. Many herds were not being treated at all; a few had been treated when the disease was too far advanced for favorable results to be expected and on all sides we found farmers condemning the treatment as useless because of these results. Many herds had been treated with favorable results but these were being lost sight of in the agitation over the unfavorable results. During the preliminary survey of the territory we found that seventy-five per cent of all treated hogs were still alive and that seventy-five per cent of the hogs in the herds not treated were dead. At each of the four township meetings an organization was formed as has been previously outlined. The owners of the sick hogs were then asked if they would go home and confine them under cover; if they would destroy all dead hogs by burning; and if they would start cleaning and disinfecting their premises at once. This they promised to do and for the most part did.

The owners of the well herds surrounding this outbreak were asked if they would watch their herds closely, isolate the first hogs going off feed, and have their herds treated as soon as cholera could be diagnosed. They were told other outbreaks were to be expected because the infection had undoubtedly been carried to other farms on which the disease had not yet made its appearance. The prediction was made there would be no sick hogs in this community after thirty days if the plan was strictly observed by all.

We held another meeting at Luther six weeks later to determine how well the control work was succeeding. We found that during these six weeks following the organization of the territory there had been but eight new outbreaks and six of these had occurred within two weeks of our first meeting, indicating that on these six farms the infection was present at the time of organization.

This leaves but two farms to which infection was spread during six weeks following organization as compared with seventy-five outbreaks during a like period previous to organization and the beginning of the control work. This demonstration surely proves that cholera can be controlled and that our plan is practical.
Recommendations

The fight for the control of cholera is now started. Ultimate victory will depend largely upon preparation we make for future work. Many difficulties are yet to be overcome. It is very difficult to learn of the first outbreak in a community until after the infection has been scattered to other farms. Some way should be devised whereby it would be necessary for any owner to isolate, confine, and report to the proper authorities the first hogs showing evidence of sickness. It should then be the duty of this authority to keep this herd under close observation until the trouble can be diagnosed. Should it prove to be cholera the early treatment of the herd should be advised. It would be unwise to attempt compulsory vaccination at this time.

Whether or not the infected herd be treated the regulatory authorities within the state should be enabled to impose and maintain such rigid quarantine, including the cleaning and disinfection of the infected premises as will insure the control of the disease thereon. In case voluntary precautions are not taken by owners of well herds in the community the authorities should be empowered to place such quarantine upon their actions as the circumstances warrant.

Serum producers should be held so liable for the purity and potency of their products that they dare not risk the sale of an inferior product. A uniform rigid inspection of all serum production should be adopted and maintained. Practicing veterinarians and others authorized to use the serum treatment should be held responsible for any neglect in the performance of their duties. This will overcome one of the chief objections advanced by the public generally—"that the results of vaccination are so uncertain we are afraid to use it."

The establishment of a uniform method of and a uniform price for the administration of the treatment would overcome the next chief objection—"it costs so much to have the hogs treated we might as well take our chances with the disease."

The results of our investigations in determining how cholera is spread indicate that seventy-two per cent of all the cholera could be prevented by the exercise of due care and caution on the part of the hog raisers. Probably many of the cases classified as indefinite could also have been prevented and the few remaining cases easily controlled by the early treatment of the herd. If it be true that all this cholera and the enormous loss occasioned by it can be prevented,—and our experience teaches us it is true, then this willful waste of property confronts us as a national disgrace. That the nation may acquit itself and prevent further loss by this dreaded disease, both federal and state
governments should prosecute the control work as vigorously as possible.

PRESIDENT DYSON: Dr. Nelson, of Indiana, is next on the program.

DR. AMOS F. NELSON: Mr. President, fellow members of the association: My paper is short, and I will read it by title only if you say so, but first I wish to refer to the remarks of Dr. Gibson.

He spoke of utilizing the carcasses of cholera hogs, I suppose for fertilizer and tankage purposes. We have had a law of this kind in the state of Indiana for about four years. If the United States army and the state militia were in control of the men that are engaged in the reduction business, it would probably be a safe proposition; otherwise I don't think it is (applause).

The class of men engaged in this business there at present and financing it, some of them are among the best citizens in the state of Indiana, but the men that they employ in the reduction plants are absolutely unreliable. If a policeman was following them up, they would violate the regulations while he was watching them. That is the situation in Indiana. I don't know anything about it in Iowa.

This law was put over without my knowledge, and I think it is a disgrace to allow men to handle cholera hogs. Those are my sentiments in regard to that.

METHODS OF HOG CHOLERA CONTROL AS CARRIED OUT BY THE STATE VETERINARIAN OF INDIANA

By A. F. Nelson, State Veterinarian

It is the purpose of the writer to give to this association in as brief a manner as possible the methods of control of hog cholera that have been carried out in Indiana during the past four years.

An act of the Indiana legislature, effective May 1, 1913, appropriated the sum of fifteen thousand dollars annually to the veterinary department of Purdue University for the purpose of testing anti-hog-cholera serum and virus and all other remedies sold for treatment of diseases of swine, and also for the purpose of visiting farmers, carrying on educational work among them, and the publishing of circulars for any purpose.

The same act appropriated the sum of ten thousand dollars to enable the state veterinarian to carry out the provisions of the same act as related to the spread of infectious diseases among swine.

Another provision of this act requires all cars in which swine are shipped to be cleaned and disinfected. During fiscal year ending Sept. 30, 1916, over thirty-nine thousand cars were cleaned and disinfected.

Prior to that time there had been little if any attempt to control the spread of hog cholera in the state by control measures.

It was first necessary to arrange some systematic method by which cars could be cleaned and disinfected without interfering with the movement of same.

This necessitated the maintaining of inspection of the work
at night at one point where large shipments are received daily, and also necessitated the placing of the field work in the hands of some one familiar with all details necessary to carry on a successful educational campaign on sanitation, control, and therapeutic measures. Dr. F. A. Bolser, assisted by various veterinarians, has had charge of the field work.

The passage of an act by the legislature of 1916 making it a misdemeanor to sell any animal showing physical symptoms of disease for food purposes unless inspected by state or federal authorities has resulted in the breaking up of the traffic in sick hogs which was formerly a profitable investment for the unscrupulous dealer, but since these animals have to pass federal inspection it is a very unprofitable one, as persons having federal inspection will only buy them subject to the post mortem findings.

The disinfection of stock cars, vaccination and quarantine of all hogs, shipped in for feeding purposes, and the campaign in the field on sanitation and control measures now being co-operated in by the federal authorities are rapidly convincing the farmer that this is the policy he must pursue if he ever expects to be rid of the menace of hog cholera. The demonstrative work done in the counties of Montgomery and Hendricks during the past three years has been successful in demonstrating the efficacy of serum, and where the sanitation and control measures were adopted in also convincing them that hog cholera is a prepreventable disease, and that prevention is of more importance than treatment.

As vaccination is the only method of prevention aside from sanitary and control measures, and as this has a tendency often to spread the disease when serum of low potency is used or improper handling and administering occurs, our line of instruction to the farmer has been on prevention by sanitation and control measures. An attempt has been made to get organizations of the veterinarians in order that a regular plan can be carried out on control and sanitary measures, uniform charges for administration of serum, careful administration, a closer relation between veterinarians and their clients and also with state and federal authorities, and to discourage the use of small dosage and cheap serums that often are of questionable potency. Realizing that the breeders and traders are going to vaccinate, we ask their cooperation in protecting their neighbors should infection be present in their herds or develop in them by some unlooked for causes after vaccination. If this is done and the movement from infected herds confined only to public stock yards for immediate slaughter we believe that control of hog cholera is possible.

Since July 1, 1916, an attempt has been made to enforce quarantine of premises on which hog cholera has been found to exist,
and an earnest effort has been made to get the owner to post with placards furnished by the state his farm showing that infection is present upon it and also induce him to promptly burn or bury four feet deep and cover with quicklime all hogs that have died and if possible get him to destroy all affected that show no signs of improving. Farmers have been encouraged to organize sanitary organizations to control and prevent the spread of all communicable diseases by cleaning up and disinfecting the premises before exchange of work has occurred, and when wagons, vehicles or threshing machinery is moved from one farm to another the usual sanitary precautions are advised.

Difficulties encountered have been lack of cooperation between state, federal and agricultural experiment station authorities, activities of county agricultural agents in diagnosing and attempting to advise farmers as to prevention and treatment of communicable diseases of swine, and veterinarians trying to advance new theories or resuscitating old ones that are not practical in the field, such as vaccination of small pigs by the simultaneous method in healthy herds. These propositions appeal to the farmer on account of free services or light cost, as the case may be.

At the present time there seems to be a better understanding between state and federal authorities, as well as agricultural experiment station authorities, as to methods employed and line of work expected from each department. This is shown by the reports from the field by federal and state field veterinarians now located in fifteen counties in the state of Indiana, and also from farmers and local veterinarians in the same counties. The future is now much brighter and we believe that the control of hog cholera is not far distant, at least to an extent that losses will be minimized as compared with those of the past twenty years.

**METHOD OF CONTROL OF HOG CHOLERA IN OHIO**

**By A. S. Cooley, State Veterinarian**

Ohio has a serum institute for the purpose of producing serum and with the new equipment installed and other economical activities pursued making possible the reduction in cost of serum. It has been reduced by the board of agriculture to one cent per cc,
and we tried to acquaint the hog raising public of this fact thru department bulletins and notifications.

Serum and virus go to the farmer through the veterinarians who qualify by putting in time at the serum institute getting instructions, and further by department sending an experienced field veterinarian into field to assist and instruct the veterinarian in two field treatment calls the doctor may be called to treat. This last movement removes some sharp criticism, and then these men are placed upon our approved list for treating and using state serum.

But there is criticism of this method because there creeps in the desire of the veterinarian getting the serum at one cent per cc. to make an increased charge for same beyond the reasonable point covering the loss and cost of handling. This has brought down upon the profession severe criticism, and due to these existing facts has been due the breaking away from using the service of veterinarians. Then here appears the laity using the treatment, and here appears the county agent, for Ohio has been afflicted with this affliction for some time and the loser thereby. I have had some experience with the county agents and institute men. There has not been much systematic effort throughout the state.

There was an attempt in Fayette county to do systematic work, and while I believe there was good come out of it, there was great antagonism to the work and quarantine placed. There was another county in which state and government co-operated; this came to naught and the hog raiser thinks today that their losses were overlooked and that the state went to paying for cattle.

That the welfare of the stock raising public should be concerned is without question, and to this end the Bureau of Animal Industry and Board of Agriculture of Ohio must co-operate in a campaign of intensive hog cholera control work. This is being arranged in conjunction with local veterinarians and farm organizations. We are confining the work to a limited number of counties.

This work must be educational and instructive, and for the purpose of this work and other instructive work by ocular demonstrations, the department is being supplied with a graflex camera to take pictures and arrange to make slides for demonstration and the biloptican for screen work in talks where we assign men to institute and grange meetings, also organizations formed for the purpose of control work. My observation is that we get better attendance at institute and grange meetings. Interest in meetings is what we want. Interest slackens when there is but little hog cholera. Interest in organized hog cholera meetings is hard to get.
Sanitation publicity for the purpose of convincing the persons who do not know the necessity thereof, or cannot be convinced, or have made up their minds not to be convinced, must have something beside talk, or the telling of them in an uninteresting dry way about the almost impossible things to carry out, that are dangerous in this great trouble.

We send out bulletins (title; suggestions for the prevention and eradication of hog cholera). These are sent out for instructive work.

What Ohio hog raisers want is more demonstrative sanitary control work. We know that lectures accomplish much, but so many cannot talk so as to create interest and have the facts they give sink in.

Investigation and fact show that treatment without sanitary regulations get but little lasting benefit, so we must show just what can be accomplished by sanitary control duty and reasonably applied with sane and reasonable action.

I believe that I can safely say that the hog cholera losses in Ohio are only about twenty-five percent of what they were in previous years. In Fayette county where there was so much last year and years prior, am told by men in the county there is but little, and this is true the state over and I believe the experience of other states.

We selected six counties for hog cholera control work, and while the work has progressed it has been somewhat slow this year, because interest cannot be so readily brought about when the farmer is not losing hogs.

I believe it reasonable and fair that state veterinary organizations suggest by resolution some reasonable charges be made to the farmer in doing his work. I believe the farmer wants their services in our state and it is up to the veterinarian to cultivate that desire.

It is the desire of our department to arrange with the veterinarians in these counties selected for control work and in state, to obtain uniform prices for the administration of serum preventive treatment. We hope to arrange for treatment without delay and have it administered by efficient men.

Not all sanitation is justifiable. We should and must be careful in our demands and see that regulative measures are justifiable, lest they become a burden without value received. Experience has taught that drastic regulations must be placed carefully and with judgment, lest reaction take place.

Hence the co-operation with the farmer in this work is desirable. The reason for this is plain, you enlist his aid.

I understand the method pursued in central Iowa is as follows:
1. Professional mileage to the farmer in answering calls to investigate or treat sick hogs the same as the other stock.

2. Ten cents per head for the administration of the serum and virus.

3. To furnish good serum at a cost not to exceed the price the farmer would have to pay should he purchase serum direct from the state plant at Ames.

This will have the tendency to eliminate to a great degree the feeling entertained against veterinarians.

PRESIDENT DYSON: Dr. Ward, of Minnesota, is next, but he does not seem to be here, so Dr. Mussellman is next on the program.

DR. S. F. MUSSELLMAN: Mr. President, I did not understand that I was to prepare a paper on this subject. I am glad I did not do it, and as the time is getting short, I will only take up a little of your time in regard to the condition of things at the present time in Kentucky.

Up until 1914, our estimated annual loss from hog cholera was about two million dollars. For numerous causes, since that time our losses now are believed to be less than a million. Our regulations and laws, which are yet incomplete, and do not entirely or satisfactorily cover the situation, require that all hogs coming into this state receive the serum alone treatment at least within five days before entry into the state; or the serum simultaneous treatment at least twenty-one days before coming into the state. These hogs are to be shipped in clean and disinfected cars, and all hogs going from public stockyards out into the state for either breeding or stock purposes, are to be treated with serum alone five days before shipment, or held in quarantine for fourteen days after the treatment, shipped and held in pens six hours before shipping out into the state. It also requires the burning of all carcasses, and we try to enforce the cleaning and disinfection of infected premises.

Without going very far along that line, I will just say that during the foot-and-mouth disease troubles in 1914 and 1915, and for some months afterwards, we required the cleaning and disinfection of all stock cars carrying stock intrastate or interstate. From the information that we get from different points in the state, not altogether official information, we estimate that our decrease in the prevalence of hog cholera was at least forty per cent. Now, I attribute that in a great measure to those requirements. Of course, we have made some progress in our educational work, and the use of hog cholera serum, but up to date we have not any definite methods for its control.

However, I am inclined to the opinion that the methods adopted and in use in the state by the federal authorities co-operating with the state livestock sanitary board in hog cholera control work, all working together, seem to be the most effective and most far-reaching of any that we have seen fit to attempt. There are so many angles to the situation that I think we have a long way to go before we can arrive at any definite conclusion. If I may take the liberty of quoting a word or two from Dr. Rutherford's speech this morning, when referring to the city of Chicago, I might say that the entire hog cholera situation, protection, control, and so forth, is a hell of a situation (laughter and applause).

PRESIDENT DYSON: Was there any second to that? (Laughter).

PRESIDENT DYSON: Dr. Cahill, of Massachusetts, is next on the program.
METHODS OF HOG CHOLERA CONTROL IN MASSACHUSETTS

By Edward A. Cahill, Department of Animal Industry

It has frequently been said at meetings such as this that in the consideration of any contagious disease, it is necessary to take into consideration the conditions as they apply to the different sections of the country; that the proper method of control in one section of the country is not applicable to another. This is undoubtedly true of many contagious diseases, and has never been more aptly illustrated than in the control of hog cholera.

While New England is not considered a swine raising section, and while the number of swine in all six New England states does not equal the number in any one of the western hog raising states, nevertheless the problem of controlling hog cholera is just as serious proportionately in New England as in the west. Many local factors that enter into consideration make it, in my opinion equally or more difficult to control under New England conditions than under the conditions as seen in the middle and western states. For instance, those of you who are accustomed to seeing swine kept on large open plains or pastures can hardly imagine the condition found in Massachusetts where 90 percent of the swine are garbage fed, and are kept under conditions which cannot be described, and can be understood only if seen. It is the fact that in New England piggeries where garbage is fed, the collection of mud, garbage, etc., is sometimes several inches deep, and in these insanitary conditions we probably have a better media for the propagation of hog cholera virus, than upon any of the culture media which we have yet used in an endeavor to grow hog cholera virus in the laboratory. Many swine never leave the house in which they are born until they start for the butcher, and in addition to this, we probably have more piggeries in closer proximity than in any other section of the country. Added to this is the fact that the disease has existed in practically all of these garbage-fed piggeries for a period of five to twenty years. Owners of swine did not believe that hog cholera existed in New England, because whereas in the west you have a mortality of from 80 to 100 percent, in New England although a large number of swine died each year, the losses were invariably confined to animals weighing from 40 to 125 pounds. Any animal which during the outbreak the previous year weighed over 40 pounds and lived, was certain to pass through the outbreak during the succeeding year without showing any symptoms of this disease. Our first effort was to convince the swine owners that this really was hog cholera, but that because the disease had existed in their herds for so many years, the mature stock had become naturally immune, conferring on their offspring a tem-
temporary immunity which lasts until the animals arrive at the age at which they weigh about forty pounds and begin to eat garbage.

After convincing the stock owners that this was the fact, we were confronted with incredulity due to the fact that anti-hog cholera serum and hog cholera virus had been used in many of these herds, in some cases with fair results, but more frequently with poorer results than if no treatment had been administered. In this respect our story was not altogether different from that which is heard today in some other states, and which can be read in almost any agricultural publication which is issued.

In an effort to properly control the disease of hog cholera, the department of animal industry was convinced then as it is today that the first and most necessary requisite was to eliminate the promiscuous use of the simultaneous treatment, to make it impossible to have either serum or virus improperly used, and to make it impossible for those using these products to obtain anti-hog cholera serum which was not potent, or hog cholera virus which was not virulent. In this opinion, we were guided largely by the experiences which were known in our own and other states. I think that I am justified in saying that there are few states in the union today which can deny that in spite of the fact that the simultaneous treatment is one of the most valuable protective immunization methods known to medicine, that under certain conditions it has probably spread as much cholera as it has prevented, this due entirely to the improper use, or to the use of material which was not of a sufficiently high standard.

In 1914, the commissioner on animal industry of our state promulgated regulations from which the following is an extract (Order No. 20).

No person, firm or corporation, shall directly or indirectly administer, or procure, or cause to be administered, or have in possession with intent to have administered directly or indirectly, within the Commonwealth of Massachusetts, anti-hog cholera serum, virulent blood or virus, or any other preparation of a similar composition under whatever name, and administered in a similar way for the prevention and cure of hog cholera, unless written permission has been obtained from the Commissioner of Animal Industry for such administration or possession.

Since that time, all serum and virus entering the state has been shipped to the department of animal industry. After its arrival, all virus as represented by each serial member, has been tested for virulence, and all serum has been tested for potency. In addition to this, bacterial counts are made on each serial member. If these products pass the required test, they are used only by agents of the department, who are especially trained in hog cholera control work, and are responsible to and paid by the state. The only expense to the owner of the swine is for the serum and virus which is used, all other expenses being de-
frayed by the state. In other words, swine in Massachusetts can receive the serum treatment only by authorized agents of the state, who use products previously tested by the department which they represent. You can readily see that this minimizes the possibility of improper administration, faulty technic, impotent serum, and the virus which is not virulent. It gives the consumer every possible safeguard, and keeps the control of a dangerous virus within the hands of the authorities charged with the control of contagious diseases of animals.

I want to give you just a few statistics on the results of the application of this method. In two years' work in herds where infection was not known to exist and where the treatment has been applied as a preventative, 12,263 animals have been treated. Of this number only one has died from hog cholera. On the other hand in herds where infection exists, under conditions which I have described as most insanitary, and where previous to treatment a large number of animals had died; 46,392 animals have been treated. Of this number, 25,422 that were showing either clinical symptoms of cholera or a temperature above 104° have received the "serum only" treatment, with a mortality of 1,369 or 5.3%. The remainder of the animals in the herds, 20,972 in number, have been classified as apparently healthy animals in infected herds having been taken from the same pens where the 25,422 were sick and where were also found many dead animals. The 20,972 head of swine have received simultaneous treatment and the deaths in this class have been 153, a mortality of seven-tenths of one percent.

These figures speak volumes, but in our opinion are less eloquent of the value of proper state control than is the fact that today ninety-eight percent of all the large herds within the state are being immunized, and, that whereas when the regulations were first promulgated, they were met with some opposition on the part of the swine owners; today there are practically not any large breeders in whose herds we have worked, who are not ardent supporters of the simultaneous treatment and of state control.

This is extremely interesting in comparison with the reports received from many other states, and particularly from the states which are lax in their regulations, or have no regulations whatsoever for the restriction of the use of serum and virus. In reading the agricultural publications I find that the farmers in most states are hopelessly divided as to the value of the treatment, many favoring it and just as many condemning it, according as the results of the same in their herds have been good or bad.

It is not my intention to give you more figures or statistics.
The report of the commissioner of animal industry for the past
two years and for the present year, gives these statistics in de-
tail, but I do want to seriously urge upon this association the
advisability of recommending more stringent rules or regulations
restricting the promiscuous use of virus. Understand that we
advocate the universal application of the simultaneous treatment,
but under the proper restrictions. If this cannot be done, we
advocate just as strongly that its use be entirely prohibited.

We believe that our method is the best which has yet been
applied. We do not say that our method in all its details is ap-
picable to all sections of the country. As stated in my opening,
we believe that control methods depend largely upon local condi-
tions. We do believe, however, that this association should look
with disfavor on the abuse to which this valuable immunization
method has been subjected. It will be only when virus is used in
a manner similar to that which I have described, and freely, under
state control that it will receive the recognition and approval
to which the simultaneous treatment is entitled. I know of no
other form of vaccination which is fraught with as many dangers
or endowed with as many beneficial possibilities as this. At the
same time, I know of no other form of immunization either in
human or animal medicine, in which the unattenuated causative
agent of the disease is used promiscuously. If opposition is
offered by swine owners, in the beginning, they are not slow in
recognizing the possibilities of state control after the same is
proven. From our experience I am thoroughly convinced that
the dissatisfaction regarding this treatment is due principally to
the poor results which have been obtained and will entirely dis-
appear to be replaced by the enthusiastic support of the swine
owning public. At the same time, the profession will receive
credit for that which we profess to be the first of our principles,
the protection of animal life and the prevention of contagious
disease.

PRESIDENT DYSON: Gentlemen, this I believe completes our program for
the day. I think that we should all profit by what we have heard here,
on the control of hog cholera. If it was a sanitary problem alone, I do
not anticipate, I do not think we would have any difficulty in handling the
situation. The economic factor involved in the movement of cholera-in-
fected hogs from cholera-infected premises is a thing that we have got to
contend with. If we can overcome that, and move the cholera-infected
hogs safely to market, I believe that we will have gone a long way in solv-
ing the problem.

In that connection I want to mention the movement of cholera-infected
hogs, or hogs from cholera-infected premises upon affidavit of the owner.
It would be unquestionably impossible to move hogs under those condi-
tions under official supervision; but I would place a great deal of reliance
upon the affidavit of the owner at the time of shipment, if he was required
to make affidavit as to whether or not the hogs were infected, or whether
they had been removed from infected premises, and require the loading
of the infected or exposed hogs from separate chutes, or direct from wagons into cars, and by placarding the cars in all cases where the owner refused to make an affidavit as to the health of the shipment offered, and by following those cars, and requiring thorough cleaning and disinfection, locating thereby the infected premises, and placing those premises under official control. I believe that we would ultimately get somewhere in that way in the eradication of the disease.

If there is nothing further in connection with the program, a motion to adjourn would be in order.

On motion, duly seconded and carried, the convention adjourned to Wednesday, December 6th, 1916, at 9:30 a.m.

Third Session

December 6, 1916,
9:30 o'clock, a.m.

President Dyson: The first thing on the program this morning is: "Abortion as it affects the Animal Industry of the United States." Dr. Eichhorn.

ABORTION DISEASE AS IT AFFECTS THE ANIMAL
HUSBANDRY OF THE UNITED STATES

By Adolph Eichhorn and George M. Potter

There was a time, not many years ago, when the owner of cattle was not greatly concerned over the cost of production. Cows could be purchased for a low price and feed was abundant and cheap. Perhaps the family cow picked up her living by the roadside and any surplus of milk above the family needs would be given to the pig or chickens. If a man owned a small dairy, the cows were cared for in a haphazard manner, the productive capacity of the cows was only guessed at and the poorest received as much food as the best. Wasteful methods were employed as a matter of course.

Likewise, the producer of beef carried on his business in an equally careless manner, running his cattle upon the great expanse of free range, where they were exposed to the vicissitudes of a rigorous climate. Even yet, we read of the tremendous losses which were the result of this system.

But these conditions are rapidly passing. Our centers of population receive their milk from dairies which are largely dependent upon purchased feed stuffs, and it is necessary to exercise every economy known to the art of animal husbandry to show a profit. In beef raising, too, the cost of production so closely approaches the selling price that we can ill afford even a slight loss.

The Wastage of Disease

The greatest waste which affects animal husbandry today is due to the various animal diseases. One has but to mention to this assemblage tuberculosis, hog cholera, Texas fever, blackleg, anthrax, and abortion, to call to your minds the almost incom-
prehensible losses to our national wealth which is due to these scourges. And the greatest of these is abortion. To some, this last statement may seem extravagant, but if the geographical distribution of the disease is considered, the truth of the statement will be apparent. In states where dairying is an important industry there is scarcely a herd of more than a few animals that has escaped the ravages of this disease. It has taken toll of the beef herds as well, and now it has extended to the range where it is going through the great herds like wildfire. The writers receive correspondence from every part of the United States, and we have attempted to visualize the distribution of abortion by sticking a colored pin in a large map, for each letter received. The result is truly appalling. Every dairy section shows extensive infection and in grazing sections where the interchange of cattle is active the disease is spreading with great rapidity. In spite of the numerous appeals for aid there are without doubt for each letter received scores and hundreds of affected farms where the owners prefer to conceal the fact that the disease is present, or they are ignorant of its true nature. In some sections where there has been practically no introduction of cattle, such as the mountainous regions of the south and certain parts of the western range the disease has not yet made its way, but with the advent of purebred cattle we may expect it to appear, unless proper precautions are taken.

Toll of Contagious Abortion

The losses from abortion disease are not confined to the death of the immature fetus. The attendant conditions of retained afterbirth, sterility, and weakling calves, and the loss of milk, the cost of combatting the disease, and not least the loss in breeding efficiency in valuable animals combine to make an enormous total. In some instances, the loss reaches fifty percent and even seventy-five percent of the calf crop. It is only the man who has had to combat abortion who can realize how long and difficult a procedure it is. The stock industry has already suffered a setback from the discouragement of owners some of whom in despair have abandoned the keeping of cattle, and others again are contemplating the same course unless relief can be afforded.

The methods of control are the important consideration, and the feature in which this association is most interested. But before we can control a disease we must learn how it is spread. Aside from the avenues of infection, which are chiefly of scientific interest, the disease is spread by the traffic in breeding animals, and the purebreds are perhaps the worst offenders. These are purchased for purposes of herd improvement and taken long distances and if from an infected herd they serve to introduce the disease. Furthermore, wrong practices of herd management
and dishonest methods are responsible for its spread. Some dairymen practice buying cows instead of raising calves to replenish their herds. It is becoming increasingly difficult to purchase good cows, and whenever an apparently superior cow is offered for sale it is very likely some one's aborter. There are many persons dishonest enough to sell an aborting cow to a neighbor. It is this combination of dishonest selling of diseased animals and their purchase by unsuspecting buyers that is responsible in large degree for the dissemination of abortion.

No Cure—Methods of Control

The control measures which have proved most effective to the present time are sanitation and a proper system of herd management. It should be frankly acknowledged and stated that no reliable cure for abortion has yet been found, and it is especially true in this case that an ounce of prevention is worth a pound of cure. The Bureau of Animal Industry would dispel the false hopes which are raised by the unwarranted claims which are set forth in the craftily worded advertisements of certain proprietary remedies. No sure and easy way of overcoming abortion is known and the eradication of the disease is dependent upon careful attention to the principles of sanitation and the control of breeding.

Drugs such as carbolic acid and methylene blue have been advanced as specifics but have proved valueless. The accepted measures of sanitation should be employed about the premises. Aborting cows should be isolated and thoroughly treated until all discharge ceases, in order that the chances of infection for susceptible animals be minimized. Animals of doubtful value should be eliminated and attention concentrated on the profitable cows. Profitable cows should not be sold because they abort. Heifer calves from the best cows should be raised to replenish the herd, and thus avoid the introduction of new infections. These methods are not at all inconsistent with the best dairy practice, and assist in the control of other diseases as well.

Control on the Ranges Unsolved

The extension of abortion to the range herds presents a problem in the control of animal disease toward the solution of which practically nothing has been accomplished. Under the conditions of range management which prevail, we are denied the use of those measures which have been effective to some degree with dairy cattle. Where cattle are handled en masse and range widely over rough land it is impossible to give the individual attention that is required. It is also difficult to detect and separate the diseased from the healthy animals, and their wild nature renders them difficult and dangerous to treat. Furthermore, the
fact that breeding is of necessity performed while the cattle are upon the range makes the control of this function an impossibility. We have been forcibly impressed, in our correspondence with cattle men, with our helplessness and inability to aid them. Some men have resorted to the use of steers, and disposed of their breeding herds. This might at first thought seem to be a solution of the difficulty, but let us consider for a moment the result if it were attempted to put this into general practice. Where would the steers come from eventually if a large percentage of the breeding herds were sacrificed? And if it were desired to resume breeding operations where could the cows be obtained? Already the slaughter of female cattle has reached serious proportions, and the general adoption of this practice would be little short of a national calamity. It should be opposed by all who have the future of animal husbandry at heart.

**Laboratory and Field Work Necessary**

The study of abortion must be undertaken along two main lines: first, the laboratory, or investigational line; and second, field work. They are of equal importance, are in no sense antagonistic and should be carried on simultaneously. The first seeks to establish the avenues and time of infection, the agencies by which the disease is disseminated, the localization of the diseases in the animal's body, problems of diagnosis and immunity, and the value of the various immunizing agents. The second seeks to develop methods of herd management that will be effective in controlling the disease, and to apply under practical conditions the information gained in the laboratory.

**The English Method of Immunization**

The possibility of immunizing against abortion disease has held the attention of scientists perhaps more than any other phase of the problem. Various substances have been used in an effort to discover an effective immunizing agent. Live organisms, killed organisms, immune serum, and combinations of these have been tried, but with such indefinite results that it must be stated that this line of treatment has not yet passed the experimental stage. The partial success obtained, however, leads us to hope that the desired end may yet be obtained.

From all indications the treatment with live organisms is giving the most promising results. Thus in Great Britain this form of treatment is gaining great popularity, which is evidenced by a letter received very recently from Sir Stuart Stockman, chief veterinarian of the board of agriculture and fisheries.

After investigations which extended for a period of several years conducted by a special commission in England, it was estab-
lished that it requires the injection of large doses of virulent cultures to induce the desired immunity. The treatment with dead organisms did not prove nearly as effective as when live organisms had been employed. It is rather remarkable that the British Government at the present time uses for immunization on animals 50 c.c. of the culture for a single injection.

The report from the agricultural society of Oxfordshire, England, appears to be impressive as to the effectiveness of this method of treatment. The period during which this method has been used extends over five years, in which time approximately 40,000 animals have been treated with live organisms. On the average about thirty percent of the animals aborted prior to the treatment, which were reduced to about four and a half percent according to the latest report. Sir Stockman writes that at first the farmers were timid in permitting this method of treatment. Now, however, the demands for the same are so great that it is almost impossible to supply the necessary material. The authorities furnishing the culture assure the stock owners that the treatment will not have any bad effects on the animals, which would indicate that the investigations have been carried on to a sufficient extent to establish that the treatment with live organisms is not harmful, does not spread the disease, and tends to reduce the number of abortions. It is natural that such treatment should be carried out only by veterinarians. Furthermore, animals which have already conceived should not be injected, and the treatment should be undertaken at least two months before breeding.

The experiments which are being now conducted by the pathological division of the Bureau of Animal Industry showed that the injection of even large amounts of bacterins does not induce in the animals a reaction to the agglutination and complement-fixation test lasting for more than several days, whereas, the injection of live cultures, especially large doses, induces a reaction which persists over a long period, and this might explain the necessity of using large amounts of live cultures for the prevention of abortion.

The nature of the organism, its low virulence, and its very slow and prolonged action render investigation difficult. Its mild action on the animal does not appear to stimulate the body to a very active resistance with the production of a sufficient amount of immunity to prevent the occurrence of abortion in all cases. The varied manifestations of the disease, together with the fact that infection with the Bang organism may produce no visible manifestation, and the absence of any truly reliable diagnostic agent, add to the perplexities of the investigator. Moreover, the prolonged periods of observation required and the cost of experimental animals render the expense of these experiments so pro-
hibitive that a sufficient number of cattle have not always been employed to make observations conclusive.

In spite of the many difficulties, we look forward with optimism toward the solution of this problem. Means for an effective control must be developed. With many capable investigators at work, under both state and federal auspices, and with our knowledge of the disease being continually augmented, we are confident that the disease will yet be brought under control.

**Exaggerated Claims for Biologic Products**

The questionable practices of some of the manufacturers of biologic products, in guaranteeing a cure or money refunded, should receive the condemnation of those who know the facts. There is a probability that these products may have some value, and therefore there is no intention to discourage their use, but to give a guarantee before the true value of the product is known is to deceive the purchaser. This practice of over-stating the value of the abortion bacterin is liable to bring into disrepute a system of treatment which may eventually be found to be very useful.

**Extent of the Infection Not Realized**

The knowledge of abortion disease among stockmen and farmers, generally, is so meagre and faulty that the responsibility rests with our federal and state departments of agriculture to warn them of their danger. Even some state officials do not realize the extent to which the disease prevails in their respective states, and many veterinarians have but little knowledge of the cause of, and the methods of combatting the disease. As before stated, there are large areas where the disease is exceedingly destructive, but it is also true that there are sections where the disease is practically unknown. As a general proposition, "It is More Important to Prevent Disease Than To Cure It." In infected areas, we may leave it to those interested to find and apply measures of control, but in the free areas it will require the action of alert and interested officials to prevent the introduction of abortion. We frequently hear the objection to any recommendation for action, "We have no satisfactory cure for this disease." But that is not a valid reason why we should not employ all the means we possess to prevent the further dissemination of abortion. If we await the discovery of an effective remedy, which may occur only after years of study, the disease will continue to spread, causing much unnecessary loss, and making its final control much more difficult.

There is imperative need that each state establish its own laboratory, where diagnoses can be made and problems more or less peculiar to its own conditions worked out. These, by co-opera-
tion with other laboratories and the Bureau of Animal Industry, could accomplish much toward the suppression of this, and other animal diseases. Some states have already established laboratories, which have been of great service to the live stock interests. The pathological laboratory at Washington has done much diagnostic work for the various states, but as the interest in this disease has increased the demand for this work has also increased until our facilities are entirely inadequate to perform the service, and much of the work must necessarily be refused in future.

Obstacles to Enforced Quarantines

In considering the possibility of sanitary police control, one naturally thinks of restrictive laws to prevent dissemination of disease. It is the opinion of the writers that, in the present state of our knowledge, such measures would not be justified. A statute could not be drawn which would hold in a court of law. The chief difficulty lies in the inability to accurately diagnose the disease. The serological tests are our most reliable diagnostic agents but they are not infallible, and should the attempt be made to make them the basis for legal action, a lawyer would have no difficulty in pointing out their shortcomings. For example, an immune animal may react as decisively as an animal in the active stages of the disease, and consequently a positive reaction does not mean that a cow will necessarily abort or that she is harboring the organism at the time. On the other hand, cows may abort shortly after giving a negative reaction, and a considerable time may elapse before the development of those bodies by which a positive reaction is obtained. And yet this cow is carrying the abortion organism in an active form, and she is more dangerous as a disseminator of disease than many cows that give positive reactions. These tests do, however, indicate the presence of the infection in a herd, and they are of undoubted value to the investigator in his experimental work. In this connection the writers can think of but one restriction which might to some extent be effective; namely, that whenever a sale of cattle for purposes other than immediate slaughter were contemplated, from a herd where the owner knew of abortions having occurred, he must declare the presence of the disease to the intending purchaser, under penalty of being held responsible for any damage sustained. A purchaser could then take precautions to prevent the introduction of the disease into his herd.

It has come to our attention that in certain states quarantines have been imposed or are contemplated. It would be interesting to learn what legal basis was found for this action, the method of enforcing the quarantine, the remedial measures recommended and the results observed.
A Campaign of Publicity

The department of agriculture has undertaken a systematic campaign for the suppression of abortion. The aim is to employ every agency which we possess for disseminating information. It is realized that the department alone is unequal to the task of reaching all owners of cattle, and we must resort to a division of labor, the state organizations, breeders' clubs, etc., assuming part of the burden. Our efforts must follow the line of educational propaganda, and to reach every owner of cattle we would enlist the aid of the agricultural press, the extension departments of the state universities and the various railroads, veterinary associations, cow testing associations, associations of beef cattle men, and in short, any organization which can reach interested parties. The greatest difficulty to be overcome is the tendency to concealment and the secret selling of diseased animals, which seem to prevail everywhere. At present, conditions are very serious, and they cannot be bettered until we meet the situation frankly and openly and employ every known means of combatting the disease.

It is desired that the best knowledge and practice to be had in this and other countries be made available for our use. To accomplish this, it is suggested that this body appoint a committee consisting of the best qualified men obtainable, who shall confer and draw up a compilation of all the established facts concerning abortion disease, and they shall recommend measures which have been found most effective in combatting the disease under certain conditions. Such a report would allay much of the uncertainty which now exists and lay a foundation for rational measures of control.

President Dyson: "Abortion and the Dairy Industry", by Dr. W. L. Williams.

Dr. W. L. Williams: My contribution to the program will be considerably marred, because I had hoped to place the principal facts of my address upon the screen with a lantern, but I found it was impossible to use a lantern here.

ABORTION IN DAIRY CATTLE

By W. L. Williams, New York State Veterinary College

At the request of your secretary, I addressed your 1912 meeting upon the subject of contagious abortion. In that address the position taken was somewhat out of accord with the prevailing views of veterinarians and breeders.

The four years which have elapsed have been rich in developments regarding this great scourge. Everyone who has had an impressionable mind has changed it during this period in some important particulars. During the four years, more men, more
study, and more money have been devoted to the effort to unravel
the mysteries and get control of this scourge than during all
previous years. Among the more salient statements, or conclu-
sions, were:

1. Contagious abortion is a widespread—well nigh, if not
quite universal—and highly destructive affection of cattle.

2. It induces many symptoms, commonest among which are
sterility, abortion, premature birth, and metritis with or without
retained afterbirth.

3. The phenomenon of abortion can not be reliably induced
in cattle experimentally.

4. There is no accurate means for diagnosing contagious
abortion.

5. There is no natural immunity acquired in abortion parallel
to that of some acute infectious diseases, such as foot-and-mouth
disease, smallpox, etc.

6. Although the infection may invade the organs of cattle
through various avenues, it can induce sterility (when uterine),
abortion, premature birth, and retained afterbirth only when a
large volume of virulent infection exists in the uterine cavity.

7. The chief avenue by which the infection enters the uterine
cavity is through the cervical canal.

8. The infection generally exists in the uterine cavity or in
the cervical canal prior to conception, or it is introduced at the
time of breeding or early thereafter, prior to the sealing of the
uterus.

9. There is no cure for abortion and no means for eradicating
the infection from a herd.

10. Abortion may be largely controlled and its ravages greatly
lessened by a comprehensive plan of hygiene—especially of sex
hygiene—in breeding and dairy cattle.

Considering these statements in their order:

1. The idea advanced that the infection is universal has gained
much ground and it is becoming more and more apparent that
such phenomena as abortion, metritis, retained fetal membranes,
the strong reactions to serologic tests, etc., are not so much de-
pendent upon the presence of the infection as upon its volume,
virulence, and location. Schroeder and Cotton, Evans, and oth-
ers have shown that the milk of many dairy cows is contaminated
with abortion bacilli, but how few cows, if any, do not have the
bacillus in their milk has not been determined. The more it is
searched for, the more found. The wider application of the
serologic tests has constantly shown a more and more common
occurrence of the infection, especially a more general infection
of new-born calves.
During the four intervening years, there has been a notable change in the views of breeders and dairymen in connection with the distribution and frequency of the abortion infection. At that time, it was the general belief that, while many herds were doubtless infected, the vast majority of them were free. During the interval I have had occasion to present the view of the omnipresence of the infection to the leading breeders' and dairymen's associations of the United States. So far as could be judged from the discussions which followed, many breeders of pedigreed cattle especially are now convinced of its universality. They recognize in this a distinct advantage instead of a handicap in their fight with the scourge. They are now viewing the disease intrinsically instead of extrinsically. They are no longer directing their sole care and thought to preventing the introduction of the infection from a neighbor's herd, but are studying critically the dangers within their own herds and gradually introducing measures to control the disease at the center without forgetting the circumference. They are commencing to realize that a belief that their herds are free from the infection is a delusion and a tremendous peril and that their safety lies in the assumption that the infection is present and that only eternal vigilance can prevent it from stealthily accumulating virulence and momentum to break unannounced as a relentless storm spreading destruction on every hand. Many breeders have learned, to their lasting sorrow, that to believe their herds free from contagious abortion is one of the most expensive and disastrous doctrines a breeder can embrace. The breeders of pedigreed cattle and the editorial writers connected with dairymen's and cattle breeders' publications generally support this view and are ready to grapple with the scourge upon this basis. Veterinarians—especially those engaged in laboratory work—are largely opposed to this view, and continue to talk optimistically about infection-free herds.

2. In the address of four years ago, it was stated that the infection induced many symptoms, prominent amongst which are sterility, abortion, premature birth, and retained afterbirth. This view was highly objectionable to many, because if accepted it would have to be admitted that the infection is universal. Gradually, surely, and inevitably, breeders and veterinarians are accepting the phenomena of sterility, metritis, and retained fetal membranes as contagious abortion.

Researches since 1912 have justified abundantly the addition to the prominent complications of contagious abortion of the white scours and pneumonia of calves. Interesting evidences of the important role of the abortion organism in these affections have appeared in the annual reports of the New York State Veterinary College, especially in that for 1914-1915, and yet
more convincing evidence will appear in the forthcoming annual report, now in preparation.

Inferentially, it has always been admitted that the new-born calf might carry the abortion infection, because, if abortion bacilli are found in the fetal organs of an aborted fetus, it is difficult to escape the conclusion that the calf, less infected, might be born alive. Next, it was learned that the living fetus constantly swallows its amniotic fluid. The fluid is not voided per anum, but is resorbed from the intestinal walls, leaving behind, as a filtrate, quantities of fetal hairs mixed with biliary and other debris to constitute the meconium. In the meconium, bacteria are frequently found which can not be differentiated from those in the infected uterus of the dam. The work of Schroeder and Cotton and of Evans added material evidence when they showed the common occurrence of the abortion bacillus in the milk. Thus it is shown that the calf has three definitely known sources of infection: (a) intra-uterine, through the chorion into the amniotic fluid, post-natal (b) through the mother's milk, and (c) from the exterior of the teats after genital discharges have trickled down the tail and thighs to contaminate the exterior of the udder. The researches in this field are barely begun. The indications are that they will prove of tremendous interest, both scientifically and in the control of the disease.

3. In 1912 it was asserted that the phenomenon of abortion could not be reliably induced experimentally in cattle by infecting with the Bang abortion bacillus. Some persons erroneously regarded this as a denial of the power of the Bang abortion bacillus to induce abortion. In the intervening four years, there has been a notable toning down in the positiveness with which investigators then asserted that they could induce abortion in cattle at will. To induce abortion clearly and reliably, there must be a fixed period of incubation, but in a chronic infection we can fix no time at which a certain phenomenon will appear. Severe infection with contagious abortion may cause a great variety of symptoms at wholly indefinite periods, but can not be relied upon to induce any one phenomenon or after any definite duration of time. On the whole, there is little said today by most experimenters regarding their ability to induce the phenomenon of abortion at will. They do not need to induce it in order to prove the relationship of the Bang abortion organism to the phenomenon of abortion.

5. It was stated in the address of 1912 that there is no natural immunity acquired in contagious abortion such as is observed in most acute contagious diseases, like Rinderpest and foot-and-mouth disease. Abortion is a chronic disease. The outstanding difference between an acute and a chronic infection is in their
power to produce immunity. In an acute infectious disease a
crisis is quickly reached in which the patient dies or the disease
ceases. If the patient survives, the infection can not as a rule
again invade the system because an impassable barrier has been
erected. A chronic infectious disease is one in which the life
of the patient and the continuance of the infection are compatible.
The patient may possess such a degree of vigor that the infec-
tion is brought under control and the patient is well, but infected.
Under severe stress, the resistance formed may break down and
the patient may sicken and die. The experimental inoculation of
white rats with the Bang abortion organism ordinarily kills the
rat very promptly by producing an acute sepsis. It does not
cause abortion. The rat has no time to abort. If, however, be-
fore the rat is inoculated with the virulent living cultures, its
system has been fortified by the use of the killed bacilli, the in-
oculation with the living organisms does not kill the rat. Neither
does the use of the bacterins prevent the infection. They change
its character from acute to chronic. The rat lives, but it carries
indefinitely in its system the infection of contagious abortion.

It was stated in the address of four years ago that there is an
age immunity in contagious abortion. The expression was not
well chosen to convey the real thought in mind. We should keep
apart the immunity of acute and of chronic infections. In the
immunity of acute infections, we assume that the pathogenic
organism can no longer invade and live in the tissues of the
host. In chronic diseases, the infection does not disappear, but
it may become so weak in comparison with the resisting powers
of the tissues that it produces no marked symptoms of disease.
The animal is infected, but not sick. In acute infectious disease,
there is an immunity against invasion; in chronic infections there
is an immunity against the disease-producing power of a persist-
ing infection. Perhaps that thought can be well illustrated by
placing before you again the data chart of the eighteen heifers
of the 1912 address then under experiment with the abortion
bacterins, bringing the history of the group down to date.

When so large a percentage of heifers abort as in this group
of eighteen, it is evident that there is a highly virulent type of
infection present and that it is involving essentially every animal
in a serious degree. Though abortion may not occur, metritis is
there, perhaps retained fetal membranes or other complications
no less important. The heifers which suffered most in 1912 are
not the ones which are doing best in 1916, but the reverse. The
greatest immunity in the group is not amongst those which were
overcome by the infection in 1912, but amongst those which then
overcame the infection. That is, in abortion the highest immunity
is acquired by overcoming, not by being overcome.
## Vital Statistics of 18 Heifers in Herd A, given Abortion Bacterius in First Pregnancy, with Female Progeny

<table>
<thead>
<tr>
<th>Number</th>
<th>Born</th>
<th>1931</th>
<th>1932</th>
<th>1933</th>
<th>1934</th>
<th>1935</th>
<th>1936</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>1</td>
<td>12.6.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Destroyed 10.5.15. Gangrene of the Uterus. Decomposition of Postitus</td>
</tr>
<tr>
<td>2</td>
<td>10.6.09</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Died of Metritis</td>
</tr>
<tr>
<td>3</td>
<td>1934</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Slaughtered on account of Sterility</td>
</tr>
<tr>
<td>4</td>
<td>1934</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Slaughtered on account of Sterility</td>
</tr>
<tr>
<td>5</td>
<td>1934</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Slaughtered on account of Sterility</td>
</tr>
<tr>
<td>6</td>
<td>1934</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Slaughtered on account of Sterility</td>
</tr>
<tr>
<td>7</td>
<td>1932</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Died of Metritis</td>
</tr>
<tr>
<td>8</td>
<td>1932</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Slaughtered on account of Sterility</td>
</tr>
<tr>
<td>9</td>
<td>1932</td>
<td>B</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>11</td>
<td>1931</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sold on account of low dairy efficiency</td>
</tr>
<tr>
<td>12</td>
<td>1931</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Died of Indigestion - 1933</td>
</tr>
<tr>
<td>12A</td>
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<tr>
<td>13</td>
<td>1931</td>
<td>B</td>
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<td></td>
<td></td>
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<td>Sold - Efficient</td>
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<tr>
<td>13A</td>
<td>1931</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>1931</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14A</td>
<td>1931</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>15</td>
<td>1931</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1935 Heifer died 2.10.4</td>
</tr>
<tr>
<td>16</td>
<td>1931</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Died or killed ———— —— 10</td>
</tr>
<tr>
<td>17</td>
<td>1931</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sold in Breeding Condition —— 5</td>
</tr>
<tr>
<td>17A</td>
<td>1931</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Remaining in herd 11</td>
</tr>
<tr>
<td>18</td>
<td>1931</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Died or killed 10</td>
</tr>
<tr>
<td>18A</td>
<td>1931</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sold in Breeding Condition —— 5</td>
</tr>
</tbody>
</table>

Assuming that each of the eighteen heifers should have calved once a year and that one-half of the calves would be heifers, there should now be in milk, counting the eighteen heifers, their daughters, and four granddaughters, a total of forty-four fe-
males. Instead, there exist in the herd eleven females of dairying age. Five cows, presumably capable of breeding, have been sold, and ten have died or been killed. In short, the size of the original group including their progeny has been diminished by five animals, or 28 per cent. This certainly indicates that no valuable immunity is caused by severe infection. Incidentally, also, the chart tends to negate the contention of those now claiming to prevent abortion by hyperinfection prior to conception. These were certainly hyperinfected when two years old, and have been liberally infected ever since. If that would prevent disaster in later years, this group should have been highly valuable.

The principle which I wish to bring out may be further illustrated by Numbers 34 and 49 of our research herd. Each was purchased at birth and has been under constant observation up to the present time.

<table>
<thead>
<tr>
<th>Breeding and Abortion, Record of Experiment Animals No.34-49 with progeny</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. 34</strong></td>
</tr>
<tr>
<td><strong>Born 1910</strong></td>
</tr>
<tr>
<td><strong>JAN</strong></td>
</tr>
<tr>
<td>1913</td>
</tr>
</tbody>
</table>
| 1914 | | | | | | | | | | | +
| 1915 | | + | + | | + | + | + | + | | |
| 1916 | | | | | | | | | | | +
| **No. 34 A** |
| **Born 1911** |
| 1914 | | | + | + | + | + | | | | |
| 1915 | | | + | + | + | + | + | + | + | +
| 1916 | | | + | + | + | + | + | + | + | +
| **No. 34 B** |
| **Born 1914** |
| 1915 | | | | | | | | | | | +
| 1916 | | + | + | + | + | + | + | + | + | +
| **No. 49** |
| **Born 1912** |
| 1913 | | | | + | | | | | | |
| 1914 | | | | | | | | | | |
| 1915 | | | + | | | | | | |
| 1916 | | | + | | | | | + | |
| **No. 49 A** |
| **Born 1914** |
| 1914 | | | | | | | | + | + | +
| 1915 | | | + | + | + | + | | | | |
| 1916 | | | + | + | + | + | + | + | + | +

Calf died
Pregnant
Calf still alive
Number 34, a strong heifer, apparently well, was inoculated in the jugular during her first pregnancy with a large volume of abortion cultures. She gave birth at full term to an apparently healthy calf, our Number 101. She then conceived with difficulty, aborted two or three times unseen, and finally gave birth to a healthy calf, our Number 3. After much difficulty, she conceived again, to abort on September 20, 1916, at the 280th day of pregnancy. Following this, she almost died from metritis. Her afterbirth was retained for eight days and when it came away all the cotyledons came with it.

From the time that the injection was made in the jugular vein in 1912, her blood has rarely failed to react highly to the agglutination and complement-fixation tests. She was, according to my view, infected before she was experimentally inoculated, but the inoculation appeared to intensify the infection and to add to its force. I consider the evidence that her final abortion was due to the experimental infection of four years before quite as strong as the evidence produced in any recorded case of alleged experimental abortion in the cow. This virulent infection has induced no visible immunity in four years. It has rather increased in intensity.

The evidence in the life of Number 34 alone does not tell the entire story. Her first calf, Number 101, in utero when 34 was inoculated, was caused to cease only with very great difficulty. Apparently she aborted once or twice unseen. Then she evidently conceived, to abort at 173 days. After a long period and great persistence, she finally conceived again, to expel prematurely, upon the 276th day of pregnancy, a heifer calf weighing 65½ pounds. Her placenta was retained, and, as in her mother a few weeks before, the cotyledons became necrotic and sloughed away. Both animals would probably have died in the hands of an ordinary dairyman. It required the best attention we could give them to preserve their lives. Whether they will ever breed again, is a wholly different question.

The heifer calf of Number 101 was evidently ill at the time of birth. She was dull and appeared in a stupor; she lay down most of the time and refused to eat; her meconium, or fetal feces, was swarming with bacteria; her large intestine was one great cesspool of infection. After vigorous handling with calf scours serum, she rallied and began to grow. She had the infection in plenty when she was born.

The second heifer of Number 34, our Number 3, born in September, 1914, has given great trouble in breeding. She has apparently conceived twice and aborted unseen. Her genital organs are normal, as far as physical examination reveals, but she simply refuses to become and remain pregnant.
Number 34 and her progeny are a thoroughly bankrupt family. They have failed utterly from the standpoint of reproduction and dairying. Yet, they have—and have had for a long time—infection in abundance and to spare.

Number 49 is a year younger than 34. She has been served five times, has produced three healthy calves, and is due to calve in March, 1917. During her first pregnancy, she was fed a liberal amount of pure cultures of abortion bacilli. If the experiment ever made any difference to her, it was not visible. Her blood has always reacted very faintly to the tests for contagious abortion. Most investigators would say that she is not infected. Since 1913, she has been the constant companion of Number 34. She has also been in the same stable—and in an adjoining stall with an open partition—with the aborter Number 101. She has run in the paddock with her. One of her mates of the same age aborted in the pasture where she was grazing during her first pregnancy. She has been exposed and re-exposed, naturally and experimentally.

The first heifer of Number 49, our Number 1, bred promptly and calved perfectly before she was two years old. The calf, Number 11, is strong, well developed, and healthy. Number 1 conceived again very promptly and is due to calve on January 1.

The second calf of Number 49 was a vigorous bull, which died from lead poisoning.

The third calf of Number 49 was a heifer, Number 14. She was sick when born, having suffered from calf scours in utero. She responded promptly, however, to calf scours serum, the diarrhea was controlled, and she is at present strong and vigorous.

The contrast between these two animals is very marked. The blood of Number 34 has always reacted high to the tests for contagious abortion; the blood of 49 has always reacted low. The blood tests of the calves of 34 have averaged very high in reaction; the blood tests of the calves, even including the second generation, of 49 have always been low. Number 34 and her daughters have always given great trouble in breeding; Number 49 and her heifer have bred promptly. 34 and her progeny show a low power of resistance to the infection of contagious abortion. Why, we do not know. They are the largest animals in the herd and look the most vigorous. The one hypothesis we can offer for the difference is the introduction of a large volume of virulent cultures into the jugular vein during her first pregnancy, with the interesting suggestion that the infection was possibly transmitted in a virulent form to her calves in utero. Her first calf was fed some raw milk, but her second heifer, which gives equal difficulty in breeding, never tasted raw milk. Every particle was boiled. It must be very evident that neither hyper-
infection nor disaster has rendered Nunier 34 or her calves immune. Now past six years of age, she has been an utter failure, and her last disaster was the greatest of all.

Number 49 has withstood all the exposure of Number 34, except that her experimental infection was given per mouth instead of in the jugular vein. She has suffered from no serious disaster and has today a higher power of resistance than 34. In other words, the exalted power of resistance—call it immunity or what you will—has been acquired, not through disaster, not through abortion, sterility or retained afterbirth, but through the avoidance of these. These two cases offering such sharp contrast are thoroughly characteristic of the evidence in general. The cow which has the greatest power of resistance and which is the most reliable as a breeder is the cow that has always had that resistance and has never been overborne by the virulence of the infection.

6. It was asserted in the address of 1912 that, while the infection may invade the body of a bovine animal through various avenues, and possibly induce various symptoms of disease, the chief phenomena noted—sterility (when uterine), abortion, premature birth, and retained afterbirth—are caused almost always by an infection existing within the uterine cavity, or cervical canal, at the time of conception, or the infection is introduced by the bull at the time of copulation or otherwise invades the uterine cavity through the cervical canal prior to the formation of the uterine seal. The revelations of the intervening four years render important modifications of the statement then made both possible and necessary. In the address in 1912, the prevalent belief that most of the abortion in heifers during their first pregnancy resulted from infection by the ingestion of contaminated food, was rejected. It was held to be untenable. Its advocates had not then designated what food was contaminated, how it was contaminated, or when it was eaten by the animal. The hypothesis was without any secure foundation. Prior to 1912 many investigators believed food contamination to be the chief cause of the spread of the disease.

The discovery of the abortion bacillus in the milk of dairy cows shed new and highly important light upon the question of food infection. The calf, in taking raw milk which contains the abortion bacilli, necessarily becomes infected so far as the alimentary tract is concerned. The fact that it has been shown that the milk of many cows is contaminated with the abortion bacillus and the impracticability of demonstrating that the milk of any cow is free therefrom renders this source of contamination highly interesting. It has been further shown by our researches that such infection occurs. This we have traced with
fidelity from the heifer calf at twenty days up to the time that she aborts during her first pregnancy. No other readily acceptable explanation is forthcoming for this persistent infection. Some contend that the infection does not endure for so long, but in our experiment animal Number 34 the severe infection has existed for four years and has only reached its climax. How much longer it may continue if the animal survives, is merely a guess.

Our experiments in the growing of calves have shed further light upon the method by which the invasion occurs. We have shown that we can change profoundly the character of a calf by the feeding. If we feed one new-born calf, sound at birth, from the very beginning upon boiled milk and another calf, also sound at birth, upon raw milk, the two calves present very marked differences in connection with their growth and development. The calf grown upon boiled milk retains clean sexual hairs while that grown upon raw milk has its sexual hairs stained and matted together very early in its existence. The blood of calves which have clean sexual hairs does not, so far as we have been able to determine, react to the tests for contagious abortion, whereas the blood of those calves whose sexual hairs are soiled and matted reacts largely to the agglutination and complement-fixation tests. These differences have not been carefully investigated and require much study. They have been very largely ignored by most investigators, but a superficial study of these differences should convince the most skeptical of the presence of an actual difference and should incite some study and attention thereto. What that difference is and what it signifies to the breeder and to the sanitarian who believes in clean milk, we do not yet know.

The experiments with calves and other studies refutes the statement in the 1912 address regarding the possibility of the infection entering the system through the digestive tract, and thence reaching the genital tract. Here the evidence is strong and conclusive. There is an infection, whether it be contagious abortion or not, which can not be accounted for in any way except that it is ingested in raw milk, absorbed, and carried to the genital tract, where it causes disease which accounts for the soiling of the sexual hairs. We can not at present disassociate the infection which causes the staining and matting of the sexual hairs from the infection of contagious abortion. We do not know that they are identical nor that they are different. These facts, however, do not entirely overthrow the opinion expressed in the address of 1912. We have no good evidence of the contamination of ordinary foods which a pregnant animal eats, nor do we have
any good evidence that it can cause abortion during the pregnancy existing at that time.

The non-pregnant heifer offers opportunities for the invasion of the genital tract by the Bang abortion bacillus from the blood stream which is not offered by a pregnant animal. Under normal conditions, the functional part of the mucosa of the uterus in the pregnant animal is the placenta, which is in contact with the chorionic placenta of the fetus. In the non-pregnant animal, the placental area is open, and from it, during estrum, the menstrual blood flows into the uterine cavity. With that menstrual blood, infection may readily enter, and the blood clot forms a medium in which the infection may multiply, but as soon as the animal becomes pregnant this avenue of escape from the blood stream of the mother into the uterine cavity is closed. At the same time, the bacillus can not readily reach the fetal blood because the placental filter, through which it must pass, is too delicate to permit the invasion. All data upon this question tend to indicate that the abortion bacillus does not pass the undamaged placental filter. Instead of that, it passes through the chorion into the allantoic or amniotic fluid. We have shown recently that pathogenic organisms become stored up in the meconium, in the large intestine, which serves as a great cesspool. All the evidence indicates that the passage of the Bang organism into the body of the fetus takes place from the utero-chorionic space through the chorion into the amniotic fluid, and is then swallowed.

7. There is no cure for abortion and no means at present by which it can be completely eradicated from a herd. Four years ago I cited an experiment with the eighteen heifers mentioned above, upon which bacterins had been used. My experiment indicated with great emphasis that bacterins had no value. Bacterins have now been quite universally rejected. They are still sold, but no establishment of high repute is vigorously recommending their use.

Methylene blue was being highly recommended in 1912, and was used very liberally. The cows, the milk, the stables, and to a considerable degree the owners were made blue, but it neither cured nor prevented.

Just at present there is considerable interest in a new plan—the hyperinfection with the abortion bacillus of already infected animals prior to impregnation. The British Royal Commission has suggested this. Under their general guidance, Mr. Bland, the agricultural organizer for Oxford county, has presented some interesting data which tend to arouse the hope that the plan may prove efficient as a preventive. A careful study of the data, however, does not afford a secure basis for hope. They do not give full records of the animals. It is frankly stated that
the cattle are changed a great deal. The experimenters do not record sterility as abortion. They do not state how many premature births occur, nor what interpretation they place upon them. There is no evidence submitted regarding the condition of the calves that were born and no hint of the amount of retained afterbirth or of metritis from which the cows suffered as a consequence of the infection of contagious abortion in the uterus.

One of the most significant items in their data is that regarding a group of 140 cows which had previously aborted. After these were inoculated experimentally with large volumes of highly virulent cultures, they proceeded to abort a second time in higher ratio than cows which had not aborted previously. It must be admitted that the previous abortion was caused by an intense degree of infection. To this was added the large volume of virulent cultures which the experimenters used. Yet, the animals aborted more freely than the cows which had not aborted previously. If the theory of hyperinfection as a preventive is correct, the cows which had aborted previously should, with the addition of yet more infection, be most free from future abortions, but the reverse proved true. This is in harmony with all published observations. Wherever a cow has aborted once, she is more liable to abort again than is another cow of the same age and under the same conditions which has not suffered from abortion, sterility, or metritis.

Readjusted in harmony with the researches for the past four years, my views regarding the source of the infection and its avenue of invasion may be outlined as follows:

1. The largest known volume of the infection accumulates in the gravid uterus and is very largely expelled prior to, during, and soon after the termination of pregnancy.

2. Less in volume than in the uterus, but more frequently recognizable by present methods, is the infection in the milk.

3. The infection may and does pass through the chorion from the utero-chorionic space, penetrates the amniotic cavity, and is swallowed by the fetus. It may cause fetal diarrhea or may be lodged in the meconium ready to cause white scours or later pneumonia, in the newborn calf. Most calves are free from the infection.

4. Infection-free newborn calves generally or always ingest the infection with their milk, either from the interior of the udder or from the exterior of the teat, which has been soiled by the discharges from the genital tract. The latter source is by far the more dangerous. If the dam or nurse cow is not severely infected, the calf thrives well and presents no evidences of disease: its blood does not react, or reacts very low. If the cow is ill from metritis or retained afterbirth, the intense infection
of the calf after birth, as well as before, is more probable, and the severity of the infection tends to be greatly increased. The infection is intensified, especially in dairies, by the use as calf food of unmarketable milk from badly diseased cows. The intensity of the infection is greatly heightened and assured through the feeding of mixed, or composite milk, by which the calf is exposed to the most virulent infection in the herd, and still more injuriously when it is fed upon raw skimmed milk and whey from creameries and cheese factories, by which means each calf is exposed to the most virulent strains of the abortion bacillus in the community. It is this exposure which is chiefly responsible for the constant increase in virulence of the disease in dairies, in contrast with the lesser frequency in beef cattle, where the calf is usually exposed to the milk infection of its dam only.

5. The cohabitation of evidently diseased with apparently sound cows; intermediary bearers, such as attendants and visitors; and the contamination of the food of adult cattle play a minor role in the dissemination of the disease.

6. The bull plays an important role. Definite experimental proof of this is wanting and the clinical evidence is contradictory. The bull must at least be a more probable carrier than an attendant. Logically, we can not expect an infection of the genitalia to be unisexual. The bull would naturally tend to be less seriously involved than the cow, and his blood generally reacts more feebly than that of the cow.

7. An abortion storm may be aroused in a herd intrinsically through unfavorable conditions within the herd or extrinsically through the introduction of new cattle of either sex from herds having a more virulent type of infection.

These views regarding the source and course of the abortion infection inevitably clash with the old, and still generally held idea of the efficiency of the isolation of aborters in the control of the disease. Fleming, in his Veterinary Obstetrics, forty years ago, made isolation of aborters his cornerstone in control. But Fleming was a copyist, and the plan dated further back—how far I do not know. This plan is still championed by many writers upon the subject. They claim that, by isolating, not all aborters, but merely those observed, they can and will eliminate the disease. In my clinical experience handling sterile cows, the frequency with which I find a dead embryonic sac lying in the vagina or in the cervical canal and other evidences of a most convincing kind teaches me that probably less than 50 per cent of the actual abortions are seen. Just how anyone can bring himself to believe that isolating 50 per cent of the aborters from a herd will eliminate the disease, I can not understand.

Again, I find a necrotic mass of fetal membranes protruding
into the vagina through the cervical canal, and all about it a voluminous discharge taking place. The anterior portions of the fetal sac and the fetus are alive. The discharge from the cervix has evidently existed for weeks. There are no exterior signs of abortion, and no rule for isolation. The animal is not known to be an aborter. Finally she aborts a tiny fetus in its membranes and the uterus is at once well nigh clean. Now comes isolation—if the abortion is discovered, which occurs in less than one per cent of such cases. The cow is cleaner and safer than she had been for weeks. I do not understand how isolating an aborter after most of the infection has been discharged can control the disease.

Sometimes I find a cow carrying a fetal cadaver for one or two years, fetal debris and uterine discharges, all the while escaping without attracting attention. She has not aborted; she is in no danger of aborting. She would be more fortunate if she could abort. The isolation scheme does not demand her segregation.

I see cows which carry their calves to full term and expel them alive. For some time prior to calving, they expel pints, quarts, literally gallons of the typical exudate of contagious abortion, but they do not abort. Still, they expel more abortion exudate than twenty cows which abort in early pregnancy. These cows have not aborted and are not subject to quarantine.

Sometimes I see a cow calving prematurely or at full term. Because of the metritis of contagious abortion, she has retained placenta and between the membranes and uterus a great mass of the typical exudate of contagious abortion. Her failure to abort leaves her in the herd, discharging far more virus than most aborters. Her live calf is infected at birth and soon has the dysentery or pneumonia of contagious abortion. Quite naturally, the calf has not aborted or been aborted, and under the rules is not subject to quarantine, but it spreads disease and disaster in the calf stable. From such cases down to the point where acceptable evidence of infection vanishes, is every gradation. The sanitarian who would control contagious abortion by isolation places himself at once between the Scylla of attempting control by removing a pitiable minority of dangerous animals and the Charybdis of practically or completely emptying the stable. Isolation as a means for controlling a contagious disease can succeed only when all or nearly all diseased animals are included in the quarantine. The futile process of isolating aborters to control abortion can succeed only when all or nearly all diseased animals are included in the quarantine. The futile process of isolating aborters to control abortion has been the cornerstone in the handling of this scourge for at least fifty years, and the
results are so evident today that one may well wonder why the plan is still advocated by anybody.

Instead of isolation of aborters, I have advocated for some years a plan of control based upon the conception of the disease as outlined above.

1. Guard and protect the new-born calf. Bathe and disinfect the cow before calving, and place her in a clean stall. Remove the calf immediately after birth. Cleanse and disinfect the udder and neighboring parts before permitting the calf to suck or drawing milk for it. Keep the calf upon the raw whole milk of the dam or of a selected cow for eight to ten days, and thereafter feed upon sterilized milk, which may be skimmed, mixed, etc. This limits the milk exposure to that from one cow and to the first eight or ten days of the life of the calf.

Keep the calf isolated as long as practicable. If it develops scours or pneumonia, proceed vigorously to cure it at once, if curable or worth curing; if incurable or not worth curing, kill it and dispose of the cadaver as a menace to the herd.

When the calf reaches breeding age, mate heifers with healthy bulls grown in the same manner. Before breeding, cleanse the genitalia of both sexes as carefully as practicable.

2. When metritis exists and causes sterility, abortion, premature birth, or retained afterbirth, cure the metritis, cure it promptly and well, or send the cow to the butcher. Examine the genitalia of all suspicious cows often enough to keep track of the pathological conditions present. If the disease of the genitalia (ovaries, oviducts, or uterus) are incurable, slaughter the cow; if curable, cure her. Do not permit the herd bull to serve a cow which can not at that time conceive. Copulation intensifies the infection in the cow and imperils the health of the bull.

3. Protect the bull by douching the external genitalia regularly before and after service.

4. Do not introduce into a herd, except when absolutely necessary, new animals of either sex which may bring into the herd a more virulent strain of infection than that already present. In other words, keep no dangerously infected cattle of either sex or of any age in the herd. If they become diseased, cure them promptly or kill them as a menace to the herd.

In the address of 1912, we referred to a dairy designated Herd B. Some interesting things have since occurred in that herd. In 1912 the management, thoroughly disgusted with the losses from white scours and pneumonia in calves and the abortion and allied complications in heifers pregnant for the first time, sold all unbred heifers and heifer calves, and began anew the effort to grow heifer calves with which to replenish the herd.
Previously, they had handled their calving cows in the usual manner. They had taken them out of the milking barn, placed them in box stalls where they were fed and watered. When they had calved, the calf was left with the cow for a few days and allowed to suck at will. Then it was removed to a large calf barn, where it was placed with many other calves and fed upon mixed pasteurized milk.

Then they changed their plan. Before the cows calved, each was given a thorough bath with soap, water, and a disinfectant. She was then placed in a carefully cleaned and freshly bedded box stall and care taken to keep her moderately clean about the buttocks, tail and udder. The calf remained with its dam and nursed for ten days, and was then placed in the calf stable and fed somewhat more carefully than before. The milk was more carefully pasteurized. More recently the milk has been boiled and the calves separated into groups of four. The mortality in the new-born calves was lowered from 31 to 22.4 per cent—an improvement of 8.6 per cent in the total number of heifer calves born, and a diminution of the mortality from calf scours and pneumonia of 28 per cent. A parallel diminution in miscellaneous deaths followed promptly. Tuberculosis in heifers decreased markedly, but other causes were affecting this problem and involving a general decrease in tuberculosis in the herd.

When the heifer calves grown under the amended plan reached breeding age, a very marked change was apparent. They conceived more uniformly and far more promptly. The plan in each group was to breed at fifteen months and have them calve at twenty-four months. Temporary sterility in the first group delayed the average termination of pregnancy three months, or until the heifer was twenty-eight months old; in the second group the average age at calving has been twenty-five months, while permanent sterility has almost vanished.

When the pregnancies began to terminate, the contrast between the two groups deepened. In the first group the calving rate was 55.9 per cent against 90.2 per cent in the second group; the abor-
tion rate in the first group was 44.1 per cent to 9.8 per cent in the second group. Lack of time forbids details, but throughout the seven years covered by the data there has been a surprising harmony between the mortality from calf scours and pneumonia during the first ten to fifteen days of life and the rate of abortion when the surviving heifer calves became pregnant. The harmony has not been limited to the one phenomenon. The scours and pneumonia inevitably laid the foundation for some of the mortality classed as miscellaneous. Only a general comparison upon retained fetal membranes can be made, to the effect that the phenomenon was common in the first group, while in the second it was very rare. Accordingly, once the scours mortality is reduced, although only partly due to the abortion bacillus, the entire symptom-complex of the disease—sterility, abortion, metritis, and retained fetal membranes—is favorably affected.

A close study of the subject up to the present time reveals no other explanation but the feeding of the new-born calf for this remarkable change in the abortion rate in Herd B. It is not one of those unexplainable depressions in the abortion rate in the herd. If it were, the drop in the abortion rate would include the adults, which it does not. During the period of the first group, the abortion rate was 44.1 per cent in first pregnancies and in the second group 9.8 per cent, while the per cent in adults remained essentially static. The ratio between abortion in heifers and in adults has been reversed. The two groups of heifers have been kept in the same stables, paddocks, and pastures; cared for in the same manner by the same group of attendants (of constantly shifting personnel); fed upon the same character of food from the same sources; watered the same; and when four to seven months pregnant are placed in the same stables with the original herd, where abortion has always prevailed. As they were not milked the danger from infection through the udder need be regarded as of minor importance, with no differences of exposure between the two groups. The bulls used for the two groups were in general the same, except that some of them were grown with the heifers in the same manner, which merely reverts to the calf feeding as in the heifer calves.

Search as one may, the only explanation appearing is the change in the care of the new-born calf, and what is more interesting and withal highly suggestive in the problem of the production of sound calves and clean milk is that the principal effect of the change is not upon the milk within the udder, but upon the contamination from the exterior of the udder. The data suggest that the genital discharges flowing down over the udder and teats and sucked in with the milk by the calf constitute a very serious menace to the life and health of the calf, tending
to cause scours and pneumonia early in life, and if the animal survives this ordeal, the infection persists, to awaken the whole symptom-complex of contagious abortion when the heifer reaches breeding age. Yet it is neither unreasonable nor strange. In cases of retained fetal membranes a bacteriologic search of the placental structures and of the meconium of the new-born calf, according to the researches of my colleagues, Fitch and Hagan, tend to give identical findings. Sometimes the fetus suffers from the scours. If the intra-uterine infection can pass through the chorion into the amniotic fluid, be swallowed by the fetus and causes fetal diarrhea or be held in store until after birth to cause calf scours, surely that same virulent infection flowing down the escutcheon, thighs, and tail onto the udder and teats, where the calf must inevitably swallow it with its first mouthful of milk, must be a serious peril.

Theories upon the source, avenue and era of infection of contagious abortion are many, conflicting, and confusing. What the breeder and dairyman desires most is not theory, but definite constructive work in the dairy itself. The amount of oxygen most suitable for the growth of the abortion bacillus may be very interesting to some, but the dairyman would like to know how much oxygen is required to kill the bacillus and how he can get the oxygen and bacillus together. It may be interesting to a breeder in Ohio to theorize upon the possibility of a visitor from New York carrying the infection on his boots from the Empire State and starting an abortion storm in the Buckeye herd, but it is of more vital importance to the Ohio breeder to have some practical measure at hand with which he can successfully combat the infection already existing in his herd and threatening financial ruin. He has already tried stable and gutter disinfection, carbolic acid, methylene blue, abortion bacterins, and a lot of quack remedies about as valuable, and now he desires something tangible. The data upon the fifteen hundred heifer calves in Herd B, following them through their first pregnancy, constitutes the cleanest cut, most comprehensive, and most encouraging chapter ever recorded in the battle against contagious abortion in cattle. These data cannot well be ascribed to chance or overthrown by elaborate theories. The only thing which can or will affect them in the least is a clear, logical explanation other than the feeding of the young calves for the difference in the two groups of heifers.

PRESIDENT DYSON: The next on the program is Dr. Charles G. Lamb, of Colorado, "Abortion and the Range Cattle Industry".

DR. LAMB: The subject I have been asked to present to you today is one that does not admit of any very lengthy or extended paper for the simple reason that it has not received any very special or extended attention, and the most we know of it is based upon experience and observation rather than upon any scientific knowledge.
It is a subject which deserves much more attention than it has ever received, and it is to be hoped that it will receive more attention in the future than it has in the past.

**ABORTION AND THE RANGE CATTLE INDUSTRY**

*By Charles G. Lamb, State Veterinarian of Colorado*

The question of abortion is of as much vital interest and importance to those engaged in the range cattle business as in any other branch of the industry. These people are in the business for the purpose of raising calves and abortion or anything else which lessens the number of calves raised lessens by just that much the profits of the business.

Whatever I may say must be considered as applying to conditions in Colorado, as that is the locality with which I am most familiar.

The term “range industry” as applied to conditions now and several years ago refers to two quite different conditions. In former years it was the custom of cattle men to turn their cows on the open range with a certain number of bulls, usually one bull to about twenty-five cows, and perhaps not see them again until the spring roundup when the calves were branded. There would be a certain percentage of the cows, sometimes greater, sometimes smaller, which would have no calves, but there was no means of knowing whether she was ever served, whether she failed to conceive, whether she aborted or whether the calf died from some cause after birth. Neither was there any way of telling, save in exceptional cases, whether the cow which did not have a calf one year also failed to have a calf the previous year.

At the present time on account of the lack of the old time open range, stockmen only keep such a number of cattle as they can feed during the winter. They still turn the bulls and cows out in the spring, but they are brought up in the late fall for the winter feeding. This feeding is done in fields varying in extent from a few acres to a few hundred acres, the hay being hauled out and spread on the snow. This method offers a most excellent method of disseminating the disease if it should be present, as, when abortion occurs, the aborting animal usually appears in the bunch with portions of the retained placenta protruding and proceeds to wander over the feed grounds, thus giving opportunity for a thorough and impartial distribution of the abortion bacillus if it be present.

Numerous reports of abortion among cows, mares and ewes reached my office during the past season, but in only two instances were samples of blood taken for examination. One sample proved positive, while the other proved negative, but in
the herd with the negative blood the proportion of abortions was
much larger than in the herd with the positive reaction.

Basing my conclusions upon the fact that my experience has
shown that in herds in which abortion occurs, the proportion of
pregnant animals which abort is usually small and also upon the
fact that though abortions may occur one year, there may be none
the succeeding year, and upon the further fact that whatever
aborted occur apparently do not produce sterility, I am forced
to the conclusion that in *almost* every instance abortion among
range cows is due to accidental and dietetic causes and not from
contagion.

One of the chief requisites for success in the range cattle busi-
ness is that animals be worked or disturbed as little as possible,
and it would be impossible to induce range men to follow the
present directions for the treatment of contagious abortion even
if it were present.

The continued disinfection of the bull would be a physical
impossibility; he might be disinfected before turning out, but
that would be the limit, and while to give the cow five or more
injections at seven or ten-day intervals as at present required
might not be physically impossible, it would be physically impos-
sible to get the stockmen to do it, and until such time as a treat-
ment which can be administered in salt or a treatment requiring
only one or at most two injections is perfected, I am convinced
that the treatment of abortion in range cattle will not be generally
undertaken.

**PRESIDENT DYSON:** "Possibilities and Limitations in Control of Abor-
tion" by Dr. C. J. Marshall, of Pennsylvania (applause).

**POSSIBILITIES AND LIMITATIONS IN CONTROL OF
ABORTION**

_by C. J. Marshall, State Veterinarian of Pennsylvania_

For a number of years the state live stock sanitary board of
Pennsylvania has received complaints from herd owners in ref-
erence to abortion, sterility, etc. The board has been able to
furnish but little assistance, yet it has given much attention to
these diseases and all the advice and help possible. Considerable
work has been done in the laboratory on the serological and
bacteriological tests, and from a diagnostic point of view there
has been some benefit derived from them. It has been observed
for a number of years that abortion and tuberculosis thrived
best and were the most difficult to eliminate in large herds where
unprofitable animals were constantly being replaced by new pur-
chases. It is quite unusual to find such herds free from tubercu-
losis, abortion, granular vaginitis and sterility.

About a year ago, our board requested Dr. W. L. Williams to
give a demonstration of his method of diagnosis and plan of treating abortion and sterility in one of our large herds where both conditions were prevalent. This demonstration was given before several agents of the board and has been the means of stimulating a great deal more interest in these diseases. We feel that Doctor Williams is doing a noble work and that his careful methods of diagnosis and his plan of treatment are extremely useful to veterinarians and breeders. Two of our agents who had been practicing for a number of years in dairy districts were put on the subject of studying abortion and sterility. They did work in abattoirs and in herds where the diseases were known to exist. Seventeen large breeding herds were turned over to the board for treatment and study. These herds were carefully examined, and whenever possible demonstrations were given before the local veterinarian. About twenty-five of the best veterinarians in the state have shown an interest in the work and are carrying it on to the best of their ability in their private practice, and reporting their results to the board. Unfortunately one of our agents gave up his position for something better, but Dr. W. H. Ridge is going on with the demonstration work. Considerable valuable information has already been gained by the work done and the board feels fully repaid for the expense and effort that have been made.

In the small herds in the rural sections of the state where animals are seldom purchased very few cases of abortion or sterility are reported. Complaints have been confined principally to large pure-bred herds. In one such herd abortion was frequent up to five years ago. There has been no abortion or sterility in this herd for the past two years. It is believed that the good results obtained were due to isolation, cleanliness and disinfection and that equally as good results may be obtained in any well equipped herd with the assistance of the average veterinarian. From the laboratory tests we know that there are still animals in this herd afflicted with this disease. Nearly all have granular vaginitis, yet there has been practically no trouble from sterility. The calves have been raised on unpasteurized milk, kept isolated from the old members of the herd until they were safely in calf, and were brought into the herd after they had dropped their first calf and became safely settled with the second. No vaginal or uterine injections were given to those that calved normally. The stables were carefully disinfected once a week and the posterior portions of the animals were carefully washed with a disinfectant every day from the time of normal calving till they were considered safely in calf again. Practically the same treatment was adopted in another large
breeding herd, yet a few abortions have occurred with the second crop of calves.

From observations made in these two herds it would appear that contagion is not carried over from the time of drinking milk. An interesting practical experiment was tried on one of these farms with twenty heifers, all of which had been raised until weaning period on the milk from animals some of which were known to be infected. When ready to breed, they were divided into two lots of ten each. Lot No. 1 was placed in a disinfected stable in which no abortions had ever occurred. This stable was located about a mile from the regular dairy barn and was attended by a man who did no work around the regular herd. Lot No. 2 was placed in the dairy barn in contact with the regular herd and handled as a part of it. Each group was bred to a separate bull. The bull used on the first group had not been or was not used on any other members of the herd. The common herd bull was used on the second group. Lot No. 1 dropped 100 per cent healthy living calves, while in lot No. 2 there was 90 per cent abortions. It is reasonable to suppose in this case that the infection was not due to feeding raw infected milk. The bull was given an antiseptic wash before and after service on each group.

There seems to be some reasons for believing that uninfected pregnant animals are reasonably safe. We believe that it is possible to control abortion in good herds that are kept in modern, sanitary stables where most of the animals are raised on the farm; especially where the owner is intelligent and interested and is given the proper veterinary assistance. The task of controlling abortion in such herds is entirely too much for the average dairy farm or the veterinarian who has never given the subject more than ordinary attention. We believe that no good will be accomplished by the use of vaginal douches as applied by the herd owner or the average veterinarian, because it does not reach the seat of trouble. In many cases such injections do more harm than good. Good results will be obtained in giving the uterus proper treatment. In former years it was the custom to advise owners not to breed aborting cattle for three or four months after abortion and that vaginal douches with mild antiseptics should be given as long as there was a discharge. It is believed now that this advice was wrong and that much more good will be accomplished by two or three applications of the proper remedy directly into the uterus soon after abortion and then breed immediately. The treatment must be given by one who has been properly trained and had the necessary amount of experience. Many cases of sterility will occur in animals that are not bred for three or four months, no difference how they are treated,
while if bred early they may conceive and carry their calves to full maturity.

So far as controlling abortion is concerned, there is no medicine or remedy known that will prevent it. No good will be accomplished in the treatment of sterility by the inexperienced or with the common operations that have been too often used, such as opening the os by forcing a sharp stick or the finger into it, or by an inexperienced person in attempting to rupture ovarian cysts. In nearly all cases of pyometra and endometritis that have been investigated by agents of the board, it was found that these diseases were brought about by improper treatment. Very good results may be obtained in most cases of sterility that are due to such conditions as pyometra, endometritis, etc., if properly treated. There has been too much of a tendency in the past to sell animals that would not breed, and those that aborted, or those that were considered incurable or dangerous to the other members of the herd. Very little will be accomplished in trying to eliminate abortion by selling those that abort. They may not recover from the disease or cease to be spreaders, but there is no doubt in our minds but that a very large part of them will not abort after the first time. Many of the sterile animals may be rendered useful as breeders if properly treated. The proper form of treatment cannot be outlined to cover all cases, but should be left to the good judgment of the man who makes the examination.

We make the following conclusions:

1. From practical observations we are satisfied that it is useful in herds where the disease has occurred and where susceptible animals are kept to disinfect the stable frequently, once a week at least, with some antiseptic that has been approved by the Bureau of Animal Industry or by some other authentic source.

2. The posterior quarters of all susceptible animals that are not pregnant should be carefully washed once each day with a suitable antiseptic.

Careful observations should be made of each susceptible animal during the period of pregnancy. If any symptoms of abortion appear in an animal, or it accidentally aborts before the symptoms are observed, it should be removed immediately to an isolation ward and kept there as long as there is any discharge. This is the proper time to treat the uterus, and the treatment should be applied by a person who is familiar with the operation. Three treatments, a week apart, with the proper remedy and properly applied is usually sufficient. The animal should then be bred as soon as possible.

4. It is an accepted fact that the disease is spread principally
through the digestive tract—the infected material originates in the genito-urinary tract of infected cattle.

5. The gutters are especially dangerous. They should be carefully cleaned and disinfected each day. Extreme care should be given to prevent the use of brooms, forks, shovels, and shoes of men from carrying infection from the line behind the cows to the feed or feeding floor. Especial attention should also be given to the prompt removal of the aborted fetus, the fetal placenta, and manure which has become infected. This should be rendered aseptic as soon as possible, or spread on the fields and plowed under.

The bull should be properly disinfected before and after each service.

The possibilities of controlling abortion in herds is not an unreasonable proposition. It can be done by the proper application of the information already at hand. The limitations depend entirely upon how well these facts are known and how thoroughly they are applied.

PRESIDENT DYSON: "Practically Significant Facts About Abortion Disease" by Dr. E. C. Schroeder, of Washington.

**PRACTICALLY SIGNIFICANT FACTS ABOUT ABORTION DISEASE**

*By E. C. Schroeder and W. E. Cotton*

Before presenting and discussing the several facts we believe our work has revealed or confirmed, we wish to say that we are not imbued with the idea that we have solved, or have nearly solved or are rapidly approaching a solution of the multiple, intricate problems that shadow our knowledge of the unique evil known as infectious abortion disease of cattle. We incline to the view that this evil, evidently caused by an obligatory micro-parasite, can be subjected to control quite easily once the factors are clearly defined on which its transmission from victim to victim depends, and this is a reasonably hopeful view to take. But, when we think of the insidious, chronic character of the disease and realize that many of its victims become more or less enduring, in some instances perpetual, disseminators of its etiological parasite, we cannot fail to comprehend that the real victory may lie far in the future and beyond a mountain of hard work.

The first fact with which our paper proposes to deal may be formulated as follows: Cows attacked by abortion disease often remain carriers and disseminators of abortion bacilli long after they have ceased to abort, and cows which have been exposed to infection but have never aborted may be carriers and disseminators of abortion bacilli.
The evidence on which this fact rests is so conclusive that it is doubtful whether anything can overthrow it without first proving that we are wholly in error regarding the specific cause of infectious abortion disease of cattle. Since the statement was published, in the spring of 1912, by the chief of the federal bureau of animal industry, that a bacterium, previously described by members of the bureau's staff of investigators as of common occurrence in market milk, which was expelled from the udders of cows and caused lesions in guinea pigs microscopically somewhat resembling tuberculosis, had been identified as the bacillus of infectious abortion disease of cattle, abundant evidence has accumulated to prove that cows affected with abortion disease often harbor this bacillus in their udders.

The proportion of infected udders among cows exposed to abortion disease has not been definitely determined. Our investigations imply that the udders of practically all cows which actually abort are at least temporarily infected. In one herd, numbering more than 150 cows, among which abortions had occurred with varying frequency for several years, a single test of the milk of each revealed that 14 per cent were expelling abortion bacilli from their udders. Had the milk of each cow been tested repeatedly the percentage, without doubt, would have been higher, as our work shows that milk from infected udders contains abortion bacilli in sufficient number for their detection intermittently rather than continuously. The proportion, however, judged from the tests in this herd, is large enough to indicate that cows with udders from which abortion bacilli are being eliminated, classified as to their rank among apparently healthy, long persistent carriers and disseminators of disease germs, have a good chance to win an unenviable distinction as real champions.

The period of time during which the udder remains infected varies greatly. After hundreds of tests with milk from many cows we concluded, though the infected condition of the udder may terminate quickly, it tends, as a rule, to persist indefinitely. In one of our cases it persisted from its discovery until the cow died seven years later, and we have a number of cases in which it persisted from one to four years.

**Abortion May Be Carried to Uninfected Herds by the Use of Infected Milk**

The significance of this fact is that once a cow has been exposed to abortion disease it is wise to look upon her as a probable, persistent carrier and disseminator of abortion bacilli, and as an unsafe animal to introduce into an uninfected herd. And, further, that milk from unproved sources, used in its raw state as food for farm animals, is a possible agent through which
abortion disease may be introduced into previously uncontaminated herds.

The second fact, or group of facts, with which we will deal, concerns the occurrence and persistence of abortion bacilli in the uterus. When a cow has aborted, the fetus, the afterbirth, the uterus and discharges from the vagina are infected with abortion bacilli, and it is important to know that the bacilli remain alive and virulent in dead animal tissues under conditions favorable for their preservation long enough to make negligence or carelessness regarding the proper disposal of the named products of abortions eminently dangerous.

**Abortion Bacilli Do Not Maintain Themselves in the Unimpregnated Uterus**

In the uterus, contrary to what the general character of the disease may lead us to suppose, and contrary to what is true of the udder, abortion bacilli do not seem able to maintain themselves; or, more precisely, do not seem able to maintain themselves at other times than during pregnancy.

We have the records of two cows, one of which harbored abortion bacilli in her uterus forty-six, and the other fifty-one days after aborting, but our tests, taken as a whole, lead us to believe that these are rare cases, and that the period during which the uterus remains infected commonly does not exceed two to three weeks. Probably it varies greatly, in a measure parallel with the damage incident to and accompanying the abortion.

In non-pregnant uteri, excepting shortly after abortions or parturitions, our numerous tests utterly failed to detect abortion bacilli. At one time we entertained the hypothesis that the increased activity of the reproductive organs during the estrual period would offer abortion bacilli, absorbed from an infected udder and distributed inwardly through lymph and blood channels, a chance to multiply and establish themselves in the uterus and related organs; but this did not prove true, and not a shred of evidence to support it was obtained. We found, moreover, that suspensions of abortion bacilli injected into the non-pregnant uteri of several cows could not be proved to have remained alive more than a week. The cows were later served by bulls, conceived and produced calves.

But, though abortion bacilli do not seem able to inhabit the non-pregnant uterus, there is a true correlation between their occurrence in the udder and the uterus, and the nature of this is defined in the following statement:

**A Correlation Between the Occurrence of Abortion Bacilli in the Uterus and the Udder**

When a cow with an infected udder produces a seemingly
normal calf in a seemingly normal manner, her uterus and the afterbirth are likely to be infected with abortion bacilli, and this is true irrespective of whether it is the first, second, third or fourth calf after an abortion or a calf produced without a previous abortion.

The tests on which this statement is based concern nearly an equal number of two kinds of cows; one kind harbored abortion bacilli and the other did not harbor abortion bacilli in their udders. Parturition among cows of the former kind, cows with infected udders, in about half of the cases tested, was associated with the occurrence of abortion bacilli in the uterus and the afterbirth. In no case were abortion bacilli discovered in the uterus or afterbirth at seemingly normal parturitions unless the udder was proved through tests with milk to be infected with abortion bacilli.

We recently examined our records with reference to cows of which we could say with certainty that they did not harbor abortion bacilli in their udders prior to abortions; we found only one doubtful case. But the total number of abortions on which our records are complete is too small to give us reliable data for an important conclusion. We hope that the simple mention of this matter may stimulate others to make observations along the same line, as it may help to throw more light on the practical significance of the occurrence and persistence of abortion bacilli in the udder.

Most investigators know that the available literature counterenances the belief that it is difficult to induce abortions through carefully guarded, experimental exposures of previously, certainly uninfected cows, unless the exposures are intimate contact with infected cattle, the intravenous injection of abortion bacilli, or the subcutaneous injection of inordinately large numbers of abortion bacilli. In speaking of the literature here we do not include those earlier publications, though they are still quoted in modern text books on animal diseases, which would lead us to believe that abortion disease can be induced experimentally, without much trouble, in many different species of animals, through almost any kind of artificial exposure, as it is questionable whether experimentally induced, infectious abortions, reported before we had the means to prove that the experiment animals used were truly free from infection at the time of their intentional exposure, can now be credited as having much value.

As we have already stated, injections of abortion bacilli into the non-pregnant uterus, as far as we have tested this form of exposure, is followed by their rapid disappearance, and such injections do not cause cows to react positively with abortion tests. We admit that our work regarding this matter, because of the
small number of animals used, cannot be accepted as finally con-
clusive, but its reliability is enhanced by its agreement with the
fact that abortion bacilli disappear from the uterus very rapidly
after abortions, and, as far as we know, even more rapidly when
the uteri of cows with infected udders harbor abortion bacilli
after seemingly normal parturition.

**Udders Infected by Intravenous Injection**

When we inject non-pregnant cows subcutaneously with moder-
ate quantities of suspensions of abortion bacilli, the only result
we have observed is that they later react positively with abortion
tests. The power to react endures varying periods of time, and
seems to be passive as distinct from active. Whether the sub-
cutaneous injection of pregnant cows with moderate quantities
of abortion bacilli causes them to abort, we believe to have re-
mained an open question, on which our work has thrown no sat-
isfactory light.

When we inject suspensions of abortion bacilli into the veins
of non-pregnant cows they disappear from the circulating blood
in the course of about two hours, and when such cows are killed
sometime afterwards careful post mortem search fails to reveal
the bacilli in their bodies until we test their udders, and there
they may have established themselves. One of our records
concerning this phenomenon is particularly interesting; it is that
of an adult, virgin animal, a heifer, approximately four years
old; its udder was not functioning and never had functioned, but
became infected through the intrajugular injection of abortion
bacilli.

It may be well to say that cows invariably react positively with
abortion tests when their udders are infected, and that, in the
numerous tests we have made with milk from many different
cows, abortion bacilli were never found in the milk unless both
it and blood serum of the cow agglutinated suspensions of abor-
tion bacilli. This does not mean that all cows, the milk and
blood serum of which agglutinate suspensions of abortion bacilli,
have infected udders, because that is not true. But, if further
tests give results like those already obtained we will have evi-
dence to support the following, now tentative or provisional, con-
clusions; that abortion reactions with either or both the milk
and blood serum of cows with uninfected udders are passive in
character, while reactions with milk and blood serum of cows
with infected udders are active, and endure as long, and some-
what longer than the infected condition of the udders.

When we inject abortion bacilli into the udder through the
teat, though we use a method which obviates mechanical injury,
we establish the bacilli in the udder, and the cow becomes truly
infected according to all available tests.
One record regarding the injection of a suspension of abortion bacilli into the udder of a cow through the teat, in a manner which almost certainly obviated or precluded mechanical injury, is equally interesting and instructive. The cow was well advanced in pregnancy at the time the injection was made, and both she and the bull by whom she had been served, according to their history and repeated abortion tests, were entirely free from abortion disease. On the 53rd day after the injection and the 279th day after service by the bull, the cow gave birth to a weak, undersized calf, which, however, rapidly gained strength and has since become a seemingly normal, vigorous animal. The parturition was associated with a retained afterbirth, which, on removal, showed much abnormal material of a yellowish color, and this was proved to be infected with abortion bacilli. Furthermore, the cow's uterus remained infected with abortion bacilli a little longer than two weeks following the birth of the calf.

This case, taken in conjunction with other evidence our work supplies to prove that the presence of abortion bacilli in the udder is correlated with their occurrence in the uterus and afterbirth, even at seemingly normal parturitions, has the character of a true, experimental demonstration of the transition of abortion bacilli from the udder to the pregnant uterus.

Before drawing the practically important conclusion the facts so far presented suggest and support, we must take a look at another group of facts which point in the same direction.

If the results obtained with numerous tests are reliable, abortion bacilli do not have the power to maintain themselves in the bodies of cattle elsewhere than their udders and pregnant uteri. We have killed a number of cows which reacted positively with all abortion tests and the udders of which harbored abortion bacilli. The blood, spleens, livers, kidneys, ovaries, fallopian tubes, uteri, vaginae, udders, milk, synovial fluid from various joints, nerve tissue, lymph glands from all portions of the body, etc., were tested for abortion bacilli, with the following results: In all cases two or more quarters of the udder, the milk from the infected quarters and one or more supramammary lymph glands, and in one case some of the pelvic lymph glands, were found to be infected with abortion bacilli, and all the other organs and tissues invariably failed to show the presence of abortion bacilli.

Truly, if abortion bacilli live and multiply elsewhere in the bodies of cows than their udders and pregnant uteri, no matter how small their number, our numerous tests should have given us at least an occasional positive result with other material than that derived from udders and associated lymph glands.
Reaction to Abortion Tests Only Passive in Calves

We know that aborted fetuses harbor abortion bacilli in their stomachs, intestines, lymph glands, livers, spleens and blood and in subcutaneous extravasations of serum; our tests have verified their occurrence in all these regions. And we found that seemingly normal calves, produced in a seemingly normal manner, by cows with infected udders, may harbor abortion bacilli in their stomachs and gastrohepatic lymph glands. The calves used to obtain this knowledge were killed shortly after they were born, within a few hours, and were not permitted to come into contact with the bodies of their mothers, or other sources of infection, which possibly might have introduced germs into their bodies not present at the moment of completed parturition. In every case in which the body of a calf of this kind was found to contain abortion bacilli, the afterbirth and the uterus of the mother also proved infected.

It is not uncommon for the blood of newly born calves of infected mothers to react positively with abortion tests, but it is uncommon for the blood of young cattle, more than three or four months old, to react. Our tests indicate that the blood of a newly born calf often reacts as strongly, or nearly as strongly, as that of its mother, but that this power to react declines rapidly and disappears in the course of two to three months, even if the calf is suckled by a cow with an infected udder. In other words, the reaction of the calf is a passive phenomenon. It should be active if abortion bacilli, not rarely present in the body at birth, were endowed with the power to multiply and persist. We cannot say that the potency of the blood of calves to react declines and disappears because the calf's body cannot produce the elements on which reactions depend, because we found that the injection of abortion bacilli into the bodies of calves causes the production of these elements. The reactions in calves, both the natural and the induced, as in the case of adult cattle which have received subcutaneous injections of abortion bacilli, are not enduring or active as we may assume they would be with the continued presence of abortion bacilli in the body.

Now, if we consider the several facts which have been presented collectively, it seems that we have a sound basis for a practically important conclusion relative to one manner in which abortion disease spreads from victim to victim, and this may be stated as follows:

Washing the Milker's Hands May Be More Important Than Douching the Cow's Uterus With Strong Germicides

If the udder of infected cows is a common habitat of abortion bacilli, in which they multiply and persist long periods of time, and the milk from infected udders is infected with abortion bacilli, it is clear that the milker's hands may be important in spreading abortion disease from infected cattle to other cattle. Therefore, it is important to wash the milker's hands after milking infected cows to prevent the spread of abortion disease.
bacilli, and the transition of abortion bacilli from the udder to the gravid uterus has been proved to occur, and the bacilli do not persist elsewhere in the bodies of cattle than their udders and associated lymph glands and gravid uteri, infectious abortion disease may tend to spread through the penetration of abortion bacilli into the udders of cows from the hands of milkers in every herd which includes a single cow with an infected udder.

Think of the manner in which the udders of dairy cows are manipulated by milkers twice daily, and how easily such manipulation may lead to the suction of small quantities of infected milk or other fluid from the hands of the milkers through the teat into the udder, and probably you will be inclined to believe as we do, that it may be more important for milkers to wash their hands with hot water and soap after each cow is milked and before the next cow is approached, than to practice wholesale douching of the uterus with germicidal solutions.

Regarding this conclusion we have one request to make; namely, that it shall not be used as a reason for the unwarranted assumption that we discountenance other dangers of infection than the one it defines. Though we have little doubt that abortion disease is spread through the medium of the infected hands of milkers, we positively do not believe that this is the only manner in which it spreads.

In the same sense we do not wish our comment on uterine douching to be misleading. Douching may be good practice, but we believe its prime object should be a flushing or washing out, and not an attempt, to our minds practically futile, to destroy germs in the uterus with germicidal solutions. If the uterus is given a proper chance to contract and heal after an abortion or the removal of a retained afterbirth, the abortion bacilli it contains need occasion little worry, as they will rapidly disappear, and it is questionable whether reparative processes are not retarded instead of advanced by douching with irritating, germicidal solutions which are strong enough to kill bacteria in a reasonable length of time, or the time during which they remain undiluted, or it is safe to permit them to remain in the uterus. Those who doubt this statement and have the facilities, should make a few bacteriological tests to determine the germicidal potency of the best and strongest germicides with which it is safe to wash extensive mucous surfaces. Our observations, though not numerous, tend to prove that it is easier to harm living tissues with germicides than to kill germs with germicides in living tissues or on wounded, living surfaces. From our point of view good practice seems to require that we should strive first to remove pernicious bacteria from the living environment in which they may occur and to kill them afterwards, rather than to at-
tempt to kill them in the living environment through the use of germicides in a manner which cannot fail to paralyze and destroy delicate tissues and possibly convert such tissues into excellent culture media for germs.

**Normal Parturition May Disseminate the Infection**

Another practical conclusion may be stated as follows: As a large proportion of seemingly normal parturitions among cows with infected udders is associated with infected afterbirth and the expulsion of abortion bacilli from the uterus, through the vagina, for a period of from one to three weeks, it is desirable that no carelessness should be permitted regarding the disposal of afterbirths in herds in which abortion disease has appeared; and, the segregation of cows which are about to calve, or have just calved, is strongly recommended.

**The Bull a Questionable Factor in the Spread of Abortion**

Before ending our paper, we wish to say a few words about bulls and virgin female cattle. As we know, such animals at times react with abortion tests; but, apart from the fact that the reactions must be accepted as evidence to prove that infection with abortion bacilli occurs through other channels than the udder, we know virtually nothing about their significance.

By subcutaneous injections of abortion bacilli we have sensitized male and virgin female cattle for abortion tests; but by feeding abortion facilli we have not succeeded in our attempts to do this, which is quite in harmony with the rapidly fading reaction of calves produced and suckled by cows with infected udders. And by intravenous injections of abortion bacilli into female cattle, either heifers or cows, we may more or less permanently infect their udders. Whether the fact eventually revealed will be that exposure to abortion bacilli at a critical time is required to cause infection, or that exposure must occur under various conditions which enable the bacilli to thrive elsewhere in the bodies of cattle than their udders and pregnant uteri, cannot be foretold.

As we have emphasized that our tests indicate that abortion bacilli do not persist in the bodies of cattle elsewhere than their udders and gravid uteri, it is important that we should record one noteworthy, possibly, though not certainly, unique or very rare, exception to the common rule. This was a bull, whose history, briefly, is as follows: Reacted with abortion tests; was at once killed and a searching post mortem examination made. The only lesion found was an abscess involving the epididymis of one testicle. The abscess was proved by cultural and animal inoculation tests to be infected with abortion bacilli. No other portion of the bull's body proved infected. Tests with blood,
liver, spleen, lymph glands, testicles, different portions of the penis, seminal fluid, synovial fluid, etc., alike failed to reveal abortion bacilli.

Our attempts to produce a similar case of infection artificially failed; and, in agreement with the difficulties many investigators have had to obtain incriminating evidence against bulls, we have thus far failed to infect bulls in a way that justifies the assumption that they are important factors in the dissemination of abortion disease. Our attempts include subcutaneous and intravenous injections of suspensions of abortion bacilli, feeding of abortion bacilli and exposure through copulation. One bull failed to become infected though he served a chronically bulling cow so frequently that his organ of copulation became abraided and inflamed. Prior to the copulations in this case suspensions of abortion bacilli were injected into the vagina and uterus of the cow.

Guard All Possible Avenues of Entrance for the Infection

Regarding the dissemination of abortion disease by bulls we may say, however, that it would be foolhardy in the dim light of our present knowledge to take liberties with reacting bulls, or bulls from infected herds, or promiscuously used bulls. For the time being, the best advice we can give to prevent the further spread of abortion disease is, if your herd has escaped the disease, don't infect it through the careless introduction of animals which have not been proved safe through properly and carefully made abortion tests, and don't permit your cattle to come into contact, directly or indirectly, with other, possibly infected cattle.

President Dyson: This very important subject has been presented from various points of view. It will now fall upon Dr. V. A. Moore to give us a summarized statement of the entire question.

Dr. V. A. Moore: Mr. President, some days ago your Secretary asked me if I would summarize the statements made at this symposium. I have not had time to prepare any summary, nor did I have the papers that I was to summarize. It seems to me that it calls for a wiser head than I think any of us possesses to attempt at this time to summarize a succession or series of facts and observations made by different people along different lines, and all for the purpose of obtaining definite and valuable information on this subject. It seems to me that we should be admonished at this time to collect the facts and hold judgment in suspension until there is evidence enough to help us, or to assure us in following some definite line.

This whole discussion has reminded me very much of the discussions that we formerly held concerning malaria, and you know that after the cause by which that disease was disseminated was ascertained, all of those learned discussions dropped into insignificance. I cannot help but believe that now we are in the process, we are in the search for the truth, and when that truth is found, very much that we look to now as possibly very important, many of the difficulties, many of which important things have exceptions, that we have just heard, will drop into insignificance, and then this whole matter will be cleared up.

Of course, we do not know how much man is destined to know con-
cerning nature's processes in these things, but I do believe that great progress has been made. When you think or reflect for a moment that it is only twenty years since we have had any conception of a specific cause of this disease at all; that prior to that time all sorts of wild schemes were suggested, and then compare that state of affairs with the one that we have today, with this large amount of accumulated data, which it is difficult, I think we will all admit, to interpret in many instances, but nevertheless we have definite data that is pointing to definite results.

It seems to me that it is unnecessary, it is impossible to attempt a summary, but I would like to just call attention to two or three things. In the first place, what progress has been made?

We sometimes feel in thinking of the different results that are obtained by different people, different conclusions that are drawn sometimes from the same data, that we are getting in a hopeless condition, but I believe that we are to be comforted in the fact that certain things are known.

For example, there seems to be little doubt that this disease is due to a definite cause, to a definite organism. That is, a great deal. They have got a definite cause. Now, we have got more than that. I think that it is pretty generally conceded that what we might call perhaps the symptoms of infectious abortion are pretty well defined, the retained afterbirth and the sterility. These things that follow have been taken up in the same way, so that we have the important facts directed in several lines, and we have got a conception of what this thing is, and what it means economically. That is a great step in advance.

We have found apparently that abortion can be prevented with certain definite methods. Just what those methods are, is very much like the use of antiseptics, one surgeon uses one solution, another surgeon uses another. One man follows one method of treating with his serum, and another, another procedure; and yet they both get good results, because they are both dealing with a fundamental principle.

And so here, while different methods may be followed, with this accumulated data, if one of these systems, which, after all, goes back to sanitary rules as a foundation, is followed, we will find that better results are obtained than otherwise would be; so we have gotten pretty definite results there.

We have found by a large amount of data, that the treatment of the uterus by washing out in a proper way has given most excellent results, and many animals that otherwise did not breed, have been made to breed by cleaning out the uterus; and it is found by analysis of this work that in this washing up we have found pus and things of that kind that we can see would interfere. We can understand those things, and good results are obtained in some cases, not in all cases, but in many cases, so that is progress.

And then we find that certain animals in which the uterus seems to be all right, fail to breed, and it has been pointed out by Doctor Williams and others that proper treatment of the ovaries will enable a certain number of these cases to breed; and so we have got another step in advance.

Then the question of calf scours, which is a corollary, perhaps, to this part of this disease, certain definite methods have been followed by a number of breeders with very excellent results, so we have made progress there, although we cannot perhaps always say just what the particular thing is that gets the results. All of these go back to general sanitary measures guided by the definite facts that we have.

Here I think is the other thing. The things that I have mentioned I
think are pretty generally acceded to in principle. We have, in other words, certain things here that we feel that we know. There are a good many things that people talk about as elementary knowledge, about which there is a good deal of controversy, and a good deal of doubt. So we have in addition to what may be definite and positive and practical things, certain doubtful things which yet remain to be cleared up, for instance, as to the distribution of this organism. Is it a group of organisms, a widely disseminated organism that for some reason causes animals to become more susceptible, or is it a disease like tuberculosis, for example, with a specific organism that is transmitted from one animal to another in all cases?

These are questions that there is a great deal of data on, and yet there is nothing conclusive. We hold judgment in suspension on these facts until we get more of them to draw conclusions; but we have things of a helpful nature along these lines.

Then the channel of infection, just how are these animals infected? Is it by the digestive tract, or is through the generative organs? The methods used of experimentally injecting blood in the circulation and those things are certainly not needed in a practical way, and we must get at this point, we must keep right at it, we must keep at it until certain things are eliminated. We may find that animals are infected in both ways. We may find like the two fellows that got in a fight, one said the flag was red and the other that it was white. After they had got through fighting they went up to look at it and they found that it was white on one side and red on the other, and that may be the case here. There may be many ways, and we cannot be positive about that.

Then the question of the feeding of calves. It is a provision of nature, and this is one of the things that I always think about. These organisms that produce these diseases are created like ourselves in the wisdom of the Infinite. There is provision made for them to get from one individual to another. Our problem is to find how that is.

In this instance it is possible that if the udder is to become the reservoir, as was said a little while ago, of this organism, the place by which it can be conserved and saved and passed on, it is not unreasonable to expect that the calves should become infected, and that these organisms become localized.

Doctor Schroeder has pointed out how these things remain in the uterus. We get different data. Stockman and Sir John Woodward pointed out that these organisms were eliminated in six weeks after abortion, but we have had animals that aborted, and have been killed and the organism has been found in the uterus much longer than six weeks after they aborted, so they are not always killed at once. In some cases they may be. The difficulty is to draw conclusions from individual experiences, or from a single case.

My experiences may be quite contrary to my neighbors', but they do not undermine the facts. Then there is the interpretation of the specific test. I do not know how we are going to interpret those. I have listened with a great deal of interest to these instructive and valuable papers this morning to see if I could find if anybody did know, but they do not seem to know.

You test an animal and you get an agglutination test or a fixation test. Is it going to show whether that animal is infected and is about to abort, or that it has been infected, the organism eliminated, the tissues sensitized, and that it is an immune animal? We must have more knowledge, it seems to me, before we can draw definite conclusions.

I think one of the most important things that came out this morning in connection with this work on abortion, is the taking of the data by ex-
experienced men, veterinarians, taking them to owners of herds and trying them out without definite knowledge and experience. I think that we are getting in a terrible muddle in many places, because of that fact. If these things are true, if this disease is due to a germ, or develops as the result of definite causes, we can go at that direct, instead of in a haphazard way; and it seems to me that as sanitarians who are interested in the prevention of this disease, one of the most important things is to see to it that you who are going at this thing should display a certain degree of knowledge and good judgment and skill in doing the work, otherwise I think we are going to get into more or less difficulty.

Then think that there is a tendency on the part of officials to look to the results of laboratory tests, in this work, with a great deal more confidence than they are really entitled to. I fear that it is leading to an erroneous conclusion. Until we know what these tests mean, why should they be made public?

I don’t know that there is anything more that I can say. There is a great deal that can be said. It is a wonderful subject, and I believe that we should take heart, as confusing as some of these statements may seem, in that progress is being made. We are, as the boys say, getting “hot”. We are, getting closer and closer to the truth, and some day somebody is going to find just the key that we need to unlock the whole situation, and then I believe that this disease like other plagues will be eliminated.

I thank you (applause).

DR. C. M. POTTER: Mr. Chairman, the paper presented by Dr. Eichhorn this morning has shown the absolute necessity of taking some action at this time which will allay some of the misunderstanding which prevails in regard to this subject. You have heard many different expressions, many different opinions expressed here this morning about this condition. It is a good time now to thresh out these differences of opinion until these matters are definitely settled. It stimulates discussion, it stimulates investigation, and only by those means can we arrive at the truth of this matter: but there is danger in continuing to differ too long.

Practitioners of veterinary medicine when we go to them, and try to instruct them in the various methods of control, will point to these differences of opinion, and they are inclined to take sides, to take up with the opinions of certain men. I think it is wrong for us to continue to differ on matters of common ground.

Now, Doctor Moore has shown to you more eloquently and more clearly than I possibly could do, the hope that there is for control of this disease, and the common ground which can be taken. If you will permit me to quote from the paper of Doctor Eichhorn, the last paragraph:

“It is desired that the best knowledge and practice to be had in this and other countries, be made available for our use. To accomplish this, it is suggested that this body appoint a committee consisting of the best-qualified men obtainable, who shall confer and draw up a compilation of all the established facts concerning abortion disease, and they shall recommend measures which have been found most effective in combating the disease under certain conditions. Such a report would allay much of the uncertainty which now exists, and lay a foundation for rightful measures of control.”

I therefore make this motion, that this body appoint a committee of such number as may be found best suited to the work, who shall confer and make such compilation, in order that it may be made available for those who are working for the control of this disease.

Motion duly seconded and carried.

PRESIDENT DYSON: We will now pass from the question of contagious abortion to tuberculosis. Next on the program: "Desirability of Requir-
ing Certificates of Health including Tuberculin Test Certificates for Cattle and Immunization Certificates for Swine shown at Stock Shows, Live Stock Exhibitions, State and County Fairs," by Dr. H. E. Williams of West Virginia.

I am just advised by the secretary that it is impossible for Dr. Williams to be here, so we will read his paper by title and include in the published proceedings.

**DESIRABILITY OF REQUIRING CERTIFICATES OF HEALTH, INCLUDING TUBERCULIN TEST CERTIFICATES FOR CATTLE AND IMMUNIZATION CERTIFICATES FOR SWINE SHOWN AT STOCK SHOWS, LIVE STOCK EXPOSITIONS, STATE AND COUNTY FAIRS**

By H. E. Williams, Commissioner of Agriculture, Charleston, W. Va.

There are many conditions growing up with our modern means of transportation, and many customs prevailing among shippers of live stock, which apparently make it necessary that we resort to greater precaution to safeguard in transportation the health of all domestic animals other than those for immediate slaughter.

A slight investigation of shipping conditions will reveal the fact that in most cases the only treatment or cleansing given to the boxcars used for the shipment of cattle and hogs, is that given by the animals themselves, and it is altogether probable that the cars may have been used for the shipment of hogs with cholera or cattle with some contagious or infectious disease, and it does not require an expert to imagine the danger to healthy animals when shipped in such cars, neither does it require the stretching of imagination to see the danger to animals along the line of transportation.

We had in West Virginia two outbreaks of foot-and-mouth disease during the recent scourge, at widely separated points, and with a thorough investigation were unable to find any trace of manner or means whereby the disease might have been carried into the state, except that in both cases the outbreak was near the railroad, and in one case it was on property adjoining the Cumbo yards, where through stock trains were often side-tracked for a time. I do not know, but in my opinion, diseases are often dropped from passing trains by the animals kicking the filth and disease germs from the cars, and thus cause new infection and a new outbreak.

It is customary in many sections of the country immediately upon notice of outbreak of cholera, to ship all hogs at once that
are able to go, and often hogs are shipped after infection, and come down with the disease in transit. This, of course, infects the car for some time to come, and exposes all animals shipped in the car and all territory through which the car goes.

Horses exposed to or suffering from some contagious, infectious or otherwise communicable disease, are often shipped by rail, or otherwise, and sometimes find their way into the fairs and expositions, exposing and sometimes infecting the other animals at great loss to the owners and the country.

It is not infrequent that some contagious or infectious disease breaks out in a fair or exposition, brought there, of course, by some of the animals which must have been exposed before shipment or in transit, and it is only just to the breeders in general, that every possible precaution be taken to prevent such results.

The prevalence of bovine tuberculosis throughout the country, and the ease with which it may be transmitted from one animal to another in transportation in stock cars previously infected, or from barns and from contact with direct infection, in fairs and expositions of the country, and especially in the little country fairs, but to more or less degree in all fairs and expositions, would readily convince one of the necessity to test all bovine animals shipped, not only for breeding purposes, but also for exhibits at our fairs and expositions.

It is customary at all fairs and expositions to stand or stall the animals in close proximity, and oftentimes herds from different states and widely separated sections of the country, are so close together that the transmission of any disease might easily result. One illustration will suffice for the occasion. The herd of Ayrshires belonging to the estate of Paul O. Reymann, of Wheeling, West Virginia, is doubtless one of the best herds and one of the best cared for herds in the country. This herd has been tuberculin-tested twice each year for several years. The show herd having in it one young bull about one year old, was tuberculin-tested immediately before leaving home for the circuit. In one of the fairs on the circuit of that season, this young bull stood directly in front of an old Holstein cow which had a cough, and showed indication of tuberculosis. On return home, the Reymann show animals were immediately taken to the hospital and were not permitted to go back in the herd and were well cared for until the test could be given, which resulted in a positive reaction for the vigorous young bull above mentioned, and this was the only case appearing in the whole herd of over one hundred cows and hulls.

My experience with glanders, cholera, tuberculosis and foot-and-mouth disease, and my interest in protecting the breeding animals of the country has driven me to this conclusion, viz:
No animal regardless of species, character, breeding or breed, should be shown or exhibited at any public fair or exposition, except on the following conditions:

All bovine animals over six months of age must have withstood the tuberculin-test within a reasonable time of shipment or exhibit. And all horses, hogs, sheep and other animals must have been examined and certified by the live stock authorities of the state to be clean and free from communicable disease, and a certificate from the owner or keeper that the animals have not been exposed to disease, and that no contagious or infectious disease has been within a reasonable distance within the past sixty or ninety days, and no animals for exhibit or breeding purposes should be shipped in cars that are not thoroughly clean and thoroughly disinfected immediately before shipment is made.

Many of our eastern breeders, with the very best animals of the country, have quit the show ring because of the danger from disease and exposure, and if these requirements could be placed upon the statute books of every state in the union, so that the general public and stock breeders may be protected, it will do more to build up the live stock fairs and expositions of the country than any other one thing, and it will create confidence among the breeders of fine animals and bring out many of these good breeders who hesitate to take the chances of transportation and the show ring.

It has been my purpose merely to introduce this subject, and I have by no means exhausted it. It is a live subject, and merits your consideration.

Only a year ago the American association of fairs and expositions, appointed a committee of which Mr. Newman, of Kentucky, is chairman, with instructions to investigate and report to the 1916 meeting, and in my judgment, it would be well for this body of men dealing with sanitation and the enforcement of law, to co-operate with that body of practical exhibitors and fair managers to the end that results may be obtained. I want to hear this matter discussed.

President Dyson: The next number: "How should a Tuberculin Test be applied to insure Accuracy in Results," by Dr. Wills, of New York.

HOW SHOULD A TUBERCULIN TEST BE APPLIED TO INSURE ACCURACY IN RESULTS?

By J. G. Wills, State Veterinarian of New York

At meetings of this and other associations of a similar character we have heard many discussions and experiences in relation to the use of tuberculin. Your program committee has seen fit to request an article upon the methods of applying this test to insure accuracy in results. It is perhaps unnecessary for me to point out that this is a subject of considerable magnitude. It is likewise a matter upon which much difference of opinion exists.
and about which there is more or less controversy as to certain
details.

It is known to all that many circumstances influence and to a
certain extent interfere with the accuracy of results obtained re-
gardless of the care, experience and attention to detail by the ex-
aminer.

When tuberculin first came into use as a means of diagnosing
tuberculosis in bovines the procedure employed was somewhat
more exacting and in some respects more scientific than was later
observed after it had become a more familiar agent. At first it
was the custom for temperature readings to be taken for some
days prior to the injection of tuberculin and to continue same for
a longer period after the administration than has been the custom
in later years. This was due to the fact that tuberculin testing
was more or less of an experiment and methods of use were not
well known. Later it was resorted to more freely and a tendency
to decrease the time occupied in conducting the examination re-
sulted. This inclination on the part of many to shorten the test
period has been followed by a corresponding decrease in accuracy
of results obtained in some cases.

In the last few years many observers have pointed out the
necessity for beginning temperature readings earlier and continu-
ing them longer. The dosage has likewise been studied and re-
sults have sometimes at least justified the statement that the
quantity of tuberculin used had been inadequate.

Recently the introduction of newer means of using tuberculin,
such as the intradermal, ophthalmic and intrapalpebral methods
have resulted in many experimenting with these later methods.

It is generally accepted as a fact that tuberculin used sub-
cutaneously may fail of its purpose as a diagnostic agent under
certain circumstances, the most important being in arrested cases
of the disease, in incubative cases of the disease and in those
where the infection is apparently so general as to neutralize the
effect of tuberculin resulting in no thermal evidence of its ex-
istence. There have likewise been cases that are continually oc-
curring where lesions of tuberculosis are found in animals that
have passed satisfactory tests and yet none of the above condi-
tions seem to have prevailed. No one has offered satisfactory
explanations for these unfortunate occurrences. It is doubtful
if they can be explained by any general rule. This is to be ex-
pected since we are dealing with living individuals, each having
its peculiarities, consequently no uniform results can be expected
with any degree of consistency.

In most states the subject of tuberculin testing has been given
much careful study. The subcutaneous method has evidently
been considered as the most accurate and has usually been ac-
cepted as the official test, the others being so far used largely for experiment only.

I think it is generally conceded that the circumstances pertaining to the administration of tuberculin, accuracy of apparatus used, times of feeding and watering, sanitary conditions under which stabled or housed, and temperature of the stable are perhaps as important factors in affecting the results obtained as are the idiosyncrasies of the individual animal itself. We have therefore to consider these details as of great importance in insuring correct determinations. It has been our custom to give particular attention to the feeding, watering and stabling of the animal while test was under way. Failure to control these factors will sometimes frequently render the examination nearly useless so far as correctness is concerned. The feeding of animals immediately before taking temperatures almost invariably results in an increase in thermal reading of sometimes one or two degrees while the housing of the individual in a stable that is close and ill ventilated has a similar effect. The ingestion of cold water will very noticeably lower the temperature and in case of reaction may sometimes nearly obscure the reaction curve. Placing of animals to be tested in surroundings which are unusual or to which they are unaccustomed may affect the temperature readings very materially. Conversely exposure of the animal to inclement weather, to drafts or extreme cold have a depressant effect on the thermal readings. Since the preliminary temperatures are taken for the purpose of determining whether the animal to be tested is in a reasonably normal condition, it is important that at the beginning of such readings the animal shall be, so far as possible, placed in a normal environment that shall continue throughout the test and shall be subjected to the same surroundings and influences as regards feed, water and external influences as will exist after tuberculin has been injected. The necessity of having accurate thermometers has been often demonstrated. As a preliminary recommendation we would therefore say that the animal should be properly stabled in normal surroundings, supplied with necessary feed and water and subjected to conditions that will remain fairly uniform for the succeeding thirty to thirty-six hours, during which time tuberculin will be injected and post temperatures probably completed. Examination of the animal for any physical conditions that might affect test should be conducted prior to the injection of tuberculin, if possible, to avoid disturbing after injection. The preliminary readings should show no exceptional variation from that to be expected in any animal under normal surroundings. Deviation from such normal temperatures should be carefully investigated and if no satisfactory explanation or reason is apparent the advisability
of administering tuberculin to such individuals is an important question. It is recommended that at least three preliminary readings be taken and that an interval of at least eight hours elapse between the first and last of such readings. Some have strongly advised that one or more preliminary temperatures should be taken in the morning preceding injection, assuming that injection would take place as is usual in the evening from six to twelve p. m., the object of such temperatures being for comparison with those of the following morning after the injection of tuberculin. Occasionally there are advantages in having these early temperatures for comparison where they can be easily obtained. In testing, however, under usual farm conditions early temperatures cannot be obtained without so much additional time being taken as to cause serious objection, and are in many cases unnecessary. Such temperatures are of course most valuable in those animals that show but slight rises of temperature and the question arises whether such individuals should be condemned, classed as suspicious or passed as healthy. In the case of typical reactors where post temperature rise of five to seven degrees above normal is shown the necessity of previous morning temperature readings does not seem to exist. Preliminary temperatures, so-called, may in certain conditions be taken after the administration of tuberculin. It is probable, however, that the temperature of some animals is increased by the excitement incident to the injection and therefore temperatures taken for a time after are not altogether to be relied upon.

In the injection of the diagnostic fluid care should be exercised to have sufficient dosage and to administer the product as aseptically as possible, being sure that it reaches the subcutaneous tissue and does not escape from the syringe or needle by leakage or otherwise. It should be injected with as little unnecessary pain or disturbance of the animal as possible. Needles should therefore be well pointed, strong but not too large. The administration of tuberculin in insufficient dosage is perhaps the cause of some inaccuracies in tuberculin testing, which is attributed to the defects of the product rather than the real cause. Post temperatures should be resumed from six to eight hours after the injection of tuberculin. In animals not previously tested it is believed that reactions seldom, if ever, occur prior to the eighth hour after the administration of tuberculin. We have seen a number of such cases killed and no visible tuberculosis found. Temperature readings should be continued at intervals of two hours for a period of at least twenty hours and if at the end of that period suspicious or irregular temperatures are recorded, should be continued for a time longer. Abnormal temperatures
should be checked by an additional reading, preferably with a different thermometer.

Animals that have been frequently tested, that have ever been suspicious at previous tests or that have had recent injections of tuberculin should, in our opinion, have temperature readings continued for a longer time than twenty hours. Of course if reactions are recorded and return to normal or nearly so as shown by the thermometer prior to the twentieth hour there is no essential necessity of continuing readings.

It is in the interpretation of tuberculin tests that the greatest necessity for care and judgment arises. In herds where no abnormal temperature readings are shown or where the reactions, if present, are distinct and definite, the exercise of as much skill on the part of the examiner is not necessitated. It requires no great scientific knowledge to determine that an animal showing a typical temperature curve after the injection of tuberculin reaching a maximum of 107 degrees should be considered as reacting. On the other hand, animals that show readings of 103, 103.5, or even 104 degrees, accompanied by no other noticeable disturbance of normal functions require care and consideration in order that mistakes be not made. In this connection the history of the herd, the number of animals showing definite reactions, the season of the year, the character of feed used and many other factors have to be taken into consideration. In other words, in badly diseased herds the suspicious temperatures are more indicative of disease than are the same temperatures in herds where little or no infection exists. Deciding upon the disposition to be made of animals in such cases is one of the most important functions the user of tuberculin is called upon to exercise. Because of the somewhat conflicting results obtained by various methods of examination there is a tendency on the part of some to discredit all tests for tuberculosis.

It would seem that a combination of the various test methods would be a logical procedure in cases where it was desired to obtain as accurate information as possible. All will agree I think that each method has some merit possibly not possessed by others. It is, therefore, reasonable to consider that the detection of the infection would be rendered more complete by the use of several means of diagnosis rather than by depending upon one. In all cases we would therefore recommend the adoption of as many means of diagnosis as is possible and consistent. In general field work, however, it is not always possible to combine as many of these methods as desired to insure the maximum of accuracy.

In conclusion we desire to emphasize the fact that a certain percentage of error may occur in tuberculin test work even with the most careful supervision. From our present knowledge it is
apparent that no combination of tests will invariably insure absolute detection of all infected animals, particularly in herds where much disease exists.

One of the most serious obstacles in the control of bovine tuberculosis by means of tuberculin has been the tendency to consider tuberculin as an infallible diagnostic agent. While correct in theory its failure under the conditions which have already been cited, which are entirely reasonable and logical, has led some to discredit it. On the other hand those not familiar with it have been led to place too great reliance upon results obtained, particularly when of a negative nature. It would appear that the value of any given tuberculin test is largely measured by the ability, competency and experience of the examiner coupled with adequate information as to the previous history of the individual animal and of the herd as a whole.

President Dyson: The next on the program, "The Nurse Cow and Her Relation to Bovine Tuberculosis," by Dr. Kinsley, of Missouri.

THE NURSE COW A FACTOR IN TUBERCULOSIS OF REGISTERED CATTLE

By A. T. Kinsley, Kansas City, Missouri

Many breeders of registered beef cattle are resorting to the use of nurse cows. Some pure bred beef cows do not produce sufficient milk for the normal requirements of their progeny and therefore the nurse cow is a necessity. Some breeders resort to over feeding of calves from pure bred beef cows, by permitting them to suckle their mothers and also a nurse cow with the expectation of excessively stimulating their early development. In a few instances it becomes necessary to take the calf from the cow immediately after its birth, thus necessitating a nurse cow. Because of the foregoing the nurse cow is now a very common addition to a pure-bred herd and should therefore be recognized as a factor in consideration of the control of infective diseases of registered cattle, especially such an insidious disease as tuberculosis.

It is common knowledge that the avenues of elimination of the tubercle bacillus depend to some extent upon the location and nature of the tubercular lesion, however, it has been found that tubercle bacilli are occasionally eliminated in the milk and the feces of a tuberculous cow regardless of the location of the tubercular lesion. (Some have claimed that the leukocytes may incorporate and carry tubercle bacilli from the lung or other portions of the body to the mammary gland, or intestine and, they with the incorporated bacilli be eliminated in the milk or feces.) It has been found by some investigators that five per cent of
market milk contained virulent tubercle bacilli, and it has been published that forty-one per cent of tubercular cattle eliminate the tubercle bacilli in their feces.

Nurse cows are subject to tuberculosis and should a tuberculous cow be used as a nurse cow, there is danger of transmission of the disease to the foster calf as well as dissemination of infection on the premises.

In the past two years two instances of the tuberculous nurse cow has required the attention of the writer, and in one instance three pure-bred cattle were condemned, all of which had been nursed by cows that were later found to be tuberculous.

Missionary work with the pure-bred breeder as to the necessity of tuberculin testing and elimination of tuberculous nurse cows is quite essential, for many breeders who recognize the necessity of testing their registered cattle do not recognize the importance of tuberculin testing of the nurse.

President Dyson: These papers are now open for discussion.

Dr. Luckey: Dr. Wills has attempted to cover a number of ideas upon which all of us need a great deal of light, especially those of us who are quite extensively engaged in testing cattle for tuberculosis. We know that the tuberculin test is perhaps the most sacred piece of work that the veterinarian is called upon to do, and when we go at this work in a conscientious way, recognizing that in some cases human lives depend upon the accuracy of our work, and then when we find now and then that we have made an error through passing a diseased animal for sound, or condemning an animal which shows no lesions, we feel more or less discouraged. We find that the condemning of an animal which shows no lesions, especially when such an animal has been closely associated with badly tuberculous cows, is not a source of any great worry, should not be to any one; to pass a tuberculous cow, especially a dairy cow as sound, should be a source of a great deal of worry on the part of the inspector.

I do not want to reflect upon the work in the different states, but it is practically impossible to find a bunch of New York cows that have come to our state after inspection without finding a great many of them tuberculous, I do not know why, but that is the fact. I am anxious to get at some method of testing whereby a health certificate will mean something. I find in making tests that cattle will react to the eye test which will react to no other, and others will react to the intradermal test, which will react to no other; and others will react to the temperature test, and react to no others. We are undertaking to get at these eccentric individuals, which do not come under the general rule.

I think I have secured one little item of aid in this respect, and the method is simply this. In a herd where we have trouble in getting it on a sound basis, we have adopted the system of going to such a herd and putting tuberculin in the eyes, and then four days later we begin the taking of temperatures at the proper hour, and inject the proper amount of tuberculin under the skin. During the time the post-injection temperatures are being taken, we have the eye reaction to return from the treatment of four days previous. We have used this to good advantage in two herds in the last year, two very valuable herds, in which we continually found reactors. In one of these herds we had two animals that were slightly suspicious both to the intradermal and the temperature tests. We put tuberculin in the eye, and with about four days...
intervening with the temperature test,- we followed these two animals on the eye reaction, one of them showing positively no reaction to the temperature test, and the other only a very slight rise, probably one or one and a half degrees, which we had passed before as suspicious. The two animals were killed, and both had tuberculosis.

In another herd near by, tuberculin was put in the eye, and four days later the temperature test was administered, and again we found an animal that was suspected showing absolutely no reaction to the temperature test, which at the next examination showed an accumulation of inflammation of the eye, and an accumulation of a small amount of mucous material; and I believe that combination will help in many of those herds where we find the non-reactors, to get at an accurate conclusion. If you use the eye test in combination in that way, you will find that it will help in some cases.

I expect to try it out wherever we have those difficult herds to deal with. I dropped onto that accidentally some eight years ago, or over, when the eye tests and the scratching of the skin was advocated. We had a herd that was badly infected with tuberculosis. We knew it to be, from the fact that some animals had died, and the local veterinarian had made a post mortem examination of certain ones and found them badly diseased. All of the animals were showing visible symptoms of tuberculosis, and we put tuberculin in the eye on Monday evening, and on Tuesday morning we found about thirty-three reactions out of sixty-five cattle thus tested. We at the same time applied the method of scratching the skin, putting a little tuberculin into it, and in the next examination we found about thirty-three reactors to that test, but not the identical animals that showed reaction to the eye test. That was done on Monday night, on Friday afternoon we applied the temperature test, and got forty-six clean-cut reactions; and on Saturday morning, five days later than the eye test was made, we found a most enormous discharge from the eyes of these reacted cattle that I have ever seen. The discharge was so great that the material from the eye, the discharge from the eye ran down to the nose: and I asked an attendant, who was anything but cleanly in his habits, if he would get a little hay for the cows to keep them quiet, and he remarked: "Hadn't I better get a gunnysack and clean up their faces so they won't soil the hay?" That will give you some idea of the amount of reaction in the eye coming back after the tuberculin had been put in the eye on the preceding Monday, and this was on Saturday.

As a rule if we take a tuberculous herd and do one or two tests, use the intradermal test and then use the temperature test, we get them all and clean up the herd, but occasionally one of these herds contains one of these abnormal animals, and if we can use this little suggestion to help pick out a few more of those, we will find that we have gained a little ground and perfected the accuracy of the temperature test to some little extent. I thank you. (Applause.)

DR. ELIASON: Mr. Chairman, in view of some of the discussions that have been elicited on the tuberculin test reminds me of a brother-in-law who telegraphed to his other brother-in-law, "Our mother-in-law died last night, what shall we do, bury, embalm or cremate?" The other brother-in-law wired: "Give her all three. Take no chances."

We have been talking of these herds where a high percentage of reaction occurs. We have done some work along these lines in slaughtering an entire herd, and in several instances where only fifty per cent of the herd reacted, we found the entire herd showed lesions upon post mortem examinations, which all shows the futility of trying to clean up a herd where there is an extensive number of reactors. Such herds should
be quarantined, and until such time as that herd is cleaned up, it should be considered a tuberculous herd.

In regard to the temperatures to be taken, we are now in a rather chaotic condition, to my mind. We have all kinds of requests for the procedure in which the subcutaneous test should be made. Some require it to the twentieth hour, some are willing to take almost any temperature, and we don't know where we are. It would seem that a committee at this time should be appointed to recommend the number of temperatures which should be taken, which should comprise a subcutaneous test, and let us stick to it. It is impossible to keep track of the various regulations which are issued over night by the various states.

Therefore, I move at this time that a committee be appointed to draw up regulations regarding the subcutaneous test which should be given as a basis for our work.

PRESIDENT DYSON: Is there a second to that motion?

DR. RUTHERFORD: Mr. Chairman, I second the motion and in seconding it I wish to say a few words in regard to one phase of the tuberculin test that has not been touched upon this morning at all, and that is with regard to the action of owners in nullifying the tuberculin test. I have had a good deal of experience of that myself, because for a considerable period I was stationed in Britain for the purpose of testing cattle for export to Canada. At the same time, the United States Bureau maintained an officer there, and our certificates were interchangeable, that is, our certificates were accepted by the Bureau, and the American officer's certificates were accepted by the Canadian Department of Agriculture.

It was a very common thing indeed, and a very difficult phase of the matter to deal with, the fraudulent use of various means for the nullification of the tuberculin test.

I found, for instance, that in a great many cases I was getting distinct clinical reactions; I was getting different symptoms, such as absence of cud, general malaise and in some cases diarrhea, without any corresponding thermic rise. I knew I was being worked, but I did not quite know how. This was some fifteen years ago, and finally by the expenditure of a few judicious half crowns in the proper quarters I got onto the combination. I may say for the credit of my own countrymen in Scotland and in England, that the idea was taken over from this side (laughter). The prescription was American in origin, and was taken over there by unscrupulous importers, who did not care whether the animals they purchased were infected with tuberculosis or not.

You know that in some breeds of cattle there are some families which are particularly valuable for some purposes, and one of those animals apparently in good condition was for the unscrupulous dealer or breeder just as valuable as if it were healthy. I found that a combination was fixed of various antipyretic preparations—I have the prescription and I will give it to anyone who desires it, whose moral character is thoroughly vouched for by the officers of this association—and this was in the form of a powder which was mixed with a little sugar and a handful of meal and thrown to the animal.

I found that where possible, it was arranged that I should test on two farms on the same day. If that was not possible two herds of cattle or three herds of cattle were separated as widely as possible in the fields available on the particular premises on which the test was being made. And the hospitality of the owners of these cattle was always a marked feature of the performance. There was every inducement to take it easy in the morning, so that the owner or his trusted employees could get around and take the temperatures before my first temperature was secured. Then there was a waterfall or an old castle or a stable of fine
race horses, or a particularly fine herd of cattle or flock of sheep somewhere in the neighborhood, which it was necessary that I should see, because in carrying out this plan it was better that the owner should see to the taking of the temperatures.

I remember one case which was rather amusing, and I think I will tell it to you. One very fine lot of cattle, some beautiful cattle that I was testing. In the course of the test I found the temperature slightly elevated, on the eight o'clock test the temperature was right down. By twelve o'clock they were all up to 106 and 107 degrees, the whole lot, and I did not know anything about it. I, of course, simply condemned them and passed on.

I spoke about this to a friend of mine at the time, and I said it was a very peculiar case. He smiled gently but said nothing. Several years ago I happened to be over in England sitting by the fireside with this same friend of mine, and he began to laugh. He said: "Do you remember those fine cattle that so and so had over there?" I said: "Yes." He said: "It is seven years ago and I don't mind telling you about that. John undertook to use that Yankee powder, and it went all right until he went in to family worship. His wife snuggled up to him and asked him if he thought it was right to do that with these cattle, and he said that when the prayer was over he concluded not to give them any more of the powder, and so the temperatures went up."

I remember another old gentleman, he is now in this country—he was very kind, very cordial indeed. We would be out and he would say: "Doctor, I will just take out the thermometer for you," and he would take out the thermometer and hand it over to me after giving it two thoroughly good shakes. That is another illustration of what you meet with in this sort of thing, but, of course, that did not last very long.

Of course, you all realize the necessity, the desirability of getting the temperatures almost immediately, that is, taking the temperatures almost immediately after the injection if you desire to test cattle that have been loaded up with tuberculin. There are a great many things of that kind that are worthy of consideration. While, of course, it is a nice thing to have a friendly outlook towards the world at large, it is also a very necessary thing to safeguard this operation in this regard.

One man in Scotland had a very nice system of dealing with cases of that kind. The inspector in this particular case was in the habit of using a very small amount of tuberculin. This man would go around early in the morning and take the temperatures of the animals and when he found any that were showing signs of going up, he turned them out in an open field and brought in animals that looked like them, and they would pass the test.

There is all the difference in the world between testing the herd of a man who is desirous of getting that herd cleaned up and getting rid of tuberculosis, and testing cattle which are being sold by unscrupulous persons, and in some cases being purchased by those equally unscrupulous. (applause).

President Dyson: Before putting that motion of Dr. Eliason, it seems to me that perhaps there would be a shorter way of getting to the uniform tuberculin test, by amending the motion to include the adoption of the federal regulations, with which we are all familiar. It seems to me that we could reach a standard that way much quicker than we could by a committee, because if we appoint a committee, it would be necessary to take a lot of time, and in all probability our final conclusions would be the same as established by the Bureau at the present time; or the Bureau may decide to change theirs in some respects, and any time they change
theirs it would seem to me that we would have to do the same, and I think it would be well to do this.

DR. ELIASON. Mr. Chairman, speaking to my motion that is before the house, as I understand the state of Ohio has increased its compensation in regard to paying for tuberculosis cows, so it has brought out a great many of these tricks and methods that Dr. Rutherford has spoken of, and I certainly think it is a good thing to know of these conditions and of the tricks that are played by cattle dealers.

The next question that is agitated in my mind is the uniformity of test charts. I hold in my hand test charts approved and personal certificates made on their own farms starting with one hour and finishing with another. One set here shows three pre-injection temperatures, three post-injection temperatures.

Passing them along, I hold here three pre-injection temperatures at sixteen hours, and passing them along, and I understand that that was perhaps an arrangement made with this association at one time. Those cattle reacted soon after going onto compensation charts or lists, so you can see the difficulty if they are going to keep up compensation, and it is a question in my mind in regard to that, of course. But I do feel that there should be some uniformity of action. If it is best, as Dr. Wills has stated here in his paper, to have eight to twenty hour records, let us have the 8th hour to the 20th hour. If it is best to have from the 10th hour to the 16th hour, and that is correct, let us have that. If it is not the correct thing, let us get something that is. It seems to me the 8th hour to the 20th hour is getting near. I think that is perhaps the consensus of opinion, and I would be in favor of some way of getting at this question.

DR. KIERNAN: Mr. Chairman, at the session yesterday morning, when I submitted the report on uniform regulations, it was decided that those recommendations would be discussed at this evening's session. The committee has recommended certain temperature tests—the number of temperatures to be taken, and I think this would be a good time to discuss that question and settle it definitely once and for all without appointing any further committee to report later on.

DR. GIBSON: Mr. Chairman, I agree with Dr. Kiernan that we should settle this matter during this session. There is plenty of ground for discussing what is the best form of test. I was not present when Dr. Kiernan reported for his Committee, but I understand he reported that the temperatures be taken from the 10th to the 20th hour, inclusive. That raises from the 18th which was our former decision regarding tuberculin test records. Before departing from the 10th to the 18th hours, inclusive, I think we need to discuss the proposition of whether we shall continue the tests as regards post-injection temperatures. Personally, if we are to change from the 10th to the 18th hour, which is now the recognized test, I believe that the eighth hour is of more importance than the twentieth.

I remember the illustrated paper that Dr. Wills gave us, where he had a number of belated reactions, but as I recollect, every one of those reactions showed some rise in temperature on the 18th hour. When we are testing a herd of cattle, I agree that we cannot be too careful and too thorough in the test; but when we are testing small shipments, emigrants' shipments that are going to the newer countries to live in the open, I believe the temperatures from the 10th to the 18th hour inclusive, are sufficient for all practical purposes.

We have heard enough here from Dr. Rutherford to show you that it matters not how long you take these temperatures, if the tricks are being practised on you. I submit again that post-temperature records,
from the 10th to the 18th hour, meaning five temperatures carefully taken by a competent veterinarian on cattle that have not been tampered with, will give true results. I think if you will refer to Dr. Will's address, you will find that when this association recommended that the temperature be taken from the 10th to the 18th hours inclusive, they stated that we must always follow suspicious temperatures or rising temperatures on the 18th hour, and I will guarantee that that method carefully followed out will give ninety-nine per cent of all reactors which you cannot get any other way.

I was very glad that Dr. Rutherford spoke about clinical reactions. I had a case of that kind myself, and I tested several times and had reason to believe she was infected. She had diarrhea and other signs of physical reaction, and I finally sent her to Ottumwa for slaughter. There wasn't any test ever made on her that you could have assailed her on, except the first one, and it was only what we would call a trifle suspicious.

The expense of testing for the emigrants in particular is about high enough. If you are going to add two hours on at the beginning and two hours at the end of this test, the veterinarians who make those tests are going to feel justified in increasing their charge, and I think that the burden is heavy enough now.

Dr. Elias: Mr. Chairman, I do not think that there is any use of carrying the discussion any further on this, and in view of the fact that it is going to be discussed and brought to a head later, I, with the consent of my second, will withdraw my motion. Will you tell me when this discussion will come up?

President Dyson: I don't know just exactly the time that it will come up, but when it does come up it seems to me that there is one important factor that should be thoroughly discussed, and that is in regard to the minimum amount of tuberculin to use in a test. In my experience we have had considerable trouble in getting a sufficient quantity of tuberculin injected. The tendency is, and the objection on the part of many owners is, that they want to minimize the amount of tuberculin injected, and I frequently have occasion to pass on certificates of 1200 to 1400 pound cattle with 2 c.c.'s of tuberculin. I believe if the maximum amount of tuberculin be given all the time, that the reactions are either going to be positive or a negative reaction, and I hope that that part of the question will be thoroughly discussed when it is finally opened for discussion. We will now close the morning session.

And thereupon a recess was taken until two o'clock P. M. of the same day.
The direct loss caused by said disease amounted to several millions of dollars, and the indirect loss sustained by stockmen, railroads and the public in general amounted to many times the direct loss.

It is my belief that a very large portion of this loss might have been avoided through a better organization of the live stock interests in the different states, and when I say organization of the live stock interests, I don't mean theorists or men who perhaps spent their boyhoods in the country and, having become wealthy in the city, make a plaything of farming and stock raising, but I do mean the live stock men whose financial existence, in whole or in part, may depend upon the rational solution of sanitary and other problems in connection with their business.

It gives me pleasure to speak to you gentlemen, because I know you will understand my meaning. During the outbreak of foot-and-mouth disease, it was necessary in many cases to bring veterinarians from outside states, in many instances from far away. These men, many of them young and possibly not having had an oversupply of practical experience in dealing with men, and coming from sections where the customs of the people and the manner of handling live stock were entirely different from the locality to which they were sent, it was no great wonder that there should have developed a great deal of misunderstanding and opposition to the method and manner of trying to enforce some of the rules and regulations as laid down by the state and federal authorities.

If there had been at that time in the different counties legally constituted sanitary boards, in whom the people had confidence, and to whom these men might have been sent to confer with as to the best methods of carrying out the instructions they had received, I believe it would have avoided many unpleasant things and have hastened the complete eradication of the disease; thereby saving both national and state governments a large amount of money, to say nothing of vastly greater sums which might have been saved to stock men and those interests closely allied to them, of which there are many.

Such county sanitary boards might consist of three members from each county appointed by the governor of the state and selected from a list submitted by the banking interests in the different counties. I believe this method of selection feasible and practical, and wish to present a few reasons in support of it.

In my own state, in a large percentage of the counties, the bankers are already organized into what is known as county units, and into units of small groups of counties in the remainder of the state. It would therefore be easy to bring a matter of this kind up for discussion and action.
There is no one interest more closely allied to the live stock interests of all kinds than the bankers. They loan vast sums of money to live stock interests of all kinds, and to the handlers of the finished product as well. They probably realize and recognize more fully than any other body of men in the counties the value and importance of the live stock industry to the community and country at large—without exception they have a more intimate knowledge of the business ability and the standing and probable influence a man might have in the community in the matter of obtaining active and harmonious co-operation between state sanitary boards and the people in general. They have business relations with men in all walks of life and know that men to properly fill a position of this kind must be broad enough to realize that their first duty is the protection of public health and sane enough to avoid unnecessary extremes in safeguarding it; big enough to know that their own endeavor is only a factor in the success of their business. What would happen to the live stock industry without proper sanitary regulation, transportation, terminal and other facilities for the speedy and proper handling of live stock? There is need for a closer relation and better understanding between the different interests which make for the success of the live stock business.

The help, counsel and probable benefit to be derived from the appointment in this way of three men in each county is well worth considering, not alone in its relation to the sanitary board, but as a source of information for the chief executive in respect to public sentiment in regard to any pending legislation, or in regard to live stock conditions in the different counties.

These county live stock sanitary boards, consisting of three members from each county in the state, not more than two of whom shall belong to one political party, whose qualifications should be that they are actively engaged in farming or the breeding of live stock, could organize by selecting from their own number a chairman and secretary. The duties of such county sanitary boards should be to actively assist and co-operate with the state board of live stock commissioners and the veterinary department of the state, either in the carrying out of the sanitary regulations of the state, or in suggesting practical methods for improving the sanitary conditions in their respective counties.

Quarterly meetings could be held at some accessible place in each congressional district, and attended by all sanitary board members in the district, and an invitation extended to live stock men to offer suggestions for the improvement of live stock sanitary regulations, or for the improvement of the live stock industry in general. The secretary appointed at said meeting to forward a report thereof to the state live stock commission. A
yearly meeting should be held at the state capital and attended
by a member of the sanitary board from each county, at which
time the live stock situation in different parts of the state could
be gone over and suggestions offered for the betterment of san-
tary conditions, or any one desiring it could have the need for
any order or regulation already in effect explained by someone
competent to discuss it; thereby establishing a closer relationship
and better understanding between the state authorities and the
people in the different counties.

Reasonable compensation in the way of per diem and necessary
expenses should be allowed county members for attending meet-
ings as provided for above, or when called upon for assistance
by the state board of live stock commissioners.

I am not advocating the creation of county live stock sanitary
boards in order to make a few jobs for somebody, but because I
believe that the most important business in these United States
for the prosperity of state and nation is the live stock industry,
and that a great saving, lasting good, an elimination of imprac-
tical rules, a better compliance to law, and an active co-operation
of the people with sanitary authorities in combatting any or all
contagious or infectious diseases of animals, might be brought
about by substituting practical live stock men in place of im-
practical and inexperienced veterinarians in the councils of state
and federal sanitary authorities.

PRESIDENT DYSON: One of the beneficial results of the recent devel-
opment of foot-and-mouth disease, was the bringing together of the
livestock producers and the livestock sanitarians and authorities. I
most heartily agree with the suggestions made by Mr. Groman on
his subject.

We have another paper on "Organization and Personnel of State
Live Stock Sanitary Boards," by Dr. Cotton, of Minnesota, and when
Dr. Cotton finishes, then we will discuss the two papers if you wish.

ORGANIZATION AND PERSONNEL OF STATE LIVE
STOCK SANITARY BOARDS

By Chas. E. Cotton, V. M. D., Minneapolis, Minn.

The purpose of the organization in a state of a live stock
sanitary board, central control body or department, is the protec-
tion of the health of the domestic animals and poultry and the
prevention of losses to the owner of live stock by the prevention
and control of contagious or infectious diseases.

The success in the prevention of disease is in direct proportion
to the education and intelligence of the owners of live stock.

The success of the Bureau of Animal Industry and the state
boards in the past two years in the eradication of foot-and-
mouth disease, and the practical results in the saving of immense
losses to the live stock industry by control and preventive meas-
asures inaugurated by these departments during the past twelve years has been of great value as a practical education to the agricultural and live stock industry of the entire country.

I am sure that if the proper men, with the help of the agricultural and live stock industries, would undertake to obtain a law authorizing the organization of a live stock sanitary board in their state, there is not a legislature in the whole United States, at the present time, but would enact a law authorizing the organization of an administrative board to control the diseases of domestic animals.

At the present time the organization of the live stock sanitary authorities in the various states differs greatly. I shall undertake to give briefly my ideas of the desirable and necessary provision for the efficient organization and personnel of such boards, together with recommendations that in my opinion are necessary to obtain the best results.

The statute creating a sanitary board should be clear in defining its duties and should clothe it with absolute authority in the control of the contagious and infectious diseases of animals and poultry. It should give the board the power to make such rules and regulations as it deems expedient to protect the health of the domestic animals of the state. The act should legalize such regulations.

The act should empower and authorize the board to enforce the laws relating to the sale of food and food products derived from diseased animals and poultry. The board should work alone or jointly with health departments or town boards of cities, towns, and villages to protect such meat and milk supplies from contamination. This duty, particularly the inspection of meats, most of the state boards, with the exception of Pennsylvania, have neglected.

The act should define the duties of owners of live stock and transportation companies with regard to the movement inter- and intrastate of animals and poultry affected with or exposed to any transmissible diseases.

It should make it the duty of every practicing veterinarian in the state to report directly to the board the existence of any contagious or infectious disease, immediately on receiving information thereof. Neglect or violation of this regulation or law should be punishable by suspension or revocation of license.

To extend the efficiency of the state live stock sanitary board, it should be authorized to co-operate with the proper authorities of the national government in all matters relating to the diseases of domestic animals and poultry.

The basic law should give the board ample authority to take proper steps in all emergencies and should provide for an emer-
gency fund in case there should be an epidemic that cannot be taken care of by the annual appropriation.

The annual appropriation should be large enough to pay all salaries, laboratory, office and field expenses, and to partially reimburse owners for animals destroyed for the eradication and control of contagious or infectious diseases.

The board should be empowered to issue popular bulletins or circulars for public distribution, giving information on the prevalence and control of diseases, their treatment and such other information or sanitation as would be of value to the stock industry of the state.

It should be empowered to control the sale or other disposal of all virus carrying infective agents of contagious or infectious diseases of domestic animals. The sale or other disposal of diagnostic agents, such as mallein and tuberculin, should be regulated by and reported to the live stock sanitary board.

The manufacture of sera and vaccines in the state should be under the supervision of the sanitary authorities.

I do not believe it is the function of the board to undertake the immunization of live stock upon the application of owners, except when there is direct danger of infection. The owner should be allowed to select any reliable qualified practitioner he desires to give hog cholera serum, anthrax, and black leg vaccine, etc., but the owner and veterinarian should be required to immediately report its use and the result.

The board should have the power to take depositions, to administer oaths and compel witnesses to attend and testify in their meetings, in the same manner as any justice court. It should be empowered to call sheriffs or constables to execute its order.

The board should be authorized and empowered to conduct scientific investigations in relation to the causes, nature, prevention and eradication of diseases of animals and should be equipped with a laboratory for diagnostic and research work.

The board should be composed of stock breeders and veterinarians. If possible the members should be appointed for a long term of years and the appointments so made that but one membership becomes vacant each year. In this way it is impossible for any sudden change in membership through the changing of the politics of the state and it places the board in a position to plan its policies and work for a long period into the future. It requires at least a year for a new member to become acquainted with the work and to be of actual service to the board.

The members of the board should not be allowed to do field work and should receive no compensation.

The board should elect an executive officer to act as secretary
to the board and as state veterinarian. He should not be a member of the board. The executive officer should be a man qualified and experienced in his profession, with executive ability and a convincing personality. His salary should be commensurate with the quality of the man. The organization of a board will accomplish little if they fail to elect the right man as executive officer as he should be the technical advisor of the board and is responsible for the efficiency and results of its work.

The board should be empowered to appoint and employ such officers, agents, field and laboratory assistants as it may deem necessary, at a compensation fixed by the board.

The field men should be qualified veterinarians and on full time pay. It is not advisable to appoint or deputize practitioners to act for or represent the board in the community in which they practice.

It is poor policy for the board to make any charge to owners of live stock for any work performed by field men.

In conclusion I wish to emphasize the fact that the sanitary boards of most of our states are not doing their part in the proper protection of their people in the meat and milk supply. The Bureau of Animal Industry inspects meat for interstate shipment only and there is practically no inspection of animals either ante or post mortem, killed for local consumption.

President Dyson: Both these papers are open for discussion, gentlemen.

Dr. Dumphy: Mr. President, I do not wish to take up the time of the meeting more than a few minutes, but I cannot help but feel like supplementing what Doctor Cotton has said in regard to the organization of state sanitary boards. We have a state sanitary board in the state of Michigan, organized very much along these lines, with the exception that we have no control of meat and milk inspection, with the exception of certain cities where they have a local inspector.

The trouble in our state in regard to supervising the meat supply is this. We have so many small butchers, so many small shops, and not any central abattoirs, except at Grand Rapids, Detroit and Cadillac, some of those medium-sized cities. I regret very much the fact that certain cities of from 3,000 to 25,000 or 30,000 or 40,000 inhabitants have not regular meat and milk inspectors. That is one thing we lack very much in Michigan in our live stock sanitary and food control work.

I find that our commission gets along very nicely with the state work. We have a commission which is authorized to draw warrants on the state treasury to recompense owners of live stock that have to be recompensed under the law. This is drawn from the general fund, we have no special appropriation for that purpose, except in 1914 we had to make a small special appropriation to cover our recompense to the farmers in the further destruction of animals on account of foot-and-mouth disease. We have very good police control, the power of quarantine, and the power to compel the sheriff of any county to take charge of that quarantine. We have the power to call on local veterinarians to help us out with the work, which I agree with Doctor Cotton is not the best thing for the local veterinarians. I think it would be much better if we had
a larger staff in our state to carry on this work without the aid of the local veterinarians, because it frequently gets them in wrong. Their clients often think that they are putting a hardship on them, where if the state steps in and does that, they know they have to comply with the law, and there is no kick coming against the local veterinarian.

We have as you know in Michigan a commission made up of three laymen, three men that must be farmers, and engaged in breeding live stock at the time of their appointment. The state veterinarian is under their control, but they give him a great deal of latitude in establishing quarantines and police matters of that kind. He does not have to wait, if he goes to a neighborhood where they require a quarantine, for state or county purposes—he does not have to wait for the action of the board. He is expected to put on a temporary quarantine in conjunction with the local officers, and then the commission takes it up immediately on his report, and makes that permanent.

There are several things in Doctor Cotton's suggestions here that I wish we had in Michigan, but as we are constituted at the present time, we are getting along very well, and we have a thorough co-operation with the Bureau of Animal Industry. We have now in the state of Michigan three veterinarians connected with the Bureau who are detailed for hog cholera work, and we have a thorough understanding and a thorough co-operation with these men.

PRESIDENT DYSON: It is a very important subject, and there should not be any hesitancy in discussing it.

DR. DE VINE: I am only sorry that I cannot disagree with Doctor Cotton, as usual, but I think that he has given us some very good thoughts here. Being a practitioner, I can readily agree with him that it is very unsatisfactory and oftentimes disastrous to local men to attempt to do state work. It is true in certain localities, being familiar with certain conditions that it is better perhaps to get a local man because he can handle it better than the regular state veterinarian, but people do not look upon him in the same way ordinarily, or as having the same power, and that interferes with his own local practice oftentimes. But you will note that Doctor Cotton said that this deputy state veterinarian should be a capable practitioner.

Now, if we should have capable practitioners in every state to act as deputy state veterinarians, the control of animal disease and sanitation would be different, certainly. But for God's sake do not pick men for those positions that cannot make a living at anything else.

DR. RAMSEY: It has certainly been a privilege to listen to Doctor Cotton's address. It has covered the ground thoroughly, and speaking from a bureau viewpoint, I wish that more states had live stock sanitary organizations along the lines outlined by Doctor Cotton.

There is one trouble that I notice in a good many states that precludes the idea of introducing the ideas expressed in his paper. That is, the state legislature in passing a live stock sanitation law, or providing a law for the appointment of a live stock sanitary board, write in so much detailed regulation, a lot of little subjects that do not belong in the law at all, that simply belong to state regulation, that as a consequence they tie the state board up so that they are unable to formulate any regulations that would meet particular conditions that come up from time to time; and I believe it is the duty of every member of this association to try, if possible, to prevent or advise against state legislatures writing too many regulations into the state laws. They absolutely make them so they are inadequate; we cannot use them.

When the United States congress passed a law in 1884, providing for the appointment of a Bureau of Animal Industry, and giving the Secre-
tary of Agriculture the power to carry on this work, it was a very short act, and Secretary Houston said to me about a year ago that he believed he was the most fortunate of any secretary of any department. He said: "I have got less instructions on my work than any other cabinet official. It is all up to me to say what I am going to do."

I believe a lot of the states are making the very mistakes made by the federal government years ago in writing too many regulations into their state laws. (Applause.)

MR. MAT. S. COHEN: Mr. President, I wish Secretary Houston had made that remark to me. As chairman of the live stock sanitary board of Kentucky we are clothed with absolute power of control and eradication of contagious and infectious diseases in our state. We have all the authority that the board requires or should demand with one exception, and that is control of the county farm agents and the demonstrators. They are doing more vaccinating in our state than all the veterinarians in any four states adjoining Kentucky. They even go so far as to advertise through the medium of the county papers that they will go and vaccinate hogs, and if necessary and if able will use a double treatment free of any charge to the owner; and had Mr. Houston made that remark to me, I would have asked him to please put a curb on the county agents in that one respect, because they are doing more harm than they are good. (Applause.)

MR. DUNPHY: Mr. President I would like to say just one word if I may intrude on you again, in regard to that matter. We had the same thing to a certain extent in Michigan, but we called a meeting of some of the local veterinarians, the state veterinarian and the live stock sanitary commission, and the state extension workers, and we got an agreement signed between all of the parties concerned, and we will see that they live up to it. They have signed that agreement, and that agreement is sanctioned by the Secretary of Agriculture, and we have there bound the state agents to desist from that work. We have arranged what is the work of each party, what is the work of the state veterinarian, and the live stock sanitary commission; what is the work of the county agent and the extension workers; and what they are expected to do with the local veterinarians. They are expected to call in the local veterinarians, and I think we have a perfect understanding now, and that is the only way to get at it, to get these county agents together, get a number of the local veterinarians together, the state veterinarian and the bureau workers, and you will have no trouble, I believe, in getting these men to sign up on an agreement of that kind. We have that signed up now, a cast-iron agreement in Michigan, and we will see that they keep it.

DR. EAGLE: Mr. Chairman, I am very much pleased to know that Doctor Cotton brought out the fact that supervision on the part of the live stock sanitary boards should be given the milk and meat supply. On the meat supply I think I am properly informed when I state that less than fifty per cent of all the meat consumed in this country is uninspected. I think about 45 or 46 per cent, is uninspected. I may not be correct in that statement, but I believe that is about right. It does not come under the supervision of the federal government, due to the fact that the proprietors of those establishments are confining their business to intrastate shipments, and the government only supervises such establishments as do an interstate business.

It seems that a great many large things can result from a small start. I have had the privilege in the last twelve or fifteen years of serving the government at different times in different parts of the country, and
in the newer countries I found that you could start toward getting proper municipal meat inspection officers by such means as he suggests. You will be surprised to know how many people in this country are not informed concerning hygiene. Also on the milk question and its relation to public health.

Some few years ago I was stationed in Texas—I am not now with the Bureau—at that time a case of tuberculosis in this abattoir developed, and I made the statement that unless something was accomplished along the lines of dairy inspection in the state of Texas, we might expect to find tuberculosis in a number of herds; and in less than six weeks from that time the city inspector of Fort Worth advised me that some herds he had condemned as high as eighty-six per cent of the cows for tuberculosis. It seemed to me it was a nucleus through which tuberculosis might spread to the range, and they are finding some tuberculosis in the range cattle of Texas. I believe that that matter is certainly worthy of consideration on the part of the live stock sanitary board.

Dr. Eliason: Mr. President, in connection with the county agent, I think that we would do very well if we arrive at some conclusion as to what this county agent's business is, and where he belongs. I quite recently read an article in a paper describing the activities of the county agent, and in enumerating some of the items that make up his salary were twelve consultations on disease at $5 each. It seems to me, the most interesting feature about that was the price he put on his consultations.

In another paper we found where a county agent had operated on a pig and taken out a tumor—the pig was doing well, thank you.

Only recently I got a letter from Missouri from a county agent, who stated that he had been into our state buying cattle with a bunch of farmers, and he wanted information on the condition on certain premises, because one of those cows was reported after they got her home. There seems to be a natural desire on the part of the county agent to antagonize anything that a veterinarian does. I do not know what the reason is, but it seems to be the fact. It seems to me that the live stock sanitary board should be given control of the county agents.

Mr. Cohen: Mr. Chairman, I will state that the live stock sanitary that they report to that body the hogs they had vaccinated, giving the name of the owner, the number of hogs, and so forth, but so far, as chairman of that board, I have never received a report. I want to set myself right before this body of gentlemen by saying that I heartily endorse the extension work by the county agents when they adhere strictly to the purpose and intent of the Smith-Lever district distribution fund, which is nothing more or less than taking scientific agricultural knowledge to the farmers, and teaching the farmer to apply it in a practical way. When he has done that, he has performed his mission; but when he steps behind that a point and clothes himself in the garb of an advisor, then he is not only doing an injustice to himself and to his community, but he is doing an injustice to the department at Washington.

Mr. J. R. Bent: Mr. President, I just want to say a word directly to that point. I am very much in sympathy with the veterinarians and the work that they are trying to do. I happen to be the unfortunate man who owns a herd. I wish to say that I for one believe that the greatest good can be accomplished by co-operation on the part of the people who are informed along different lines, working together as the gentleman from Michigan suggested, and not bucking each other and knocking each other.

I am in favor of live stock sanitary boards, selected by virtue of the
ability of the individuals on them, removed from political control so far as possible, consisting perhaps largely of the best veterinary ability that can be had, but consisting also of representatives of the other phases of the industry, including the business side of it. (Applause.)

Dr. Cooley: I wish to say that our board in the state of Ohio is a bi-partisan board of six gentlemen representing the stock growers, as the gentleman here has mentioned. I am a product of their selection. I have tried to keep my veterinarians entirely bi-partisan.

Dr. Cotton: Mr. Chairman, in the presentation of my paper I did not anticipate leading to the discussion which followed, but I wish to state in answer to some of the propositions that were made by gentlemen who took part in the discussion, particularly in the statement that it was up to this body to try to get away from politics—gentlemen, this is a democratic form of government. It is not up to us to change conditions wherein we can get away from politics. We must meet these conditions, and we must be somewhat politicians. This is a democratic form of government, but I tried in my paper to bring this out fairly, in order to bring definite policies far into the future, so that a shift in the state authorities every two years, as in our state, would not necessarily interfere with the working of that body.

In Minnesota we have a state license board made up of three men who are breeders or directly interested in the live stock industry, associated with two qualified veterinarians. We employ a field force. The members of our board received no compensation whatever. A change of politics in our state does not mean that every official is going to lose his position. The members of the board are appointed for five years; each year only one man goes off the board, and as the governor is elected every two years only two men go off of that board during his term; but, gentlemen, you cannot get away from politics, you are never going to get away from politics unless you establish a monarchy. (Applause.)

President Dyson: The next thing on the program is: “Desirability of Exempting Range Bred and Branded Cows and Heifers from State Regulations Governing Importation of Cattle for Breeding and Dairy Purposes,” by F. S. Hastings, of Texas.

**DESIRABILITY OF EXEMPTING RANGE BRED AND BRANDED COWS AND HEIFERS FROM STATE REGULATIONS GOVERNING IMPORTATION OF CATTLE FOR BREEDING AND DAIRY PURPOSES**

*Synopsis of Address by F. S. Hastings, Manager S. M. S. Ranches, Stamford, Texas*

I must treat the subject assigned from a little narrower standpoint than as given, and in order to make myself plain will discuss it from the following standpoint:

“The desirability of exempting branded range bred she stuff of distinct beef families, either straight or cross bred, from the Tuberculin test when shipped direct from the range interstate for breeding purposes.”

I have narrowed it to beef breeds for several reasons. First, because the great mass of evidence shows range bred beef herds to be free from tuberculosis. Second, because there are practi-
cally no range bred dairy cattle, except so far as beef breeds may be used for dairying purposes. Third, because all of my knowledge and investigation is limited to range bred beef herds. Fourth, because I am here in response to an unusual renewed interest all over America in breeding beef cattle. And the fact that the great pastures, called ranges of the West and Southwest, produce the best beef cattle in America, and is the only real source of supply for high class breeding females in appreciable quantity, and at attractive prices.

I must, however, before entering the subject, ask that nothing that I say will be construed as directly or indirectly asking or suggesting that any regulation which guards the welfare of the livestock interests of any state be relaxed to the detriment of its livestock health. But rather that you investigate carefully the data which I shall put before you, and figure out for yourselves what the best interests of your citizens suggest. I want to go a little further and add that I am not asking, and do not want for my company any special privileges. There are hundreds of well bred beef herds all over the range country just as good as any cattle raised in quantity anywhere in America, and they are equally available with anything we may have to offer. Every state should think of the problem selfishly as to whether its farmers and breeders are being helped or hurt by the exclusion of range bred heifers of beef families for breeding purposes.

No range breeder objects to the test—it is simply the impracticability of making it on the range or in transit. Thousands of range bred steer calves and yearlings go to the corn belt every year, and soon become very adaptable and domestic, but on the range raised in immense pastures are wild, and the temperature test is out of the question. When shipped they encounter all the new noises and strangeness of everything, and in any carload the chances are that a few at least would show temperature from fright before the introduction of the tuberculin.

The very much increased values of cattle have stimulated farmers and breeders all over America to try again the plan of breeding beef cattle. A limited number of cattle of proper age and quality can be found in the markets, but as a proposition producers will only sell at a known price at home. The present inquiry with us lead me to obtain data from every state as to their regulations for admitting heifers for breeding purposes. I found that the great bulk of Northern, Southern and Eastern states included everything east of Missouri River, require the tuberculin test on all stuff over six months for breeding purposes. Also that many require the temperature test, and many the intradermal test. The government leaving it entirely with the states as to their own regulation, but not recognizing the intra-
dermal method, and furnishing inspectors at market points only for the temperature test.

I made a trip to Kansas City and St. Louis; asked for the assistance of the Bureau of Animal Industry in making an investigation both as to facilities for and practicability of making the temperature test in transit. They entered into the investigation heartily. Facilities are ample at both places, but at both places they said that in their opinion quite a percentage of cattle would show temperature from fright, which in turn would detain car-loads, or cut into them in such a way as to make the test in transit impracticable.

We have always worked in very close co-operation with the Bureau of Animal Industry in the matter of tick eradication, and everything else in connection with the welfare of cattle in Texas, so we wrote Doctor Ramsey asking for statistics as to whether range bred cattle of beef families had ever specifically shown tuberculosis under slaughter inspection. We had hoped that records would perhaps show that cattle of this or that brand had been rejected, but are advised that rejection does not go beyond the fact that an animal is rejected. He was, however, able to give us some very conclusive data which is submitted a little later on. We made every effort to locate any case of range bred cattle showing the disease, but were able to locate a record of only one small herd in Montana which a good many years ago got it from bulls brought in; discovered it in good time, and stamped it out.

Doctor Ramsey informs us that the Government record of slaughter inspection over the whole United States in plants under government supervision, is 2.22 per cent for six months ending December 31st, 1915. The markets of Denver, Fort Worth, Omaha and Wichita, which show the largest percentage of range cattle, drop to 38 of one percent, and Kansas City, which also slaughters a good percentage of range cattle, drops to .70 of one percent.

It is to be regretted we cannot give figures by sources, and while I have an immense lot of data showing origin of cattle marketed at Kansas City, it would still be deductive figuring. I feel, however, that the figures given support significantly the fact that tuberculosis is more prevalent as the direct range supplies decrease.

After making my investigations I addressed a circular to all state veterinarians and state sanitary boards covering my investigations, and calling attention to the inquiry for heifers and asked them to consider the problem from the standpoint of their own citizens wanting stuff not available under existing regulations in many states.
Most states admit she stuff for feeding purposes. We figure, therefore, that stuff admitted for breeding purposes and subject to test any time the state might deem it necessary did not in any way offer a menace.

Kansas, Colorado and Montana all of which states have perhaps had more experience with range bred cattle than most states, and are in splendid position to know of the development of tuberculosis in any range bred cattle brought in, admit range bred she stuff any age shipped direct from the range without the tuberculosis test in any form.

Our circular met with a very keen interest. Many boards have changed their regulation in some form or another. Quite a few issue permits for each specific shipment, reserving the right to make the test at home of buyers after cattle become more adaptable.

Illinois admits under nine months, which looks like a safe regulation for states, and is practicable for the producer who weans in fall and ships, but always has some stuff over the six months limit.

As a summary, at this time, say December 1st, 1916, twenty-nine states admit range bred heifers without the tuberculin test—about half of them with some restriction as to age or specific permit or inspection later at home of buyer. Thirteen states will not admit without it, and six states have made no reply—they should, therefore, be placed in the negative with the result twenty-nine for and nineteen against admission direct from the range—beef breeds.

I have been asked my view as to what regulations should apply. I think that where the state has any doubt from inexperience or conviction, specific permit is a good thing, and the reservation of the right to test later if inspection suggests it. This gives the authorities absolute information on anything shipped in without the test. And I would say that whenever a range bred heifer is going to be used to furnish milk for human consumption, that she should first be subjected to the tuberculin test.

The serious limitation is that most men who are going into the breeding business want the yearling or two-year-old—usually the yearling for fall delivery, or early spring delivery as a coming two-year-old. No raise in the limit of the calf age will help the situation, and the buyer will much prefer to pay the range carrying charge to keeping a heifer calf until old enough to breed.

I am only asking you to take these things home and discuss them with your own people. Your states need our cattle just as much as we need your market, and my whole thought is some plan which will bring us together without in any way jeopardizing
the safety of the live stock interests of your states. I could not be here without a word as to the splendid work you are doing in your various states, and in a national way as a representative body for the health and advancement of live stock interests.

Our own state of Texas is doing a wonderful work in co-operation with the government, and I am sure that ten years will find Texas without a tick.

I am with you 'till the last horn blows on whatever may be for the best interests of the live stock industry in every state in this nation.

PRESIDENT DYSON: There is absolutely no question but what our breeders and feeders have got to soon look to the source of supply. With the eradication of the Texas tick, the southern country takes its place as the logical breeding ground for our future cattle for the feed lots.

DR. RAMSEY: Mr. President, I might say that I was probably the primary cause of the gentleman coming here and addressing this Association. I may say that when our men at public stock yards undertook to do the work of testing for interested men, it was not the intention in the first place to do that on a large scale, but it has drifted into a big scale, and they are offering now 500 and 1,000 head at a time. We would like that changed. I want to say that the test of range herd cattle at public stock yards has been somewhat unsatisfactory in a number of instances, some cattle have been held at some stations as being reactors, showing a high temperature, when they were all right. We have this condition now. Some of the states will permit cattle to come, direct from the range to their states for breeding purposes, but if they go through Kansas City or Omaha or some public stock yards, then they must be tested. I believe there is a way for the state live stock sanitary officials to eliminate some of this red tape. I believe it could be done safely. We have instructed some of our men, when they put it up to us, that they have five hundred cars of cattle that they wish tested, to let the state test it. If the state wanted to test, let them do it. We feel just that way, if the state wants to assume the responsibility, that is up to them, but we do not wish to carry out that duty ourselves with the meager assistance that we have at hand. We only started as a matter of convenience to the carriers moving the cars.

PRESIDENT DYSON: It seems to me that the live stock sanitary boards could not possibly render a more valuable service than to make it possible for the beef cattle breeder to obtain his supply direct from a field that is practically, you might say, free from tuberculosis. You avoid the further handicap of having such cattle pass through public stock yards, and there being exposed to any contagion, and if there is any contagious or infectious disease in the country, you can look for it at the public stock yards about the first place. It seems to me that we might take this up in the form of a resolution, or have a motion made in regard to it. I will suggest that to the chairman of the resolutions committee. It seems to me a very simple matter to make satisfactory arrangements to have cattle go direct from the ranges to the purchasers.

The next on the program is "Suggestions for Regulations Governing Interstate Movement of Live Stock," by Dr. E. M. Ranck, of Mississippi.

Regulations of Interstate Movement of Live Stock

DR. RANCK: Mr. Chairman, and members of the association: When your worthy Secretary gave me this subject, simply suggestions, I thought
it would be out of order and out of proportion to write a paper, and as the program is very interesting this evening, and a number of other very important papers are to come up, I am very glad I did not attempt to write a paper.

The state of Mississippi has adopted the federal regulations to control infectious and contagious diseases, and therefore, in accordance with that regulation, I could not legitimately allow stock to be shipped in there over six months of age to be used for dairy or breeding purposes, without the tuberculin test. Doctor Ramsey has suggested a moment ago that possibly the states should assume that responsibility themselves. To my mind, and after talking with several of the practitioners from Texas here, at this meeting, some of whom have told me—I cannot recall their names, that some of the range cattle are more or less tuberculous, I rather believe it would be a dangerous procedure. That is my honest opinion about it, so far as I am concerned now.

The tuberculin test, and the issuing of a certificate, is a question of personal equation, because if a man wants to be crooked, and he is mean enough and foolish enough to be crooked, he can issue any kind of a certificate. It is a question of personal equation. I am glad that there is a movement started on foot here to give light to us who are groping in darkness.

The southern sanitarians have a great deal more to accomplish in the next few years than you have, because our crops have been knocked out from under us there, our main source of revenue has been cut off, and it is up to us to get those people started in a new line of work. We are looking to livestock, and those of you in different parts of the country that ship your livestock in to us, we want you to understand that we will gladly do anything that we possibly can to encourage your business, because that means more good stock for us. We do not want you to think that we are putting any bars against you or your states or your shippers, Mr. Hastings, or any other man in this audience. On the other hand, it is our duty to protect the interests of our state in every way that it is possible to do, and I hope that before we leave here, through this uniform certificate arrangement that Doctor Kiernan has so clearly and distinctly and completely outlined, that we will be able to at least start something that will be of some material benefit to all parties concerned.

Why have these many different kinds of certificates, anyway, gentlemen? Your problems are the same in New York and Pennsylvania, Minnesota, Montana and Kansas, as they are in Mississippi, and the other Gulf states. So far as these conditions are concerned, your problems are not different from ours, with the possible exception of some of the diseases, like tick fever that we have down there. Why should one state stand with a great big lot of red tape in the form of certificates to keep them from shipping out? I have an arrangement right now, made with the state veterinarians of my adjoining states, Tennessee, Arkansas, Alabama and Louisiana, to this effect. I have been through the extension workers, advocating the raising of livestock. Take the poor man, the little fellow, if he raises a pig and he wants to sell it, he lives perhaps 25 or 50 miles in an inland town away from a railroad, away from a veterinarian, and if we would require a veterinarian to go and make that inspection, he would necessarily have to charge more than the fellow got for his pig, because it would take him probably a day to make that trip; and yet we want to encourage the development of pure-bred production of livestock. Don't you see what a proposition we are up against, but what will we do?

I wrote to the state veterinarians in my immediate neighboring states.
and asked them if I would vouch for these men and make an affidavit to the effect that no disease existed on their places, whether they would accept it, and they said yes. And so we have to work out a uniform plan, and my idea is that we should endeavor at this meeting to take in all these little points; but remember that the personal equation of the whole proposition is the most serious one of all.

If you wrote letters to a dozen different men asking them to tell you exactly how to make a tuberculin test, there would not be three of those answers alike in detail. Why is that? Is the tuberculin test any different in Pennsylvania than it is in Mississippi? If it is, then there is something wrong, so we have done this. Knowing we have a condition there that northern people do not know anything about, we have adopted a uniform system of inspection in issuing certificates, and that has worked out to such an elegant degree that in 1917, the 15th of December, 1917, Mississippi will be free from ticks, not in 1920 (applause).

And it is only through the co-operation of the federal and state departments that this has been brought about, and the uniform issuance of certificates; so I believe it is up to us at this meeting, and I hope I am not going to take up any more of your time, because I cannot—I do not feel capable of even suggesting how this should be done, but I hope and pray that before we leave this meeting, that we will at least start a movement to bring about a uniform method of inspection and issuing certificates. (Applause.)

DR. PETER F. BAHMSEN: Mr. Chairman, referring to Doctor Ranck's talk, I think that he has overlooked the fact that the tuberculin test of range cattle is not practical. You take the range cattle, and the temperatures vary, at their first reading, from 104 to 105 degrees.

It has been our experience, without commenting on the Texas cattle at all, that on the range cattle of Georgia we have practically no tuberculosis. That the packing house at Atlanta during the last two years that it has been in operation, I don't think that they have found as much as one-fifth of one per cent of tuberculous cattle, and that includes some of the discarded milk cows. It certainly is a hardship on the buyer, as well as on the seller, if there is no tuberculosis in range cattle to compel them to undergo this test, and we should by all means arrange some way to facilitate the movement of these non-tuberculous cattle without subjecting them to this expense and inconvenience.

I think that the suggestion made by Mr. Hastings is not very fair, the way I look at this matter.

MR. HASTINGS: If unfortunately it seems to be the idea that in speaking of Mississippi it was in a spirit of criticism, I want to dispose of that right now. I mentioned Mississippi because I do not think that any state in the union is asking more for information about breeding cattle than Mississippi. I have been very much interested in the comments about tuberculosis on the range. I have gone to the limit. I think the man who fools himself is the worst fool on earth. and to come before you with the statement that Texas cattle or cattle from the range were free from tuberculosis, if I could find that they had tuberculosis, would be simply to defeat anything I might say. If there is anything wrong with those cattle, then we ought to take every precaution, but on the other side, if they are free from tuberculosis, we want to get our cattle to you in the manner most comfortable to them and with the least complications.

DR. RAMSEY: When this matter comes up, if those proposed regulations are adopted, it will provide for this. If you look at the top of page six, section two:
“It is hereby ordered that any firm or corporation or any common carrier wishing to import into this state bulls, work oxen, or female cattle over six months old intended for breeding or dairy purposes, other than branded range stock, must procure, before shipment, a health certificate and a tuberculin test chart in triplicate from the state veterinarian or assistant state veterinarian, or a veterinarian whose competency and reliability are certified to by the authorities charged with the control of diseases of domestic animals in the state from which the cattle are to be transported or moved, or from a veterinary inspector of the Bureau of Animal Industry of the United States Department of Agriculture.”

If that meets with the approval of the federal authorities, it certainly will meet with the approval of Mississippi, if endorsed by this Association.

Mr. Hastings: Mr. Chairman, of course, stock might be shipped and held in a place for a year and shipped ahead, and it might have a chance to be infected. If you are afraid of tuberculosis in range bred cattle, and those cattle are stopped on the way, give them the limit in the matter of inspection before you let them go anywhere else.

Dr. Ramsky: Mr. President, in regard to the suggestions made by Doctor Ranck about introducing the range-bred cattle under special conditions, I would like to ask a question and that is this: What is a range-bred animal? I would like a definition in there of what a range-bred animal is, and I would suggest this, that nearly all the western states have got branding associations, and these range-bred animals should be branded by a brand recognized by the branding association of the state in which the animals were raised. That will probably cover that. We have had this question of what is a range animal. I think we ought to have some qualifying term in there. If a state live stock sanitary official was in doubt as to whether these animals were bona fide range-bred animals or not, he could always wire the secretary of the branding association of the state and find out if this man was raising range cattle, and whether his brand was registered with him.

Mr. Hastings: As a practical range man, I might suggest that there is a way out of this, if you want to leave it in the hands of the state authorities to make any investigation they want. That puts it up to you to make your own investigation. It leaves the matter still in your own hands, if you know what they are, and if you don’t, all you have to do is to hold your ground.

Another thing, when you say cattlemen must belong to an association, you might be under criticism, particularly if the Government took part in it, of obliging a man to join the association in order to have his cattle made available. A man might say: “I don’t want to go into the Texas cattle raisers’ association, and I cannot ship my cattle unless I do.” It is up to you to know whether they have a right to come in or not.

Dr. Frank A. Ingram: Mr. Chairman, I am from the eastern part of the country, where the most we see of these beef cattle is after they are on the table. However, there has been a movement started east of the Hudson River, whereby that part of the country will produce a superior quality and a considerable quantity of beef. I notice scattered around here some of the literature of the large ranches, like the ranch Mr. Hastings represents, in regard to the stock, and we have, I am very glad to say, found that our recent additions to the beef reserve cattle are very satisfactory.

Now, in regard to the admission of animals from the ranch, provided we know they are from the ranch, they can be released from quar-
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antine according to law and they should be admitted, and this pertains to the eastern states as a rule. When those animals are shipped in, if they are accompanied by a tuberculin test certificate that is satisfactory, they are released at once; but in the case of beef cattle, brought into Connecticut, for instance, for feeding or breeding purposes, they may be released according to law in the judgment of the shippers, or the association there, by a physical examination, or if found necessary, after a tuberculin test.

Now, there is no difficulty in testing range cattle. There might be difficulty on the range, but after they get down there in our small state, in our stables, they can be, in a short period of time, made gentle sufficiently to test them if necessary. I think the problem of the tuberculin test should not interfere with the shipment of any cattle intended to improve the supply of either beef or dairy cattle. Our dairy cattle, unfortunately, in the east, would contaminate any cattle. There is no doubt that in New England thirty per cent of the dairy cows are tuberculous and it is a grave question with us. If you introduce healthy beef cattle among contaminated dairy cattle, your beef cattle will soon show the disease, as well as the dairy cattle.

Of course, that can be dealt with as local cattle are dealt with.

DR. ANDERSON: Mr. Chairman, this subject that is being discussed interests me very much. There is one side of this subject that is being neglected, there is one feature, I think, that is very material that has not been fully brought out, and that is a condition such as ours, situated as we are located right on the border of a range country, and a feeding or farm country.

In Omaha we have cattle brought in for every purpose. The shipper who ships them in consigns them to a commission man and that is the end of his ambition. They are taken care of after they leave him, and he gets his money for them. The thing about it is this. Those cattle are shipped east on a feeder permit, maybe honestly enough at the time they are shipped out, but after the man gets them out in the country 100 or 200 miles, he will maybe be right back into the grazing country again, and he changes his mind and sells them for dairy cattle. This is being done every day of the week, and it is a serious proposition.

In answer to the gentleman from Texas, I want to say that we have considered this thing seriously, and realize that nature is very kind to us. Range cattle are practically free from tuberculosis. You may have an old range cow that has tuberculosis that is out in the rain or sleet and she perhaps dies, and in that way you are rid of your tuberculous cow, but it does not always happen. Nowadays some of those people out there are building barns, and the old tuberculous cow is picked up when a storm comes and put in the barn to infect the other cattle on the farm.

For that particular reason, we have got to consider seriously whether or not to accept animals of this particular character without a tuberculin test. I am not saying that we ought to have a hard and fast fixed rule. I, for one, would not consent to such loose regulations as this, as to permit range cattle or feeders and grazers, because when you talk about range cattle you are talking about feeders and grazers—it is all one thing—and if some man in this audience would undertake to define a feeder or grazer, and have that animal remain that way for twenty-four hours or longer, it would accommodate me—we have tried to get a definition of what a feeder or grazer is, and how long it remains in that condition, how quick it can change. The time has passed for doing that. A man intends to be honest, but he finds when he gets into a country like the western part of Nebraska, he goes into the dairy business,
Many farmers have done it on a small scale, some not so small, some may have forty or fifty cows, and that milk is taken to the railroad stations and shipped.

This is a proposition that I do not hope to figure out, but I do not want to have this matter overlooked. I want to bring it to your attention, because it is an important feature. It is a serious matter with us. We live right on the border of the range and the feeding farming country, and it keeps changing from one place to another. I haven't got anything to say about the health of our cattle otherwise than that we are very free from tuberculosis. (Applause.)

PRESIDENT DYSON: If there is nothing on this subject, we will pass to the next: "Reasonable Regulations for Cleaning and Disinfecting Stock Cars," Mr. Cohen.

MR. COHEN: Mr. President, and gentlemen of the convention: When my friend first wrote me and asked me would I make a little talk along the lines of reasonable cleaning and disinfection of stock cars, I wrote him back immediately yes; but after giving the matter some thought, thinking of how easy it is to misunderstand each other, or to say something that we did not exactly mean to say, I have prepared a little paper, and my reasons for reducing it to manuscript form were brought about by the fact that it often happens that you become involved in real trouble even in your own home simply by being misunderstood and misconstrued.

We had that thing plainly brought out in my own home. My father was one of the most thoughtful men in the world, and when away from home over night, mother not knowing where he was, the following morning he would always wire her what he was doing, and where he was. On one occasion he came to Cincinnati with several cars of cattle, but not liking the market, he decided to keep on going to Chicago with them. Taking the sleeper that evening, at the first stop out, about eighty miles, an elderly lady came up into the sleeper, and there she found every berth, lower and upper, and even the state room occupied. My father seeing the predicament of this old lady said to her: "Madam, I have lower six. It is yours. I will go back and impose on my friends." She, seeing the sincerity of his offer, accepted, and on to Chicago they went. On his arrival the next morning, following his usual custom, he repaired to the telegraph office and wired my mother as follows:

"Am in Chicago. Reached destination o. k. Feeling fine. Gave berth to an old lady." (Laughter.)

Now, I am glad I reduced this to writing, because you might have misunderstood me.

REASONABLE REGULATIONS FOR DISINFECTING STOCK CARS

By Mat S. Cohen, Commissioner of Agriculture, Kentucky

I have always been taught to believe and do believe that cleanliness is next to godliness, and in making that confession it will impress upon you from the very outset that I am a stickler for as nearly perfect sanitary conditions as it is possible to have them. From observation, I believe that the best way to check or hamper the spread of any infectious or contagious disease is by disinfecting, thoroughly cleaning, in such manner as to welcome the rays of God's sunlight, which is one of the greatest germ destroyers known. From experience I know that the bet-
ter the sanitary conditions are, the cleaner the premises, the more wholesome the air, the more inviting condition of sunlight, the happier and healthier are all kinds and classes of animals. Understand, I am not discussing from the standpoint of the coon, the possum and the ground-hog. I also know from experience that unclean, filthy stock cars, where the manure, bedding and slush have been permitted to remain in the cars for an indefinite period, are one of the greatest germ havens known. I also know from experience that condition of stock cars of this character shortens to a great extent the period of usefulness of the cars, and I believe the officials of many of our leading railroads have come to the conclusion that by the frequent cleaning of the stock cars its presence is kept from the repair shop for a period many times longer than the cars which are permitted to carry the above described filth. Therefore, it should be as much to the interest of the railroads to keep their cars clean and free from this germ carrier as it is to the live stock interests, and it is equally true that the railroads receive a larger revenue from transportation of live stock, when such are plentiful, because the more hogs we have the more hogs there are to ship; and the same is true of all other classes of live stock. In my state the hog cholera has decreased from 40 to 50 per cent since the eradication of foot-and-mouth disease, and that can only be attributed to one fact, and that is, through the medium of cleaning and disinfecting cars. The same is true of scabies in sheep, and tuberculosis in cattle. Therefore, what I would construe as reasonable cleaning and disinfecting stock cars would be for congress to enact a law requiring the railroad companies to clean and disinfect their cars at least once every thirty days; and in order for the connecting lines to know when the car was cleaned and disinfected, each road should be required to card the car, showing on the face of the card when it was last disinfected, the place of disinfection, and by whom; and make the penalty for failure to disinfect so severe that no railroad agent would dare permit stock loaded out unless the placard showed that the car had been cleaned and disinfected within thirty days. I know some of the railroad companies will protest against such a measure, but if they will only stop and consider the fact that it prolongs the usefulness of the car, and at the same time makes possible a greater supply of live stock, they cannot as a matter of good business offer very strong argument in rebuttal. Some one may say, “Let the states take it up first.” In other words, practice the doctrine of local self-government, which is all right so far as it goes; but that would be liable to work a hardship on some markets. It has been less than six months since the live stock sanitary board of Kentucky, of which I have the honor
to be chairman, required that all cars coming into market centers and going out from market centers in the state, be cleaned and disinfected immediately prior to loading; and for this cleaning and disinfecting some of the common carriers added the charge of $2.50 per car. The Illinois authorities did not require such cleaning and disinfecting at that time, and as a result of our live stock sanitary board's orders, stock was diverted from the Louisville market to that of St. Louis, and in every case investigated the reason was given, "because they did not have to pay $2.50 per car for cleaning and disinfecting when shipping to the National yards at St. Louis." Why, in less than one month the Louisville market lost over 500 cars of stock; and as soon as the live stock sanitary board of Kentucky saw the effect it was having upon the leading live stock market of Kentucky, it rescinded the cleaning and disinfecting order and by so doing placed the Louisville market upon equal footing to that of St. Louis. That is why I say that this organization should appoint a committee to provide a bill to be introduced in congress, requiring the cleaning and disinfecting of all stock cars along the lines herein stated; and then urge upon each member of this association to consider himself a committee of one, to take the matter up with his congressman and United States senator in an endeavor towards enacting such measure into a law. The sooner this is done, the better it will be for the entire live stock industry; and the greater the live stock industry, the happier the homes of this community. We should not overlook the fact that at the close of the European war all eyes will be turned toward America, and it behooves this organization to get behind the American farmer in the greater production of live stock, not only for consumption in this country, but to feed the unnecessarily made widows, orphans and cripples of Europe; and the first step in that direction would be to have congress say to the various common carriers, "Each and every stock car must be cleaned and disinfected at least once every thirty days; and since it has been shown that the railroad companies would be equal benefactors, they should be compelled to do this cleaning and disinfecting without an additional charge upon the shipper."

I thank you.

PRESIDENT DYSON: Dr. Marshall, you are next on the program.

DR. C. J. MARSHALL: Mr. Chairman, I have prepared nothing on this subject. I am very much interested in the subject, however, but have nothing to add to what has been presented in this good paper that we have just heard. I wish to endorse the sentiments, and add to it perhaps to clean every car that is known to handle animals that are affected with transmissible diseases. I have nothing to add to it, and I will asked to be excused.

PRESIDENT DYSON: Dr. Torrance, will you tell us something about this?
Dr. Frederick Torrance: Mr. President, and gentlemen: Your secretary invited me to present a paper upon the subject of car cleaning in Canada. I did not know that I was expected to criticize or follow another paper upon this subject, and I must confess that I do not feel at all inclined to criticize the methods that are in use in your country. I will therefore present, without any comment, the account which I have written of our system in Canada. It may possibly present some ideas which would be of value in dealing with this matter in the United States.

CLEANING AND DISINFECTION OF STOCK CARS AND YARDS IN CANADA

By Frederick Torrance, Veterinary Director General of Canada

The system in operation in Canada is based upon the authority of a law of the Dominion government. This law is known as the animal contagious diseases act, and gives authority to the governor-in-council to issue such regulations as may be necessary to carry out the intention of the act.

The regulations under which this work is carried out are worded as follows:

Sec. 86. "Stock cars or other vehicles used for the conveyance of live stock shall be cleansed and disinfected at such times and places as the Minister may order. Such disinfection shall be done by the thorough cleansing of the car and its subsequent whitewashing with lime and carbolic acid in the proportion of 1 pound commercial carbolic acid to 5 gallons of lime-wash or such other process as may be approved by the Veterinary Director General."

Sec. 87. "Any inspector may at any time when he deems such action necessary or advisable, order any steamship, steam, or other vessel, railway car, or other vehicle, used for the conveyance of animals, to be cleaned and disinfected to his satisfaction, as provided by Section 86, at the expense of the person or company, owning or operating same, and may prohibit the use or removal of such vessel, car, or other vehicle, until his orders in regard to cleansing and disinfection have been properly carried out. Shippers may refuse to place their animals on any unclean or unsanitary vessel, car or other vehicle and may lodge a complaint with the nearest inspector, who, if he deems such action necessary or advisable, may exercise the powers conferred upon him by this section."

Sec. 88. "The Minister may from time to time make such orders, not inconsistent with the provisions of this order, as may appear to him necessary or expedient."

It will be noted that this is a federal law, not provincial, and is equally effective in all parts of Canada. This law was passed in 1903 and the cleansing and disinfection of cars was required whenever there was reason to suspect that they had carried infected live stock and whenever an inspector objected to the dirty condition of a car.

It became evident after some experience that the system would have to be extended if it were to give the protection desired, and in 1909 ministerial orders, Nos. 33 and 37, were issued. These extend the cleaning and disinfection to all stock cars, irrespective of whether they may have carried diseased live stock or not, and forms the basis of our present system.
Ministerial Order No. 33

Under and by virtue of the authority conferred upon me by the provisions of the Order in Council of November 30, 1909, containing regulations relating to Animals Quarantine, I do hereby order that:

1. All stock cars intended for the conveyance of animals from any point in Canada to the United States, or for transit through United States territory to any other part of Canada, must be thoroughly cleansed and disinfected before such animals are placed therein.

2. All cars conveying animals into Canada from the United States, whether such animals are intended for points in Canada or for transit to some other part of the United States, must be inspected, and unless found in a clean and sanitary condition will be returned to the United States.

3. All stock cars, whether of Canadian origin or not, and whether empty or conveying merchandise other than live stock, entering Canada from the United States, must, if not already showing evidence of having been so treated, be thoroughly cleansed and disinfected to the satisfaction of an inspector of this department, otherwise they will be returned to the United States.

4. Stock cars which have conveyed animals from the United States to points in Canada must be thoroughly cleansed and disinfected immediately after being unloaded, and before being returned to the country whence they came.

5. All hogs entering Canada for transit and all cars conveying such hogs must be inspected by the inspectors of this department immediately after entering Canadian territory. Any cars containing hogs showing evidence of disease, and any cars which are dirty or which do not, in the opinion of the inspector, meet in every way the requirements of the regulations of this department, are to be immediately returned to the United States.

6. All inspections, as provided above, must be made between the hours of 8 a.m. and 4 p.m.; provided that should any railway company furnish artificial lighting and other facilities satisfactory to the department, inspections may be made for such company at any hour, on due notice being given to the inspector on duty at the time being.

7. All cars conveying swine from the United States into Canada intended for transit to some other part of the United States, must be fitted with ten-inch foot boards in a manner satisfactory to the inspectors of this department.

8. The practice of douching or drenching with water United States hogs, or cars containing United States hogs, while in transit through Canada, is strictly prohibited.

9. United States hogs while in transit through Canada must not be unloaded from cars containing them on any pretext whatever.

10. Any animal dying from any cause whatever when in transit through Canada from one point in the United States to another in that country, must not be removed from the car in which it died while in Canadian territory.

(Signed) Geo. F. O'Halloran,
Deputy Minister of Agriculture.

Ministerial Order No. 37

Under and by virtue of the authority conferred upon me by the provisions of the Order in Council of November 30, 1909, containing regulations relating to Animals Quarantine, I do hereby order that:

1. All empty stock cars arriving at or passing through any of the places hereinafter mentioned shall, unless bearing evidence of having previously been so treated, be cleansed and disinfected under the supervision of an inspector before being allowed to proceed:

- Halifax, N. S.; St. John, N. B.; Montreal, Point Levis, Quebec, Que.; Toronto, Chatham, Ont.; Winnipeg, St. Boniface, Man.; Moose Jaw, Sask.; Medicine Hat, Lethbridge, Calgary, Edmonton and Strathcona, Alta.; Cranbrook, Nelson, Revelstoke and Vancouver, B. C.

(Signed) Geo. F. O'Halloran,
Deputy Minister of Agriculture.

The work of cleaning and disinfecting stock cars is done by the employees of the railways under the supervision of our inspectors. At each point where car cleaning is done the railway has the necessary plant in a suitable location in the railway yard. Stock cars are switched to this cleaning depot soon after
unloading and not returned to traffic until our inspector has affixed his certificate. All manure, dust and refuse is first cleaned out and the car swept out. The disinfecting solution is then sprayed on floor and walls until our inspector is satisfied with it. The inspector then signs the car inspection certificate and tacks it on to the car. He also makes a record of the car number and the date when cleaned.

For disinfecting we designate no special disinfectant. The railways are permitted to choose for themselves, but we do insist that whatever disinfectant is chosen shall be submitted to us for approval. Samples of each disinfectant which they desire to purchase are submitted to us, and tested at our laboratory. If found satisfactory, its use is permitted. We also test samples from the bulk packages received at the cleaning station as it is sometimes found that a disinfectant sold under a certain trade name will vary in strength to a considerable extent.

The staff employed by us in the work of car inspection consists of three traveling inspectors, two for western Canada and one for eastern, and a car inspector at each cleaning station. The traveling inspectors supervise the work of the local car inspectors, and are also responsible for the condition of railway stockyards all over the country. Whenever a stock yard is dirty or in bad repair, the traveling inspector is responsible for having it placed in proper condition. Reports are made regularly to head office, so that we are in constant touch with the work.

At the present time we can, I think, claim for Canada a very efficient system of car cleaning. Officers of the British and French remount depots have been surprised at the cleanliness of our stock cars and say that they are kept in the best condition of any in the world. This has not been accomplished all at once. Railway managements were at first inclined to resent interference with their cars. This attitude has altogether changed. The railways are now fully convinced of the importance to them of controlling contagious diseases of live stock, and we have their hearty co-operation in this essential matter.

The indifference and carelessness of railway employees has often been an obstacle, but the firm stand taken by the department has stiffened the management so that little trouble is now experienced in that way. If a car has carelessly been allowed to proceed without cleaning we have it returned to the cleaning plant as soon as it can be located, sometimes involving a return journey of a hundred miles or more. We are able to do this by a system of comparing our list of cars cleaned with the railway list of stock cars received at that point.

The credit for introducing this system and perfecting its details belongs to my predecessor, Dr. Rutherford, who had many
difficulties and obstacles to surmount and was successful in
attaining his object. At first there was much difficulty in getting
the railways to do the work properly. Some of them would try
to disinfect on top of the manure, others would send cars out
without cleaning or disinfecting, others again said it was im-
possible to do this work in winter, or that it was too expensive.
However, by insisting on the return of uncleaned cars to the
nearest plant, and reporting the case to the railway manager,
the situation gradually improved. Now that the railways are
permitted to charge the shipper for the cleaning and disinfecting
of his car, they can make no objection on the score of expense
or trouble, and we have every reason to demand that the work
is done carefully and efficiently.

In conclusion; I would say that in the control of animal con-
tagious diseases, there is nothing of more importance than the
sanitary condition of stock yards and cars. Under modern con-
ditions, live stock is carried hundreds, and sometimes thousands,
of miles by rail, assembled in vast numbers in public stock yards,
providing extraordinary facilities for the dissemination of con-
tagious diseases. Only by constant vigilance, and the application
of modern methods of sanitation, can this peril to our live stock
interests be held in check. Car cleaning and disinfection should
be universal and maintained at the point of greatest efficiency
by constant governmental inspection.

PRESIDENT DYSON: Gentlemen, this is one of the most important san-
tary problems that we have confronting us, and if you will just notice it
a little bit, you will note the inconsistency of our livestock sanitary regu-
lations. For instance, calling for a certificate of health upon an ani-
mal that is going to be shipped interstate, and then permitting that ani-
mal to be shipped in any kind of a car that might have carried infected
livestock to public markets. As long as we have no restrictions regard-
ing the shipment or movement of livestock to public markets, we certainly
should have a very strict cleaning and disinfection of the stock cars
moving livestock from those markets in interstate traffic.

I trust that will be fully discussed. We have decided, owing to the
lateness of the hour, that we will put the two remaining papers over
until tomorrow, as it is now five-thirty, and I think that the next few
minutes could very profitably be employed in this discussion.

MR. COHEN: Mr. Chairman, I wish to introduce a resolution in sub-
stance as follows:

Resolved, That the President select a committee of three members of
this association to draft a measure to be introduced in Congress, requiring
all railroad companies to clean and disinfect their stock cars once each
and every thirty days.

Motion duly seconded.

DR. TORRANCE: Mr. President, before the motion is put, I would like
to suggest that in setting that limit of thirty days in this resolution, you
are not considering that sometimes stock cars may remain unused for
thirty days after they have been cleaned and disinfected. If you had a
law of that kind it would be necessary for the railroad companies to dis-
infect these cars again at the end of thirty days, even if they had not been used.

We all know under certain conditions stock cars and other cars are sometimes unused. I think in passing the resolution that it provide that all stock cars should be cleansed and inspected when they have been used for transportation purposes. It does not matter how frequently they are cleaned and disinfected, and the only way to keep them clean is to clean and disinfect them after they have been used.

Dr. Connaway: Dr. Torrance, will you tell us something of the cost?

Dr. Torrance: The railway commission in Canada recently authorized the railway companies to make a charge for the cleansing and disinfecting of stock cars, and shippers must pay that. The commission went into the subject of the proper amount that the railways should be allowed to charge for this work, and it was found that the cost of this disinfecting and cleansing was about fifty cents per car. The railways also insisted that the cost of switching to and from the cleaning plant should be allowed in addition to the cleansing, so that the rate fixed for cleansing and switching those cars has been fixed at 75 cents, double-deck cars, $1.50; and that rate is at present in force. I might say, though, that this has not been accepted by the live stock men of Canada with any feeling of gratitude. They have been accustomed for years to have this service done by the railways without paying for it, and when this disinfection of railway carriages in the United States was rendered compulsory upon the railroads, during the time when the foot-and-mouth disease was rampant, and the railways obtained permission to charge this up to the shippers, the Canadian Railways got busy and applied for authority to charge this work up to the shippers in Canada, and that is what they have done.

At the present time the livestock organizations in Canada are fighting this, and hoping to have the matter placed back where it was before. They are saying that there is no more reason why the railroads should charge the stockmen for cleaning a car than that they should charge the passenger for cleaning a car, or than that the Pullman company should charge the passenger for a clean sheet on a Pullman, and there is a good deal to be said along that line.

Personally, I think the railways should be obliged to furnish clean cars.

Mr. Cohen: Mr. President, I wish to say that I see no reason why the common carriers of the United States or Canada should object to paying for the cleaning and disinfecting of the cars even once every thirty days. It prolongs the usefulness of those cars, preserves those cars.

For twenty years I was associated with a railroad company as a live-stock claim agent, better known as a cow coroner, and during the summer months in Kentucky, especially in the shipment of hogs, some of the claims for loss and damage on account of injured hogs were enormous, and I prevailed upon my people to inaugurate the policy of filling these cars with dirt and water; in other words, make a hog wallow for the hogs. They kept that up for about four years, and then they rescinded that order, and their reason for doing it was that they asserted the mud and water and slush in the cars knocked out the sides of the car.

It was proven to us, I think, in 1915 at the meeting of this association, that it cost less than fifty cents to clean and disinfect a car, and with the car shortage that we are now having, the worst one that we have experienced for the past four or five years, I do not think that there is a chance in the world for stock cars to be idle; and if a railroad company is not perfectly willing to bear that little expense of fifty cents per car, then it should be made to.
DR. GARRETT: I don't see why this resolution should not include the words there: "After every time of use," for the reason that in thirty days a car could be used a dozen or more times. I do not see why they should not put that in there, and require these cars to be cleaned and disinfected immediately after and before the next time used. Therefore, I suggest that.

DR. RAMSEY: Mr. President, I agree with Dr. Torrance in regard to the cleaning and disinfection of the cars every thirty days, and making that all one regulation. In our car records in Washington that we keep, in going over them and taking the record of a car, sometimes we find a car cleaned and disinfected probably twice a week, maybe four or five times a month. Then probably it may not be cleaned and disinfected again for six months, until it carries some animals that have had a contagious disease. I do not believe it is a very good plan to designate any particular time, but to say that they should be cleaned after livestock had been unloaded, that would probably be a better way of putting it. At the present time, as you know, the federal government requires cleaning and disinfection of all cars that have contained animals found diseased. That is about as far as we have felt that we could go.

The next proposition is in the case of an outbreak of disease like we had in the foot-and-mouth disease, where the Secretary of Agriculture called upon the transportation companies to clean all cars that contained livestock within the last 20, 30, 40 or 50 days.

Furthermore, in regard to making this a law, I believe it can be done by passing it to the Secretary of Agriculture, just like I stated a while ago. It is unsatisfactory to have too many laws, especially if you have got to go to Congress and have them repealed. Our Secretary of Agriculture, under the present law, has the power to call on the railroad companies to clean and disinfect the cars if he has it presented to him, and I believe you can present it to him just as well as you can to Congress.

Another matter is this that I would like to speak about, that some years ago when we had quite a lot of scabies in the western country, and the diseased animals moving west exposed other animals at that time, there was a regulation requiring the cleaning and inspection of all cars containing even animals that had been exposed to the disease. The result was that a good many cars that came from the western country to the Missouri River at Milwaukee and Chicago were stored on side-tracks awaiting cleaning and disinfection. I dropped into the St. Paul office, and I found that they had about 1,700 stock cars, out on their tracks awaiting cleaning and disinfection. At the same time these stock men out in the west were crying their eyes out to get cars. The railroad company said, "Well, the government has got them held up down here, waiting for us to clean and disinfect them, and we cannot get our cars out." But the fact of the matter is, the railroad companies did not want to move those cars over their tracks. They were simply hiding behind a regulation of the department.

I believe we have got to be careful for fear we inflict something upon the livestock interests that they do not want, and I think that they would be better off without that kind of a law. For that reason I would rather make it a department regulation than a United States statute, in case we find that the railroads will take advantage of it so as to relieve themselves of purchasing a lot of additional power and putting all the cars over the road, or all the livestock over the road that they cannot do otherwise.

We have had this thing discussed several times, and I agree with Mr. Hastings that the infection of cars is a very dangerous thing, and the
way we have of moving livestock cars at the present time so fast, they
can spread an awful lot of disease in a week.
We load the livestock in a car, they shoot around the country, and
the first thing we know they are a thousand miles away. I believe it is
a good thing to keep track of the cars, but if possible put it in such
a way that the railroads cannot use a government regulation or a United
States statute as a means to relieve themselves of providing a sufficient
number of cars and a sufficient amount of power to move this stuff over
the rails.

DR. CONNAWAY: Mr. President, I think the suggestions of Dr. Ram-
sey are very wise. There is a great deal of this can be handled through
regulations such as he mentions, and I know of one regulation—I just
recall one regulation applying to the shipment of hogs that I believe is
going to help Missouri a great deal in the control of the disease, with-
out any Missouri law at all, because of our situation of having our
packing establishments just over the line in some other state. All of the
hogs that go from Missouri to the big yards, to the big markets, go
outside of the state, therefore they are under the control of this federal
regulation, with the exception of the St. Joseph yards. Our farmers can
ship their dead hogs over to St. Joseph, but they cannot ship them to
Kansas City, they cannot ship them to Omaha, they cannot ship them to
Chicago, they cannot ship them to East St. Louis, so I think that this
particular law about shipping dead hogs is going to call the atten-
tion of the farmers to the importance of being a little more careful right
back at the farm and not let any of these hogs get sick, vaccinate them
if necessary to keep them well. I believe that these states must sup-
plement the regulations of the federal bureau by local laws, and in our
own state it would be wise to pass some regulation so that all of the hogs
of the state are not diverted up to St. Joe. I do not believe very many
are going, but I think this regulation of the Bureau is a very wise one.

MR. COHEN: Mr. Chairman, I have to differ with the gentleman from
Missouri and the gentleman from the Bureau, in that I do not believe
that it is wisdom to vest so much authority in any one man. When
you have to appoint a committee to go to Washington to get what is
absolutely necessary and essential to promote the building up of the live
stock interests of the United States, you will never succeed. How-
ever, I withdraw the motion in the form in which it was made and
move as a substitute that it be referred to the committee on resolutions.

MR. BENT: I want to second the motion of the gentleman from Ken-
tucky, and in doing so I wish to call attention to one thing. It seems
to me it would be unwise to put it in any such form, regardless of the
use that cars may have been put to. I happen to be interested in a
coal mine, and for the last three weeks I think we have averaged six
thing like twenty stock cars a day which they have furnished us to load
coal with, and the sooner they will take them away and give us some
coal cars, the happier we will all be. Our fellows declare that those
cars have not been cleaned in thirty days, and some of them will take
their oaths that they have not been cleaned in thirty years, and it seems
to me that the proposition is what use they have been put to. It has
always seemed to me that while there are many regulations, many laws
in the various states in regard to the movement of live stock infected
with infectious diseases, they are not enforced. There is practically
no law or no regulation that is strictly enforced regarding the movement
of live stock infected with contagious diseases to market centers. That
is where we find them. There is where they go every time if they dis-
cover cholera or foot-and-mouth disease or anything else, that is where
they go with them. Consequently, to make a regulation, it seems to me

that a regulation requiring the cleaning and disinfecting of all stock cars delivering livestock to public markets could be made possible by regulations of the various states and by the federal government. We would then have a thorough check on this, because the public markets are operated under the supervision of the federal authorities, and they could soon, in cooperation with the state authorities and public stock yards, catch all of the cars coming or delivering livestock to the public markets.

**PRESIDENT DYSON:** Do you withdraw your first motion?

**MR. COHEN:** Yes, I move that it be referred to the Committee on Resolutions to be disposed of.

Motion duly seconded and carried.

**PRESIDENT DYSON:** Gentlemen, I think that ends the program for today, and we will adjourn to meet promptly at 9:30 tomorrow morning. Whereupon, an adjournment was taken to Thursday, December 7, 1916, at 9:30 o'clock a.m.

**FIFTH SESSION**

December 7, 1916, 9:30 o'clock a.m.

Convention Convened Pursuant to Recess.

**PRESIDENT DYSON:** The first thing on the program is the report of the committee on uniform regulations. Dr. Kiernan, have you anything to offer this morning?

**DR. KIERNAN:** There was some discussion on that last evening, relative to Section 2 of Regulation 4, exempting branded range stock from the tuberculin test, and several have suggested, and it seems wise that that be amended to read: beginning at Section 2:

"It is hereby ordered that any firm or corporation or any common carrier wishing to import into this state mules, work oxen, or female cattle over six months old intended for breeding or dairy purposes, other than state accredited herds"—substitute "state accredited herds" for "branded range stock," "other than branded range stock." Those herds can become state accredited herds through the state officials in the respective states.

Of course, in this association for a number of years there have been attempts on the part of the livestock breeders and livestock shippers and the railroad companies and everybody concerned with the livestock interests, to come to some agreement as to uniform regulations.

Now, with that object in view, the committee went to work and got up this plan of regulation, and copies of it were sent to every member of the committee, and we agreed upon it, and it is about the best work that the committee could get out. Of course, there are some things in it that will not satisfy everybody; it would be an absolute impossibility to get up any regulation that is going to suit everybody in the state of Maine, in the state of Florida, in the state of California and in the state of Washington.

**PRESIDENT DYSON:** Dr. Kiernan, for information, have you considered uniform method of administering the tuberculin test? Is that included?

**DR. KIERNAN:** No, sir, we thought that would go too much into details to include that. I think the uniform health certificate that was adopted by the association a few years ago provides for that.

**PRESIDENT DYSON:** Yes, that provides for that.

**DR. KIERNAN:** And this requires a uniform health certificate?

**DR. ELIASON:** Mr. Chairman, would it be proper at this time to strike out the discussion on the subject of what should properly constitute a tuberculin test?
PRESIDENT DYSON: Yes, I think that we might simply refresh our memories with regard to what was considered or what was adopted here a few years ago, and if that is not acceptable now, this would be the time to make a change. You have the floor, Dr. Eliason.

DR. ELIASON: It has been quite forcibly brought to our attention, the differences between the east and the west in regard to what should properly constitute a tuberculin test. Some of those of the east have taken as many post-temperatures as seven. In the west most of them are still commencing at the tenth hour and taking five temperatures, two hours apart. As far as we are concerned, we are willing to compromise this matter in any manner in which this association recommends. I do not say when it should commence or when it should end, but it would seem that we should take some action so that we would know what should properly constitute a tuberculin test, so that we may not test for a man on one day taking five temperatures, and the next day be compelled to take seven. All of those things make us ridiculous in the eyes of the public, and it is after all they that we have to satisfy. I realize that we are already getting too many regulations in regard to what should properly constitute a subcutaneous test or any other test. You get out into field work, and you are confronted with the regulation prescribing only two cubic centimeters, and you are injecting four or five. That test is no good. If we do not enforce the regulations, we should not have them. We should agree upon the routine which should be followed, and stick to it.

DR. MARSHALL: Mr. President and gentlemen: I would like to say a few words on this federal method of applying the tuberculin test. I listened yesterday to what Dr. Rutherford said, with a great deal of interest, about the crooked things that are done in tuberculin testing. I would not blame all of the bad results on crooked work in testing. I know that what Dr. Rutherford said was true, I know that a good many mistakes are made in applying the tuberculin test, because we do not know what to do when we run up against just such things as Dr. Rutherford told us about, but you can lay those things aside and do the work the best you know how, and you will have a dangerous lot of tuberculous cattle getting by the tuberculin test.

I think it is time that we changed our methods in applying the tuberculin test, if we ever expect to get any place. I have about made up my mind that it requires a combination of tests to find how many tuberculous cattle we have. I believe that ever since we have been using tuberculin, we have had too much confidence in the test. I think we have found that about 98 per cent of the animals that reacted showed post-mortem lesions. We take that as 98 per cent accurate. I think if we would kill all the animals, we would find we were mistaken on that, and that we had done much worse than occasionally condemning one that did not have the disease.

We have done a lot of work in Pennsylvania checking up ordinary tests, and it is not an unusual thing to apply a tuberculin test, and to go over it again in two weeks and get nearly as many as we did on the first test. We got twenty reactions out of seventy-five from a herd in less than two weeks with a combination of tests. If you leave that number of cases in a herd, it will do a lot of damage, and it is going to discredit the tuberculin test, and has already.

I am sure that beginning on the tenth hour is not soon enough to begin taking temperatures. I am sure also that if you quit on the eighteenth hour you quit too soon. Why should this association or a state or the federal government stand back of a test that we know is not properly applied? Recommend to herd owners and veterinarians...
When they want to get good results to begin on the eighth hour perhaps and continue that for twenty-two or twenty-four hours. Why should not this association say what is the right thing to do, and then stick to it, whether we can live up to it or not? I think Pennsylvania can live up to anything that is reasonable. We cannot require eight-hour post-injection temperatures, and quit on the twenty-second hour, if half of the other states are going to be satisfied with the tenth and eighteenth; but if it is a uniform regulation, we can apply it, and I am sure it is necessary.

In speaking of what is recommended in this regulation, it seems to me if we adopt what is required already by the Bureau of Animal Industry, we will be nearer right. I am not satisfied entirely with that, but they begin taking post-injection temperatures on the eighth hour and continue to the twentieth hour, every two hours. That is nearer the time, but that is not sufficient. I would rather see it begin on the eighth hour and continue every two hours until the twenty-second hour, I believe that is near enough, but we can afford to be conservative, and fix the thing as near right as we can get it from a practical point of view; but I am certainly opposed to the tenth to the eighteenth hour proposition.

DR. DE VINE: Does not the Government say the tenth hour after injection?

DR. MARSHALL: Eighth, and continuing for eighteen or twenty hours. DR. RAMSEY: Mr. President, I would like to say that while the Bureau instructions say to discontinue at the twentieth hour, still the men have all got instruction in case they see any tendency of a rising temperature, that they must continue taking the temperature, and we believe in starting the tenth hour has been very satisfactory, and furthermore it is nearly impossible for our men to get to a stock yards in the morning before six o'clock to start taking the first temperatures, when they get the cars running. We just naturally could not do any testing at public stock yards any earlier, and we would like to have it ten hours, unless there is some very good reason for changing it from that time.

DR. DE VINE: Isn't that what your instructions read now?

DR. RAMSEY: Yes.

PRESIDENT DYSON: I thought the instructions were eight hours? When have the regulations been changed?

DR. RAMSEY: We start at six in the morning, we begin at the tenth hour.

MR. BENT: I think if there is any reason for wishing to prolong the readings and it is in the interest of the industry to do it, the only thing that can stand in the way would be lack of uniformity. If all of the states would do it, there would be very little opposition to it. I have personally tried always in the case of testing my own animals to exceed the requirements wherever there was any chance of getting better results, and I know other owners who do it, but that only protects us in our own cases. It does not protect us from the other fellow that we may buy from. I think if we go to the expense and trouble of having a tuberculin test, we want to be able to depend upon it, so far as it can be depended upon, humanly speaking.

DR. WARD: Mr. Chairman, I move that this association go on record as recommending to the various state live stock sanitary boards the adoption of the Bureau's standard tuberculin test.

Motion duly seconded and carried.

PRESIDENT DYSON: I think that settles it, so far as it will be possible to act at this time, and if the bureau in the mean time sees fit to change
its regulations, I suppose our resolution would automatically be in force and effect.

Dr. Bahnson: Mr. President, what action has been taken on the delayed report of the committee on uniform regulation?

President Dyson: We have not taken any action on that as yet.

Dr. Bahnson: I want to offer an amendment, striking out in the first and second lines, on page six, the words: "other than branded range stock," and inserting in lieu thereof "other than cattle out of state accredited herds or branded range-bred cattle, certified by proper state authorities under special permit issued by the state veterinarian."

President Dyson: Does it say "Direct from the range to the purchaser?"

Dr. Bahnson: It did not include that. I left that out so that the state veterinarians themselves could stipulate the conditions under which they should move.

President Dyson: How does that differ from the proposition as read by you, Dr. Kiernan?

Dr. Kiernan: That coincides with it.

President Dyson: It would not in any way interfere or invalidate the provision if you included the words suggested "other than those."

Dr. Bahnson: No, sir, it would not. It would not in any way affect that, except that it just strikes out the section that range brand cattle should be inspected, and then, in order to make it uniform, since we have just passed a resolution to accept the federal standard on the tuberculin test, in the last line of regulation four, where it says ten hours, we ought to insert eight hours, as the eighth hour is the uniform hour accepted by the regulations.

President Dyson: I would like to have you read it, as you propose it.

Dr. Bahnson: The entire section, or the regulation?

President Dyson: No, just that portion of it.

Dr. Bahnson: By striking out on the first and second lines on page six the words "other than range branded cattle," inserting in lieu thereof the words of "other than cattle out of state accredited herds, or branded range cattle, certified by proper state authorities under special permit issued by the state veterinarian." That is all supported by the preceding language.

President Dyson: There might be, as I see it, some complications owing to the handling of the cattle en route from the range, after being certified to the purchaser. If it is possible to overcome that by including "direct from range to purchaser," I believe that would avoid a lot of trouble, possibly.

Dr. Ramsey: Mr. President, when we say "direct" we are going to interfere with the federal government's 28-hour law. We have a 28-hour law that requires shipments going interstate to be unloaded, fed and rested, every twenty-eight hours or every thirty-six hours, if they have a permit to that effect. Now, at a great many places it is impossible for these men to get facilities for properly feeding and caring for a trainload of live stock. They could stop at some small point outside of a public stock yards and change their route a little to take care of maybe one or two cars, but if they have got a trainload, they have pretty nearly got to go into a public stock yards, where they can get proper facilities, and I don't believe it would be a good place for us to put in that regulation anything that would prohibit a man from going into these public stock yards. We believe the public stock yards are kept fairly good and clean from disease. They do a lot of cleaning and disinfecting, they are
cleaned up every week and disinfected, and I believe they are in good shape, and I do not believe that live stock are going to come in contact with disease to any extent while they are stopping there for feed, water and rest. It would be a different thing if the state veterinarian has passed the animals for shipment to another state, and they are held there for six months or a year, and then it is in his discretion to permit their coming into the state or not. But I do not believe it is proper that we should limit a man and say that he has to ship his animals a certain way, over a certain route, and that he may not use the facilities that are provided by transportation companies and stock yard companies.

President Dyson: I think you misunderstood my meaning. That does not include stock yards, but it is to prevent changing cattle en route, or the shipping of a load of cattle, unloading them at a stock yards and substituting something else, and I think it is a very wise provision, from some of the experiences we have had in this and other states that I know of.

Dr. Bahnsen: I think that the language of the amendment is such that it would permit the state veterinarian to take care of all those conditions. He could stipulate any of the conditions.

Dr. Bahnsen's motion was duly seconded and carried.

Dr. Bahnsen: Mr. Chairman, I move the adoption of the entire report as a whole as amended.

Motion duly seconded and carried.

ACCREDITED HERDS

By O. H. Eliason, State Veterinarian of Wisconsin

When the tuberculin test became recognized several states proceeded to put up bars against the importation of cattle from other states, unless tuberculin tested. The Bureau of Animal Industry made it a misdemeanor to ship a reactor from one state into another. Some of the states did some work among the home herds; others did not.

Wisconsin went so far in 1909 as to formulate a law forbidding the sale of cows or bulls for dairy or breeding purposes, unless such animal had been tuberculin tested within one year. Due to the fact that the same session neglected to furnish the necessary funds for its administration, or even providing for sufficient tuberculin, the law was repealed about nine months after it went into effect.

Some states have provisions whereby the pure bred herds are being tested annually. Some cities have demanded that their milk supply should be from herds tested annually or semi-annually as might be necessary.

In sections where city ordinances have been enforced, as in the case of Madison, Wisconsin, where such an ordinance has been enforced since 1909, reactors are now a curiosity; other cities of our state, such as Ashland and Superior, the same condition also exists. Milwaukee has been gradually working up to this, but has not been entirely successful due to lack of support —either from the people of the city itself or from the producers.
It is very evident that where the stock owner has cleaned up, he appreciates the situation and follows up with an annual test, without urging.

A number of breeders have voluntarily tested and persisted in the use of the test showing that a clean herd is desirable. When shipment is made from such herds into other states the breeder often expresses disgust because he has to test again. This refers, of course, to herds that have been entirely clean or a normal number of reactors found. On the other hand, breeders have declared that they would test only when they made shipments as some of the states required test within thirty days.

To overcome some of these obstacles to the process of cleaning there was suggested at different times the idea that herds might be tested annually after being found fairly clean and certificates issued on the basis of the yearly test.

Dr. O. E. Dyson drew up an outline for this plan and submitted it to this association in 1914 and the members all went home; sat down to watch how it came out with a view of establishing something of the sort if it proved a success.

Wisconsin Department of Agriculture started a campaign in February of this year. Considerable enthusiasm was stirred up over the project and fifteen breeders whose herds had been previously tested asked the department to give them a final test. Several hundred more could be certified also and they would soon do so if there was very much inducement. When informed how many states will accept cattle under this plan, however, there is evidence of disappointment.

A recent letter sent out to the state departments elicited a number of different opinions upon this subject. One fact is quite glaring and that is that the majority have not given this any serious thought, either from a standpoint of accepting cattle from other states on this plan or providing anything of the sort for their own constituents.

It does not seem to have impressed but a few that the first step in this matter is to modify your regulations so as to permit shipments to be made into your own state, and, until a large majority of the states do, no progress can be made.

As to the plan itself there also seems to be a wide variance both as to what herds should be entered and who should do the work.

Some think this should be confined to purebred herds only, that the examination should be without cost to the owner and preferably by federal veterinarians, or check tests made by them.

Personally I am of the opinion that if the state or government tests gratis at all, such testing should be confined to testing out areas, with a view of cleaning up certain sections. If it is selec-
tive or optional, the owner should pay for same, unless the state and government are in a position to offer the same to all requests. A considerable number of the breeders of Wisconsin have tested their cattle for some time and paid for it themselves. They are willing to continue to pay for the service if we can show results. Under our system, the breeder pays the state direct, that money being reverted to the department of agriculture as a revolving fund. In this manner the tester is in no way connected with the owner of the cattle. So far as efficiency is concerned I fail to see why such arrangement is not beyond suspicion.

This does not necessitate the further outlay by the state board, and therefore it would not be necessary to wait for the appropriations to do this by the state outright.

Practitioner’s Test—As a general rule too little credit is given to the private practitioner for the valuable services rendered by him in this work. Too much time has been spent in talking about the dishonest veterinarian. The fact is that most of what has been accomplished up to this time has been done through the persuasion and suggestion of the private practitioner. There seems to be too little sympathy between the state department and the private practitioner. Where the person in charge of the sanitation is not a veterinarian or is a veterinarian who has not been compelled to start out from college empty-handed to make his living from an unsympathetic public it is no doubt hard to understand the conditions under which the private practitioner must work. You, who have been practitioners and have had experience with the tuberculin test, will know the unreasonable attitude which some persons can take for a time at least, in connection with the result of the test. I have seen men who should know better insist on a retest in case that the animals reacted, arguing that it was impossible for an animal of that description to react, and on the other hand when the veterinarian condemned one on physical diagnosis, after it had failed to react, he insisted that it did not react, consequently he wants to keep it, regardless of the danger of keeping such an animal in the herd. Nevertheless a number of practitioners are making a success in handling their clients under these conditions. Fortunately not all breeders take that view of it, but place the elimination of tuberculous animals entirely in the hands of their veterinarian and await the result.

I do not wish to give the impression that as a rule the breeder is not a “game sport” and takes his medicine without very much grumbling. It is the aggravated cases to which I allude above. We must also consider that a number of the private practitioners are in a better position to know the condition of the herd within the scope of their own practice and in our state I may refer to
two veterinarians who have within the last six years tested 10,548 and 8,360 head of cattle, respectively. Nevertheless, even these two men have supported the idea of accredited herds and also possibly the state doing all the testing direct. They realize the position in which it often places a veterinarian and although these men have been in a position to enforce their better judgment in their cases, it is nevertheless a fact that their enforcing the results of the tests has depreciated their general practice to some extent.

The original scheme of the accredited herd plan was to grade the herds—A, B, C and D—according to the number of reactors found. The opinions expressed by most of the state authorities now concede that no breeder wishes to advertise himself as being in any of the latter three. He either wishes to be in class A or else not be advertised at all. In fact it is impossible to have any other grade so far as interstate shipment is concerned, and it will be impossible to allow the shipment of any animals from a suspected herd unless the test has been made within a short space of time. The main idea is this, that if a herd is not in a condition to warrant the issuing of certificates on the basis of an animal test the entire herd should be tested again within six months until no more reactors are found.

On the other hand if we are to make this too iron clad and remove the herd from the list of "accredited herds" whenever any reactors appear, this measure is not going to become popular. In our experience reactors will appear occasionally in the best regulated herds and lesions may or may not be found upon post mortem. It would seem that some discretion must be left with the persons in charge in order to administer this, uniformly and with justice to all.

In conclusion I would urge that it be definitely recommended as to who shall be the proper authority to administer this system—whether it shall be left to the state board or the Federal Bureau of Animal Industry, or on a co-operative plan between the two. The plan should be sufficiently elastic to encourage the breeder to co-operate and keep all the facts on the surface. Inasmuch as there are several plans drawn up for this purpose, I shall leave that to the committee to draw up as a result of comparisons of the different plans. Copies of the plan, as submitted to the Wisconsin breeders, have been distributed in the audience and a copy is hereunto attached.

**PLAN OF THE LIVE STOCK SANITARY BOARD OF THE DEPARTMENT OF AGRICULTURE FOR THE ESTABLISHING OF ACCREDITED TUBERCULIN TESTED HERDS.**

**HERDS ELIGIBLE.**

The owner of any herd of cattle may make application to the Wisconsin Department of Agriculture to have his herd placed on file for preparation
to enter "Accredited Tested Herds" list. It is not required that these herds must have been tested prior to application.

TESTING OF HERDS.

(a) The tuberculin testing of these herds after application has been made shall be by veterinarians in the employ of the Department of Agriculture.

NUMBER OF TESTS.

(b) The number of tests required to be made upon each herd will depend upon:
1. If any re-actors are found.
2. NUMBER of re-actors found on first test.
3. PREVIOUS HISTORY of the herd with regard to tuberculosis.
4. Whether or not some of the herd have been BOUGHT FROM UN-TESTED HERDS.
THE HERD MUST BE CONSIDERED SAFE.

DISPOSITION OF RE-ACTORS.

Re-actors and other deceased cattle must be removed under the direction of and in a manner satisfactory to the Board.

DISINFECTION OF PREMISES.

If tuberculosis has existed or re-actors are found, the premises shall be disinfected under direction of the Board.

INTRODUCTION OF NEW ANIMALS AND CALVES.

No adult cattle shall be introduced into these herds unless such cattle are either from accredited tuberculin tested herds or have been tuberculin tested by a graduate veterinarian immediately before entry into the herd. Untested calves shall not be placed in these herds when bought from any herd except a herd which is also on the accredited tuberculin tested herds list, and any other calves bought must be segregated until such time as they can be tested.
Nurse cows or other cows introduced temporarily into herds must be on same basis as the above.

MILK FOR CALVES.

Calves in these herds shall not be fed on milk skimmed in public skimming stations or on whey from cheese factories unless such milk or whey has been sterilised by thorough pasturization or heating, sufficient to kill tubercular germs.

EXPENSE OF TEST.

The expense of making these tests must be met by the owner of the herd. This shall be as near the actual cost of the work as can be calculated by the Live Stock Sanitary Board. Seventy-five cents per head with a minimum charge of eighteen dollars for each herd of less than 24 head of cattle.

AGREEMENT.

DEPARTMENT OF AGRICULTURE LIVE STOCK SANITARY BOARD.

C. P. Norgord, Commissioner. O. H. Eliason, State Veterinarian.

I, the undersigned, hereby agree to place my herd of .......................................................... cattle in the care of the Department of Agriculture and Wisconsin Live Stock Sanitary Board for tuberculin testing by its employees for the purpose of placing such herd in the "Accredited Tuberculin Tested Herds Class," when it is considered clean from tuberculosis by the said Board.

I also agree to follow instructions as to removal of re-actors and suspects, such as shall be issued by the said Board, through written orders, or, as given by the state veterinarian and his assistants. I further agree to pay to the Board, seventy-five cents (75c) per head or a minimum of $18.00 for each test of my herd, said tests to be conducted annually or as often as the Board deem necessary. Date .......................................................... Owner.

DR. ELIASON: I would emphasize finally the necessity of the different states taking some action with reference to the acceptance of herds under this plan if we are going to get anywhere. It is impossible to get a breeder to see the necessity and the gain unless there is an incentive to get him under this plan. (Applause.)
President Dyson: While on this subject, and before it is opened for discussion, I will say that nineteen states in the union have agreed to accept shipments of cattle from Illinois on the state accredited herd plan.

Next on the program is "Advantages of a State Accredited Herd," by Mr. J. R. Bent, of Oglesby, Ill., a cattle breeder. (Applause.)

ADVANTAGES OF A STATE ACCREDITED HERD

By J. R. Bent, Oglesby, Illinois

When I received a letter from Mr. Ferguson inviting me to prepare and present a paper on "The Advantages of a State Accredited Herd," my first thought was that he had made a mistake in addressing the letter. I certainly felt that I was not in any sense especially qualified to present a paper before such a body as this. On more mature thought, however, I concluded that inasmuch as the general subject of tuberculosis and the scheme for state accredited herds were to be presented by professional gentlemen who are well informed, and able to forcefully and correctly do so, the purpose of adding a paper by me to the program must be to obtain the view point of the average progressively inclined owner and breeder. This I claim to be, no more, no less. This conclusion together with my deep conviction as to the imperative need of better sanitary methods and restrictions surrounding this country's enormous live stock industry, and the consequent duty resting upon each of us, to do his share, made me consent to contribute my mite.

As I look upon the subject, the arguments for an anti-bovine-tuberculosis campaign in general, and the plan for state accredited herds in particular, while tremendously weighty, are not numerous. Therefore, you will be as thankful as I am that what I wish to say can be said in a few words.

The sensational nature of an epizootic of such diseases as the foot-and-mouth disease is in itself a guaranty that its appearance in our midst will be combated by extraordinary efforts; and the successful way in which this disease was stamped out, in the recent dreadful outbreak, is a conspicuous proof of the value of thoroughly arousing all interested breeders, owners, government officials and the veterinary profession to united, organized, intelligent and vigorous action. Foot-and-mouth disease, we are convinced, is a relatively trifling menace as compared with the more subtle, insidious, persistent and all too universal workings of such diseases as contagious abortion and bovine tuberculosis. Unfortunately, the difficulties in combating contagious abortion are inherent in the disease itself, and as it is not the subject we are interested in this afternoon, I may pass on with
the expressed hope that ere long a successful means of eradicating it may be discovered and put into operation.

With bovine tuberculosis the difficulty seems plainly to be not so much with the disease as with mankind— with the breeders and owners primarily, but also somewhat with some of the various state authorities, and with many of the rank and file of the veterinary profession. The eminent veterinary authorities present here today may tell us that there is much opportunity still for research, for perfection of scientific methods of diagnosis, for possible curative treatment, and for organized, or legislative provision for eradication; nevertheless I believe that the greatest need today is some successful way of arousing the men in the industry to action.

There may be much of truth, that appeals to us, in the old saying that “Where ignorance is bliss, 'tis folly to be wise;” but I take it that this refers to ignorance of troubles that cannot be overcome or mitigated, and not to the type of ignorance (really senselessness) displayed by the ostrich who sticks his head in the sand in the presence of danger and consoles himself with the reflection, “I will not see danger, therefore I am safe.” I fear this last resembles the attitude of many breeders and herd owners.

It is not at all difficult to find cattle owners who otherwise are apparently intelligent and progressively inclined, refusing to allow their herds to be tuberculin tested. To me it would seem just as logical for a man who has a fire smoldering in some portion of his building to declare that he will conceal it and not call the fire department because he fears damage from water; or to allow his child to die with scarlet fever rather than call in medical assistance, lest his home be quarantined and his neighbors shun him, for a while. It is the old story of “out of sight, out of mind.” The man who is afraid to test lest he find tuberculosis in his herd, or who knowing he has it, conceals it, lest he suffer commercially, is not only guilty of bad ethics, and morals toward his neighbor, his customer and the industry in general, but looking at it in his own selfish light, he is “penny-wise” and “pound-foolish.” If tuberculosis worked its devastation on the surface and in a conspicuous way, so that the owner could see it not only drag the individual animal down as its prey, but spread from one to another, and on through the entire herd, how quickly would he fly for assistance, and how uncompromising would he be in eradicating the trouble, even at great temporary loss. Invaluable as is the right hand, far better to lose it if blood-poisoned, than to retain it and lose one's life. It is not, as so many seem to think, accepting an avoidable evil, but simply choosing, when forced, the less of two evils.
This is the day and age of standardized accredited methods. What a state of confusion and uncertainty would we all be in, were it incumbent upon each individual to look out for his own safety and use his own uninformed judgment in all matters! Instead we go to the grocery and buy our foods with the feeling of security. Why? The pure food laws and inspection service assure us that these foods will be up to recognized standards of healthfulness and purity. We take an elevator for an upper floor in one of the great buildings, because the building inspection and elevator inspection service assure us that we are reasonably safe. We drive an automobile or team across a bridge. It never occurs to us to question its stability. We would not know how to inspect or judge of it were we obliged to do so. All this has been done for us by standardized, organized, informed methods. Why, then, should it be left to each of us individually to decide when, how and by whom, if at all, we should test our herds for tuberculosis, and, after the information is in our hands, need to rely upon our own judgment as to how to eliminate it, if present, and what sanitary and other precautions we shall observe in the preservation of the good health of our clean animals. Is it not in keeping with just ordinary "horse sense" to adopt modern day, standardized, accredited methods in this as in other things? As I see it the plan for state accredited herds is just this, no more, nor less.

Then, "What are the advantages of a state accredited herd?" I have mentioned one—the idea of standardized methods and practices. A second advantage can perhaps be put under the head of "Efficiency," How much better that a herd be tested regularly, all the animals at one time. This is by far the most economical way. It saves the relatively much higher cost of special trips, as well as the delays involved, in testing an animal after it is sold, and before shipment. Under the state accredited plan, when a sale is made, no trip or test is necessary, because it has all been taken care of at the regular intervals, so that a certificate to this effect is the only prerequisite to shipment.

In the third place, we cannot over-estimate the advantage of inspection and supervision. Too often people are inclined to think that restrictions of one kind or another are devised for their particular annoyance and handicap, instead of for their protection and for the advancement of their real interests. At the coal mining plant in which the writer is interested, we carry boiler insurance. The object of indemnity in the remote case of accident is of very minor importance with us, compared with the great every-day advantage of the intelligent, professional inspection service that we receive. The thorough, intelligent in-
inspection followed by safe practices is a far more attractive guaranty to us than the ability to collect indemnity in case of disaster; and so to me it seems that the safeguards and sanitary practices that are thrown around the state accredited herd, once established as tuberculosis free, are of tremendous value to the owner. Last, but not least, and as a consequence of all of the foregoing, is the great advertising value. The man who is able to advertise his herd as state accredited class A enjoys a prestige that is a great asset in a business way. How much more readily careful purchasers will select and buy from a state accredited herd, than from one of doubtful character. It is because of this very fact that I believe the general adoption of the plan will be a most potent, forceful influence in the campaign against the disease in general. Breeders and dealers who might not otherwise be aroused, will by the aggressively successful competition of the state accredited owners be forced more and more to rouse themselves and enlist. As a rule the man who succeeds first and most thoroughly is, other things being equal, the man who first and most thoroughly recognizes a public need and equips himself to fill it. Please observe that I did not say public demand, but public need. If the need has reached a point where the public has made a demand, and no material effort has been made to fill it, the success of the man who can meet it is all the quicker and surer. The public will, and indeed I believe now does, demand that milk and dairy products, dairy and beef stock, shall be clean and free from disease; and the producer who has equipped himself to meet this need has, I believe, taken a long step in the direction of success.

In conclusion, I wish simply to express the hope that the state accredited plan has come to stay; that in this and other states it can be advanced steadily, rapidly and surely, regardless of possible political changes; and that breeders and owners will more and more rapidly adopt the plan. All honor to the men who are pioneers in this work, whether public officials, practicing veterinarians or herd owners.

President Dyson: It is exceedingly unfortunate that we could not have had 150 or 200 breeders of pure-bred cattle from each and every state present here today to hear Mr. Bent's paper. If that could be published in bulletin form and distributed among the breeders, there is no telling of the good results that would follow.

The papers of both Dr. Elisha and Mr. Bent are now open for discussion.

Dr. Fielden: Mr. President, there was one thought that came to my mind in Dr. Eliaison's paper, which is strongly pressed on veterinarians in almost every state where testing is done, and that is the charge of dishonest work. I have been connected with large dairy interests in three of the great eastern dairy states for the past twenty years, having tuberculin test work done, and in all my experience
I have never seen or known a veterinarian to make any effort whatever to do anything in a dishonest way in a test, and without the connivance of the owner, it will not be done.

Dr. Nelson: Mr. President, I have been waiting to hear something on the order of Mr. Bent's paper. In Indiana this subject has been taken up with the breeders, and for some reason or other no one has taken the initiative. The rule has been to apply the tuberculin test, and for this reason in putting it before the breeders, I felt that this was a move that could be viewed as Mr. Bent sees it, in their own interest. They must take the initiative. At present there is a move among several to start accredited herds. I feel that the advertising derived will amply pay any man for having an accredited herd, let alone the annoyance that each owner has by testing a few animals at a time.

A purchaser when visiting a herd, we find frequently—I know all of you have the same experience—he first selects the animal that he wants, and then he has to have that animal tuberculin tested, if it has not been done recently, and it all depends on the result of that test whether the deal is consummated or not.

It has always appealed to me since the first mention by Dr. Dyson and Dr. Melvin, of the Bureau, that it was strange the breeder was not broad-minded enough to take this up himself, that the state authorities or federal authorities can make very little progress in the matter.

Now, take Mr. Bent's herd, or any of the accredited herds, when a dealer goes to that herd, or a purchaser, and finds an animal whose breed and quality suits him, all he has to do is to consider the financial proposition, and he is ready to ship out at any time. That is the way we feel in our state, and I believe it is the only solution. I said so here last year, but I feel that it is the breeder's solution, and we are ready to help him, instead of trying to tear down the industry that he is connected with. The illustration of the boiler insurance is the best that I see in that line. Our interest in protecting him is what he needs, and we have to restore and develop his protection, instead of doing something that will decrease the value of his interest, and when we do that I believe we are getting something.

Mr. Glover: Mr. Chairman, accredited herds to me provide for systematic work. There is a reason why farmers are against tuberculin tests. Too much has been claimed for it back twenty and twenty-five years ago. I can well remember how a few years ago when the health commissioner of Chicago, who was going at the tuberculin test, stated how in the vicinity of Chicago he would clean up the tuberculosis in a year. I said: "Doctor, you cannot do it," and he argued with me, as much as to say: "Young man, you do not understand your business." Twenty years ago when I was a boy on the farm, I knew what time it took, but he was going to tuberculin test all the cattle in the vicinity of Chicago in a year and at less than fifty cents apiece. They did pass this law, forbidding dairy products to come into Chicago unless they were from tuberculosis free herds, or pasteurized. The campaign continued and it swept over northern Illinois and over northern Indiana until the farmers were thoroughly disgusted, and then a man that had the audacity to stand up before those people and say "tuberculin" was in danger of being put out of the hall.

Five years ago I went down to Harvey and they said: "What are you going to talk on?" I said: "I am going to talk on tuberculin
tests and tuberculosis. They will let me say anything here. I have worked so many years with them, they take whatever I say, with a grain of salt perhaps," and I talked before those farmers upon that subject. Many thought we could not. What has that to do with the accredited list? Not very much except this. It does show the things that have been done to bring farmers against the use of tuberculin. Their faith in it has been shattered, and rightly shattered, too, because too much has been claimed for it. Clean up your herd, test your herd, throw out the reacting animals and it is clean. No such thing. This accredited work has got to be taken up in a systematic way, and I believe in doing that. We are going to educate the farmers to see the value of a clean herd. If tuberculosis was not such an insidious disease, if we did not have to keep after it year after year, we would not need to be cleaning up those herds, but we have got to do it, and furthermore we must make systematic provision for paying the farmer for the losses, not as we have been doing. We have been going out and testing a herd here, testing another one over there, and paying a man a little bit towards his losses, and we have not got very far in cleaning up tuberculosis. I doubt much whether our tuberculin test has done anything more than to educate us as to what we ought to do. Of course, that is valuable. I doubt whether our interstate law that provides for a tuberculin certificate is really doing as much good as it is injury.

For instance, you go up into Wisconsin where I live, you go onto a farm, and you can get some of those animals that do not react, that can go into interstate commerce, and a farmer buys them thinking he is absolutely safe, when as a matter of fact the tuberculosis is in the incubating stage, and I cannot see but what if that man took them and shipped them with his eyes open, there would be less injury done, although I am not prepared to say that this law that compels the tuberculin test, cattle to be tuberculosis free before they can enter into interstate commerce, should be repealed, but it is only a step in the right direction.

I believe that farmers should be paid for cattle condemned with tuberculosis on the same basis as you pay for animals slaughtered with foot-and-mouth disease. There is just as much argument for it. It is for the protection of the whole cattle industry. It is not only that, it is protection for the people, and if that is true, the whole state should help bear that expense, but not promiscuously.

I don't believe that it would be wise for each state simply because they find a few reacting animals in a herd, that the state government should come in and pay for them, and permit that man to go right on with the seed in his herd all the time to reinfect, because it would be a most splendid way for the farmer to sell his scrub cattle; but when a herd owner turns a herd over to the state or to the federal government, and says: "Here, come into my herd, I put my herd in your hands, and not only will I permit you to tuberculin test them, but I want you to give me directions for handling this herd. How shall I segregate these animals?"

Then I believe that that man should receive fair compensation for his cattle, and when that time comes, we are not going to have any trouble in cleaning up this disease. It is an easy matter to provide a law of that kind, and to provide paying for animals in herds that are being tested in that way, and the farmers would come around one after the other.

You can talk with the farmers in this northern part of Illinois, and lots of them will say: "I would like to have my herd tested, but if
I have it tested if it goes down I am broke, and I have my family to support. So I say, take up this accredited work, put it on a proper basis, make it possible to pay the farmer reasonable compensation, almost full value, I would say, for his cattle, and the man that did not come in under that, do not pay him anything, because it is no use to pay such a man.

I believe in veterinary science and what you do, and I think that I can say what I am going to say to you, recognizing that some of you have made serious mistakes, but we believe in the veterinary profession, we believe in honest veterinarians for the people, but I did regret as I came into this hotel on Tuesday night to hear that this association was against the county agents.

I don't believe that you are as an association, just because a few county agents have made mistakes, just because they may be overlapping at the present time their field of endeavor, which I wholly agree should be the education of the farmer; but you as an association, you people that are laboring in your profession, cannot afford to have the public say that the veterinary profession is against the county agent.

If I was a veterinarian I would go into a county where there was a capable county agent and I would co-operate with him, and I would make it the best county in the state, and I believe that a young man qualified to carry on his profession can well afford to co-operate with the county agent, because he is the man that gets over the county and finds out a lot of things that the veterinarian cannot get in touch with. When you speak of the mistakes of the county agent, couldn't we cite mistakes of many a man that has taken the title of Doctor, and is a practicing veterinarian, when he only learned it around a livery stable? It is not fair to your profession to have you all criticized because there are a few among you that are making horrible mistakes, and should not be there. So I beg of you, for the good of your cause, that you represent, for the good of the live stock interest, that you co-operate with the county agent, and forget the criticism that you have passed.

Before I had even come into this meeting, I heard somebody say: "Those veterinarians up there are criticizing the county agents." I came up yesterday and I heard some criticism; but, gentlemen, the county agent is going to be a power in making for better live stock conditions in this country, and there must be hearty co-operation between them and the qualified veterinarians; and when we want to criticize the county agent for overlapping, let us go straight to the men that have the power of changing. I know lots of these men. I know men in Wisconsin that would gladly receive these criticisms, and would gladly modify the rules, and make these county agents occupy the place they ought to. You men can well afford to co-operate with the county agent. He is a power, he is the man that comes into our state and says we must buy herds that are free from tuberculosis. He says: "Gentlemen, you must test your cattle, you must practice sanitary methods." He is working hand in hand with you.

Of course, some of them are not going to stop there. We will have these mistakes always with us, for, as Dr. Cotton says, this is a democracy, but we like it better than a monarchy, and you as an association should not have it go out that you are against the county agent, but that you are working with him, and have worked with him and the accredited herds are going to come, and we should make some provision whereby these men can send out their accredited cattle into interstate commerce without retesting. (Applause.)
President Dyson: Any further discussion?

Dr. De Vine: Mr. President, there is a phase of this that appeals to me, because our conditions, perhaps, in and about the eastern states now are a little different than they are in the west. The men that have made their money in Wall Street are beginning to take up the agricultural industry, they are beginning to take on pure-bred herds, and the thing that has been neglected, I think, by the veterinarian, particularly the practicing veterinarian, is to start those herds in the right way.

As Mr. Glover said, it was for several years thought that these men could go out and buy cattle on a tuberculin test, and if they got non-reactors, they were all right; but after they had installed them, they found the next time they tested, that they had some diseased cattle, and naturally that discouraged them; and I believe that if every practitioner could get more confidence, more in touch with the big owners particularly, they would be able to do a great deal in cleaning up the herds of cattle. I am going to tell you that if a man came to my office tomorrow and said to me: "Doctor, where can I go and buy a hundred head of cattle that are free from tuberculosis?" I could not tell him. I mean absolutely free from tuberculosis. You could not do it.

About two years ago I thought I would purchase a herd, and I built some little buildings, but where did I go to get my cattle? Did I go out to some fellow that had a particular strain of any particular breed, and purchase individuals from that herd that did not react? No, I went to herds that I had been associated with, that I had had charge of for several years, and I asked them to sell me some very fair cows, because I knew they were free from disease.

The question of abortion and sterility also enter into it, and I have spent two years in building up a herd that will be free from tuberculosis, where people who wish that kind of cattle can purchase them, and that is what these accredited herds would do. (Applause.)

Dr. Marshall: Mr. President, I would like to endorse what Mr. Glover said about the county agents. I would hate to have the impression go out that this association is opposed to or is fighting the county agent in any way. In Pennsylvania we have twenty-six of those agents that are doing elegant work, we have never had a run-in with one of them. During the outbreak of foot-and-mouth disease those men helped us a great deal. In some cases they helped us more than veterinarians could help, and they helped in every way they could. We have not drawn up any articles with them or any agreement. I do not want the impression to go out that everybody in this association is opposed to the county agent, because I am not. In reference to what Dr. De Vine said, I want to endorse what he has said, and what Dr. Eliason has said about accredited herds. I think it is very important that we establish accredited herds. Just how we will do it, I do not know.

We have been in correspondence with several state veterinarians to see if we could get a uniform requirement for endorsing those accredited herds. Up to the present time I do not see my way clear to make any other suggestion, but I do wish to leave it to the good judgment of the United States Live Stock Sanitary Association to work this question out in a big way. I think that can be done. There are already a number of states in the union from which Pennsylvania will be satisfied to accept animals from herds that they say they believe are free from tuberculosis.

I do not know just how is the best way to handle Dr. Eliason's
recommendation, but it seems to me if we could refer it to the resolutions committee, there isn’t any better way to handle it, and if that is in order, I would like to move that the recommendation for approved tuberculin-tested herds be referred to the resolutions committee.

Motion duly seconded and carried.

PRESIDENT DYSON: In this connection, anyone having resolutions to offer, there will be a meeting of the resolutions committee held very shortly, anyone who has any resolutions to present should turn them over to Dr. Cotton, chairman of the committee.

I want to endorse the statement of Dr. Marshall with reference to county agents. In this state we have nineteen, and they were of great service during the outbreak of foot-and-mouth disease. We have had no trouble, and I have not heard of anything particular where they have overlapped upon the live stock sanitary regulations, or in any way interfered with the operations of the department.

DR. INGRAM: Mr. Chairman, I want to endorse, on behalf of the people of Connecticut and New England in general, the remarks of Mr. Glover, of Wisconsin, in regard to the county agent. We have in Connecticut an office established which has control or partial control over diseases of domestic animals, and it is the first time that we have ever had any assistance in locating and otherwise particularizing places where disease may be found. We have five county agents. I want to say, gentlemen, that the benefits we received are vast. We are beginning to wake up to the fact that it is of great public interest, and these men have established in every instance local interest in the live stock industry of our little state. In behalf of the people of the east, I want to thank Mr. Glover for the stand he has taken.

DR. DUNPHY: Mr. President, I want to endorse what has been said by Mr. Glover in regard to the country agent and what has been said by Dr. Eliason in regard to state accredited herds. I think that it is going to be of a great advantage to us. Yesterday I mentioned the fact of co-operation of county agents, and I was ridiculed by a speaker here, claiming that we would be justifiable in communicating with the officials of the asylum. He went on further to state that the girls that had taken courses in domestic economy would be practicing midwifery. Conditions must be different in Missouri from what they are in Michigan. We do not fear that.

But laying that aside, we have twenty-five or twenty-six county agents in Michigan, and we are co-operating with them, and they are doing a good work, and we are not in the least afraid of them interfering with the veterinary profession. They are educating the farmers in a certain sense to have confidence in the veterinarians, and they are assisting the veterinarians to have confidence in the farmers in regard to the development of contagious diseases.

We are now forming county veterinary associations, and at these associations we are advising the men in these county associations to get in touch with their county agricultural agents and assist them in every way they can, and we are confident that the county agents will not interfere with the veterinary work.

MR. STRATTON: Mr. Chairman, as one much interested in your vital discussions, which I have heard from time to time, I wanted to say, not to keep you long, that there is a field in publicity of the accredited herd proposition, and I would like to see this association ask of the county agents organization their assistance in the establishment of accredited herds. In our neighborhood we have had two herds
tested and under the care of the state. In one of these herds there had not been an animal introduced excepting bulls for twenty years. Thirty-six came out clear of tuberculosis in a test, clear reactors. From the other herd, twenty-six were clear. In neither herd was there a single reactor. I was not told to pay something by our state to put a premium on that character of dairy business, those people who are cow jockeys, who gather up cheap stuff, who load it and test it and pass it on.

Mr. Bent: Before we pass to other business, there is one expression that I would like to throw out, not to have anything done with it necessarily this morning, but I have not heard yet any discussion as to the best method of preventing dishonest usage of tuberculin. You can have laws and laws and laws without end, but unless you can devise a means of catching the dishonest fellow, you are not through with your troubles. I am not prepared to say what would be a good way to go after it, but if by safeguarding the use of tuberculin by putting it under official supervision, or by requiring all tuberculin to be registered and accounted for, and with either of those processes we could prevent a man secretly using it to hold his stock, and then sell it, and we would accomplish a great deal.

President Dyson: That question, of course, has been before the association for a good many years, and been discussed pro and con, and a great many states have endeavored to make such regulations, but I have never heard of any that have succeeded. That question is just a little bit foreign to the matter under discussion. We are very much pressed for time, and I would suggest that we confine ourselves strictly to the question under discussion.

Dr. Nelson: Mr. President, I read a paper here yesterday, and perhaps I owe an explanation, lest you take it for granted that I am opposed to the county agent. I thought I made plain in a few short words there our attitude. I want to make a little explanation. We know that we have had many mistakes in diagnosis by county agents on hog cholera, no question about that. We have had them diagnose it where it was not hog cholera, and this year we have had the diagnosis that it was not hog cholera and it was hog cholera; but during the outbreak of foot-and-mouth disease, in two counties, at least, in Indiana, no man could have had any better support than I had from the county agents. I believe the county agent is a very useful man, but I believe when he mixes in and undertakes to make diagnosis of disease, he is getting outside of his sphere, and I don't believe there is an intelligent farmer or editor of an agricultural journal but what believes the same thing.

President Dyson: Gentlemen, it will be generally admitted, I think, that there has been some overlapping in some few cases. Admitting that, and admitting the further fact that we are getting away from our subject now under discussion, I would ask that we confine our remarks from now on strictly to the question of state accredited herds. I think it would be well to drop the question of the county agent at this time. Any further discussion upon this question of state accredited herds?

Dr. Cooley: Mr. Chairman, I was very glad to hear Mr. Stratton of our state speak in regard to herds being placed on the accredited herd system. We have perhaps peculiar conditions in Ohio, inasmuch as we are paying, as Mr. Glover stated, perhaps larger compensation than any other state in the union. The dealers that Mr. Stratton speaks of are hard men to deal with when you get into the question of compensation. The compensation that we understand is
to be placed by the Board of Agriculture—we are going as high as $200 for pure-breds, and $75 for grade cattle, or fifty per cent, giving the carcass value to the men. We have decided for our department, and I am making it regulatory in the matter of testing, that testing for compensation must be done by our department for compensation. We cannot give that over to veterinarians, outside veterinarians, although cattle going into those herds, after we have tested same, can be done by an approved veterinarian. I have placed upon our list something like eighty herds that were approved since I have been in there, new herds that are going on that list.

Here is one of the conditions that was brought to my mind—I will lead up to the accredited herd system—a man came in and cleared his herd, a veterinarian that was on this approved list, made a test of cattle to go into that herd. For precaution's sake we put them in quarantine, although he was on the approved list, and the test chart appeared to be all right, and retested them and one bull reacted, and we slaughtered him and there were post mortem lesions of tuberculosis, so that you could see how nicely those cattle could have got into that herd for compensation.

I have given a form for an accredited herd that we have written up to Dr. Eliason, and that form must be operated in conjunction with our form seven, in getting compensation, and we hope that if we formulate here some plan by which we can conform to the law, that we may be able to take that and put it into working order.

PRESIDENT DYSON: We will proceed with the next on the program, which is Dr. Ingram's paper, on Municipal Meat Inspection.

**MUNICIPAL MEAT INSPECTION**

*By Frank A. Ingram, Connecticut*

The importance of this subject is apparent when it is estimated that at least 40 per cent of the meat used for food by the people of the United States is slaughtered, placed upon the market and consumed without any inspection. One of the principal objects of meat inspection is to protect the consumer from disease or unwholesome meat. This involves not only the inspection of the meat for the detection of disease or other unwholesome conditions, but the requirement of sanitary conditions and equipment in the abattoirs and packing houses and the enforcement of sanitary methods in the preparation, curing and handling of the meat. To meet the first requirement there should be a competent veterinary inspection of the carcass at the time of the slaughter, or, in case inspection at the time of slaughter is impracticable, the inspection may be performed later if certain viscera are retained with the carcass. Too often the local meat inspection service, where it exists at all, does not provide for an inspection of this kind, but consists merely in the inspection of the meat as it is offered for sale in the markets, with sometimes a sanitary supervision of the markets. Although such inspection has some value, it is far less important than the veterinary inspection of the carcass at the time of slaughter. The average consumer is able
to determine for himself whether or not meat is tainted or spoiled, but is not able to determine whether or not it comes from an animal affected with a contagious disease. Neither can even a skilled inspector always detect disease in meat after it has been dressed and the viscera disposed of. The most important requirement in meat inspection, therefore, is to protect the consumer against dangers from which he cannot protect himself, and this can be done only by a class of inspection that is seldom provided by local authorities. The federal meat-inspection system depends for its authority upon what is known as the interstate and foreign commerce clause of the constitution of the United States, and this inspection is therefore limited to the product of establishments that are engaged in interstate or foreign commerce. The federal government is powerless to exercise any supervision over an establishment the meat of which is slaughtered, prepared, sold, and consumed entirely within a single state. It is a duty which the state or the municipality owes to its citizens to install and maintain a system of meat inspection that will afford adequate protection against diseased and unwholesome meats, so that all meat sold locally which has not passed the federal inspection will come under the requirements of an efficient local inspection system.

Some idea of the necessity for substantial permanent and efficient local inspection may be obtained by considering the extent of disease among the live stock slaughtered for food which varies greatly in different parts of the country, for instance in Connecticut very few of the beef breeds are raised, consequently nearly all the beef slaughtered by local butchers consists of dairy cattle which for some reason or other are undesirable members of milk-producing herds of which it is estimated that at least thirty per cent are suffering from tuberculosis in various stages of development.

For slaughtering this class of cattle it will be seen why the places which have no inspection will be so well patronized by local butchers and dealers in cattle sold for slaughter by the dairymen.

Slaughter houses conducted without official inspection have, as a rule, many features which are not only objectionable, but dangerous to the public health. Such slaughtering places should be abolished. The odors arising from the country slaughter houses, while not in themselves injurious, convey the impression, which is a true one, that the places are inexpressibly foul and filthy.

These slaughter houses are usually located in some out of the way place outside the corporate limits, often surrounded by other
buildings which are used as a stable, barn, pig-pens, etc. Sometimes they are located on the banks of streams, the waters of which become polluted and flow through neighboring pastures, becoming the means of spreading disease. It is frequently the custom to feed offal to hogs or to throw it where dogs, hogs, and rats have access to it. By this means trichinae, tapeworms, and other animal parasites are disseminated, some of which are dangerous to man. Hog cholera, tuberculosis, foot-and-mouth disease and other contagious diseases may also be spread by such conditions. Usually there is no protection to the meat against rats, flies, and other insects and vermin, and this condition constitutes a dangerous source of contamination and infection.

The objectionable conditions are not confined to the little slaughter-houses in small communities. Even in some of the large cities there are large abattoirs which do a purely local business and at which the conditions and methods are exceedingly insanitary and where a very poor class of live stock is slaughtered.

One of the problems to be overcome before adequate inspection can be maintained is the establishment of a suitable building where it is possible to carry on the work of inspection in a substantial manner. Even then certain difficulties not found by the federal meat inspection service will be encountered, one of which is the disposition of the offal and meat condemned as unfit for food. When local authorities must furnish inspectors for small scattered, poorly equipped and very insanitary slaughter-houses the difficulties of inspection become more numerous and expensive. It is therefore desirable to concentrate the slaughtering for each community into one place.

There should be a public slaughter-house under either municipal or private ownership, and in either case under official supervision. Municipal abattoirs are quite common in Europe and have been found to be an exceedingly satisfactory method of enforcing an efficient inspection, but such abattoirs are very few in this country. Aside from facilitating inspection and making it more economical, central abattoirs afford commercial advantages. They provide machinery, facilities, and equipment such as are found in the large packing houses and which are not otherwise available to the small butchers. There is also economy in the cost of operation of a central abattoir as compared with the cost of a number of scattered places, and there is an opportunity to obtain revenue from by-products which are usually wasted at small establishments.

It is preferable for the town to build and own the abattoir and to require all slaughtering to be done there, except where conditions are such as to justify private plants and where inspection is already in effect at such plants or can be readily applied.
Where it is not practicable for the municipality to own and operate an abattoir the next best plan is to have a central public abattoir owned and operated by private enterprise, and in that case the plant should of course be under an official inspection system.

There should be a system of fees or charges to provide an income sufficient to pay the cost of operating and maintaining the abattoir and the cost of inspection, and to meet interest and provide a sinking fund in case bonds have been issued. A certain sum per head could be charged for killing in case the entire operations were carried on by the management of the abattoir, or the butchers could be permitted to bring their stock to the abattoir and do the work there themselves by paying a certain sum per head for this privilege.

Where the slaughtering is done at a central place the system of inspection used in the federal service can very easily be adopted, but where there is very little slaughtering, and this is done at different points, it is a difficult problem to work out a system of inspection that will be efficient and not too expensive.

The rules and regulations for the guidance of the inspectors of the Bureau of Animal Industry are the most comprehensive, practical and complete yet in use by any country. It is necessary for state or municipal inspectors to familiarize themselves with the system of the bureau. To do this it is very desirable, in fact necessary, that the inspector be a veterinarian trained for the work, otherwise even a modified method of inspection could not be carried out with success.

A man who is a graduate of a veterinary college is not only specially trained to recognize animal diseases, but also has a knowledge of the danger of such diseases to human health. If a veterinarian is not available in some of the small villages the services of a local physician might be obtained. A physician without special veterinary training would not have the required knowledge of animal diseases and would not be able to recognize such diseases as readily as a veterinarian would. It is part of the veterinarian's special education not only to know about animal diseases, but to know, so far as science has determined, whether or not they are communicable to human beings, and to know when diseases and conditions found in animals are likely to be detrimental to the health of the human consumer of the meat.

Whenever it is necessary that laymen be employed to carry on inspection either by themselves or as assistants to veterinarians or physicians, they should have received special instruction in meat inspection under competent instructors. Where a layman is assigned to inspect in some remote place it could be arranged for him to send specimens of all doubtful cases to the chief in-
spectator at some central point where they could receive proper examination, the carcass being held until a decision is reached.

Perhaps the most satisfactory plan of compensating the inspectors is for the state or the municipality to pay them annual salaries. No inspector should under any circumstances receive his pay directly from the slaughterers, for reasons that are obvious. The expense of inspection may be met by charging fees, but these fees should go into the state or municipal treasury, and not directly from the meat dealer or slaughterer to the inspector.

Where one man has to inspect at more than one place it will be necessary to arrange the times and days of slaughtering so that he can cover all places satisfactorily. A schedule could be arranged by which slaughtering would be done at one place on one day, at another place on another day, and so on; or slaughtering could be done at one place in the morning and at another in the afternoon. In Germany there are inspectors who cover several towns and who are known as ambulatory inspectors. It might also be permissible under some conditions and when absolutely necessary to permit slaughtering in the absence of the inspector, provided all carcasses and viscera are retained for his examinations later. If the inspector can not be actually present at the time of slaughter the viscera should be held, under refrigeration if necessary, until he can pass on the animal.

Animals killed on the farm and brought to town for sale present a difficulty which may be met fairly well by requiring that they must have certain viscera attached and be brought to a certain point for inspection.

It would be good public policy for the state to reimburse or partly reimburse the owner of animals condemned as unfit for food suffering from contagious disease, such as tuberculosis. It would be a good idea to establish the ownership of the animals condemned as it would assist in many cases in locating other diseased animals, which is one of the most important results of compulsory inspection. Meat that has been inspected and passed for food should be identified by marks similar to those used by the bureau inspectors.

At the present time when food products of all kinds are exceedingly high in cost it would be a good economic measure for all municipalities to own and conduct a public abattoir since it would procure for the producer an equitable revenue and be a stimulus to the production of mature veal and better animals for slaughter. As the situation is now, particularly in the dairy sections in the eastern part of the United States the local cattle offered for slaughter bring a very low price regardless of quality due to the fact that consumers look for the inspector's stamp which is conspicuous by its absence on meat slaughtered and pre-
pared for market in the local slaughter houses which have no inspections. The public are suspicious of these places and rightly so, due to the fact that the sanitary conditions and the character of the animals slaughtered are both of unsavory reputation.

A few municipal slaughter houses have been established in the United States and are maintained by those cities at very small cost and while the conditions are not all that could be desired, it is a great improvement over no inspection. It is noticeable that the municipally owned abattoirs are nearly all in the south, New Orleans, Louisiana, Jacksonville, Florida, Baton Rouge, Albany, Ga., Beaumont, Texas, Paris, Texas, New Britain and Bridgeport, Conn., have municipal abattoirs. Several other cities have ordinances which have brought about very good inspection service. If state or municipal inspection could in some way be regulated in a uniform and permanent manner by the Bureau of Animal Industry who have done so much to bring our interstate meat products to a very high standard, it would benefit the entire country and be contributory to lowering the cost of and improving the quality of our meat supply.

PRESIDENT DYSON: The next is: "How can State Live Stock Sanitary Officials Best Serve and Co-operate in Promoting the Interest of Live Stock Producers," by Mr. E. Z. Bussell, of the "Twentieth Century Farmer."

HOW THE STATE LIVE STOCK SANITARY OFFICIALS CAN BEST SERVE AND CO-OPERATE IN PROMOTING THE INTERESTS OF THE LIVE STOCK PRODUCERS

By E. Z. Russell, Editor, "Twentieth Century Farmer," Omaha, Nebraska

First, we want to say that we are firmly of the opinion that best results will be obtained if sanitary matters and quarantine regulations of the various states are under the control of the live stock sanitary board instead of a state veterinarian or commissioner, as is now true in quite a number of the states.

If this sanitary board will be able to serve the farmers and live stock growers to the fullest extent, it must necessarily be made up of the right kind of men. In the selection of these men, we would, if possible, taken into consideration geographical localities within the state. That is, we would have the different members of the board residing in different parts of the state, that they may be in better touch with exact conditions throughout the state as a whole. The different interests involved should have representation on the board.
We are of the opinion that the best kind of a board will consist of five members, three of them to be practical stock men and farmers, the other two to belong to the veterinary profession. One of the two veterinarians should be the chief veterinarian at the agricultural college in the state, who should be a member of the board ex-officio. The four principal interests are the horse, cattle, sheep and hog. With only three stock men on the board, the four different lines could not be represented by a man most interested in that particular kind of stock. Consequently, we would select the three kinds having the most interest in that particular state and select one man who is a practical breeder and grower of each of these three different kinds of stock. The selection of these three men is of utmost importance. They must not be shortsighted and narrow-minded; they must be men who are always open to conviction, ready at any time to listen to appeals that may be made to them by farmers and breeders. They must also be broad enough to fully recognize the veterinary profession and its connection with the live stock growing business.

Possibly the greatest care of any should be given in the selection of the veterinarian member of the board. He must be a man who is of the highest standing in his profession, a man of unquestioned integrity, capable of looking at any proposition from all sides. He must be able to see and comprehend the farmers’ and live stock growers’ side of any question that may arise, as well as looking at the side of his profession.

The law forming this board should be so constructed that all the members of the board do not go out of office at the same time. We prefer the plan of having different members appointed for a term of five years, one whose term would expire yearly.

There is one word in the English language that spells disaster to live stock disease control work more than any other one, in our opinion. This little word is “politics,” and the successful live stock sanitary board can only exist when politics are absolutely eliminated both in its make-up and in its workings. There must necessarily be an appointing power to a board of this kind. This power is generally the governor of the state. If he comprehends at all the importance of such a board, he will be big enough to forget politics and will appoint every member of the board whose political affiliations are with another party than his own, if it is necessary to do so to get the best men qualified for the position. Above all else in the workings of the board, they must under no circumstances in
their official actions ever be under the influence of politics in any way, shape or manner. Only one consideration should ever be given official action and that is, "Is it right?"

The state veterinarian of any state should be appointed by the live stock sanitary board and his tenure of office should not be for any particular number of years. The selection of the state veterinarian is of the greatest importance. First, we would not select a man whom we were not reasonably sure could be retained in office almost indefinitely if he were found to be competent and his services satisfactory. One of the greatest services that a live stock sanitary board can render to the stock growing interests is to make a wise selection of a man to fill the office of state veterinarian. He should, in the outset, be given to understand that satisfactory service only will insure him his position. He should also be given to understand that if he gives satisfactory service and does his work well he can be reasonably sure of his position.

The state veterinarian must know that he submits to the dictates of no one save and except the sanitary board. The most influential citizen or politician in the state should be no more to him than the humblest farmer.

A sanitary board should be able to discern the difference between an expense and an investment. Sufficient appropriation should be made to have plenty of money available that a sufficient amount of money in salary may be paid to the state veterinarian to secure the services of the best man possible. Money spent in this way is never an expense—it is a genuine investment.

We regret that it is necessary to make this statement, yet it is an absolute fact that co-operation and free feeling between veterinarians and stock growers do not exist to the extent they should for the interests of both parties. Their interests, in a way, are identical. The veterinarian cannot expect to succeed unless the stock grower succeeds, and the stock growers, in order to have the services of the best veterinarian possible, must be willing to pay a sufficient fee for services well rendered. We want to say right here that we are firmly of the opinion that, as years go by, the standard of men engaged in the veterinary profession is being raised higher each year. The grafting, grasping man in the profession will, in a short time, be automatically eliminated, as he should be. The veterinarian who is satisfied with receiving a good, reasonable fee for services rendered and does not insist on making a good, stiff profit on everything used by the stock grower in treating a case, is the one who will in the long run be holding the confidence of the stock men and be sure of a good practice.
The sanitary board can, in our opinion, render no greater service to the stock growers of the country than in using their efforts to bring stock growers and veterinarians together for their mutual benefit. They can very materially assist in doing this work by the selection of a man for the office of state veterinarian who is big enough and broad enough to take this viewpoint, who will be big enough to denounce the practice of grafting, regardless of what veterinarian may practice it.

One of the important powers of the sanitary board is that of quarantine. During the foot-and-mouth disease that was in this country during the past two years, many of our stock growers fully realized this particular part of their duties. We know that in cases of this kind it is absolutely impossible to satisfy everyone. However, the sanitary board, seeking to serve best all the people, will seriously consider every side of a question when contemplating the placing of a quarantine on any district. They will place such quarantine only in the interests of the greatest number of people and place it wherein their judgment says it should go, regardless of whom it may affect. When the necessity of quarantine arises, prompt action should always be taken. On the other hand, the good sanitary board will keep in close touch with the situation and be just as prompt to revoke the quarantine order when the need no longer exists as they were in placing it when necessity demanded it.

In the matter of quarantine especially, we firmly believe in a very much greater co-operation between sanitary officials of the different states than now exists. In our opinion state lines should never be considered as quarantine lines unless it so happens that they are the correct lines at the particular time for this work. It is our opinion that districts affected should be the quarantine areas. If this plan is carried into effect, oftentimes it is necessary for the sanitary boards or officials of two states to co-operate in placing the quarantine, and why shouldn't they? Very generally conditions in two adjoining states are very much the same and we can see no good reason why one rule should apply just over some particular line when it does not apply on the other side.

In this connection we are very much of the opinion that quarantine lines should be established very largely upon the advice and under the direction of the chief of the Bureau of Animal Industry. We have confidence enough in the organization of this Bureau to believe that they are always acting only in the best interests of all the people concerned. Men in their employ are of high standard, are men who have particularly equipped themselves to handle their different branches.
We feel that the interests of the live stock grower would be very greatly helped if state sanitary boards would consult and co-operate with the Bureau in the establishment of quarantine lines. We believe the recent outbreak of foot-and-mouth disease bears out this idea. If we are not mistaken, every quarantine line established by the Bureau proved to be sufficient, not a single outbreak occurring because area established was not of sufficient size or the line far enough away from the affected premises.

Every effort possible should be made consistent with safety to not quarantine any district unnecessarily.

This brings up a question of uniformity of shipping rules and regulations which certainly do not exist at the present time. Co-operation between sanitary boards in this respect would be of inestimable value to the stock growing interests; particularly would this be true of the pure-bred breeder. As it is now, our shipping regulations into the different states is nothing more or less than a jumble. What may be necessary to ship a cow or a hog from one state to the adjoining one on the east would not be allowed under any circumstances to ship this animal or animals to the state on the south. We can't see any excuse for many of these varied regulations.

We want to say right here that these jumbled-up regulations are one of the causes for the stock growers' antagonism toward veterinarians because a veterinarian has generally been the official who has had the prescribing of these regulations.

Our experience in handling some of the big hog shows of the country has brought this matter very closely to us. Every year in shipping from our state fair, we have found one or more shipments held up some place along the line because the necessary certificate did not accompany the shipment. With our present conditions, it is practically impossible for the practitioner to know what is necessary in every state. We feel sure that a good many state veterinarians even do not know what is necessary to ship into every other state. Railroad and express officials are in the dark. We, personally, know of several instances where pure-bred breeders were deprived of good sales just because of wrong information being given to the stock owner.

Regulations for shipment of live stock into any other state should be made with the idea in mind of protecting the community or state into which such shipment goes and requirement made for such shipment should be only such as will give the best protection. It should also be borne in mind that when
veterinarians' certificates are necessary, sometimes it is a considerable burden on the shipper, as he may have to send a considerable distance to get the veterinarian. This should always be taken into consideration in prescribing the rules and the necessary regulations. Herein is another place where stock growers have claimed that veterinarians, in making these regulations, were only trying to fatten the pocketbook of their profession. We must confess this sometimes looked like the truth. While we are free to say that oftentimes this charge is made without any foundation whatever, it is, however, best to give the matter serious consideration, if the board renders the best service to the stock owner.

We don't want to rehash too much what has been done, yet oftentimes past experiences are splendid teachers. Every man here knows the fight that has been going on in the hog growing states over the question of who should do the work of vaccinating. It has always been, and is now, our contention that by his training and education the veterinarian is the best qualified man to do the work if he will but give it the required attention. If the sanitary board can, by regulation of some kind, require this work to be done by men fully qualified in a scientific manner and at a reasonable fee, they will certainly be rendering a service to the hog growers in general.

We believe that the time is near at hand when another line of work in animal diseases will be given far greater attention than it is at the present time. We refer to that of testing cattle for tuberculosis. If best results are going to be obtained in testing cattle, men who have an intricate knowledge of how to test and when to test should do the work. We want to say that in our opinion there are a good many veterinarians who are absolutely unqualified at the present time to do this work. They can, however, with a little trouble and application qualify themselves. In our opinion, far more strict regulations in the movement of cattle will of necessity be made in the fight against this disease.

Genuine service will be rendered by the sanitary boards of the country if they will prescribe such regulations as are necessary to allow no cattle to be tested except by men qualified both as regards their professional ability and their integrity.

Every rule and requirement passed by a sanitary board should be a practical one. We know that in several states there are rules that are not practical in any sense, and why they are there, we don't know. For instance, some states require that for shipment of cattle to be used for dairy purposes entering the state, a veterinarian's certificate, accompanied
by a chart showing that they have been tested for tuberculosis within thirty days last past and that they have not re-acted to the test, must accompany the shipment. This same animal may have been tested thirty-five or forty days prior to this date of shipment, and as everyone familiar with the facts knows, it is practically impossible to get a true test on an animal unless at least six or eight weeks lapse since the last test has been made. No real protection is given to the community into which an animal goes by the enforcement of a rule of this kind if the animals have been but recently tested before the test for shipment is required.

Many other shipping regulations along this line are among the requirements in some states and should be avoided. The sanitary board in making regulations should consult safety and follow common sense.

In conclusion, let us say that sanitary boards are of the greatest importance to the live stock growers and can be of service all the time to the veterinarians, live stock growers and the general public by the enactment of only such rules as are necessary, and further, to see that their rules are made for something and not to be violated or thrown aside whenever it is convenient to do so.

President Dyson: It was the intention in preparing this program to have the editors of the various farm journals follow. Mr. Gregory, Editor of the "Prairie Farmer."

Mr. C. B. Gregory: Mr. President, gentlemen of the Live Stock Sanitary Association: It is getting late, and I do not want to take up much further time at this time. I do want to endorse Mr. Russell's splendid paper, which I feel covers the situation very thoroughly.

In taking up this question it seems to me that the word co-operation covers the whole thing, and under that we should have co-operation in two lines, co-operation between the state sanitary boards of different states, co-operation between the sanitary board of one certain state and the farmers and veterinarians of that state. Mr. Russell brought out very well the need of co-operation between the sanitary boards of the different states. A man who is going to ship stock into various states, needs to keep a card index and a secretary to keep track of the different regulations with which he must comply.

It is a very difficult matter, and it would seem to me that stock that meets certain requirements, so that it can be shipped across one state line, ought to be allowed to be shipped across any state line by complying with the same regulations.

I realize that that is a difficult thing to handle, because the different state boards have different ideas, and it is a difficult matter to reconcile those ideas, but it seems to me that some method should be inaugurated, and some means taken to bring these state sanitary boards together and secure uniformity of regulations which will do perhaps more than any other one thing to relieve the present burden on shippers of livestock from one state to another.

The second thing is co-operation between the state boards and between farmers and veterinarians in certain states. There is un-
fortunately in a good many cases, more or less feeling between farmers and veterinarians, and not as much co-operation as there should be. The veterinarian, I think, is inclined to under-rate the value of the farmer's opinion. The veterinarian has been educated along sanitary lines and he feels that the farmer who has not had the benefit of such training and education, is not entitled to say very much regarding live stock sanitary regulations. The farmer, on the other hand, feels that the veterinarian is inclined to be a little theoretical; that he overlooks the practical and financial aspects of the regulations that he is inclined to favor.

I am inclined to think that in maintaining this attitude, both parties are more or less right. I think that the farmer needs more respect for the veterinarian, the knowledge of the veterinarian, and the veterinarian needs to consider more the practical financial aspects of the regulations that he favors. The only way out of this, it seems to me, is for the making of rules and regulations to be in the hands of some such board as Doctor Wills favors, a board composed of real stock men, and of the best veterinarians that could be obtained today. With such a board and I realize fully that Mr. Russell's board is an ideal one—it is difficult to get away from the question; it is difficult to get the best stock men upon such a board; it is difficult to pick out the best veterinarians to place on such a board, but that is the ideal towards which we should work. With such a board as Mr. Russell has outlined, having charge of live stock sanitary work in any state, I believe that that work will progress, will do more than ever has been done in any state to forward the cause of livestock sanitation. I think in working towards that ideal we can do a great deal, and that we can greatly improve sanitary conditions, and can do much towards the elimination of disease. I thank you. (Applause.)

PRESIDENT DYSON: Mr. C. A. Snyder, editor of the "Farmers' Review."

MR. C. A. SNYDER: Mr. Chairman and Gentlemen: I assure you at the outset that I appreciate my privilege. In the first place, I want to congratulate you on the architect of your program, not only because of his admirable brilliance in the selection that he has made among the representatives of the agricultural press to appear before you, but essentially because in asking the agricultural newspaper men to appear before you, he has, and through him you have, definitely recognized the agricultural press as a vital factor in your work. Not only is it a vital factor, but to my mind it is the most vital factor in your work.

It was not many years ago, for instance, when the railroads were in disrepute. They were made the subject of attacks from every isolated cross-roads in the country. When a cheap politician wanted to curry the favor of those before whom he appeared he "cussed" the railroads, and he got the glad hand for doing it, because nobody had a good word for the railroads. What did the railroads do? The railroads immediately started a great campaign of advertising to tell the people who they were and why they were. It is not necessary to tell you the results. Almost everybody has a good word for the railroads.

Other industries went through the same experience. The telephone industry, the International Harvester company; and if it takes half as much brains to run the packing industry as I suppose it takes, we shall expect within not many moons to see the packers telling the people who they are and why they are, for certainly the packers
are not today making any boasts about the friendship of the people in general.

Now, we come to you gentlemen here. If I am not mistaken you are more or less in disrepute with the people, at least in many cases, there are many people in all parts of the country "cussing" you. It is not the fault of any individual among you, and at the same time it is the fault of every individual among you, because you have not gone to the people and won their confidence. What is everybody's business is nobody's business. Nobody has paid much attention to this phase of your work. I do not think it is necessary for me to express my respect for and confidence in the veterinary profession, not only those members of it who are in private practice, but those who are holding official positions. I do not think the entire profession should be condemned because a few members in it have done things they should not have done, any more than I think the farmers as a whole should be "cussed" because a few of them may be crooked, but stories have been circulated about your work. Some of them have started from very humble sources, and some of them from higher sources, and those stories have been told, somebody said so and so about you, and the next time that story is told it is so and so and so and so, and the next time it is so and so and so and so, until you are all sewed up in the distrust of the people you would serve.

My notion is this, and I think it is an important one. These stories have gone out, and you have not denied them. You have not used the agricultural press in an educational way. I do not charge you with any such financial backing as the packers and the railroads and so forth, and you don't need it. It will not cost you a cent for the advertising you need today, if you will go to the agricultural press and explain who you are, why you are and what you are trying to do. Go to the people and tell them what things need to be done, what you are trying to do, what the veterinary profession as a whole can do to serve the livestock interests—go to them with that story, and if you are a little bit smooth about it you can get paid for doing your own advertising; the farm papers will pay you for the stuff, but go to them with the story, and tell the farmers what you have and tell them what you are trying to do.

(President Dyson: Dr. Rutherford is next on the program, "Live Stock Sanitation, Past, Present and Future." (Applause.)

LIVE STOCK SANITATION, PAST, PRESENT AND FUTURE

By Dr. John G. Rutherford, Canada

Mr. President and gentlemen: I have not very much to offer you. I do not know that you will be any wiser after I get through than you are now, as I am only going to give you a brief, friendly talk on the subject which has been allotted to me.

I have not had time nor opportunity to write a thesis on the subject of livestock sanitation, past, present and future, and I would suggest that at some future meeting of this association that subject might be a feature, beginning at the first hour of the first day and continuing through to the end. It would be much
more satisfactory than to attempt to deal with the whole subject in a few minutes at the close of the program.

We need hardly spend any time going into the past of livestock sanitation, because in a sense it has no past. We can go back to the days of Moses. I notice that in every room in this hotel there is a copy of the Holy Bible and if you will study the books of Exodus and Leviticus, you will be surprised how much that old Hebrew knew about sanitation, livestock and otherwise. Perhaps his knowledge was not based on microscopic research, but he had the best kind of good hard common sense, and the principles which he laid down in those early ages are being, to a very considerable extent, followed today, although with more knowledge of the reasons why.

We come on down through the ages—I will hurry over those ages, because from the point of livestock sanitation they are unimportant, and we find that there was always more or less attempt being made to enforce sanitation, although people did not know very much about it; until we reach what may be termed the dawn of our own civilization.

The 18th century is about the beginning of anything in the nature of scientific veterinary not to say medical work. I have made a collection of the old books, published, a few of them at the close of the 17th century, but a majority of them in the 18th century. A perusal of those portions which deal with infectious and contagious diseases of animals, and the methods taken for their control, will show at once that the knowledge possessed by our predecessors of the 18th century was exceedingly limited. As a matter of fact, they contradict each other in a most astounding way, and we find that up to nearly the end of the 19th century, people had most remarkable ideas in regard to the nature of contagious diseases, and the manner of preventing their spread, not only among animals, but among human beings as well. In the past, at any rate the somewhat remote past of livestock sanitation, there is nothing much with which I could profitably occupy your time.

Among the principal antiseptics recommended by the veterinarians of the 18th century, and the first half of the 19th century, were asafoetida, saffron, anise seed, and our old friend the goat. The goat, that is, the he-goat of some age, and bouquet, was looked upon as being perhaps the most effective disinfectant which it was possible to keep around for the purpose of warding off attacks of contagious diseases. He has since been largely utilized for another purpose, but at that time his principal role was that of head, center and cornerstone of livestock sanitation.

We find even in the later years of the 17th century quite a good many references to corrosive sublimate, although the
strength in which it was used would make most of us sit up and take notice at the present time. Then lime began to be used very largely, but there was little or nothing in the way of scientific disinfection until after the discovery of carbolic acid and the other coal tar products.

Some of the younger men here may not have realized that when I left college in 1879 the spontaneous origin of contagious diseases was still being taught and was a prominent feature in all of our text books. I remember well when the late Sir George Fleming, then principal veterinary surgeon in the British army, was fighting a lone fight, single-handed, amongst English speaking veterinarians for the promulgation of the theory that contagious diseases were always of specific origin.

I hold in my hand a little book, to which I will refer later, as one of the most remarkable works of our profession of modern times. It is a little monograph on glanders published in the month of November, 1887, by the late William Hunting, who was one of the greatest authorities on that disease, and in it he quotes as follows:

"Of all the contagious maladies affecting man or the domesticated animals, perhaps glanders is the disease which would be selected as an example of the spontaneous or direct development of a virulent or infecting element. Those who maintain that a contagious malady can never be generated, but that its appearance must depend on the presence of a previously existing germ, have had but little or no experience among horses, or of this disease. The highest continental veterinary authorities, and those who have most attentively studied the etiology of the affection, are absolutely unanimous in their opinion as to its being at times developed directly, and without contagion having anything to do with it. The innumerable facts derived from many years' observation afford perfectly conclusive evidence that, under the influence of certain causes of an appreciable character, glanders will develop itself without the intervention of a contagium." So says Dr. George Fleming in a book published only ten years since.

Now, that book was published by George Fleming, who was in 1877 one of the leading authorities, especially in the English speaking world, on veterinary subjects. It was only in 1879 or 1880 that Fleming became a convert and from preaching such doctrine as that, which I have just read to you, took the other end of the argument and fought the whole veterinary profession on the question of the spontaneous origination of contagious diseases.

It is hard for men to believe that such professional ignorance existed so short a time ago. You know that Professor Wil-
liams of Edinburgh, as late as 1890, in his wonderful text book, which was the veterinarian's bible for a good many years, still declared himself unquestionably of the opinion that glanders frequently originated spontaneously.

I remember when I was a boy the big outbreak of rinderpest in Great Britain in the early 60's, and I remember the crude and futile methods which were adopted for the suppression of that disease. Looking back at the efforts which were made then in the suppression of cattle plague, I long ago reached the conclusion that providence in past centuries had played a very important part in the restraint of contagious diseases of all kinds.

Many of the older men here will remember when pleuropneumonia was a very live subject with all veterinarians, not only in the old country but on this continent, how little was known about it and how many different theories were promulgated.

If any of you want to realize fully how great and rapid has been the progress in live stock sanitation, I would advise you to get hold of a book "The Four Bovine Scourges," which was published in 1879 by the late Professor Walley, who succeeded Professor Dick as Principal of the Royal Veterinary College in Edinburgh. It deals with four diseases, rinderpest, pleuropneumonia, foot-and-mouth disease and tuberculosis. This book was then justly regarded as the very last word on veterinary sanitation, at least with reference to these four maladies, but read in the light of present day knowledge it is rather astounding. Its most interesting feature is perhaps the satisfaction evinced by the author as having reached the last possible conclusion as to the nature of these various maladies and the best methods of controlling them.

Right here I may say that this same satisfaction is evident through all the ages. You find it away back in the 17th century, you find it in the 18th century, you find it in the early years of the 19th century, and it is still abundantly evident in the 20th century. We are still apparently quite satisfied that we have found out about all that can be found out, and we are, many of us, at least, as emphatic as if there was no more to be learned. I was sitting a few years ago in the old garden of the Royal Veterinary College in London one Sunday afternoon, with Sir John McFadyean and William Hunting, who had with him the proof sheets and the plates of that wonderful new book of his on glanders which was published shortly before he died. We were discussing the whole subject in going over these pages of proofs and the plates, and I said: "That little monograph on glanders which you published in 1887 is one
of the most interesting books on the subject that I have ever seen." Mr. Hunting said: "Oh, no, that is no good now. It never was much good, and it certainly is no good now." I said: 'I differ with you. That book was the only authoritative publication on glanders between the date of the discovery of the bacillus mallei and the beginning of the use of mallein as a diagnostic agent; and your vagaries and your wonderings and your speculations as to how the contagion of glanders is spread, as set forth in that book, are certainly very interesting to me, and I think will be interesting to all veterinarians in all the years to come, owing to the striking difference between the partial knowledge of the facts which you then had and the much greater knowledge of the nature of glanders which followed the application of mallein as a diagnostic agent.'

Those of us who are old enough all remember the mysterious way in which glanders moved before mallein came into use. We would eliminate all the clinical cases from a stable and, after examining all the others very carefully from a clinical standpoint, we would say "This stable is absolutely free from disease" and then a year or fifteen months or eighteen months afterwards there would be another case or two or three cases of glanders, possibly in horses that had been added to the stable since the previous manifestation had occurred, and we would go to that stable again and clean it out, and we would have the same experience over and over again.

Then in regard to tuberculosis. When I was a youngster, when we were asked to examine a herd for tuberculosis, we had no tuberculin to tell us what was going on in that herd; we had to find out if we could—of course, we could not in a great many cases—and yet without any tuberculin, without any syringe, we would make a great deal better job at picking our diseased animals by clinical examination, than would the modern veterinarian who has been brought up on the bottle, as it were. (Laughter.)

Fleming was the first man in the English-speaking world to write a comprehensive work on live stock sanitation. Fleming's Veterinary Sanitary Science and Police, which was published over thirty years ago, is still a text book, and a most valuable text book.

It was the first magnum opus performed by a veterinarian on behalf of live stock sanitation.

We, of course, made tremendous strides when mallein and tuberculin came into use as diagnostic agents. If my memory serves me right, tuberculin came in about 1890 and mallein, I think, some two years and a half later. They made a radical change in our outlook, because they not only simplified the
work in regard to tuberculosis and glanders to a very large extent, but they also opened up new channels for pathological research, which have been followed by many faithful, earnest workers ever since.

You all remember when Koch first announced the discovery of tuberculin that he regarded it, or at least, he was represented as regarding it, as a curative agent, and you will remember how laboriously Sir John McFadyean in England and many other veterinarians on the continent of Europe experimented with tuberculin, in the hope of being able to establish the fact that it had curative properties, and how they were all disappointed. You will recollect the French experiments with mallein in 1889, and the Glasgow experiments with the tramway horses in 1900 and 1901, and the still later determination of the authorities of the United States army, to demonstrate the fact that mallein was a curative agent, which kept us back for a good many years.

That Glasgow experiment was particularly interesting. After having been tested and retested a number of tramway horses were sold as ceased reactors considered cured to various parts of Scotland, with the result that a number of new centers of glanders were created in the rural districts. You all know now, as it has been demonstrated time and again, that there is no surer way of disseminating glanders than by sending out these ceased reactors, as was done from this great city of Chicago for a long time. The veterinary profession owes a very considerable debt of gratitude to the city of Chicago, because of the large amount of professional work which was furnished to the veterinarians of the northwest on account of the horses purchased in the stockyards by intending immigrants, and brought up into our country.

We have not got very far with some diseases. When I think of rabies I feel that it is fortunate that in the majority of cases, dogs are not very valuable.

Some years ago we had a serious outbreak of rabies in western Ontario. Some of you may remember the joke that Dr. Walrod worked off on me at the A. V. M. A. meeting here in 1909. In my official report I had stated as the origin of the outbreak, that on the 27th of May, 1907, a dog had crossed the suspension bridge from Lewiston, N. Y., to Queenstown, Ontario, and after biting several dogs on the Canadian side, returned to the country whence he came. And the old gentleman got up in the meeting and wanted to know which was the Canadian side of a dog.

When this outbreak was in progress, one of the leading sheep breeders of eastern Ontario, now gone to his reward, came into
my office and, after having carefully closed the door and taken every possible precaution to prevent his being overheard, asked me in a stage whisper if it would be possible to get a few of those dogs from western Ontario down into eastern Ontario, so that we could kill the dogs off in the same way that we were doing in the western part of the province.

I may just say in passing that it is a perfect disgrace that the dog should receive so much more consideration than the sheep receives on this continent. In a great many communities it is practically impossible to keep sheep on account of the prevalence of useless curs. It is a good thing that rabies does not as a rule affect animals of any great economic value. It is worth remembering that at the present moment there are men having more or less standing in the medical profession who dispute absolutely the fact that rabies is a disease at all, and simply scout the idea of its being a transmissible disease. This constitutes a very serious reflection, not only on the intelligence of the people who make these statements, but on the standing and influence of the veterinary profession.

We have progressed in the last thirty years in the most remarkable way and we are still going forward in the matter of pathological research. The pathologists both in Europe and in America have done excellent work on behalf of live stock sanitary science. The value of the discoveries of the various serum tests and that as to the prophylaxis of diseases by the use of vaccines and other preparations, cannot be overestimated.

The discovery of the fact that many animals not showing any signs of disease are nevertheless carriers and in many cases breeders of disease, while remaining quite unsuspected individually, is also of very great importance to us all.

Among other great discoveries is that of the intermediate host of which a most outstanding illustration is the excellent work done by the Bureau of Animal Industry in the control of tick fever.

I remember being called upon one occasion away back in 1886 to examine one of a large number of bulls that had come from Missouri to Manitoba, several of which were suffering from red water. The incident is very definitely fixed in my mind because I had a broken thigh at the time, and it happened that the bull, who was occupying a recumbent position suddenly raised himself, and butting me right in the hip sent me flying, broken leg and all. These bulls undoubtedly had tick fever but nobody either in the United States or Canada then thought that the ticks on such animals had anything to do with the disease.

We did not then consider the tick as of any importance and,
when one thinks of the tremendous amount of work which has been done in that particular line in less than twenty-five years, one cannot but realize how very new live stock sanitary science really is.

We may now consider a few matters which have more or less bearing on present conditions in their relation to the future. The inauguration of government control was a big step in advance but there is much more uniformity required in the matter of government control than we have at the present time. It is very interesting to take the different regulations issued by the various countries of the world, and compare them, and see the different points of view which are expressed or represented in these regulations. It is still more interesting and much more vitally important to us, to take the regulations issued by the various states of this American union, and compare them and note the differences in the viewpoints of those responsible for their promulgation.

That is all wrong, absolutely all wrong. I think it was on this platform last year that I urged very strongly on the Assistant Secretary of Agriculture for this great country and the gentlemen who were attending that meeting, the necessity of having intelligent co-operation between the various authorities in this country who are responsible for the prevention of the spread of contagious diseases among animals.

It is a duty—it is not a matter of inclination or taste, it is a matter of duty to see that these regulations are uniform, and that they are properly and intelligently enforced. Before I conclude, I am going to speak a little more strongly on that point, but I just want to point out an interesting oversight that occasionally takes place in the drafting of regulations in the matter of live stock sanitary work.

A few years ago I was talking to a certain prominent member of the British Cabinet, and I was discussing what has always been a rather interesting and at times rather painful subject between the Dominion and the mother country, the regulations governing the importation of livestock into Britain, and I said:

"You have regulations about live animals and various other things, but what are you doing about wools?"

For years, ever since England became a great manufacturer of wools, you have had continual recurrences of wool sorter's disease, anthrax, malignant pustule or other forms. What provision have you made for safeguarding the bringing in of wools? You are having outbreaks of anthrax all over England and Scotland and Ireland among farm stock, and you are bringing in this disease in wool; as well as in hides. You have absolutely no regulations to prevent the introduction of the disease through
wool or hides. Your live stock regulations are very full, very
drastic, very severe, but what about your wool and your hides?
"What about your locust beans? How often does it occur that you
have imported locust beans being fed on the same place where
anthrax breaks out. You are not looking after that at all."

You all know the drastic nature of the order in regard to
dogs which was issued by the British government in 1901, and
it was only in 1910 that a master of hounds in one of the English
counties died of rabies, and the fact was brought out that he
had been bitten by a fox.

Remember that not a foreign dog had been permitted to enter
Britain for nine years without going through the most drastic
form of quarantine, when this master of hounds was bitten
by a fox and died of it. It was found that this was a French
fox, and that they were in the habit of bringing in French
foxes when they ran short of English foxes, turning them loose
and hunting them, without regulation of any kind.

It is only within very recent years that any attention was
paid to menagerie animals. I can tell you a rather amusing story
about that. I happened to be away from Ottawa once for
some time, and during the interval a repatriated Canadian who
had presented a public park to one of our towns in Ontario,
decided to add a zoo, and he bought two buffaloes here in Chicago.
I don't know whether they were indigenous to the city, or
whether they had been brought here from some other point,
but this was where he bought them. They came over to Sarnia,
and as the regulations said that all animals of the bovine species
should be submitted to the tuberculin test on admission to
Canada, they started in to test those buffaloes. I think the battle
lasted about a week or so. I never saw the actual carnage itself.
but I saw the scene of the fight afterwards. The buffaloes were
returned to Chicago because they simply would not submit to the
tuberculin test. They were subsequently shipped in without being
tested, but the incident furnishes an excellent illustration of the
desirability of having all regulations so drafted that they may
be properly enforced in a practical way.

It is possible, as we all know, to prevent the introduction of
many diseases by a careful physical examination of wild animals
intended for exhibition purposes. With these menageries crossing
and recrossing the international boundary during the summer season, it was a matter requiring some little diplomacy to so arrange matters as to be able to make satisfactory and thorough inspection of these large and very costly collections, but it was done, and now every circus that crosses from the United States into Canada has every animal belonging thereto subjected to a careful physical examination.
It is the duty of the veterinary profession in regard to all these matters, to secure at all costs, greater uniformity, greater certainty, and above all greater judgment and sound common sense in the promulgation of regulations to prevent the spread of contagious diseases. In my experience it is of the first importance to have a thorough and full discussion of the whole matter between the authorities and the producers, who, after all, are the parties most vitally interested, but who, because of their lack, in many cases, of the opportunity of giving expression to their views, are apt to be overlooked. The consumers, too, are also of some little importance in this matter. Veterinarians are inclined sometimes to think because of their official positions, that they are the people most vitally and intimately concerned in the enforcement of live stock regulations, but I would suggest that the interests of the producers and the interests of the consumers might be taken into consideration from time to time. Then you want intelligent, thoughtful, friendly collaboration between the federal and the state, and in our country the provincial and in both countries the municipal authorities, with the professional element, before you can have a satisfactory state of affairs. Without this intelligent collaboration and thorough understanding making for united effort, you do not get very far, and you never will. There is always somebody offended, somebody hurt, somebody troubled.

It is not a bad idea to discuss all regulations carefully with the transportation people. I found when I was in public office that one of the most satisfactory ways of securing gratifying results, before enforcing any new regulations, was if time permitted, to consult everybody who was interested in any way.

Many a trip I made to Washington in the olden days before I imposed some of the rather drastic regulations which it was necessary to impose along our international boundary, and you may have noticed that we never had any friction over these matters between the governments of our respective countries, because of this matter of discussing things beforehand. Dr. Salmon and his successor also followed the same principle and policy in regard to the regulations which they were about to impose, and the lack of friction referred to is just an illustration of the vital importance of consulting with everyone who is going to be interested or possibly injured by the promulgation of new regulations. It is impossible to attach too much importance to this phase of live stock sanitary work. It is especially important in rural districts.

Always, when I was in the position of having to do unpleasant things I found it to be of inestimable value to have a full and free discussion whenever time permitted, with the people in the localities to be affected.
Again, one must bear in mind the effect on the public mind of differences of opinion among those who ought to be authorities. There is not a veterinary practitioner here who has not seen time and again in his own experience the folly of two veterinarians going to look at the same case and expressing widely divergent views as to what was the matter with the animal, and what ought to be done to relieve it. As a rule the farmer says they are both damned fools and don't know what they are talking about.

It is the same in regard to regulations relating to livestock sanitary methods. One authority says so and so, and the next says so and so, and thus it goes on, and the public says: "Well, these veterinarians don't know what they are talking about, they don't know anything anyway," and that becomes the general opinion.

The effect of divergent opinions between various authorities is always bad, but the effect of sane, level-headed authoritative pronouncements by responsible bodies is always beneficial. That was the reason the international commission on bovine tuberculosis was conceived and created.

The members of the veterinary profession on this continent did not all think alike in regard to some very vital and important features regarding the control of tuberculosis. They were rushing into print, many of them, making statements widely at variance with each other, with, of course, the result that even such great papers as the Breeders' Gazette, and other agricultural publications were ridiculing the veterinary profession and its attitude in regard to tuberculosis, owners of valuable herds were fighting, and the great live stock world was in a chaotic condition in regard to the proper policy to be pursued regarding bovine tuberculosis.

The commission was created in 1909, and reported at San Francisco in 1910, and its report is still a standard, and I do not think that since that time there has been any serious attempts by anybody to contradict its findings. The advantage of that to the veterinary profession as a whole is incalculable. I feel that I need not take up your time longer on the importance of having intelligent, sane, joint pronouncements in regard to the various contagious diseases with which we are called upon to deal.

Now, do not overlook the crank in this connection. You know cranks are very useful. They are about the most useful members of society, if they are properly dealt with, properly handled and properly controlled. Don't simply say he is a crank and attempt to suppress him as such, but take him in hand and utilize him and his energy, his individuality, his initiative, his courage, because as a rule your crank is no coward. They must, however, be properly utilized, and in everybody of this kind there should be a crank committee, a special committee appointed to quietly,
unobtrusively, gently but firmly deal with the cranks, and see that their idiosyncratic eccentricities are properly directed.

There is very great danger in matters pertaining to live stock sanitary work, in jumping at conclusions. We want to go very slowly. We may think we know it all, but there are others, there are always others. In a multitude of counselors there is wisdom. It is always well to carefully consider every move beforehand when time permits—and I have only used that in an interjectional way, because time should always permit; in other words, there is no great crisis in live stock sanitation likely to arise nowadays for which the responsible authorities and the veterinary profession as a whole, should not be reasonably well prepared. Forewarned is forearmed, and the entire country has had experiences pointing to the absolute necessity of being forearmed. It is a very bad thing for any individual to be unprepared. If it is a bad thing for an individual, it is certainly a great deal worse for a great nation possessing many multiples of intelligence. We should have the machinery and the organization necessary to deal with any crisis liable to arise in the matter of livestock sanitation, and we should be always prepared, always ready.

Never jump at conclusions. If possible, get together and reach a sane, intelligent decision as to what is to be done, and then having made sure that you are right, go ahead. Of course, one of the drawbacks to this is, that speaking generally of our own profession—the medical profession is just as bad—we are always so cock-sure about the correctness of present-day knowledge. As I have already said, this obsession seems to be universal. It is with us today, and I do not know that it is altogether a bad thing, because after all the only knowledge on which you can base conclusions and take action is the knowledge which you actually have; the knowledge which you are going to have next year or the year after cannot help you very much just at the present time. It is none the less a good thing that one should make certain before urging a conclusion that there is no more knowledge actually available.

We have had in the last fifty years, in the last thirty years, in the last twenty years, in the last ten years, in the last five years, rapidly accumulating knowledge, and it is quite simple when you come to think of it. You know this world is only about two hundred years old. I am a crank of this two hundred year old business, but when you bear in mind that a hundred years ago, when your grandfather wanted to communicate with my grandfather at a distance, he used exactly the same means, exactly the same methods that Isaac did when he wanted to communicate with Abraham; that a hundred years ago when a man wanted
to go from one point to another and could afford to do something besides walk, he used exactly the same apparatus, only very slightly modified, that Pharaoh did when he pursued the Israelites on their flight from Egypt. When you consider that it is only a few years over a hundred since when a man wanted to do anything after dark, he used exactly the same apparatus, only very slightly modified, that Noah did when he went to milk the cow after sundown on the ark; when you recollect that a hundred years ago the number of people who could read and write in the ordinary civilized community was about equal to the number of people who today cannot, you will realize that it is the brain development of the multitude which is giving us this rapid accumulation of knowledge, so vast that it is hardly possible for a man to keep up with the procession even in one specific line. It is not until the brain is educated that it develops and it is the cumulative work of all these now educated and developed brains, engaged in studying the problems of life, which is responsible for this modern deluge of knowledge. We must bear in mind that this is getting to be an age of specialization. It is not going to be possible in the future for a man to have even a general knowledge of a great many matters, he will have to confine himself to a certain line of work and follow it out very closely.

We must take advantage of the knowledge of others. The days of individualism in regard to matters of opinion are over. We must have open minds. We must hear what the other fellow has to say. We must listen to his argument if we are going to reach satisfactory solutions, at least on matters of public or general importance.

We want friendly rivalry, but we want to eliminate what has always been the great bugbear of the veterinarian in the little country town, has become a bugbear in the small cities, and even in the large cities while in official work its cloven foot is constantly becoming evident, and that is jealousy. Friendly rivalry all you like, but jealousy, no.

There should be no antagonistic feelings between the authorities in one state as against the authorities in another state, or between the authorities in any of the states, and the federal authorities at Washington. I am speaking now of your country, because in our country we have reached a fairly satisfactory solution of this difficulty, but your difficulty is that you have too many controls, and unless and until you get hearty and friendly co-operation between these various controlling bodies, you are going to have more or less trouble. You ought to unite for cooperative effort between the producers and the consumers, all your different authorities, professional and otherwise, and the members of the veterinary profession as individuals.
You must always remember that the veterinary practitioner is one of the most indispensable factors in the prevention of contagious diseases of live stock, because he is in touch with the local situation all over the country. It is invaluable to the authorities responsible for the regulation and control of these diseases, in providing for live stock sanitation, that the veterinary practitioners throughout the country should individually and collectively be interested in this work and friendly. It is therefore most important to secure that friendly attitude on the part of practitioners, even in the smallest communities.

You must hitch your wagon to a star. We haven't got anywhere near where we ought to be in the matter of live stock sanitation. Many of us have high ideals but it is a long way to the star. There is only one way to reach that star, and that is to go one step at a time. Do the thing that is given to you to do, as well as you know how, but do it. There will be something else tomorrow and something else the day after, and you may not be able to keep your eye on the star all the time. Keep the thought of the star at the back of your head, because your eyes will be needed for the work you have to do. Keep right on day by day, and after a while you may reach the star, but in any case, whether you do or not, you will have the satisfaction of knowing that you have done your best, and that you have made a certain amount of progress along the path of service, because after all efficient public service is what we are trying to attain. That should be the aim of every practitioner, every pathologist, every official, every publicist. Every one should do his bit, and if he does his bit, and does it as well as he can, does it with honest, earnest, single minded effort, the results will certainly show for themselves. (Applause.)

And thereupon, the convention adjourned until two o'clock P. M., of the same day.

**Sixth Session.**

December 7, 1916, 2:00 p. m.

_President Dyson:_ Gentlemen, we will proceed with the regular program. The next is the report of the executive committee, Dr. Cary, of Alabama.

_Dr. C. A. Cary:_ Mr. Chairman, I will say there has just been one meeting of the executive committee, and there was just one thing done at that, and that was relative to the Salmon memorial. That was deferred indefinitely for future reference. The fact is we have been unable to get more than one or two members of the committee together. That is the only report I have to make.

_President Dyson:_ The report of the Finance Committee, Dr. Crewe, chairman.
TWENTIETH ANNUAL REPORT

Report of the Committee on Finance.

Your committee has checked the accounts of the secretary-treasurer and find same to be correct. (For summary see report of secretary treasurer.)

W. F. Crewe,
Chairman.
Charles Keane,
W. B. Mack.

Financial Statement.

Balance on hand November 27, 1915.................................................... $759.53

Receipts.

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Expenses per vouchers attached................................................................. $769.26

Receivable from program advertising......................................................... $1,356.68

Balance on hand Dec. 1, 1916................................................................. $1,856.68

Report of Committee on Salmon Memorial.

Your committee has examined the various suggestions and proposals that have been made for some fitting testimonial to the late Dr. D. E. Salmon. The one we wish to recommend to the U. S. Livestock Sanitary Association is known as the Salmon Memorial Fund, which was finally adopted by the 51st Meeting of the American Veterinary Medical association.

The American Veterinary Medical association has appointed a committee of seven men for the carrying out of the purpose of this memorial fund.

The form of testimonial adopted was of an educational character—a scholarship or fellowship in some advance special course of interest in Animal Husbandry, as may from time to time be recommended by this committee for action of the association.

The American Veterinary Medical Association has proposed to raise
$10,000 for this purpose. The money is to be distributed under the direction of the association so that the income may be used in defraying the expenses as outlined.

The scholarship or fellowship shall be in an American veterinary college. If a fellowship is decided upon, it cannot be taken in any college from which the candidate was graduated.

There is already a fund of close to $4,000 pledged. The contributions received up to the present time are somewhat as follows:

- New York Veterinary Medical association: $500.00
- Pennsylvania Veterinarians: $350.00
- Iowa: $262.50
- Ohio: $195.00
- Forty-eight members pledged $25 each, and so on: $1,200.00

Dr. Salmon was one of the leading livestock sanitarians of the age. The work he did in planning and organizing the work of the federal bureau of animal industry is unexcelled by any other government. For twenty-five years he gave the best efforts of his life to this service. Scarcely a man interested in animal hygiene in the world but what knows of the wonderful work accomplished by Doctor Salmon. His noble work was exactly in line with the work and the purpose of the U. S. Live Stock Sanitary association, and it is to be hoped that the association and the members will contribute generously to the Salmon Memorial Fund.

C. J. MARSHALL, Chairman.
JOSEPH HUGHES, C. A. CARY.

DR. W. S. CREWE: We have included in the report that $100 be appropriated to pay the Assistant Secretary for her services during the past year, and I move that that be done.

Motion duly seconded and carried.

PRESIDENT DYSON: What action do you desire to take with reference to the report of Dr. Crewe?

DR. VAN NESS: I move its adoption.

Motion duly seconded and carried.

PRESIDENT DYSON: The next is the report of the Program and Publication Committee, Dr. D. M. Campbell. Dr. Campbell is in the room at present, but I understand there has been nothing before that committee, and there is no report.

The Grievance Committee, Dr. Wills.

DR. J. C. WILLS: Mr. President, there is nothing to report. No grievances have been officially brought before this committee.

PRESIDENT DYSON: I think there is nothing in the work of the advisory committee to the secretary. Dr. Musselman, who is the chairman, is not present, and I do not know anything that has been reported.

We will take up the report of the tick eradication committee, Dr. C. A. Cary, as Dr. Gibson is not here.

DR. C. A. CARY: Mr. President, we present a tabulated report which was taken from the official reports made by the department, giving the progress of tick eradication to December 11, 1916. This is a tabulated report, and it is not necessary to read it. I will simply submit it.
REPORT OF COMMITTEE ON PROGRESS OF TICK ERADICATION

Progress in Tick Eradication, July 1, 1906, to December 11, 1916

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*Only portions of 5 of the 61 counties were quarantined.

REPORT OF COMMITTEE ON DISEASES*

The committee on diseases finds that during the last year our country has not been visited by any new or unusual disease with the exception of outbreaks of stomatitis or glossitis and severe losses from shipping fever and pneumonia in horses. Further, there has not been recorded a severe outbreak of any disease indigenous to our country or that has been introduced heretofore. This speaks well for the efforts of those who are responsible for the live stock sanitation and control of infectious diseases in our states.

The chairman of your committee requested that each member bring, as his contribution, a report on the existence, spread or control of any disease of unusual interest that may have occurred in his community or to his knowledge in the country. To this end the following contributions are offered, namely: Infectious Stomatitis of Horses, by E. C. Schroeder, and Some New Centers of Anthrax, by A. T. Kinsley.

In the absence of more serious topics for consideration, the chairman of your committee has been prompted by an irresistible desire, growing out of observation and experience, to bring into focus at this time a few principles fundamental in the prevention and control of disease.

The first principle to which I desire to call attention is, what may be called, the symptom-complex of preventive medicine. The logical conclusion drawn from the true conception of the nature of the infectious diseases is prevention. Pasteur believed that it was within the power of man to eliminate these diseases from the face of the earth. To this end, national, state and city governments have made

*The Committee on Diseases did not receive notice of its appointment until about November first. This precluded the securing of data and the preparation of a comprehensive report.*
special provision by legislation and appropriation, and they have profited by many successes. A student of sanitary police, however, will soon recognize that such diseases as glanders, tuberculosis and rabies, as well as many of the lesser maladies, are being allowed to spread, often extensively, because of the neglect of adequate methods for combating them. The veterinarian stands in his relation to the stock owners as does the sanitarian to the health of the community, and in this capacity he is, and justly so, held responsible by the owners for the prevention of animal plagues. The symptom-complex of prevention, therefore, consists not only in issuing an executive order but also in an understanding, on the part of the local veterinarians, of the nature of the disease, the direct and indirect means by which its virus may be disseminated, contracted by healthy animals, detected when infection has taken place and the procedure to be followed in each and every instance. The methods of prevention may be varied, but of whatever kind, they must be first applied by the veterinarian in the field. I am aware that some practitioners feel that sanitary work should be looked after by specialists. The failure of practitioners to become co-workers in the fight against preventable diseases, by mastering the fundamental knowledge and methods by which success alone can be attained, is allowing such maladies as anthrax, infectious abortion, tuberculosis and others to spread and to become veritable plagues in communities where they should not exist at all. The corollary of this principle is a more complete understanding of the ways and means by which these diseases are disseminated and the succession of new hosts interrupted. This knowledge should lead to methods of procedure that will enlist the full and complete co-operation between owners and their veterinary advisors.

A second principle to be observed, more carefully than it has been in the past, is a wiser application of methods of precision in diagnosis and interpretation of the findings. In the prevention of a disease as well as in its treatment, the first and most important task is to make an accurate diagnosis. Formerly, this was done from the history together with certain signs and symptoms. Now we know that the diagnosis of occult cases is necessary for success and that their detection depends upon certain specific reactions. This brings into use the delicate biologic reagents. The interpretation of the effect of these agencies upon the diseased individual or tissues of the same has come to constitute one of the most difficult problems in preventive medicine. The practitioner or diagnostician, therefore, is obliged to recognize, and at all times to take seriously into account, the possible limitations of the aids employed. This emphasizes the fact, so often overlooked, that the agencies employed in diagnosis are only aids and that they cannot take the place of knowledge and skill on the part of the person using them. The failure to recognize these facts has caused irreparable loss and afforded opportunity for the spread of tuberculosis, for example, under conditions that were pronounced safe and the owners believed that their interests were properly protected. A thorough understanding of methods for diagnosis, therefore, is of the first importance in the control of infectious diseases, especially those of an insidious and chronic nature. The sanitary work most needed is to combat and eventually eliminate the chronic and widespread infections which are destroying our flocks and herds. We are well provided with machinery for combating great epizootics that attract general interest, but we are less fitted to give and to carry out wise and efficient counsel to the owners of animals suffering from insidious infections. It might not be unwise to insist
upon such fundamental knowledge as a basis for a license to practice.

The third principle underlying live stock sanitary control to which I desire to call attention is the opportunity of individual veterinarians who are first called to make the diagnosis and, if the law requires, to report to the officials. In the last analysis, it is the veterinarian in private practice who is the guardian over the flocks within his community. Necessarily he is the first to see the cases and upon him falls the responsibility of making the diagnosis and the high privilege of initiating the treatment whether it be remedial for the individuals affected or protection for the well animals in the herd. For a veterinarian to live up to the full measure of his responsibility in this matter, requires a close adherence to the knowledge and laws which govern the cause, diagnosis, prevention and treatment of disease and absolute integrity in carrying out the details.

Finally, I desire to emphasize the importance of protecting the sound flocks and herds against infection. The emphasis seems to be placed too much upon the diseased animal. Our statute books are burdened with laws going into great detail concerning the handling of the infected animals and penalties for violating these laws but there is little legislation to emphasize the importance of protecting the healthy animals against infection or to encourage the owners of sound animals. I have long felt that efforts in live stock sanitation should be positive and aggressive on the side of health rather than disease. Why should we not center the attention of live stock owners on the most important feature? To obtain the best results in the warfare against diseases in our domesticated animals, there must be an unbroken chain of action and co-operation between the owners of the animals, the veterinarians who are called when they are first affected and the county, state or national officials charged with the responsibility of not only properly disposing of infected animals but also of protecting the healthy ones.

INFECTION STOMATITIS OF HORSES

E. C. Shroeder, Washington, D. C.

During the last few months a disease has appeared among horses which has attracted considerable attention since literature does not contain any record of a similar affection. It is manifested by stomatitis with a predilection for the mucous membrane of the tongue. The other parts of the buccal cavity are rarely affected, but the lesions at times extend to the commissure of the lips and may affect the nares. It is ushered in by a temperature which reaches 103° to 104°, but persists only a short while. A general depression with a tucked-up appearance is frequently observed. During the early stages the mucous membrane of the mouth is reddened; soon that over the tongue shows elevations in areas varying in size from a dime to a silver dollar. The underlying parts are filled with serous fluid which is, however, rarely observed since in most instances the vesicles rupture before they are recognized. In the affected parts the mucous membrane soon undergoes necrosis, leaving a surface which, as a result of confluent erosions, may and frequently does involve the entire dorsal portion of the tongue. This condition prevents the animal from eating for a period of from three to five days, and at this stage profuse salivation of a stringy tenacious character is present. Healing is rapid and the affected animals usually recover in from ten to fifteen days.
The disease appears to be highly infectious since it has been observed to affect all animals shipped in a single car. Transmission tests made with saliva gave positive results, and caused the characteristic lesions in the artificially exposed animals.

The etiological factor has not yet been established. The bacteriological investigations, however, reveal constantly a diplococcus in the lesions and the serous fluid of the vesicles. Its etiological relation to the disease, however, has not yet been demonstrated. Investigations along this line are now being conducted by the division of pathology of the Bureau of Animal Industry.

The disease probably originated in the western range country, the first data regarding it having been obtained from Dr. Howe, Inspector in Charge, Denver, Colo., who, when called upon to investigate a suspected case of foot-and-mouth disease, described the condition in his report of September, 1916, as occurring in horses and cattle. Soon after that date other reports of the occurrence of a peculiar stomatitis in horses reached the Bureau of Animal Industry. Investigations revealed the disease, as described above, among horses kept at feeding stations and concentration camps in the middle west, especially in Grand Island, Nebr., Lathrop, Mo., Calumet Yards, Ill., Union Stock Yards, Chicago and Clark, Ill. Through shipments from these places, points in the east also became infected. The proportion of infections at various places varied from about fifteen per cent. to fifty per cent.

Since the period of incubation proved to be from two to five days the Bureau placed restrictions on interstate shipments of exposed animals for eight days and the isolation of infected animals was also made effective. The extensive occurrence of the disease and the large number of infections may be attributed to the extraordinary conditions incident to the war in Europe, existing in the traffic of horses. Large numbers of animals are often quartered in small sheds and pens and exposed to all climatic conditions. Up to the present time the disease has been confined apparently to shipments of horses for export and it is hoped that the danger of a general widespread occurrence in cities and on farms will be averted.

Oidiomycosis in Cattle

During January, 1916, a number of bronchial and mediastinal glands from cattle were forwarded to the division of pathology of the Bureau of Animal Industry, by Dr. MacKeller, of San Diego, Calif., to be examined for actinomycosis. Regarding this material Dr. L. T. Giltner of the division of pathology has supplied me with the following information:

Microscopic examinations of pus from the affected glands revealed numerous spherical bodies, from five to thirty microns in diameter, with a double contoured and highly refractive covering.

A study of the development of the organism on artificial culture media; its pathogenicity for guinea pigs, rabbits, white mice, dogs, calves, sheep and hogs, and the histological character of the lesions it caused, enabled its classification as a developmental form of a pathogenic odium. The striking resemblance of the organism to that described as occurring in oidiomycosis of man, together with the marked similarity of cultural characters and the lesions caused in experiment animals, strongly suggest that the fungus recovered from cattle and that pathogenic for man may belong to the same species.

The occurrence of this previously unreported disease in cattle is of particular interest both because of the close resemblance of the lesions found in the lymph glands to those of actinomycosis and
because of the possibility that it may be transferable from animals to man.

**Dourine.**

Active work on the part of the federal bureau of animal industry concerning dourine is still in progress and the eradication of this evil will be pushed forwards as rapidly as possible. Some new infected centers have been found, which, if the peculiar character of the disease is taken into consideration should cause no surprise.

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**SOME NEW CENTERS OF ANTHRAX**

By Dr. A. T. Kinsley, Kansas City, Mo.

The object of presenting this brief paper at this time is not for the purpose of discussing any new phase of the subject of anthrax, but is for the purpose of calling attention of sanitary officials to one recent introduction of this disease into new territory and the establishment of new anthrax centers.

In 1914 anthrax was wide spread in Texas and the losses occasioned by it were large. During 1916 new anthrax centers have been found in Oklahoma, Nebraska, Arkansas and one new center has been identified in Kansas. The source of infection of the various aforementioned new centers have not been determined. The losses in Oklahoma, Kansas and Nebraska have not been serious, but the fact remains that the soil in these new areas is now infected and serious outbreaks of anthrax may occur at any future time.

The similarity of generalized anthrax and hemorrhagic septicaemia has led to some confusion in field diagnosis particularly in areas where anthrax had not previously existed but the sanitary officials in the various states mentioned have not spared time and expense, and the local practitioners no doubt can successfully control enzootic outbreaks of anthrax in the future. Because of the scarcity of veterinarians in the portion of Oklahoma where anthrax appeared, one county agricultural agent in attempting to assist the stock owners, became infected by autopsying an anthrax cadaver.

For the welfare of the communities surrounding the various newly established infected areas, bulletins should be issued by the proper sanitary authorities and thus enlighten the stock owners, that they might be better prepared to successfully control future outbreaks. Special information should be disseminated regarding the infectiousness of anthrax and the danger of further spread of the disease from the infected animals and carcasses of animals dead of anthrax, and especial emphasis should be given on the proper methods of destroying carcasses in their entirety including the skin. Quarantine regulations prohibiting the marketing or moving of animals from infected herds should be rigidly enforced until there is no further danger of the spread of this infection to public stock yards or to farms or pastures.

Respectfully submitted,

V. A. MOORE.
JOHN REICHEL.
E. C. SCHROEDER,
A. T. KINSLEY.
Committee.

**PRESIDENT DYSON:** We will pass on to the next report, the Committee on Legislation, Dr. John R. Mohler.

(At this point Dr. Marshall took the chair.)
REPORT OF COMMITTEE ON LEGISLATION

DR. MOHLER: Mr. President and Fellow Members:

Your committee on legislation begs to submit the following report regarding the various new laws and regulations passed or prescribed by states since December, 1915.

Alabama.

General regulations were issued in 1916 governing all diseases of live stock. Additional features include the necessity for immunization of swine against hog cholera and the prohibition regarding the admission of equines affected with shipping fever or other infectious disease.

California.

Rules and regulations of March 15, 1916, govern the admission, except from Illinois, of cattle, sheep, other ruminants, and swine in compliance with Federal regulations; from Illinois only upon permit; and the admission of cattle from Mexico only upon permit.

Connecticut.

Regulations of May 8, 1916, govern the importation of all kinds of animals. Swine are not admitted within thirty days if immunized with the simultaneous treatment.

Georgia.

Regulations have been adopted for Texas fever in cattle, to prevent the spread of hog cholera, to prevent the spread of tuberculosis and glanders, and to govern the sale of biological products.

Idaho.

Order of February 21, 1916, governs the admission of live stock, serum and virus.

Kansas.

Regulations of March 20, 1916, are to prevent the spread of tuberculosis in cattle; regulations of April 5, 1916, permit movement of stock hogs from Kansas City stock yards into the State; regulations of May 1, 1916, contain rules and requirements relative to the interstate shipment of live stock.

Kentucky.

Regulations effective December 1, 1916, regulate the control of hog cholera virus.

Louisiana.

Act of June 19, 1916, prohibits the movement of cattle from quarantined area to free area or area where tick eradication is being systematically conducted. Act of July 5, 1916, provides for State-wide tick eradication which is compulsory on and after April 1, 1918.

Mississippi.


Nevada.

Order of March 21, 1916, contains restrictions to prevent the spread of rabies. Order of July 1, 1916, governs admission into the state of all classes of live stock.

New Mexico.

Order of March 8, 1916, provides for the admission of cattle, horses
and swine, and contains special restrictions on such shipments from east of the Mississippi River.

**North Dakota.**


**Oklahoma.**


**Pennsylvania.**

Regulations of February 15, 1916, seek to prevent the spread of hog cholera by prohibiting the admission for thirty days of hogs which have received simultaneous treatment. Regulations of June 15, 1916, are to prevent the spread of sheep scab.

**South Dakota.**

Regulations of July 19, 1916, govern the importation of all classes of animals and the sale, distribution, and use of serum and virus.

**Tennessee.**

Order of August 10, 1916, seeks to prevent the introduction and spread of hog cholera.

**Texas.**

September 1, 1916, sheep regulations were adopted requiring dipping once after arrival, of all sheep brought in for purposes other than slaughter. General regulations seek to prevent the spread of Texas fever in cattle; to prevent the spread of cattle scab; to prevent the spread of hog cholera; and to govern the admission of live stock into the State.

**Utah.**

On June 9, 1916, dipping and quarantine orders were adopted for sheep scab.

**Wyoming.**

Regulations of March 1, 1916, govern the importation into the state of all classes of animals and the sale and manufacture of serum and virus. Regulations of May 15, 1916, contain restrictions to prevent the introduction of rabies. Regulations of November 12, 1916, deal with cattle scabies.

Your committee is pleased to report that it has received forty-five responses out of the forty-eight states to which letters of inquiry were addressed.

Respectfully submitted,

J. R. MOHER,
Chairman.

C. J. MARSHALL.

**CHAIRMAN MARSHALL:** What do you wish to do with the report of the committee just read by Dr. Mohler?

**DR. DE VINE:** I move it be accepted, and take its regular order.

**CHAIRMAN MARSHALL:** If there is no opposition, it is so ordered.

The next order of business is the Resolutions Committee. Dr. Cotton.
The report of the Resolutions Committee was read, and after con-
siderable debate, resolutions were adopted as follows:

**Resolutions**

The report of the Resolutions Committee was read, and after con-
siderable debate, resolutions were adopted as follows:—

Adopted by the United States Live Stock Sanitary Association in

WHEREAS, It is important that outbreaks of contagious and in-
fected diseases be promptly quarantined, therefore, be it

RESOLVED, That the federal law and such state laws as provide

BE IT RESOLVED, That this association recommend to the various

RESOLVED, That the United States Live Stock Sanitary Asso-

WHEREAS, It is highly desirable that tuberculosis be eradicated

WHEREAS, The plans as laid down for the establishment of

THEREFORE BE IT RESOLVED, That the members of the

WHEREAS, It has been shown by investigations made by a repre-

WHEREAS, It is believed that the ravages of this disease can be


THEREFORE, Be it resolved that this association, urgently request that the federal state authorities promptly adopt and enforce such measures as will tend to control the spread of shipping fever of influenza.

And be it further resolved that this association recommend an appropriation of $100,000, by the federal Congress for the control of this equine plague and that copies of this resolution be forwarded to the Secretary of Agriculture and the Chairman of the Committee on agriculture and Forestry of the Senate and the Chairman of the Committee on Agriculture of the House of Representatives, Washington, D. C.

PRESIDENT DYSON: While we are waiting, Dr. Connaway, if you will kindly proceed with your report on Hog Cholera Control.

HOG CHOLERA CONTROL

DR. J. W. CONNAWAY: I just want to make a little verbal report, and beg a continuance of this committee of the incoming officers if they are satisfied with us. Because of the unfortunate circumstance of Dr. Stange's illness, there was not a man on that committee that knew he was a member until just a few weeks ago; but we set to work to get as much information together as we could to make what the secretary wanted, a comprehensive report on hog cholera; and in order to get that, it is our purpose to secure information from every possible source that could give us any information on the solution of these problems, state veterinarians, college veterinarians, extension departments, railroad men, serum plants, and everyone who could give us any light on this matter. We wanted information and we expect to compile this or put it in shape so that it will give a comprehensive view of the situation.

I am glad to state, however, that in this inquiry we have found that there is much less hog cholera this year than there was last year. Just why this has been, we have not been able to find out. In places where very little has been done in the way of control, they did not have very much cholera, and in other places, where active control measures have been carried on, the results have been good; but how much it has been due to the active efforts of the people and how much to good Mother Nature giving us a hot summer and plenty of good sunshine to kill off these germs, I do not know just how much credit to give these agencies.

In Indiana, for instance, Dr. Nelson, in his reply, contrasts two counties where active work was being done, and in other counties where there had not been such active work done, and he was not able to say, he was not able to analyze the conditions, the causes, to find out just why it was, and I think this is true all over. We do not know yet, but I believe by making a little larger inquiry into this matter, we may be able to come back next year with a comprehensive report. We have gotten together quite a lot of good material, and if I am not reappointed on this committee I am just going to keep on this work anyway for my own benefit, just to find out what the conditions are, and I believe that I have good helpers on this committee who will help me to analyze the data that we get. (Applause.)

PRESIDENT DYSON: Dr. Gibson, are you ready to report now?

UNIFORM HEALTH CERTIFICATES

DR. GIBSON: Mr. President, there has also been a little misunderstanding on my part concerning the committee on the uniform health certificates. Some few years ago we adopted a health certificate, as I understood, and I thought that settled it, but when I got my program and looked the matter over, I found I was there for that purpose. I then
made requests of various state departments to send me copies of the official certificates then in use in their states. I have heard from thirty-six. It was just a few days ago, and I presume there has not been time to hear from the others. There are twenty-four of these that simulate the certificate outlined in the previous meetings of this association.

First I mention the Dominion of Canada and the Bureau of Animal Industry. The two national departments are using export certificates very similar in character, so much so that they might be called uniform.

These are the states that we class their certificates as uniform in that they simulate more or less the form of certificate recommended by this Association: Alabama, Arkansas, California, Florida, Georgia, Illinois, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, North Carolina, North Dakota, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Wisconsin and Wyoming.

As you know, the uniform certificate was a very close copy of the certificate used by the bureau governing interstate shipments, a certain color for horses, a certain color for cattle, so that in Iowa, we made a certificate resembling it, and tried to get into it all the important things. It was drafted so that it would be used not only for horses, but for cattle, for hogs and for all classes of shippers.

I believe personally that there should be but one official health certificate for each state, and I cannot do better than recommend that some of the gentlemen here that have given attention to this matter want to now adopt a certain certificate, and I will say to you in all candor, I do not believe you can beat the Iowa certificate.

There are some other states I did not feel justified in giving credit with having fallen in line in any degree with the use of a uniform certificate such as we have recommended in this association. Those states are: Maine, Maryland, Massachusetts, New Jersey, New Mexico, Ohio and Vermont, six states. I brought one sample down just to show. Without saying anything unkind, this is from Maryland, and I submit, gentlemen, that that is not a practical paper for the purpose for which it was prepared. The bureau certificate is a little larger, but this is supposed to go in a typewriter.

I have said before that we ought to agree upon things in this association, we ought to decide what is best, and then we ought to adopt it, we ought to do business. We ought always to be careful when it comes to the last hour that we do not soil the results of the meeting by resolutions or other procedure.

Why not every state in the union adopt a certificate as nearly as possible uniform. In Iowa we thought it best to adopt the colors of the Bureau, and I find the colors are mixed to quite an extent. In ours we have the original white, the duplicate pink or buff color, and the triplicate yellow. I might mention that one state, Wisconsin, I believe it is, has issued a quadruple certificate, making one copy for the owner. It is a fact that a great many owners would like to have a copy of the certificate, but if the triplicate certificate is properly disposed of, the original accompanying the shipment, the duplicate going to the officials of the state of destination, and the triplicate to the officials of the state of origin, the original being kept on file by the railroad company with the bill of lading, as their own protection that they were warranted in carrying this shipment because it is coming by a proper certificate, that is sufficient.

I know of one state, and I cannot recall which it is, that requires that the copy of the certificate that accompanies the shipment is to be sent to their office after the shipment reaches destination. I was just wondering if the railroads were willing to do that, and whether they claimed the right to file one copy of the original certificate as their authority for carrying the shipment.
Let me ask you all to get out a certificate in triplicate that resembles the form of the bureau certificate used for shipment of horses and cattle, adopt the colors, if you can make them uniform—most of the states are using those three colors, white, pink and yellow. Let us get out a uniform certificate to be used all over this country, so that whenever anyone sees a certificate covering a shipment in transit, they will know by its form and by its stipulations that it is really an official certificate.

One thing we do to all Iowa certificates is, under the address of the owner to have a line, origin of shipment. The address of the owner does not always give you the origin of shipment, and I think the origin of shipment is a valuable piece of information.

I neglected one point in making this report, and that is that the committees on uniform health certificates and uniform regulations, their work runs together to such an extent that I think one committee would be better than two. I would suggest that one committee be appointed, which would be a committee on uniform regulation and uniform certificates.

PRESIDENT DYSON: That would be up to the incoming president.

I think we should have the report of the committee on credentials now.

REPORT OF CREDENTIALS COMMITTEE

Your committee has investigated the qualification of the following list of applicants and recommend that they be accepted members of this association.

APPLICATIONS FOR MEMBERSHIP RECEIVED.

Since Annual Meeting 1915

Abbott, Dr. A. J., State Board Vet. Examiners, Marshfield, Wis.
Wolcott, Dr. W. A., Secretary Wisconsin Veterinary Medical Association, Madison, Wis.
Alford, Dr. I. S., Assistant State Veterinarian, Paxton, Ill.
McElroy, Mr. T. E., Assistant Manager William Cooper & Nephews, Chicago, Ill.
Spierling, Dr. Wm. E., Evanston, Ill.
Leibold, Dr. A. A. Professor of Pathology and Bacteriology, Chicago Veterinary College, Chicago, Ill.
Lockett, Dr. Stephen, University Extension Division, Reno, Nev.
Records, Dr. Edw., Assistant Bacteriologist, Reno, Nev.
Jakeman, Dr. Harry W., Inspector Live Stock, University Nevada, Reno, Nev.
Timmons, Dr. Wilford H. B., A. I. Inspector, Madison, Ind.
Henderson, Mr. J. S., Salesman, William Cooper & Nephews, Collierville, Tenn.
Hall, Dr. Maurice C., Parasitologist, Parke-Davis & Co., Detroit, Mich.
Houghton, Dr. E. M., Director Biology and Research Depts., Parke-Davis & Co., Detroit, Mich.
Kernkamp, Dr. Howard, Assistant Veterinarian, University of Minnesota, St. Paul, Minn.
Günster, Dr. F., Corvallis, Ore.
Layne, Dr. Ernest, Huntington, W. Va.
Atherton, Dr. I. K., Veterinary Inspector, B. A. I. Room 33 Federal Building, Ft. Dodge, Iowa.
Morgan, Dr. C. M., Assistant State Veterinarian, Manchester, Ia.
Gallaway, Mr. Grade, Attorney, L. S. S. Commission, Ft. Worth, Tex.
Stewart, Dr. E. F., Assistant State Veterinarian, Ft. Worth, Tex.
Burleigh, Dr. W. F., Assistant State Veterinarian, Clemson Coll., S. C.
U. S. LIVE STOCK SANITARY ASSN.

Potter, Dr. Geo. M., Veterinary Inspector, B. A. I., Pathology Division
B. A. I., Washington, D. C.
Buckley, Dr. John S., Pathologist, Bureau Animal Ind., College Park,
Md.
Fisk, Dr. A. G., Veterinary for Colorado Fuel & Iron Co., Trinidad,
Colo.
Hutchens, Dr. H. C., Assistant State Veterinary, Georgia, Atlanta, Ga.
Hirleman, Dr. A. L. Veterinary Inspector, B. A. I., Atlanta, Ga.
Phehps, Dr. J. G., State Veterinarian, Pierre, S. Dak.
Hunt, Mr. F. R., Manufacturer Disinfectants and Dips, 3335 Broadway
Road, Cleveland, Ohio.
Gery, Dr. Chas. G., Veterinary Department; H. K. Mulfords Co., Phil-
adelphia, Pa.
Becker, Dr. Chas. J., Veterinary Inspector, Birmingham, Ala.
Dinwoodie, Dr. John T. E., Extension Veterinarian, Brookings, S. Dak.

DEFERRED APPLICATIONS FOR MEMBERSHIP.

Simmons, C. B., National Stock Yards, Ill.
Vedder, S., Rutherford, N. J.
Owen, F. D., B. A. I. Inspector, Elizabeth, N. J.
Flower, H. P., Assistant State Veterinarian, Raleigh, N. C.
Himmelberger, Dr. L. R., Fort Dodge, Iowa.
Buckley, Saml. S., Animal Industry Extension Dept., College Park, Md.
Schneider, F. H., Member State Examiners Board, Philadelphia, Pa.
Gandy, M. H., Assistant Executive Officer, Baton Rouge, La.
Cole, Dr. C. G., Iowa State College, Ames, Iowa.
Starr, Chester G., Purdue University, Lafayette, Ind.
Mollan, Dr. Paul A., Pitman Moore, Indianapolis, Ind.
Johnston, Elmer J., Deputy State Veterinarian, Sedalia, Mo.
Graham, Ralph, B. A. I., Sedalia, Mo.
Goebel, C. H., Fowler Serum Co., Kansas City, Mo.
Hess, Dr. O. B., B. A. I., Washington, D. C.
Jones, Dr. Frank R., B. A. I., Fort Worth, Texas.
Cosford, Dr. S. E., B. A. I., Beatrice, Neb.
Hawkins, Frank W., Pitman Moore, Indianapolis, Ind.
Chadwick, Chas., Stock Grower, Albuquerque, N. M.
Blanchard, G. I., Mo. Valley Serum Co., Kansas City, Kan.
Glover, Dr. E. K., Pres. Royal Serum Co., Kansas City, Mo.
Meade, Dr. R. N., Hog Cholera Invest. B. A. I., Indianapolis, Ind.
Morgan, W. J., Veterinarian, Seaton, Ill.
Norden, Carl G., Veterinarian, Kansas City, Mo.
Hull, Dr. Martin, B. A. I. Inspector, Franklin, Neb.
Bott, Dr. A. E., Asst. State Vet., E. St. Louis, Ill.
Niven, Dr. A. B., Veterinarian, Crawfordsville, Ind.
Robertson, James, Chicago, Ill.
Palmer, Dr. J. F., Asst. State Vet., Milwaukee, Wis.
Bodle, Dr. H. Geo., State Vet., Boise, Idaho.
Armstrong, Dr. J. A., Provincial Veterinarian, Regina, Sask. Canada.
Nattress, Dr. J. T., Asst. State Vet., Delavan, Ill.
Mills, Dr. C. C., Asst. State Vet., Decatur, Ill.
Blattenberg, Dr. John K., Veterinarian, Lima, Ohio.
Weaver, G. S., Hog Cholera Invest. B. A. I., Mitchell, S. D.
Huff, T. B., Serum Manufacturer, Sioux City, Iowa.
Beach, B. A., Asst. Prof. Veterinary Science, Madison, Wis.
Beckwith, J. W., Veterinarian, Shullsby, Wis.
Crump, Leroy S., Veterinarian, Fort Atkinson, Wis.
Collins, J. B., Asst. Veterinarian Wis. Dept. of Agr., Chippewa Falls, Wis.
Bemis, H. E., Acting Dean, Iowa State College, Ames, Iowa.
Petersen, Peter T., Asst. Veterinary Science Univ. of Cal., Berkeley, Cal.
Birch, Raymond R., In charge Vet. Exp. Sta., Cornell Univ., Ithaca, N. Y.
Caldwell, Harry, Asst. State Vet., Wheaton, Ill.
Fielden, Henry, Farm Manager, Buron, Ill.
Kelley, C. W., Salesman Sioux City Serum Co., Sioux City.
Cusack, S. F., Mgr. Sioux City Serum Co., Sioux City.
Bent, J. R., Bailey Falls Farm, Oglesby, Ill.
Walsh, E. J., Pres. Live Stock San. Board, Minot, N. D.

DR. CONNWAY: I move the report be adopted as read.
Motion duly seconded and carried.

PRESIDENT DYSON: Now, is there anything under new business?

DR. RAMSEY: Mr. President, I was going to ask about this association adopting uniform state regulations. I wish that the secretary would take it up with the different live stock sanitary boards and state veterinarians, and obtain from them information as to what action may have been taken by those boards, with a view of adopting those regulations. Along in the spring we start out in the bureau to get the information in regard to new laws and regulations, and the organization of the live stock sanitary boards throughout the different states, and it would be a very great help if we could be relieved of that to as great an extent as possible. I believe every state that has a live stock sanitary board should be informed as to the nature of uniform regulations, and send a copy of it, so that they might consider it and return a reply to your secretary.

PRESIDENT DYSON: I think the secretary will accept the suggestion.

Election of officers is now in order.

The following gentlemen were nominated for President: J. G. Wills, C. A. Cary and George W. Dunphy.

The ballot resulted: Dr. Wills, 48; Dr. Dunphy, 25; Dr. Cary, 7; and Dr. Wills was declared elected president of the association for the ensuing year.

Messrs. R. A. Archibald, Adolph Eichhorn, Robert Graham, F. A. Ingram and Fred Torrance were nominated as vice-presidents, and there being no other nominations, the secretary was instructed to cast the ballot for the association for the gentlemen named, as vice-presidents for the ensuing year.

The following gentlemen were nominated for secretary: John J. Ferguson, S. H. Ward and Nelson Mayo.

Professor Ferguson withdrew his name, and the ballot resulted as follows: Doctor Ward, 53; Doctor Mayo, 26; and Doctor Ward was declared elected secretary-treasurer of the association for the ensuing year.

DR. MARSHALL: Mr. President, in view of the excellent service rendered us by Professor Ferguson during the past six or seven years, I move...
that we extend a rising vote of thanks to him for the able manner in which he has conducted the secretariyship of this association.

Motion duly seconded and carried by a rising vote, amid applause.

DR. CREWE: Mr. President, in view of the fact that our retiring secretary for the last several years has extended to this association very valuable services, I move you that a committee of three be appointed to select a suitable gift to be handed him, to show the appreciation of this association.

Motion duly seconded and carried.

PRESIDENT DYSON: This I believe closes the regular business session. I feel that this has been one of the best attended and one of the most successful meetings we have ever had, and I desire as a retiring officer to thank the members, each and every one of you, for the support that you have given during the past season, which has largely tended to make the meeting a successful one.

I will appoint Dr. DeVine and Dr. Marshall to escort President Wills to the chair. (Applause).

PRESIDENT WILLS: Gentlemen, there is nothing that I can say, except to thank you for this mark of appreciation, and to say that I hope, with the co-operation of the members of this association, to be able to carry on its affairs in a manner that will compare favorably with that that has preceded.

DR. WARD: I would like to make a motion that the association authorize the secretary to employ the services of Mrs. Flawes as clerk and assistant. Mrs. Flawes is the lady who has had charge of the office for the last five or six years.

Motion duly seconded and carried;

(At this point the chair appointed Dr. Ferguson and Dr. Bahnsen to escort Secretary Ward to the chair.)

SECRETARY WARD: Gentlemen, I desire to thank you for the honor that you have done in electing me as your secretary for the ensuing year. I am afraid it will be very difficult to fill the position after the very able secretary that you have had for the last five or six years. I did have the honor of being secretary of this association some few years ago, and after that someone else was elected, and from that time on the association thrived.

PRESIDENT WILLS: Is there any new business to come before the association? If not, a motion to adjourn will be in order.

On motion, duly seconded and carried, the convention adjourned sine die.
We have had a year of peculiar climatic conditions. Our spring was rather dry, the summer very wet and the fall very dry. The extremely wet season of summer was probably responsible for an excess in the number of cases of certain infectious diseases that have occurred in the state.

1. We have had more blackleg than commonly. This is partly due to the increase in the number of cattle coming into the state and partly the climatic conditions of the year.

2. We have had a large number of cases of hemorrhagic septicemia which have been rather widely distributed over the state.

3. The work of tick eradication has been advancing rather rapidly in this state; seventeen counties and a small portion of other counties were cleaned of ticks. In fact, this is the largest area cleaned in any infected state. Every county in the state has some dipping vats and has done some work but not every county is doing the work officially. The prospects are that the entire state will be free of ticks by 1919 or 1920.

4. Hog cholera has been rather prevalent during the year. However, the losses have not been as great as usual because the farmers are taking advantage of anti-hog-cholera serum for prevention and are also observing better sanitary conditions than usual. There has been some carelessness on the part of farmers and others in the moving of infected hogs and in the disposal of dead carcasses. It is my opinion that hog cholera is distributed largely in Alabama by visiting farmers, movements of hogs, and the want of burial of dead carcasses and by buzzards. No county in the state is taking up actively any method of stamping out hog cholera. All the work so far has been done by the state, the Federal authorities, private individuals and demonstration agents.

The education of the farmers in the methods of prevention by disinfection and proper sanitary methods will help materially in the reduction of cholera.

5. A few cases of glanders have been found in various parts of the state but generally speaking the conditions at present are favorable. In fact, very few cases have been found during the year.

6. Influenza, strangles and shipping fever have been rather common among horses that have been moved from stock yards through sales stables, but the number of cases have been alarming only in a few centers. It is my opinion that if the larger sales stables and the stock cars were regularly disinfected and the animals were properly inspected before and after shipment there would be fewer of these cases attributed to the methods of handling and carelessness of dealers.

7. A few cases of tuberculosis among beef and dairy cattle have been found and a number of them have been destroyed. Except for a few dairies and possibly a few lumber oxen there is relatively a small amount of tuberculosis among cattle in Alabama.

C. A. CARY
State Veterinarian.

ARKANSAS

1. During the past year we have had five counties infected with anthrax. In non-immune animals, the death rate was 85 per cent. In animals properly immunized, the death rate was about 20 per cent. Total loss in five counties during the summer season amounted to about $1,500,000.

2. Hog cholera is rather general over the state, but on account of increased vaccination, individual owners have been able to protect their herds. The large number of hogs which run in open range make it impossible at the present time to eradicate cholera by sanitary methods.

3. From test reports received, tuberculosis is on the decline. The number of animals tested showed less than 1 per cent. infected. In the dairies of the state very few of the cows are raised on free range.

4. We have had about twenty-five cases of glanders reported.

5. We have noticed this fall a large number of horses and mules that were shipped from the St. Louis and Kansas City Stock Yards were infected with shipping fever. I would say 90 per cent. of the animals received were infected in this way.

6. With the co-operation of the United States Government, seven counties were freed of ticks and dipping vats have now been installed in all counties in the state and from the amount of preliminary work completed, the prospects are that ticks will be eradicated in the state of Arkansas in four years.

7. We have noticed blackleg on the increase. We have had outbreaks in about ten counties. Vaccination has proved very successful, with small loss.

8. During the past year we have observed several outbreaks of hemorrhagic septicemia.

The Bureau of Animal Industry has co-operated in hog cholera work, having a representative doing educational work over the entire state. In fact, this depart-
ment has enjoyed the most hearty co-operation from the Bureau of Animal Industry during the past year.

R. M. GOW,
State Veterinarian.

CALIFORNIA

1. Probably the most outstanding feature of the year in connection with the live stock sanitary work in California is the work that is being done in connection with the tuberculin testing of dairy herds. The last session of the legislature provided for the tuberculin testing of all dairy herds, the products of which are not pasteurized.

2. There has been nothing unusual in connection with our work during the past year, and live stock diseases, with the exception of cholera, have been under complete control. Cholera in California, as elsewhere, is still the cause of severe losses to the hog industry.

3. Co-operative work is still going on in California in connection with sheep scab control and eradication. However, this disease is absolutely under control and its early complete eradication is assured.

4. A noteworthy occurrence during the year was the removal of the last federal quarantine in this state for southern cattle fever. As far as federal regulations are concerned, California is now a clean state.

CHARLES KEANE,
State Veterinarian.

DELWARE

1. We are at present doing some immunizing to prevent hog cholera which is more or less prevalent in certain localities. In general the work has been successful. We have treated about 3,200 hogs.

Within the past week or two some unsatisfactory results have been reported. The fact that hogs are dying on two farms where they were vaccinated in the early fall (simultaneous method). The diagnosis has not as yet been thoroughly decided upon, but the trouble existing has all of the "ear-marks" of cholera. This occurrence in a small state like Delaware has an unfavorable effect on our work.

2. Tuberculosis, I am sorry to say, exists to an alarming degree. About all we can do is to educate the cattle owners as far as possible. We can prohibit the shipping or driving of cattle into the state, but we have no means of eradicating the disease within our borders because of a lack of funds to reimburse the losers of condemned animals, and I can see no relief forthcoming.

3. Anthrax is very rare.

4. Anthrax gives us more or less trouble, but by vaccinating, which we attend to very closely, it has been found that the disease can be kept fairly well under control. Yearly vaccinations on all infected premises are practiced. The work gives entire satisfaction.

5. Forage poisoning is not so prevalent as in past years.

6. Rabies is entirely too prevalent.

7. Infectious abortion of cattle is more or less prevalent. Nothing is being done as yet by the board.

H. P. EYES,
State Secretary.

IDAHO

1. Blackleg has appeared in herds in several sections of the state, but with little loss. This disease is easily controlled by vaccination with blackleg vaccine, which the cattle raisers generally are getting acquainted with.

2. Hemorrhagic septicemia made its appearance in one herd in the southeastern part of the state. Considerable loss was sustained, but by placing the herd in strict quarantine the disease was soon checked.

3. Tuberculosis is found to varying extent throughout the entire state. This department has always made tests where cases have been reported. Five reactors were found and were slaughtered.

4. The disease has prevailed to an alarming extent among chickens in the northern part of the state. Tests have been made in twenty-eight flocks, in which 316 reactors were found and slaughtered.

5. Contagious abortion has been reported from several sections of the state, but upon investigation the abortion has been found to be due to some other cause.

6. Glanders is one of the most dangerous diseases with which we have to contend. Requests were made from several sections of the state during the year to investigate suspicious or suspected cases of glanders. Investigation of all such cases were made as promptly as possible and where the results of these examinations revealed the presence of the disease, the animals were promptly destroyed and the carcasses burned or buried.

7. It is evident from all sources of information that hog cholera is on the decline in Idaho. The federal agents have the disease under control on the Twin Falls tract, and no free serum has been given since July 1, 1916. This department has cooperated with the federal authorities in organizing the farmers in school districts. Meetings are held in each district and the farmers are instructed in the use of serum and disinfections. A supervisor is appointed in each district and when cholera appears it is immediately reported to the supervisor and he notifies the nearest state deputy, whose duty it is to immediately treat and quarantine the herd. The state furnishes the serum at actual cost. Most of the work has been carried on in the eastern part
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of the state. No cholera has made its appearance elsewhere. Only six cases were
reported in the Boise Valley during the year.
6. The general dipping which was ordered last year of all exposed sheep in
Owyhee county has practically eradicated sheep scab which has always
been a hotbed for this disease. Several small bands broke in the eastern part of
the state and were promptly quarantined and dipped. The state today is entirely free
from the disease.
7. Several cases of foot-rot have been reported and are now undergoing treat-
ment.

H. G. Bodle,
State Veterinarian.

INDIANA

1. Glanders has been found present only in three counties during the past year,
and in each case only one animal was found to be affected. Nineteen hundred and five
horses and mules were malEin tested during the past year.
2. Tuberculosis has not been found prevalent to an alarming extent. Out of a
total of four thousand two hundred and forty-seven cattle tuberculin tested during
the past year, one hundred and forty-three reacted to the test, or only 3.3 per cent.
As the greater number of these animals were for interstate shipment and owned by
breeders or farmers, this is not a fair estimate as to the percentage of tuberculous
animals in this state, as the number of dairy cattle tested was not as many as in
herds kept under ordinary farm conditions.
3. Symptomatic anthrax (or blackleg) has been increasing each year and is now
present in many counties within this state.
4. Hog cholera has been less prevalent during the past year than for years. Inten-
sive hog cholera eradication work is now being carried on in five congressional districts
of this state by the Bureau of Animal Industry in co-operation with this department.
In each district one federal and one assistant state veterinarian have been co-operating
in teaching sanitation and control measures. Proper attention is also given to proper
administration of serum and handling of herds before and after vaccination, but in
no case has the use of the simultaneous method been advocated in areas free from
hog cholera. Local veterinarians and farmers have been organized in order to control
the spread of contagious diseases, and a campaign of prevention is being carried out,
which at the present time is working nicely and which we believe will soon convince
the farmer and stockman that with their co-operation contagious diseases can be
controlled.

A. F. Nelson,
Indiana State Veterinarian.

IOWA

During the past year I am pleased to be able to report that we have had no serious
outbreaks of disease affecting live stock in Iowa.
1. Infectious Stomatitis.—In connection with the movement of horses for war
purposes we have had a few cases of infectious stomatitis, more especially at the yards
or horse market in Des Moines. The first case that came to my notice, however, was
that of a horse shipped in from Chicago to the local office of an express company,
located in Des Moines. Since this infection was first noticed, in connection with the movement of army
horses, we arranged for a detention yard at the horse market, where animals affected
received a few treatments, principally of a solution of permanganate of potash. All
horses showing signs of this infection were placed in this detention pen and given
treatment, as mentioned, with the liberal use of disinfectants. All yards were cleaned,
scraped and disinfected also, and in this way the disease was quite easily controlled
and at no time did it prove really serious or reduce the animals in flesh in any way.
2. Shipping Fever.—We have had more or less shipping fever in connection with
sales at the horse markets in different parts of the state, this disease being far more
serious from the standpoint of the shipper than stomatitis.
3. Dourine.—At our last meeting, I may have mentioned an outbreak of dourine
in the southern portion of Carroll County, Iowa. This outbreak was very carefully
investigated by the Bureau of Animal Industry (our department co-operating) and
we found in all forty animals infected, sixteen of which died, leaving the remaining
twenty-four animals still in quarantine, as the killing of these animals has been
delayed for the reason that we have no funds to reimburse owners.
4. "CORNSTALK DISEASE."—I might state also that a few cattle have died of the
so-called "cornstalk disease." A number of these deaths have also been charged to
hemorrhagic septicemia. This term is as convenient among veterinarians as "la grippe"
is among physicians.
5. Stock Yards Infection.—We have also lost some cattle from a disease called
"stock yards infection." Patients affected with this disease generally show well-
marked lesions of pneumonia and pleurisy, with petechiae or hemorrhagic areas. I
understand a bi-polar organism is present in this disease, also in some cases dying in
the corn stalks.
6. Hog Cholera.—We have had some hog cholera in Iowa this season, but not
such as in years past.
In conclusion, I am pleased to report that considering our immense live stock
investments, and value, our people have suffered but nominal loss.

J. C. Gibson, State Veterinarian.
U. S. LIVE STOCK SANITARY ASSN.

KENTUCKY

During the year of 1916 nothing unusual has occurred in live stock sanitation. No unusual epizootics have existed during this time.

1. Hog cholera has been less prevalent than for several years preceding. This might be attributed to three causes. First, during the outbreak of foot-and-mouth disease and for a number of months afterwards, we required the cleaning and disinfection of all stock cars handling live stock intrastate or interstate. Our stock yards were cleaned and disinfected and no cholera was found to exist in them, until late in 1916; then all hogs removed from same were immunized and dipped. While these orders were effective, losses from hog cholera had decreased approximately 40 per cent.

Second, fewer hogs were raised and fed during this year.

Third, the general use of anti-hog cholera serum with certain sanitary precautions.

Co-operative hog cholera control work was begun in early summer, and we are now working in four counties. While progress has been slow, results have been very satisfactory. Increased interest is being manifested. I predict more rapid progress from this time. It is our intention to take in new territory, when conditions will justify.

2. A little progress has been made in the eradication of tuberculosis, yet we cannot reimburse owners for the destruction of reactors.

3. Hemorrhagic septicemia has given us no little concern. Outbreaks have been found in different sections of this state, usually in herds that have recently been shipped from public stock yards, or in herds directly exposed to such herds. No accurate data is at hand giving the number of deaths; however, losses have been heavy. Treatment has been, as a rule, successful in checking the spread of the disease.

4. Rabies has existed to a far greater extent during the past year than was ever known. Heavy losses were sustained in five counties, principally among cattle. Isolation, district quarantines, destruction of all animals showing clinical symptoms; cleaning, disinfection and open warfare against dogs, seems to have had the desired effect, as no animal known to have been inoculated is now living.

S. F. MUSSELMAN, 
State Veterinarian.

LOUISIANA

1. Respecting new legislation we have the pleasure to report that the recent legislation passed, in both houses, a state-wide tick eradication act, to become effective April 1, 1918, known as act 127, and leaving optional with this board to call on as many parishes as we see fit, to prepare for work any time subsequent to April 1, 1918; also at this session of the legislature was passed a very important piece of legislation, in our opinion, known as act 18, which prohibits the shipment of cattle and other live stock from any territory that is quarantined on account of the cattle tick, by the secretary of agriculture, to any territory in this state that is tick-free or that is undergoing systematic tick eradication, or from any territory within this state that is quarantined to any parish that is free or undergoing tick eradication, unless such cattle, and other live stock, have been dipped twice, within five to twelve days, in a standard arsenical solution, under supervision of a federal inspector or a duly authorized state inspector co-operating in tick eradication work.

Due to the universal interest manifested in tick eradication throughout the entire state and the number of parishes, amounting to thirty-three in all, making arrangements to begin systematic work as early as possible, the United States Bureau of Animal Industry has opened an official office in this state with an experienced veterinary inspector in charge, co-operating substantially and harmoniously with this department in every respect.

The State Live Stock Sanitary Board is at the head of tick eradication in the state and it is through the co-operation of this board, with the Federal Bureau of Animal Industry, that this work is being carried on for the benefit of our cattle owners.

2. Anthrax, for the first time in the past ten years, has shown a marked decrease this season, there having been a limited number of outbreaks in seven parishes, whereas last year this disease was extremely prevalent in thirty-six parishes.

3. Hog cholera has been prevalent throughout the state in various sections and, as a whole, has consistently shown a decrease of thirty per cent during the past twelve months as compared to its prevalence in 1915. Our state serum plant, which is operated under the supervision of this board and distributing serum to farmers and live stock owners of this state at one cent per c. c., has thus far been able to furnish all necessary serum promptly upon request.

4. Several outbreaks of spinal meningitis have been reported in various localities, investigation demonstrating that such affection is attributed to ingestion of mouldy corn or other damaged feed.

5. Three calls for investigations of suspicious cases of glanders have been made during the past year by this board, each, however, resulting negatively; and as far as we know there is not a case of glanders in this state at the present time.

6. The importation of all live stock into this state must be accompanied by a certificate of inspection given by a qualified veterinarian endorsed by the live stock sanitary board, or state veterinarian, of the state in which shipment originated, or certificate given by a B. A. I. inspector, preceding the shipment of such live stock. Additionally, it is required that all cattle shipped into this state, except for immediate
slaughter, be accompanied by tuberculin test chart showing their freedom from tuberculosis.

LOUISIANA STATE LIVE STOCK SANITARY BOARD.

E. PEGRAM FLOWER, D. V. S.,
Secretary and Executive Officer.

MICHIGAN

1. Hog cholera control work is being carried on very successfully in this state at the present time. We have formulated a plan for the work, in conjunction with the Bureau of Animal Industry, that has given good results so far. In several counties where this plan has been put into operation we have reduced the losses from thousands of dollars to a few hundreds.

2. Our work in the control of tuberculosis has been carried on by the usual plan of testing herds where there is well-grounded suspicion of the disease.

The testing for public sales, city milk supply, and interstate shipments, have resulted in the discovery of the disease in a number of herds which were not previously suspected. These herds have been taken charge of by the state, and the control of the disease in this manner is giving very satisfactory results, showing that the testing, quarantine, and weeding out process can be a success if thoroughly conducted.

3. Glanders has not prevailed to any extent in Michigan during the year, there being only a few isolated cases that have been quickly disposed of.

4. Hemorrhagic septicemia has made its appearance in a number of places throughout the state, but in all cases except two it has been in cattle that have been shipped in from the large stock yards, usually taking about twenty per-cent

5. In the control of contagious diseases in live stock, we find that the co-operation of the live stock commission, state and Bureau of Animal Industry veterinarians, with the local practitioners, along educational as well as practical lines, is the most successful plan of control work, as we are very much encouraged with the very beneficial results shown in this state.

GEO. W. DUNPHY,
State Veterinarian.

MISSISSIPPI

Number of outbreaks on anthrax ........................................... 20
Number of hogs, including hogs with anthrax ......................... 200
Number of counties involved during outbreaks ....................... 12
Number of animals vaccinated with anthrax vaccine reported ........ 50,000
Cost to the state live stock sanitary board ......................... $4.50
Number of cattle tested for tuberculosis, including export ........ 10,000
Number condemned and destroyed, or quarantined .................. 150
Number of outbreaks of glanders reported ........................... 12
Number of glandered animals destroyed ............................. 56
Number of animals tested with ophthalmic mallein (B. A. I.) ....... 300
Number of outbreaks of blackleg reported .......................... 50
Number of animals died reported ....................................... 200
Number of animals vaccinated estimated ............................ 50,000
Number of outbreaks forage poisoning reported .................... 17
Number of deaths reported ............................................... 100
Number of outbreaks of tick fever, native and imported cattle .... 30
Number of deaths reported from tick fever (many not reported) ... 200
Number of cases swamp fever (infectious anemia) reported ........ 300
Number of deaths estimated ............................................. 150
Number of bacteriological examinations made ....................... 209
(bacteriological laboratories A. & M. College)
Number of positive diagnoses of infectious diseases made ....... 59
Number of chemical examinations made for animal poisoning ....... 33
(chemical laboratories A. & M. College)
Number of positive diagnoses of chemical poisoning ............. 11
Number of examinations made for animal parasites reported ....... 10
(zoological laboratories A. & M. College)
Number of animals imported from other states during the year, including horses, mules, cattle, sheep, swine and goats ..................... 7,936
Amount of anti-hog-cholera serum distributed from the office of state veterinarian, approximately .............................. 1,250,000 c.c.
Number of animals vaccinated by single and double methods .......... 50,000
Number of animals exported for immediate slaughter not accurately known, but one county in the state alone shipped fifteen car loads of hogs, and another county shipped about thirty car loads of cattle, both of which a few years ago depended upon cotton for the money crop.

The cost of most of the outbreaks was met by funds appropriated by the various boards of supervisors of the counties, who were authorized by House Bill No. 143, laws of 1910, to make any payments necessary to eradicate disease in animals.

A number of cattle were tested and exported from the state but no record furnished this office. The list above shows those tested with tuberculin furnished through this office by the J. A. I.

The animals destroyed with glanders were in most cases appraised and paid for by the boards of supervisors.

A great many small outbreaks of blackleg were not reported to this office, but the supposed was that the disease existed and vaccination advised. Much of this work was done by the owners themselves and demonstration agents at the request of the owners.

A large number of hogs were treated with serum not secured from this office, but the above figures approximate the amount of serum sent out from here.

**TICK ERADICATION**

(Taken from the report of the Federal Inspector in Charge, Dr. J. A. Barger, Jackson, Mississippi, working in cooperation with the Mississippi State Live Stock Sanitary Board.)

<table>
<thead>
<tr>
<th>Area released previous to 1915</th>
<th>31 Cos. and 5 parts of Cos. or 21,284 sq. mi.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area released in 1915</td>
<td>3 Cos. and 2 parts of Cos. or 2,238 sq. mi.</td>
</tr>
<tr>
<td>Area released in 1916</td>
<td>12 Cos. and 3 parts of Cos. or 7,652 sq. mi.</td>
</tr>
<tr>
<td>Total area released</td>
<td>51 Cos. or 31,174 sq. mi.</td>
</tr>
<tr>
<td>Area not released</td>
<td>30 Cos. or 15,176 sq. mi.</td>
</tr>
<tr>
<td>Per cent of state not released</td>
<td>31%</td>
</tr>
<tr>
<td>Cost per head of cattle for eradicating ticks</td>
<td>$0.46</td>
</tr>
</tbody>
</table>

It is expected that the entire state will be in condition for release from federal quarantine not later than December, 1917.

The State Veterinarian, through the recommendation of the Governor and other members of the Mississippi State Live Stock Sanitary Board, was instructed to prepare a suitable exhibit for the Centennial Exhibition at Gulfport, and a liberal appropriation has been set aside from the serum fund to pay for same.

E. M. Ranch,
State Veterinarian.

**MISSOURI**

1. During the year 1916 greater progress in live stock sanitary control work was made than ever before. A larger number of cattle was tested for tuberculosis. On account of accumulating an enormous amount of claims for indemnity, the work was discontinued about the middle of the year. The tuberculosis quarantine regulations were upheld by the courts after a long drawn-out fight with one railroad company.

2. Hog cholera control work was taken up and carried to a successful termination in fourteen counties.

3. Our state was fortunate in remaining free from anthrax, which apparently threatened to invade the central and northern states this year.

4. The foot-and-mouth disease scare was the only unusual occurrence of the year. On November 20th, a lot containing 131 cattle were unloaded and rested in the St. Joseph Stock Yards and forwarded to Kansas City, where they arrived on November 21st. These cattle came from Wauneta, Nebraska. A part of the lot was sold for slaughter and twenty head were shipped to Tecott, Kansas. Some fifty-seven head remained in the hands of speculators in the Kansas City yards. On the 23rd, symptoms of foot-and-mouth disease were discovered among the cattle still in the yards. The mouth symptoms were considered very typical of the contagious foot-and-mouth disease. No foot lesions developed. A report, from the Nebraska ranch where these cattle originated, showed that about ten per cent of the cattle and ten per cent of the horses on that ranch were affected with a peculiar mouth disease and that some 700 hogs were free from it. After most careful tests and investigations by representatives of Missouri and Kansas, and of the Bureau of Animal Industry, it was determined that this was not the contagious foot-and-mouth disease.

In the meantime, strict quarantines were placed against the movement of livestock from the Kansas City and St. Joseph yards. Between the time of the arrival of those cattle in the yards and the placing of the quarantine, some 200 lots of cattle, hogs and sheep went from these markets to the interior of the state of Missouri. Without waiting to determine whether or not foot-and-mouth disease was present, every one of the 200 shipments were rounded up and carefully examined and, in most cases, placed under temporary quarantine. Immediately upon determining that there was no contagious foot-and-mouth disease present, all quarantine restrictions were withdrawn.

D. F. Luckey,
State Veterinarian.
NEW JERSEY

In accordance with the provisions of an act passed at the 1916 session of the legislature, the work relative to contagious diseases of animals previously conducted by the state department of health has been transferred to the state department of agriculture. This act took effect July 1, 1916, and subsequent to the date the work above referred to has been carried on under my supervision. Dr. Price informs me that no cases of anthrax were reported to the state department of health from January 1st to July 1st, 1916, and while a few cases of glanders, hog cholera and blackleg were reported, no epidemics of these diseases occurred and therefore he has no report of interest to make.

Since the enforcement of the laws relating to contagious diseases of animals in New Jersey was taken up by the state department of agriculture on July 1st, 1916, the following cases have been taken care of:

1. From November 1, 1915, to July 1, 1916, 3,884 imported cattle were tested for tuberculosis after entering this state and 182 animals condemned and slaughtered. During the same period there were 4,609 imported cattle tested before entering the state. From July 1 to October 31, 1916, 4,065 imported cattle were tested after coming into the state and 135 condemned and slaughtered. During the same period, 4,431 imported cattle were tested before entering the state.

2. 15,200 horses tested for glanders with ophthalmic mallein with result of seventy-eight animals condemned and slaughtered, in the following counties: Bergen, twenty-five; Passaic, four; Union, two; Hudson, seventeen; Essex, twenty-nine; Middlesex, one.

3. Hog cholera was reduced 40 per cent in 1916.

4. There were no cases of blackleg or anthrax reported.

5. Five hundred horses belonging to the Allies, shipped from St. Louis, were quarantined at the Central Union Stock Yards, Jersey City, suffering from necrotic stomatitis. They soon recovered and were shipped to France.

Cleas. McNabb,
Chief Inspector.

NEW YORK

There have been no unusual epizootics among animals in this state during the past year.

Owing to change in the laws in this state during the legislative session of 1916, the fiscal year was changed from period extending from October 1st to September 30th to period extending from July 1st to June 30th; therefore the past fiscal year consists of nine months only, namely from October 1, 1915, to June 30, 1916.

The subcutaneous tuberculin test remains the official means of diagnosis but animals may be tested for tuberculosis with a percentage reacting of 7%. This is about the same as for the two previous years, but shows a decrease from former years in the number found affected.

The methods of dealing with this disease have not materially changed. The subcutaneous tuberculin test remains the official means of diagnosis but animals may be tested for tuberculosis with a percentage reacting of 7%. This is about the same as for the two previous years, but shows a decrease from former years in the number found affected. The methods of dealing with this disease have not materially changed. The subcutaneous tuberculin test remains the official means of diagnosis but animals may be tested for tuberculosis with a percentage reacting of 7%. This is about the same as for the two previous years, but shows a decrease from former years in the number found affected. The methods of dealing with this disease have not materially changed. The subcutaneous tuberculin test remains the official means of diagnosis but animals may be tested for tuberculosis with a percentage reacting of 7%. This is about the same as for the two previous years, but shows a decrease from former years in the number found affected. The methods of dealing with this disease have not materially changed. The subcutaneous tuberculin test remains the official means of diagnosis but animals may be tested for tuberculosis with a percentage reacting of 7%. This is about the same as for the two previous years, but shows a decrease from former years in the number found affected. The methods of dealing with this disease have not materially changed. The subcutaneous tuberculin test remains the official means of diagnosis but animals may be tested for tuberculosis with a percentage reacting of 7%. This is about the same as for the two previous years, but shows a decrease from former years in the number found affected. The methods of dealing with this disease have not materially changed.

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3. Rabies has been less prevalent in the state in the past few months than at any time for several years. It is evident that if adequate quarantines could be efficiently maintained it would be possible to control and eventually eradicate this infection from this state.

4. Hog cholera continues to be an important infection among swine but the increased use of anti-hog-cholera serum, where properly administered, is holding the infection in check. The department has recently put in effect regulations prohibiting the shipment into the state of virus used in the simultaneous treatment of cholera, except after proper report, and provides for its use under proper supervision only.

5. Blackleg and anthrax have not shown any unusual prevalence. Vaccination against these diseases is being generally followed and is strongly recommended by this department.

There has been no work undertaken in this state, other than the usual routine, by the Bureau of Animal Industry. In all general inspection work close co-operation exists between this office and that of the federal department.

J. G. Wills
Chief Veterinarian.
NORTH CAROLINA

During the year of 1916 North Carolina has been comparatively free from epizootics among live stock. We have had few cases of hog cholera, blackleg and glanders. During the year one herd of cattle was found to be affected with anthrax. This is the first case of anthrax that has been found by us in the state. By promptly vaccinating the herd the disease was checked and the owner sustained a loss of only three animals.

1. There have not been as many cases of blackleg as in the previous years. This, we believe, is due to the extensive use of the blackleg vaccine.

2. Hog cholera has received a great deal of attention during the year. This work has been carried on in cooperation with the United States Department of Agriculture. North Carolina has been fortunate in having a representative of the United States Department of Agriculture to co-operate with us in this line of work for a little over two years. We feel that a great deal of good has been accomplished. Until July of the present year, this representative of the United States Department of Agriculture devoted his time to educational and demonstrational work. Since July his efforts have been confined to a restricted area in which we are undertaking to enforce stricter sanitary measures and with the liberal use of the serum and the serum and virus, it is hoped that hog cholera can be controlled if not eradicated.

3. The veterinary division of the department of agriculture has co-operated with the United States Department of Agriculture in tick eradication as it has in the past. During the year the method in tick eradication has been somewhat changed and we feel that the work will now go forward more rapidly than it has heretofore. This is due, as stated above, to the change in the method and to more money being raised.

4. This year has brought an unusual number of reports of milk sickness among cattle and sheep in the mountainous section of the state. As yet we know very little about milk sickness. It is now hoped that during 1917 the work will be taken up in cooperation with the United States Department of Agriculture and that we will be able to determine something definite in regard to it. Milk sickness, in a measure, is retarding our cheese making in the mountainous counties.

5. As yet we have been unable to take up any systematic work towards the elimination of contagious abortion among cattle. We feel that this condition should receive prompt and energetic measures towards its control and eradication, but because of a lack of funds we have been unable to do any work along this line.

B. B. FLOWE,
State Veterinarian.

NORTH DAKOTA

The condition of the live stock industry in this state for this year, is the best from a sanitary standpoint regarding the existence of contagious diseases than any year since the organization of the state live stock sanitary board ten years ago.

1. The number of animals annually destroyed for glanders has been reduced from 1,169 for the year 1907 to 223 for the year 1915-16.

2. The number of animals destroyed for dourine has been reduced from 459 in the year 1914 to 28 in the year 1916.

3. The number of cattle admitted by tuberculin test has increased remarkably, 15,162 being admitted during the year 1916 compared with 3,792 for year 1915.

There is also a very marked increase in the number of stockers and feeding cattle shipped into the state.

Cattle numbering 7,288 remaining within the state were tuberculin tested. For this year five per cent reacted to the tuberculin test compared with fourteen per cent for the year 1912. Of these cattle, 3,123 were pure bred.

Regulations have been established for the classification of pure bred cattle herds entitled to official recognition as being free from tuberculosis.

4. The amount of hog cholera serum used during the past year is only about 25 per cent of that used in the previous year, indicating that hog cholera has existed to a less extent.

5. The first case of sheep scab found in the state for five years was located this season. The disease was apparently introduced through bucks shipped from Sioux City, Iowa.

We have had the continued co-operation and assistance of the Bureau of Animal Industry especially in connection with the work of eradicating dourine.

W. F. CREWE,
State Veterinarian.

OHIO

1. Hog Cholera: Losses only about 25 per cent compared with previous years.

2. Tuberculosis: Cattle tested since January 1 to November 1, 1916, 7,610; reactors, 815.

3. Glanders: Horses tested since January 1 to November 1, 1916, 1,231; reactors, 80.

4. Blackleg: Two small outbreaks; three head in one, two in another. All healthy animals vaccinated and no further losses occurred.

5. Infectious eye trouble in horses: Several reported outbreaks in different parts of the state with many reported cases of blindness resulting in one or both eyes.

6. Co-operative hog cholera control with the Bureau of Animal Industry started in six counties and will extend to other counties as the work progresses.

A. S. COOLEY,
State Veterinarian.
OKLAHOMA

1. In the counties in which tick eradication has been carried on in this state, the number of cattle dipped were 2,243,307. The following counties are in the advanced stage in this work: Adair, Cherokee, Cotton, Creek, Delaware, Garvin, Grady, Jefferson, Murray, Mayes, Muskogee, McClain, McIntosh, Okmulgee, Osage, Pottawatomie, 4-S, Pontotoc, Stevens, Seminole, Tulsa and Wagoner. These counties will be closed to the federal line next year.

2. The number of licenses issued by this department to administer serum and virus to hogs were 690. This work has been progressing in a satisfactory manner, this year there being not over 10% of the loss of former years. Fifteen cows have been condemned and killed on account of tuberculosis. Eighteen horses and mules have been condemned and killed for glanders. Very little scabies showed up in sheep.

This work is being done under the direction of the State Board of Agriculture.

F. M. GAULT.
President, Oklahoma State Board of Agriculture.

OREGON

During the past year, Oregon has suffered from no widespread ailment of live stock and no new disease has made its appearance within the state.

1. Considerable anxiety was felt from the dangers that were at hand during the epizootic of foot-and-mouth disease, but our remoteness and such sanitarian police precautions that we carried out prevented the disease from being introduced within the borders of our state.

2. Hog cholera has been less prevalent this past year than in former years. This is probably in part due to the fact that the hog industry has not forged to the front during the last year as in former years. The high price of grain coupled with a relatively low price for pork during the fall of 1915 discouraged many of the farmers from embarking in the hog industry. There was an extensive liquidation in hogs, many going to the extent of selling out the business completely. For this reason hog cholera has not had the chance to spread that it would normally have had. The state is well supplied with many sources of pure mountain stream water and coupled with cool nights, hogs seem to be more resistant here than they are in the states of the corn belt. We carried on an active campaign against the spread of hog cholera and vaccinated with the serum alone method all infected and exposed hogs. During the past three months we have had only one district reporting hog cholera.

3. Tuberculosis continues to be the most prevalent infectious disease of live stock. In certain localities the disease is very prevalent, while in other localities it is unknown. This condition is doubtless due to the fact that the state has two climates very different in nature; one is of the high, dry desert nature, the other is of the low, damp, humid nature. Animals in our desert half of the state have less than one per cent of tuberculosis, while the herds of the western half of the state are probably affected to the amount of five per cent. In some herds we have found as high as sixty to seventy per cent to be infected. Perhaps not over ten per cent of the herds of the state are infected. The state pays an indemnity of $25.00 per head for grade animals over two years of age and $27.50 for pure-bred animals over two years of age. In addition the owner receives such salvage as may come from the sale of the carcass.

4. Glanders is much less prevalent than in former years. The western half of the state is almost free from this malady. The eastern half, where desert conditions obtain, is fully infected. The disease is no worse than for years without showing any considerable amount of inconvenience. For this reason owners are loath to believe their animals are infected and frequently allow them to go for years with their bands of animals harboring this ailment. The state pays an indemnity of $35.00 for animals weighing under one thousand pounds and $25.00 for animals weighing one thousand pounds or under.

Other diseases which have been prevalent in this section are hemorrhagic septicemia of cattle, sheep and goats, forage poisoning or a form of hemorrhagic septicemia of horses, and several parasitic infestations of sheep.

Hemorrhagic septicemia has been the cause of numerous losses to our dairy industry. This malady has been particularly prevalent in the timbered sections of the state. The disease has been seen most frequently in mountain pastures where decaying vegetation and lime leached soils abound. Apparently the lack of lime salts has some influence upon the virulence of this malady. We believe here in Oregon that soils containing a high acidity due to lack of lime salts causes the organism to take on an increased virulence. At any rate, the disease is highly prevalent under these conditions. In conjunction with the bacteriological department of the Oregon agricultural college, we have had manufactured certain vaccines made by attenuating the live culture of this organism. These vaccines are used in amounts of one cubic centimeter for cattle and one-half cubic centimeter for sheep. Uniformly good results have been had in affording protection by the use of these materials.

In eastern Oregon a condition has existed there in horses for a number of years has been designated by the laymen as the walking disease. This ailment appears to be of a mold poisoning nature. It is possible that it is due to the organism of hemorrhagic septicemia found in horses, and, for want of a better name, the use was made of hemorrhagic septicemia vaccine. We vaccinated in all some two hundred head of horses in six different bands. In previous years the losses under these conditions would have been from fifty to sixty per cent, while this year only three horses died after the same were vaccinated.
6. Liver fluke is the most prevalent parasitic disease of sheep. Treatment is of little avail and the best success is had in changing pastures and avoiding soils that border on low lying streams.

The Federal Bureau of Animal Industry co-operates with the Live Stock Sanitary Board in controlling diseases of sheep and also in investigating certain diseases of live stock.

W. H. Lytle,
State Veterinarian.

PENNSYLVANIA

Live stock sanitary conditions during 1916 have run along about the same as the previous year. With the exception of the more common transmissible diseases, such as glanders, tuberculosis, anthrax, blackleg, hemorrhagic septicemia, hog cholera, etc., our state has not suffered seriously.

1. We have done considerable work in various sections of the state with the W. H. Lytle, treatment for sterility and contagious abortion in cattle.

2. Vaccination against hemorrhagic septicemia has been carried out on exposed animals on infected premises with fairly good results.

3. Considerable work of a comparative nature has been done during the year with the various tuberculin tests, i.e., subcutaneous, ophthalmic and dermal tests. A report of the results obtained is in the course of preparation.

4. Our new meat hygiene law, after little more than a year's trial, has been found to work satisfactorily and its application has brought good results.

5. The live stock law under which we handled foot-and-mouth disease, forbids removal of "hay, grain straw, fodder and other foods" from quarantined premises. A man who was seeking to create sentiment against slaughter of diseased animals carried samples of milk from a quarantined herd to the city for examination. During the subsequent trial of the case the question arose: was milk included as a food under the general term "other foods"? An exhaustive opinion by the court held that the term included "all foods" and not merely foods of a like or similar nature. The defendant was convicted.

Recent epidemics of milk-borne diseases have created public interest in the question of wholesale milk, and the incoming legislature will, no doubt, respond by adopting an adequate milk hygiene law.

South Dakota

The work of live stock sanitary control in South Dakota during the year 1916 has been most successful and no disease of live stock is noted to be on the increase in the state, nor were there any epizootics covering any large territory.

1. The unusually small percentage of tuberculosis among cattle in this state, estimated by the state veterinarian to be about five per cent, has been secured through the strict regulations of this board during the tuberculin test on all cows, heifers and bulls over six months of age, being shipped into the state.

2. Because of vigorous efforts in the eradication of glanders and assisted by a state indemnity for horses destroyed on account of glanders, this disease is on the decrease in South Dakota.

3. A large amount of work has been done by this department in a few northern counties in the eradication of dourine. In this work the state has been greatly assisted by the Bureau of Animal Industry, which has had an efficient force in the field during the entire season.

4. Anthrax outbreaks are not uncommon in herds in the western part of the state, but they have invariably been confined to small areas and large losses prevented by vaccination.

5. A few areas have been affected with cattle scabies and the state and the Bureau of Animal Industry have done considerable work in its eradication. A large number of dipping tanks have been built in the state and outbreaks are well under control.

6. There is no sheep scabies in the state.

1. During the current year this commission has done considerable work in the eradication of hog cholera, both independently and in co-operation with the Bureau
of Animal Industry. We have quarantined the counties of Knox, Haskell, Childress, Collingsworth, Hale, Lubbock and Lamb and parts of Taylor and Erath. Subsequently on account of the enforcement of the quarantine regulations and proper treatment of hogs, releases were issued on the counties of Lubbock, Childress, Haskell and Knox. We have also done considerable work in other sections of the state on premises under local quarantine.

Dr. Frank R. Jones, veterinarian representing the Bureau of Animal Industry, in co-operation with this commission has been conducting regulatory hog cholera work in the counties of Collin, Grayson, Denton, Hall and Collingsworth.

There has not been any unusual amount of hog cholera in these counties or in any other part of Texas, but the reason they have been placed under quarantine is that we have been devoting more attention to all kinds of contagious diseases, having increased our veterinary force for that purpose. There has not been such a widespread contagion of this disease even in the counties quarantined, but there was a sufficient amount that we deemed it proper to quarantine them and prevent its further spread. There has been a marked decrease in the number of cases of cholera this fall and winter compared with the same season of last year, which is, no doubt, due to the vigilance we have exercised during the past year.

2. During this year a great deal has been accomplished in ridding dairy herds of tubercular reactors; especially in the larger towns and cities of this state, such as Ft. Worth, Dallas, El Paso, Corpus Christi, Greenville, Amarillo, Wichita Falls, Mineral Wells, Tyler and Texarkana. There has also been some work done at Houston. The above testing for tuberculosis has been done by veterinarians registered with this commission with tuberculin furnished by the Bureau of Animal Industry, and where reactors have been found they have been quarantined and slaughtered subject to government post-mortem examination.

Some of the herds above mentioned have been almost entirely free of tuberculosis, while in others there has been as high as twenty-five per cent of tubercular infection found. However, the percentage of reactors found during the current year has not been as large as was found on tests made during the previous years.

3. We have had only a few cases of glanders during this year, but in each instance the animals have been promptly quarantined and destroyed.

4. We have had a few cases of anthrax, but there has not been an increase of this infection during this year; neither has there been an increase in the number of cases of glanders.

5. We have been conducting tick eradication work in about twenty-five different counties in the state during this year in co-operation with the Federal government and have accomplished great work in ridding them of the fever tick. Texas now has approximately 125,000 square miles of territory free of the fever tick infection, and we are conducting work in an area comprising about 15,000 square miles.

On account of the work that was carried on this year, the state and Federal government will release about six or eight counties from quarantine. During this year over four million cattle were dipped in tick eradication work in this state.

6. We have also, in co-operation with the Federal government, done considerable work in eradicating cattle scabies, and five counties were released from quarantine this year and considerable work done in other counties that have not yet been released.

This commission is now co-operating with the county authorities of sixteen counties in this state in the eradication of sheep scabies.

D. H. Cunningham,  
Chairman Live Stock Sanitary Commission.

UTAH

1. I cannot give you any correct figures regarding hog cholera, tuberculosis, glanders, etc., though I will say that, in the two years 1915-16, the state has tested all the principal dairy herds in the principal counties in Utah, and from the figures gathered there is less than one-half of one per cent of tuberculosis.

2. Regarding glanders: We have destroyed but five animals in the same time from this disease.

3. Hog cholera has been quite prevalent in two counties in this state, and several hundred head of hogs have been lost from this disease on account of people not reporting the cases, treating the animals themselves, and refusing to employ competent veterinarians to immunize their swine.

This Bureau of Animal Industry has not co-operated with this department for the past four years.

4. There have been a number of cases of anthrax in localized sections of the state, and I believe we have had this disease here for a number of years, but people have never understood the seriousness of it, nor have they reported in anti1 recently.

A. CARRINGTON YOUNG,  
Inspector.

VERMONT

Summary of Work Done July 1, 1914, to June 1, 1916

<table>
<thead>
<tr>
<th>Description</th>
<th>Number</th>
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</thead>
<tbody>
<tr>
<td>Total cattle brought into Vermont on permits</td>
<td>3,912</td>
</tr>
<tr>
<td>Tested and passed</td>
<td>2,675</td>
</tr>
<tr>
<td>Tested and passed (intra-dermal method)</td>
<td>6</td>
</tr>
</tbody>
</table>
Examined physically (practically all young calves) &ldquo;.....300
For immediate slaughter &ldquo;.....82
Unloaded at Vermont points, and then removed from the state &ldquo;.....348
Held over for periods varying from 24 hours to ten weeks &ldquo;.....224
Held over for farm work (oxen) &ldquo;.....2
Vermont cattle returning, and not tested, of which 74 head &ldquo;.....160
For breeding and service purposes, and then taken home &ldquo;.....18
Loaded at Vermont points for shipment out of state &ldquo;.....87
Vermont cow returning from Massachusetts, tested and condemned &ldquo;.....1
Condemned after test and destroyed &ldquo;.....9
Horses, ponies, mules and donkeys brought into Vermont on permits &ldquo;.....6,159
Horses examined and passed &ldquo;.....5,657
Horses tested and passed &ldquo;.....2
Horses tested and passed, ophthalmic test &ldquo;.....353
Horses died before examination &ldquo;.....1
Horses for brief stay during summer season (not examined) &ldquo;.....42
Horses, Vermont animals returning and not examined &ldquo;.....37
Horses unloaded in Vermont and removed from the state &ldquo;.....2

6,094

Ponies examined and passed &ldquo;.....16
Ponies admitted for brief stay for pleasure purposes during summer, not examined &ldquo;.....6
Ponies, Vermont animals returning from fairs &ldquo;.....23
Ponies unloaded in Vermont and removed from the state &ldquo;.....1

45

Mules examined and passed &ldquo;.....18
Donkey examined and passed &ldquo;.....1

19

Cattle tested upon application of owners &ldquo;.....11,961
Of which there were condemned and destroyed &ldquo;.....1,390
No indemnity allowed for 24 and full appraisal paid for 2.
Cattle tested for shipment out of state, under the provisions of Section 21
Act 225 of 1912 &ldquo;.....9,702
Of which there were condemned and destroyed &ldquo;.....366
No indemnity allowed for 20 and full appraisal paid for 2.
Private tests reported &ldquo;.....6,165
Of which there were condemned and destroyed &ldquo;.....222
No indemnity allowed for 13.
Totals &ldquo;.....27,828

1,978

Cattle examined physically and passed &ldquo;.....8
Cattle examined physically, condemned and destroyed &ldquo;.....3
One condemned cow shipped out of state. Authorities notified and owner arrested and fined.
One cow killed order owner. No lesions found.
Horses ophthalmic maltein tested &ldquo;.....85
Of which there were condemned and destroyed &ldquo;.....35
Horses tested, old method &ldquo;.....36
Of which there were condemned and destroyed &ldquo;.....5
Horses examined physically &ldquo;.....7
Of which there were two condemned and destroyed, No indemnity paid.
Black-leg vaccine supplied, doses &ldquo;.....5,844
Vaccinations reported &ldquo;.....3,425
Hog cholera serum supplied, in c. c. &ldquo;.....5,300
Hogs injected, 212; serum used in c. c. &ldquo;.....4,780
N. B. The state supplied the above vaccine and serum, and owners paid for the veterinary services.
Ordinary permits for horses and cattle issued &ldquo;.....1,420
Pasture permits issued &ldquo;.....59
Exhibition permits issued &ldquo;.....60
Special racehorse permits issued &ldquo;.....17

Special permits issued during quarantine for foot-and-mouth disease &ldquo;.....386
For sheep &ldquo;.....39
For rabbits &ldquo;.....5
For hides &ldquo;.....9
For monkeys &ldquo;.....1
For poultry &ldquo;.....115
TWENTIETH ANNUAL REPORT

For dogs ................................................................. 85
For swine ................................................................. 108
For goats ................................................................. 8
For various .............................................................. 16

Nine owners of stock reported to this office of suspected cases of foot-and-mouth disease. Cases were investigated promptly by the commissioner or veterinarian appointed by him. Quarantine notices were posted at the state lines and all rumors and reports traced out. Suspicious cattle were quarantined until sure they were not infected. Besides the actual charges of the commissioner and veterinarians attending to suspicious cases, there were charges for telephoning, etc., which bring the cost to the state of keeping out of foot-and-mouth disease to approximately $250.00.

F. L. Davis,
Live Stock Commissioner.

WASHINGTON

The live stock industry of Washington represents an investment of over forty-seven million dollars ($47,000,000.00). During the year of 1915 there were four hundred and sixty thousand (460,000) fleeces, or three million eight hundred and eighteen thousand (3,818,000) pounds of wool, produced in Washington.

The development of the live stock industry in Washington is receiving more attention than in the past, due principally to a realization by our farmers that the introduction of live stock as a factor in diversified farming is essential to a sound agricultural economy.

1. Bovine tuberculosis still continues to be the principal sanitary problem with which this division has to deal, and while the disease is not so prevalent in this state as compared to many others, due to our geographical situation and our stringent laws governing the importation of live stock, it still assumes proportions in some counties that materially decrease the profitable returns of many farms.

It is still to be regarded as the most disastrous disease of cattle and a menace of such economic importance that it cannot be ignored by either the herd owners or the interests involved in the conservation of agricultural resources and the protection of public health. Every animal slaughtered and found unfit for food is a direct tax on the public meat supply. Every cow which is removed from the milking string on account of tuberculosis, adds to the cost of milk production.

TESTS UNDER THE PROVISIONS OF CHAPTER 100, LAWS 1915.

<table>
<thead>
<tr>
<th>Tested</th>
<th>Reacting</th>
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<tr>
<td>June 10, 1915-June 30, 1916</td>
<td>28,930</td>
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</table>

The enactment of Chapter 100, Laws of 1915, appropriating $25,000.00 and providing for the compensating of owners for a portion of their losses through bovine tuberculosis, has been a very popular measure, and has had the endorsement of the State Grange, the Washington Pure Bred Live Stock Association and various other live stock organizations as well as all public health officials. The present law provides, on the written application of the owner of any bovine animal, the tuberculin test will be applied by one of the inspectors of the department. This inspector is a duly qualified veterinarian employed by the department and who has given a bond to the state in the sum of $2,000.00.

Upon the completion of the test, if any tubercular animals are found, there are two courses open for the owner. He may select indemnity or quarantine. In case indemnity is selected, the reactors are appraised by the inspector and owner. In their failure to agree upon a value of the animals in question, the county agriculturist of the county is called upon to settle the matter. In case there is no county agriculturist of that county, the judge of the Superior Court of that county appoints a third appraiser. It is worthy of note that in testing more than 28,000 cattle, and in slaughtering 1,842 "reactors," the confidence of the owners in the fairness of the inspectors is shown by the fact that a third appraiser has been necessary in but two instances.

The wonderful accuracy of the tuberculin test is shown in that of a total 1,842 animals killed, 1,790 showed upon post-mortem examination evidences of the disease. When we consider that a few of these animals come under that class called "suspects," i.e., in which the reaction is not clearly defined, the results are truly remarkable.

Unfortunately the division was obliged to suspend the tuberculin test work on July 1st, as there was only a small balance remaining in the fund, and consequently hundreds of cattle owners were notified that their applications could not be acted upon.

The test work on July 1st was in full swing as a result of our educational program and the fair and liberal provisions of the act, and great enthusiasm existed among the farmers; so it was with feelings of profound regret that this work was suspended.

The department has under consideration a plan to recognize tuberculosis-free pure-bred herds through the accredited system.

To put this plan in operation it is necessary that we receive the cooperation of the pure-bred breeders of the state. Cattle of this state, and especially the pure-bred percentage of tuberculosis, and it is to be hoped that this proposed plan of inspection, testing, and control, provided for, and certified to, by the state will afford an opportunity to the breeder to add to the value of his herd.

2. An outbreak of foot-and-mouth disease during the fall of 1914 presented a serious menace to the live stock industry of the United States.
On November 10, 1914, the State Department of Agriculture received information that a shipment of cattle en route from Wisconsin to Roy, Wash., had been unloaded and fed on November 5 in yards at the Minnesota transfer situated near St. Paul, Minn., and that these pens were occupied November 2 by cattle which were later found to be affected with foot-and-mouth disease on arrival in Montana. The advice indicating this shipment should have arrived over the Northern Pacific railway as it was presumed at that time to be in transit somewhere in Montana.

The cattle did not arrive at Spokane until November 13, 1914, when an examination was made in special corrals, constructed for these cattle by the transportation company. The first examination revealed a slight stomatitis, or inflammation of the mouth cavity, with no apparent lesions among any of the animals. Immediately upon receipt of this advice, the cars containing the shipment and the individuals caring for the animals, were placed in quarantine with the cattle.

By Saturday, November 21, 1914, all the cattle had been killed and cremated, cars thoroughly disinfected and all pens, litter, etc., safely disposed of.

Subsequent to the Spokane outbreak the department traced and examined every shipment of sheep that entered the state since October 1, 1914, and supervised the disinfection of 2,000 live stock cars and every public stock yard in the state.

3. For many years the prevalence of glanders among the horses of the commonwealth has been widespread. During the period of this report we have investigated 123 different reports of this disease. There have been 1,234 horses tested with ophthalmic mallein, or the blood complement fixation test. One hundred and fourteen horses reacted and have been destroyed.

The disease has appeared in Adams, Columbia, Chelan, Douglas, Franklin, Ferry, Garfield, Grant, King, Lincoln, Okanogan, Spokane, Walla Walla, Whitman and Yakima counties.

4. Hog cholera continues to be a menace to the swine industry of the state, and although it has not reached the degree of prevalence as reported in our first biennial report it is still a factor to be considered by the hog raisers.

Walla Walla, Whitman, Okanogan, Klickitat and Yakima counties have been most seriously affected, but by prompt quarantine and serum inoculation measures coupled with sanitary requirements and disinfection of the premises, I am pleased to state that the ravages of this disease are abating.

5. During the period of this report we have investigated several reported cases of anthrax. Dr. G. A. Jones, Sedro Woolley, reported an outbreak of anthrax on the premises of H. L. Robertson, Van Horn, Wash., in February, 1915. Blood specimens were forwarded to the federal public health laboratory at Seattle and identified as probable anthrax, so as a precautionary measure all exposed animals, numbering one hundred and two head, were given anthrax vaccine and the premises thoroughly disinfected. No further losses were reported.

Dr. J. H. Woodside, Redmond, Wash., reported an outbreak of anthrax on the premises of Frank Dupuis, Issaquah, Wash., in March, 1915. Laboratory examination of blood and post-mortem appearances indicated anthrax. The exposed animals were vaccinated with no further losses.

6. Blackleg prevention consists of proper hygienic and prophylactic measures. It has been found that preventive vaccination is successful and during the period the division has distributed several thousand doses of vaccine to the farmers of the state which was furnished by the United States Bureau of Animal Industry.

7. Brucellosis has been prevalent throughout this state during the past year, but in far less degree than during the period covered by the previous report. The department has taken active measures in the suppression of these outbreaks, and while the disease is still reported from time to time we do not feel it practical to promulgate a state-wide dog-muzzling regulation at this time.

8. A large number of cases of actinomycosis have been investigated. Affected animals are either destroyed or quarantined for treatment, depending on local conditions and the extent of the infection.

9. Contagious keratitis. We have investigated several outbreaks of infectious keratitis in western Washington, which have been effectively controlled through prompt treatment. No animals suffering from this trouble have been slaughtered during the past period.

10. In April, 1915, Dr. C. M. McFarland, inspector-in-charge, United States Bureau of Animal Industry, Spokane, Wash., advised us that sheep scab had been reported in sheep and goats near Hartline. An investigation confirmed this report, except that...
only goats and no sheep were involved. All affected and exposed animals were immediately quarantined and ordered dipped, under our supervision, with no further spread of the infection.

11. Verminous bronchitis is due to a parasitic invasion of the respiratory apparatus. It is commonly called "lung worm disease." Wet seasons favor the development of the disease, as moisture insures the life of the embryo outside of the animal body; therefore the complaints and requests for investigation have been extraordinary during the past season. The proper control measures have been recommended in all cases.

12. During the past two years we have investigated a number of outbreaks of cerebral meningitis (forage poisoning), which have been both sporadic as well as epizootic in form. The disease occurred in Adams, Columbia, Grant, Spokane and Kittitas counties.

13. Sickness and death among domestic animals from other diseases not classified herein are more or less constantly occurring in the different localities of this state. Often these losses are reported as being due to a contagium and an investigation is necessary in order to determine the causative factors. Improper care and feeding of animals was, in many cases, the cause of such sickness, and when the advice and instructions of the inspectors were followed, the trouble ceased.

H. T. Graves,
Acting Commissioner of Agriculture.

WISCONSIN

The following is a report of work under sanitary control during 1915 and 1916:

1. Number of cattle tested, tuberculosis
   Total number tested .................................................. 69,728
   Total number reacting .................................................. 3,216 or 4.6%
   Total number slaughtered .............................................. 3,090
   Total tested for shipment into other states ......................... 28,232

2. Hog cholera has not appeared to any extent in the southern part of the state or any place where it has usually occurred. Only one outbreak of any size occurred, which was confined to the northwestern part of the state, comprising Buffalo, Pepin, Pierce, St. Croix, Dunn, Barron, Chippewa and Eau Claire counties. Owing to the people in this section not being familiar with the mode of combating a disease, the disease gained more headway than usual.

3. Only an occasional case of glanders has been located. The total number of condemnations twenty-three.

No work has been done in co-operation with the Bureau of Animal Industry, except in a few cases where we were in consultation over reported foot-and-mouth suspects.

O. H. Elison,
State Veterinarian.

WYOMING.

Contagious abortion—This disease is surely being imported into Wyoming through infected dairy cows, and as our dairying centers grow, so must this disease increase. However, as compared with eastern states, we are very fortunate. No native cattle have been found affected with this disease. Nine premises (imported cattle) were found infected.

Actinomycosis—Eleven cases of this disease reported.

Anthrax—None.

Blackleg—Cases of this disease found in every county of the state. Most owners now vaccinate regularly.

Brisket disease—Three cases of this high-altitude affection reported and investigated.

Calf diphtheria—Seven cases of this disease reported and treatment outlined.

Dourine—8,470 stallions and mares tested for dourine. 228 horses found diseased, appraised and destroyed. Disease found in six counties of the state.

Foot-and-mouth disease—None.

Glanders—Twenty horses destroyed on account of being afflicted with this disease. Diseased animals found in eight counties of the state. This for the years 1915 and 1916.

Hemorrhagic septicemia—Twelve outbreaks of this disease in Wyoming—all imported cattle. Vaccinated with excellent results.

Hog cholera—Eight outbreaks of hog cholera. Treated serum alone method.

Influenza and strangles—Horses in every county in the state found affected with these diseases.

Rabies—None.

Cattle scabies—527,149 cattle inspected for scabies in 1915 and 1916. 158,000 dipped.

Per cent infected of the number inspected, less than ever before in Wyoming.

Swamp fever—Horses affected with this disease in three counties.

Tuberculosis—Fifty cattle and twenty-nine swine destroyed account this disease. All of our tuberculosis imported. 3,283 cattle tested.

A. W. French,
State Veterinarian.
## LIST OF MEMBERS

<table>
<thead>
<tr>
<th>Name</th>
<th>City/State</th>
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<tbody>
<tr>
<td>Abbott, A. J.</td>
<td>Marshfield, Wis.</td>
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<tr>
<td>Alford, I. S.</td>
<td>Paxton, Ill.</td>
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<tr>
<td>Allen, L. J.</td>
<td>Fort Worth, Texas</td>
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<td>Allen, S. W.</td>
<td>Watertown, S. D.</td>
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<td>Anderson, Wm.</td>
<td>Penn, Kansas City, Mo.</td>
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