TWENTY-FIFTH
ANNUAL MEETING
OF THE
UNITED STATES
LIVE STOCK SANITARY ASSOCIATION

HELD AT THE
HOTEL LA SALLE, CHICAGO, ILL,
Nov 28, 29 and 30, 1921
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NOTICE

The delay in the publication of this report was occasioned by a lack of funds, this in turn was due to drawing upon the receipts of the current year to offset a deficit for 1921 due to the high cost of printing and the fact that many members failed to remit their annual dues.

Publication of the report, even at this late date, was only rendered possible through willingness on the part of the Webb Publishing Company to extend credit to the Association.

Under ordinary conditions and with sound business management during the next few years, the Association should be able to efficiently function and also accumulate a reserve fund to meet any exigency arising in the future thereby insuring a prompt issuance of the annual report, which should authoritatively serve as a guide in all matters pertaining to live stock sanitation.

O. E. Dyson,
Secretary-Treasurer.
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Twenty-Fifth Annual Meeting

OF THE

UNITED STATES LIVE STOCK
SANITARY ASSOCIATION

HELD AT THE

HOTEL LA SALLE, CHICAGO, ILL.

Nov. 28, 29 and 30, 1921

FIRST SESSION

November 28, 1921, 11:00 o'clock A. M.

The meeting was called to order by President W. F. Crewe, who said:

Gentlemen:

You are about to commence the program of the Twenty-Fifth Annual Meeting of the United States Live Stock Sanitary Association. We have been somewhat delayed this morning, waiting for the first speaker on the program and as yet he has not arrived, so we will have to call on another gentleman to take his place. This gentleman needs no introduction, I think, and I will call on Prof. H. R. Smith, of Chicago, to make the Address of Welcome.

ADDRESS OF WELCOME.

H. R. Smith, Chicago.

Mr. President and Gentlemen:

This is quite a surprise to me to be called upon to take the place of the head of our Health Department here in Chicago. I feel very sorry that Dr. Robertson is not here, and something must have delayed him, because he was planning on being here. He is very much interested in the work that you are doing, and it would be very proper to have Dr. Robertson as a representative of the city administration to deliver this Address of Welcome; but inasmuch as he has not arrived, I will do the best I can in a very few words.

First I want to say that as a representative of the City of Chicago, we are very happy to have this body of men meet here this year, and we hope you will come every year. Chicago is the logical place for holding these meetings. It is the logical place, because it is the greatest live stock market in the world. We have here assembled in Chicago every year millions and millions of hogs and cattle that come here for slaughter and inspection, to be distributed throughout the world. It is a center of agriculture in not only the United States, but you might say in the world, and so it
seems proper that this great organization, representing the sanitarians of the United States, should come here, where we have the great live stock industry centered in this city.

Chicago is a city that is agricultural in every respect. Our people here in Chicago realize that their prosperity depends upon the prosperity of the farmers of this country. Our biggest men in Chicago are men who have been indentified with agriculture. Our biggest industries in Chicago are closely related to agriculture, and to live stock in particular, and for these reasons, it is proper that you meet here.

Chicago is greatly interested in having your organization come here, because they realize that so much depends upon your work to make that great industry prosperous. We are dealing with an industry representing about ten billion dollars a year, and the value of that industry depends to a great extent upon the success of your work. A ten billion dollar industry is something that cannot be tampered with, and we are very much interested here in Chicago in having everything done to keep that industry in a healthy condition. I believe that I feel this more than ever before as I have become more in touch with the health side of the live stock industry. For all these years my concern has been more particularly with the quality of the product, with the means of production, but as this work has gone on, I have become greatly interested in this business, and I have learned and I believe that the matter of health is just as important as the matter of quality production in live stock.

And so, as a representative of Chicago, it is with great pleasure that we welcome this organization here today, and we hope that while here your deliberations will be very profitable, not only to yourselves, but to the great live stock industry which you represent. (Applause.)

PRESIDENT CREWE: The next item on the program is the Response to the Address of Welcome, and I will call upon Mr. J. H. Mercer, of Topeka, Kansas, Live Stock Commissioner of that State.

RESPONSE TO ADDRESS OF WELCOME.

By J. H. Mercer, Topeka, Kan.

Mr. President, Mr. Smith, Gentlemen of the United States Live Stock Sanitary Association:

I am very much pleased that the proceedings have gone the way they have this morning. To illustrate this, I want to tell a little story of how I felt when I received the invitation, or rather, the notice from your Secretary that I was to be on the program to respond to the Address of Welcome.

One time there was a man got off of a train in a strange city early one Sunday morning. He was accustomed to go to church every Sunday, and as he was strolling down the street he ran across what we might term, perhaps, a city sport, no doubt just coming in from perhaps an all-night outing and he was not as steady as he might be on his feet. This man stopped this town sport and said: "Can you tell me where the First Presbyterian Church is in this city?" He told him as nearly as he could, started on and then stopped, hailed the man and then said: "Say, this is a city of about fifty or sixty thousand people, and I was just wondering how in the devil you came to ask me where the principal church was in this city?" So that illustrates how I wondered why in the devil your Secretary selected me in all this vast multitude of brilliant fellows here to respond to the Address of Welcome of the city representative of Chicago.

I believe, gentlemen, however, that that part of the program in this city connected with this organization at least could be dispensed with, for
the reason that we have been coming here so long that it seems to be the home of this organization.

Another reason is that the people of the United States, and especially we western people, feel that Chicago is not only a city of the State of Illinois, but it is the nation's city, perhaps the greatest industrial commercial city in the world, and we are proud of course, to be guests in this city, to come here and spend a few days among its people.

Chicago can be proud, of course, of many achievements. Among some of the things, of course, is her great men and her great women that have come up through the honest endeavors of their lives, and reached a high plane of constructive effort towards things beneficial not only to this great city, but to the entire country. It is also gratifying to note, and the greatest thing to my mind that comes into our thoughts when we think of Chicago and the State of Illinois—it being located in the State of Illinois—is that from this wonderful state there was given a man to the nation's welfare, the greatest in his age—Abraham Lincoln; so the things that concern this wonderful industrial city are vivid in our minds in all sections of this great Republic.

It is also noted and well known that located in this great city is the greatest live stock market in all the world, where in a single year there have been over fourteen million head of live stock sold on this market, aggregating more than a billion dollars, so I say it is fitting that we in this great city and here at the fountainhead of the great industry that we represent, deliberate on its welfare.

While we can say these things with praise and pride as to this great city and our own country, yet, gentlemen, we have some serious things to think about today in connection with the industry that we represent. Never in its history—I speak advisedly I believe when I say that never in its history in this country was the live stock industry of this nation undergoing and going through one of the most depressed and trying times of its entire life. It has become a tragedy in the lives of many men that have spent their lives in the production of agricultural products and live stock. We cannot avert it now. It is here, and it is truly a tragedy, and it is a time for this Association to deliberate carefully upon the things pertaining to what we have to do with that industry, and to lend to it every effort of constructive force that we have, and can bring out in this meeting in support of bringing back and stabilizing again this wonderful industry, the greatest of all industries in this great nation of ours.

It is unfortunate we have to speak of this, but these are the facts, and we believe, gentlemen, that the American people have got the brains, and out of it all will come better things in the future, and some time—and we hope not very far in the future, that there will be a light for those that are now undergoing such a tragedy as they have never undergone in the history of their lives before.

I can say to Professor Smith that we feel that we are in our own home, so to speak, and I can also say—and I do not say this in any sarcastic manner—but I believe it would have been better for the City of Chicago in this great day or in this trying time in the history of this great industry which is so pronouncedly represented in this city, if they could have diverted a little bit of their time to have come out and met you people. We believe if a campaign of political endeavor was on, we would probably have had some greater lights—and that is casting no reflection on my friend Smith, because he is one of them—here today to represent either the great City of Chicago or the great State of Illinois in this the beginning of our deliberations. But also I wish to say to Mr. Smith—and
I believe that this is voicing the sentiment of all the people, that we hope he will extend this morning to all the city officials an invitation to come down and mingle with us in our deliberations. I certainly appreciate being here this morning with you, and hope we will have a splendid successful meeting. I thank you. (Applause.)

PRESIDENT CREWE: The next item on the program is the President's Address:

PRESIDENT'S ADDRESS.

By W. F. Crewe.

Gentlemen:

I feel most highly honored by being in a position to preside over this, the twenty-fifth annual meeting of the United States Live Stock Sanitary Association.

In looking up the earlier reports of this Association, we find that prior to the 14th annual meeting held during 1910, it went under the name of the Inter-State Association of Live Stock Sanitary Boards and there appears to have been no constitution or by-laws.

The purpose of the Association apparently was the getting together of the Federal and different State live stock sanitary officials to confer and discuss the various problems connected with live stock sanitary control work. During the thirteenth meeting of the Association, held in Chicago in the year 1909, the present constitution and by-laws, since slightly amended, were submitted and adopted.

Under the constitution, the name was changed to the United States Live Stock Sanitary Association.

The purposes of the Association were clearly defined in Section 2 of the constitution which reads, as follows: "The purposes 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 among live stock." This is still the purpose of this Association and this section has stood without any change.

The By-laws provided that any person engaged in live stock sanitary work for Federal, State, Territorial, County, or Municipal governments should be eligible to membership and any other persons interested in live stock sanitation could be elected to active membership. This constitution and these by-laws were well drawn as indicated by the fact that they still prevail with very little change.

To illustrate the growth of this Association: The report for the thirteenth annual meeting, held during 1909, indicates that there was an attendance of sixty-three, including members and visitors. The membership of this Association today and the attendance at this meeting fairly indicate the increased interest being taken in this work.

During the life of this Association, many important matters pertaining to live stock sanitary control work have been given serious consideration. Improvements in methods have been made. Scientific facts have been developed and demonstrated. Serious outbreaks of diseases menacing the live stock industry of our country have been controlled and eradicated and still the outlook for usefulness of this Association looms up greater every year. There is no doubt but that the work of this Association has been a great factor in bringing about a coordination of the Federal and different State Live Stock Sanitary Departments and thereby creating more uniform and systematic methods of carrying on live stock sanitary control work.
In glancing over one of the earlier reports of the proceedings of this Association, to be exact, for the year 1909, I noticed, in the introductory statement made by one of the contributors on the subject of glanders, the remark that it did not make very much difference what was done, for in a few years the horse would probably have become obsolete, in view of the new transportation, the automobile. While we are pleased to be able to say, at this time, that the disease—glanders—is practically eradicated, it was not eradicated by the elimination of the horse.

A great deal of propaganda has been spread in an effort to substitute gas motive power for horse power not only where draft power is required in the cities but also in the agricultural districts. It is true that the manufacturers of motive power have made great strides in this direction; but the reaction has set in and is rapidly on its way.

Many city industries are finding gas power an expensive luxury, far more expensive and less efficient than horse power for hauls within a reasonable distance.

The agricultural interests find, to a large extent, gas power too expensive to be used profitably on the farm. This is recognized by the falling off in the purchase and use of tractors and the increase being made in breeding of horses.

You must admit that the horse is still quite a factor in our live stock industry as indicated in the Federal statistics for the year 1921, showing the valuation of horses and mules in the United States to be in excess of two billion dollars. But it would appear that the horse had ceased to be a factor in live stock sanitary control work if the program of this meeting is any criterion. If you will look over the program, you will fail to find one subject that alludes to the horse. This statement is not made with an intent to criticise the program; for, as a matter of fact, we have no serious infectious disease of the horse to deal with to any extent at this time. Glanders and dourine, the two most important communicable, incurable diseases, have been practically eradicated.

I just desire to mention that splendid efforts have been made by the Horse Association of America towards the development and improvement of the horse industry and that Association is entitled to our heartiest cooperation.

While there is a general depression in all live stock values at this time, there must be no let up in the campaign of suppressing the various communicable diseases that are a menace to the industry. The campaign for the eradication of bovine tuberculosis is the outstanding undertaking of Live Stock Sanitary officials at this time. This campaign has been in progress under the so-called accredited herd plan for a period of four years and the reports you have received from time to time through the U. S. Bureau of Animal Industry indicate the progress that is being made.

In view of the importance of this campaign, it seemed strange that this Association never had a standing committee appointed to make a study of this undertaking, rendering reports and making recommendations for the consideration of this body. However, a motion prevailed during your last meeting, providing for the appointment of such a committee and I have had the honor of naming the personnel. In naming this committee, I endeavored to select officials that had taken an active part in this campaign and were located in the different sections of our country, North, East, South and West, and a representative of the U. S. Bureau of Animal Industry. I know this committee has done a great deal of work on this problem and that their first report presented for your consideration at this meeting will contain some important recommendations.
Another disease that has become of great importance to the live stock industry is infectious abortion. While there has been a great deal of experimental and research work carried on to secure more information regarding this disease, there has been no policy recommended that could be adopted by sanitary authorities in a general control of this infection. Your committee on this disease is comprised of members prominent in doing investigational work on abortion disease and we hope that some additional information may have been secured during the past year that can be used in adopting general methods of control.

You will note that the program includes reports from various other committees on important diseases as well as the addresses on the different important subjects.

I want to draw your attention to the first item on this afternoon's program that is an innovation in a way for this Association. This item provides for a joint session of this Association, the National Association of Commissioners, Secretaries and Departments of Agriculture, and National Association of Market Bureaus. These Associations are all vitally interested in the live stock industry and we believe we can all be benefited by such a joint session.

There have been no serious outbreaks of disease or happenings of unusual importance, pertaining to the live stock industry, called to the attention of your officers within the past year.

I think we have a well balanced program and I hope it will prove to be a most profitable and interesting meeting.

PRESIDENT CREWE: The next item on the program is the report of the Secretary, Dr. Burnett.

REPORT OF THE SECRETARY

Theo. A. Burnett, Columbus, O.

Gentlemen:

The Twenty-Fifth Annual Session of the United States Live Stock Sanitary Association finds the Association in a good condition. We hope we have a good program that will bring out in the discussions to follow useful facts that will assist the members in their different walks of life when they return to their homes.

We have devoted one session of our program to a joint meeting of four separate associations, but all of them interested in some phase of agriculture. This joint session is being tried as an experiment, and at the end of the session the question is to be left to the members whether it is to be continued as a part of our yearly program or not.

On account of the increased cost of printing, and consequently the increased cost of the printed annual reports, I would suggest that the Executive Committee of the incoming administration appoint a committee to devise means to increase the revenue of this Association.

PRESIDENT CREWE: Gentlemen, you have heard the report of the Secretary. What is your pleasure?

DR. BUTLER: I move it be accepted.

Motion duly seconded and carried.

PRESIDENT CREWE: The next item on the program is the Report of the Committee on Legislation, by H. R. Smith, Chicago.
Mr. President and Gentlemen:

There are two matters that I will report on in connection with this Committee. The first will be on the Reclassification Bill, which most of you are familiar with. You remember Congress appointed a Committee on Reform of the Civil Service, and a Bill was prepared, in which considerable discrimination was made in the salaries of the veterinarians in the Federal service.

That matter was brought to the attention of Congress through personal letters from various parts of the country. The breeders of this country were very much concerned over the purpose of that Bill. They took the position that it would be a very unwise thing to have the salaries of the men in the field below the salaries of the men in the laboratories. They realized that the quality of the work done in the field should be of the highest order, and that men should be paid accordingly. Considerable pressure was brought to bear upon members of Congress by appealing to them in that way.

The Committee on Reform of the Civil Service had a joint meeting, the House Committee and the Senate Committee. Dr. Mohler attended the meeting, and the last report is that the Committee has reported out the Bill, with all these adjustments properly made, with the salaries of the veterinarians on a par with other men in the Department. It has been reported favorably, and we have reason to believe it will go through Congress in its present form.

Our Committee on Legislation stands ready to work with the Committee of the National Association in case our services are required to put this Bill through in its present form.

In the matter of legislation pertaining to tuberculosis eradication work, I will say this: that the Emergency Appropriation, which is now very much needed, the present indications are that it will go through early in the next session of Congress. We had a very difficult situation to deal with in that Emergency Appropriation. Congress took the position that any emergency appropriation should come in the way of a recommendation from the Secretary of Agriculture. The Secretary took the position that any recommendation or any bill or any request for an emergency appropriation, should come from Congress, and there we were. It was a case of passing the buck back and forth.

We had numerous telegrams and numerous letters sent to members of Congress. I would like to show you a stack of copies of letters sent by the farm bureaus in different parts of the country to their members of Congress on this matter. Our Farm Bureaus have been of very great help in getting this before Congress, and I would like to show you their correspondence that passed back and forth on this subject. The different live stock exchanges in the country have been of very great help, and particularly the Omaha people, which has been directed by our friend, Dr. Spencer.

Appeal has been made direct to President Harding in behalf of this legislation, and the last and most recent report as outlined by Dr. Mohler, which we were all very glad to receive, was to the effect that the Secretary of Agriculture with the consent of the President, had finally asked for an appropriation of $900,000; it had been approved by General Dawes, who is now Director of the Budget, reported favorably by the Senate Committee, and will doubtless be inserted by the House Committee on Appro-
TWENTY-FIFTH ANNUAL MEETING

Appropriations, and if it is, as we have every reason to believe it will be, it will unquestionably pass Congress in the General Deficiency Bill, as it did last year.

Possibly some of you know or do not know, that Congressman Reed introduced a Bill calling for $600,000. That Bill was referred to the Committee on Appropriations, but the Chairman of the Committee, Congressman Madden, from Chicago, refused to have anything to do with it, because he said that under the new budget law the recommendation should come from the Administration. At any rate, it has been fixed up, and I think from now on it will have clear sailing. We hope this appropriation will be available in the early part of the next session of Congress.

I want to say just one thing about the future of this legislation. I am not going to say very much, but this is the second year we have had this trouble. Work has been going on all over the country. Last year the Federal indemnity became exhausted and several states were up against it. This year because of the new policy of apportioning the Federal indemnity among the states, there are only a few states in which the fund was exhausted early in the year. It should not be. Congress should appropriate enough to carry this work on in the very best possible manner.

Last year when our Committee went to Washington and appeared before the Committee on Appropriations, we were confronted with a difficult proposition. We asked for an appropriation of two million dollars for indemnity. We argued in behalf of that appropriation, because we stated that we felt sure the states would appropriate at least two million for indemnity. Congress originally proposed that this work should go on on a fifty-fifty basis. The State legislatures had not yet acted upon their appropriations, and the members of the Committee thought that we were over-enthusiastic, and so they put it up to them this way, that the Committee would not recommend an increase in any appropriation not asked for by the Secretary of Agriculture. The entire delegation went over and called on the Secretary of Agriculture, and he put in a supplemental recommendation for an additional million dollars; but the Committee did not see fit to grant the increase, and an appropriation of a million dollars was made for indemnity, with the result which you already know, the fund became exhausted in several states.

I think this year if a delegation goes to Washington we will have a more concrete proposition. We know now what the states have appropriated. They have appropriated approximately a million dollars for operating expense, and approximately a total of three million dollars for indemnity. We have, it seems to me, a very good reason to believe that Congress can be persuaded that a three million dollar indemnity fund is needed at this time. It was through legislative action of Congress that this work was proposed on a fifty-fifty basis. Congress proposed to indemnify owners in a certain way if the states would pay at least an equal sum; so it would seem that Congress is under a moral obligation to provide an indemnity fund equal to the total indemnity fund provided by the states in this Union.

My personal views on this are that a representative delegation should go to Washington to meet with President Harding, to meet with General Dawes, and to meet with the Committee of Congress and put this thing strongly before them. What is an appropriation of three million dollars for indemnity on the part of Congress, in comparison to the expenditure of forty-two million dollars on the Battleship Maryland? (Applause.)

Now there you are. I think that we are all of us agreed that this three million dollar indemnity, or four million dollars total fund that we
will need will do more good in conserving the wealth and the health of the people of this country than a whole fleet of battleships.

It would seem a most propitious time, because in the early session of the next Congress, when we have reason to believe that this disarmament conference will cut down the enormous expenditures that we have heretofore had upon the Army and Navy—which we are all very thankful for, because we do not feel we need it now—I believe that with the policy of a marked reduction in expense for the Army and Navy, particularly the Navy, that Congress will be much better disposed to listen to us in behalf of a very liberal appropriation to make this work go on, of wiping out tuberculosis just as soon as it can be wiped out; and I would ask for the privilege of presenting this to the meeting of the Commissioners of Agriculture to get their support in the matter of sending a delegation to Washington. I know the breeders of the country will be glad to join us, and from conversations I have had with Mr. Howard, President of the American Farm Bureau Federation, I can say that they are squarely behind us in that sort of a program. I mention these to have you know that there is reason to believe that by some effort of this kind we can get a fund that will carry this work through the year without these serious interruptions we have had during the past.

I do not want to say anything further on this, but I simply want to say this, that we feel that the expenditure of three or four million dollars is a very good investment for the country, and we do not have to go to Congress with any apologies. We do not want them to think that this is an expenditure, but an investment, and that is what it is.

I do not think I have anything further, Mr. Chairman, on that subject.

PRESIDENT CREWE: You have heard the report of the Chairman of the Committee on Legislation, and I think we all appreciate Prof. Smith's effort in co-ordinating all these different interests, in order to bring pressure to bear in the interest of the livestock industry.

What is your pleasure in reference to this report?

DR. MUNCE: Mr. Chairman, in view of the most excellent and encouraging report submitted by the Chairman of the Legislative Committee, and the optimistic outlook which he has pictured to us with reference to the future, I would like to move that the report be accepted, and that the recommendations be adopted and approved by the Association, and that the associations as a unit get in back of this committee, and assist in every way in bringing about a consummation of the recommendations.

Dr. Munce's motion was duly seconded and carried.

DR. C. A. CARY (Auburn, Ala.): Mr. Chairman, I would like to add to that that the Committee be continued.

DR. MUNCE: I will accept that.

PRESIDENT CREWE: Gentlemen, you have heard the motion. Are there any remarks?

Motion put to a vote and carried.

PRESIDENT CREWE: We have now come to that item on the program providing for a Memorial Period for Departed Members, and I will call on Dr. J. I. Gibson, Chairman of the Resolutions Committee, to preside during this period.

(Chairman Gibson here assumed the Chair.)

Chairman Gibson: Gentlemen, I am thankful to state to you that a kind Providence has protected us as an Association scattered over the entire country, exposed to many accidents and vicissitudes, with but one exception. One of our brightest lights has been snuffed out. I refer to the death of Dr. Horace W. Hoskins, and without taking up any unnecessary
time, I will now call upon a friend of his, who was personally acquainted
with him for many years, and associated with him closely in work per-
taining to the welfare of the veterinary profession, and in educational
work. I will call upon Dr. J. F. De Vine, of Goshen, N. Y. to eulogize our
departed friend; Dr. Horace W. Hoskins.

IN MEMORIAM OF WILLIAM HORACE HOSKINS
Address delivered by J. F. De Vine at the Annual Meeting of the United
States Live Stock Sanitary Association
Held at Chicago, Ill., November 28, 1921.

We meet this morning to commemorate the life of one who is with
us no more. His public career and distinguished services are fresh in
your memory. But it is fitting that we give an expression of gratitude as
a testimonial to one who served his country and profession so ably and
so faithfully. His absence at a meeting of this sort so saddens us as to
make it difficult to speak.

William Horace Hoskins was born at Rockdale, Pa., July 23, 1860
and died August 10, 1921, at his home, at 135 East 30th Street, New York
City, after a distressing organic disease of the heart had confined him to
his bed for about two months.

Dean Hoskins was a student, practitioner, teacher, politician, writer
and orator. His record of zeal, enthusiasm, energy and loyalty for the
advancement of veterinary science for two score years—from the day of
his graduation until death sealed his lips, is without parallel in this
country. The force and vigor with which he attacked every phase of
veterinary education and advancement can truly be likened to the virile
manhood that made Theodore Roosevelt stand out so prominently in states-
manship and politics.

He entered the American Veterinary College in 1879, graduating at
the age of twenty-one from that institution which he loved and revered
to the day of his death; having never missed attending, in all these years,
a single annual alumni meeting of his Alma Mater. His versatile ability
was little short of phenomenal. For thirty years he conducted a general
practice in Philadelphia, numbering among his clients and friends some of
the finest people of the commonwealth of Pennsylvania. He was always
regarded by his colleagues as a particularly capable diagnostician and
clinician. During all these busy years, he found time to be a thorough
student of all worldly affairs and a particular student of his profession
and of political economy.

Notwithstanding these activities, his ability as a writer could not be
curbed and for many years, he was editor of the Journal of Comparative
Medicine and Veterinary Archives, the best veterinary publication of its
time. In addition to this he served on the faculty of the Veterinary Col-
lege of the University of Pennsylvania as professor of Veterinary Juris-
prudence, Ethics and Business Methods, performing all these duties with
a thoroughness that at once attracted recognition and admiration for his
skill and interest in veterinary matters. His boundless energy carried him
into the turmoil of politics, where his strong personality, his outstanding
logic and his ability as a scholar and an orator brought to him the nom-
ination for Mayor by the Democratic Party of the City of Philadelphia, and,
while defeated in a hopelessly Republican city, still he received more votes
than any other Democratic nominee for the office had ever received.
Every veterinarian who has attended the meetings of the A. V. M. A. knew William Horace Hoskins. During the 36 years that he was a member of that Association he never missed a meeting; a distinction that no other veterinarian in the land can boast of. He was Secretary of the A. V. M. A. for five years, 1888-1893, when he then was elected to the high office of President and served as such for three consecutive terms. He also served every succeeding year on some of the important committees. He knew the A. V. M. A. as no other man knew it, because he kept on knowing it; his interests were not fitful or spasmodic and his service for the Association and the veterinary profession of America on the Army Legislative Committee will stand as a monument to his loyal, strong, self-sacrificing work as long as our profession recognizes the services of its leaders. His participation in debates at veterinary meetings were at times confusing to his friends. His ideas on all problems of importance were always very definite—one of the most amiable of men at his fireside, he was a veritable tiger on the floor. He could use his oratorical skill as a shield or a sword without a moment's preparation; and fortunate indeed was he for whom he plead, for his scathing arraignment of those whom he believed to be in the wrong often brought fire from his audience for which some could never forgive him; but once his heated utterances were done, his heart had no place for enmity, and all mankind to him were friends.

He was also a member of this Association. Into its activities he threw himself with the same force that he attacked all problems and with voice and pen he spread far and wide the gospel of sanitation and conservation for the benefit of mankind. To name all the Veterinary Associations of which he was a member, either active or honorary, would include nearly all of those in the East and Middle West.

**His Alma Mater**

In 1897 Alexander Lauceur, the father of Veterinary Medicine in America, bade adieu to the "Old School," the American Veterinary College, and sailed for his native land, France. The College suffered another blow in 1917 and seemed doomed when one of the most lovable men, Dean W. J. Coates, was called to the Great Beyond. It was at this time that Dean Hoskins came to the rescue of his Alma Mater. His character of loyalty was well set forth in his own words: "I shall dedicate the balance of my life to the school I love and if, as an instrument in the hands of others, I can make the 'Old School' one where students can secure the best rounded-out veterinary education obtainable in any school in the land, then I shall not have lived in vain."

**His Home Life**

To few men indeed has it fallen the lot to have known the ideal home life that blessed the union of Dean and Mrs. Hoskins. She was always sympathetically concerned in his many activities and he equally so in her happiness and comfort. Like those of old, who had faith, they were thrice blessed with two splendid sons, whom they gave to our profession, and a charming daughter, who, with their mother, now mourn the father and husband.

His beautiful home life will ever remain outstanding in the memories of all who respect the effect of such lives on our morality and civilization. How sad indeed that his physical strength could not have equaled his zeal. He had not passed on Life's highway the stone that marks the highest point. He knew only too well for the last year or more that he lived and worked in the shadow of death; but with the same fortitude that characterized his life, he calmly waited for Him to call who at will commands alike—the mightiest of Gods and the noblest of men. By his death our
country has lost an able, progressive citizen, our profession a patriarch, whose guidance and support will be sorely missed, his Alma Mater, its keystone and his family and friends one who has left to them a heritage of pleasant memories which cannot be effaced while hearts still beat and memory endures.

CHAIRMAN GIBSON: I will now call upon Major Charles H. Jewell, of the United States Army, to say a few words concerning Dr. Hoskins.

MAJOR CHARLES H. JEWELL: Mr. Chairman, and Gentlemen: It is a great pleasure to speak a word in memory of our departed colleague, who, we in the army feel, was the father of our veterinary service. We all know the trouble the army veterinary corps has been through in years past, and not until the reins were turned over to Dr. Horace W. Hoskins as the leader in this work for the American Veterinary Medical Association, was any great amount of good accomplished for our army veterinary surgeon. It was due to his leadership that the Bill which gave the veterinary corps of the army a status along with other organizations was passed June 3, 1916. It was due to this Bill that we were able, by the aid of that man, to go ahead and prepare for a great veterinary service during the World War. Otherwise the veterinary service would have gone in under its old organization, and would have been a dismal failure under such conditions; but due to the passage of that Bill an efficient organization was formed and the veterinary service I believe did work in this World War that we may all be proud of.

Before closing, I would like to say that I think I speak for all of the veterinarians that we all have the greatest love for our departed brother, and it would seem that it might be fitting if some time in the future some lasting memorial could be established in memory of our departed brother, Horace W. Hoskins. (Applause.)

CHAIRMAN GIBSON: We will delay a moment if any gentleman wishes to offer any timely remarks on the life and character of Dr. Hoskins.

DR. A. EICHORN (Pearl River, N. Y.): Mr. Chairman, the Alumni Association of New York University will hold a memorial meeting on December 10th, in honor of our departed friend, Dr. Hoskins, and in view of his splendid achievements, and his own membership in this Association, I move that the Association be represented at that meeting by a delegate appointed by the President of the Association.

Motion duly seconded.

CHAIRMAN GIBSON: Gentlemen, you have heard the motion. Are there any remarks?

DR. Eichorn's motion was put to a vote and carried.

CHAIRMAN GIBSON: The motion prevails. The Chair will appoint a delegate.

I will now call upon Dr. Lester H. Howard, of Massachusetts, to present a Resolution.

DR. LESTER H. HOWARD: (Reading)

WHEREAS, the Supreme Being, in His infinite wisdom, has called from our midst a highly respected and dearly beloved member,

BE IT RESOLVED, That this Association records its deep regret and profound sorrow at the passing of Horace W. Hoskins:

That we pay tribute to the memory of one whose life early pledged to highest ideals has been sacrificed in devotion thereto:

That while submitting in solemn reverence to omnipotent decree, we pause in deep reflection of the great loss sustained by our Association and beyond any one organization, by the whole cause of veterinary sanitary science, which by his energy has stamped a marked influence in the evolution of the world's progress.
That we commend to all veterinarians and sanitarians as worthy of emulation the example of this life, characterized by its attributes of honesty of purpose, tireless energy, faithful devotion of duty, unswerving loyalty to the cause and crowned by its willing sacrifice.

COMMITTEE ON RESOLUTIONS.

Mr. Chairman, I have the honor to move that this Resolution be adopted by the Association, be spread upon its records, and a copy forwarded to the family of the deceased member.

Motion duly seconded.

CHAIRMAN GIBSON: Gentlemen, you have heard the motion. All in favor of the motion will please rise.

The motion was adopted by a rising vote.

CHAIRMAN GIBSON: Now, gentlemen, in closing this memorial service, may I bespeak for all of you during the coming year health, happiness and prosperity, and for this Association great success. I thank you.

At this point President Crewe resumed the Chair.

PRESIDENT CREWE: This concludes the morning’s program. I want to direct your attention to the first item on the program for this afternoon. You will notice that this is the Joint Session that has been mentioned, and that the meeting place is to be announced at this time. It has been decided that this Joint Session will be held in this room, beginning promptly at 1:30, and in view of the prominence of the first speaker, the Committee’s desire is that everybody be here as promptly as possible.

And thereupon, the Convention adjourned until 1:30 P. M. of the same day.

SECOND SESSION
November 28, 1921, 1:30 o’clock P. M.


The meeting was called to order by President Crewe, who said:

Gentlemen:

As was stated in this room this morning, and I will repeat it again, this is to be a joint session of the four different organizations—the United States Live Stock Sanitary Association, The National Association of Commissioners and Secretaries of Agriculture, The National Association of State Marketing Officials, and the International and American Association of Fairs and Expositions.

Unfortunately, we are disappointed in Secretary Wallace not being with us at this time. A committee has been appointed and are with him at this time, we understand, but they have not reported as to whether he is coming or not. We feel that possibly we should not delay this program any further, so we will start the program by taking up one of the other speakers, and as soon as the Secretary arrives, he will take his place on the program.

I am going to ask the Honorable Alva Adee, Secretary of Agriculture of the State of New Jersey, to preside for at least a portion of the time during this session, and I take pleasure in introducing to you the Honorable Alva Adee. (Applause.)

(At this point the Honorable Alva Adee took the Chair.)

CHAIRMAN ADEE: Gentlemen, there is no reason under the sun why I should preside instead of the presiding officer you had this morning,
except that as I had white hair, he seemed to think that he must insist that I do so. And yet I esteem it an honor, and I am glad to do it.

I wish that I could in just a moment cause each one of you to realize what I believe to be the true value of a get-together meeting. We are all of us public servants, we are using public money, we are out among the people that need the service, and they do not understand the relationships, they do not understand why we do not know what the other fellow is doing. I feel if we would get together one session during our meetings here in Chicago on a joint program in which we would get acquainted with the work of the other man, and see that there is unity in it all, that we would be more efficient when we go back to the man who foots the bills, the farmer back home.

Sometimes we have been criticized by people because we center our attention only upon one thing. As a specialist I believe in that. As a man dealing with the farmers of the country, I believe it would be well if we would feel we are only part of a great whole, that we know something about all of it, are interested in the success of all of it as applied to the man with whom we come in contact.

Now, they did not say anything about my taking up any of your time when I was given the honor of presiding, and I will not abuse my privilege any further. Obeying orders, I have the privilege of presenting first upon our program this afternoon, while we are awaiting the coming of Secretary Wallace, our Federal Head, Dr. O. H. Eliason, of Wisconsin, state veterinarian, who is going to address us on Live Stock Regulations at Fairs and Expositions. Dr. Eliason. (Applause.)

Chicago, Illinois, Nov. 28, 1921.

LIVE STOCK REGULATIONS AT FAIRS AND EXPOSITIONS

O. H. Eliason, Madison, Wisconsin.

Mr. President, Members of the U. S. Sanitary Live Stock Association, Secretaries of Agriculture, and State Fair Secretaries: Gentlemen:

The subject which I would assume as being uppermost in the minds of the people assembled here today is: "Should separate space be assigned to exhibits from ACCREDITED HERDS?"

Incidentally, we may discuss in general, the regulations necessary with regard to the health of all cattle entered at fairs, analyze the situation as it is today and possibly determine how far the fairs should go in protecting both accredited and nonaccredited herds.

In laying the ground work for this subject it might be well for us to retrogress for a moment and consider the situation which existed less than four years ago, when only very few fairs required any test at all.

I well remember that when Wisconsin inaugurated very much modified requirements in 1916 we were looked upon as radicals. Today, we are confronted by the suggestion that Accredited Herds should be given separate space at fairs. A demand of this kind must be actuated on the basis of protection alone.

The proposition then simmers down to the questions, "Is it necessary to provide separate quarters or barns? Is this demand actuated by fear of exposure or simply from a desire to get all you can while the getting is good?"

These questions are not asked with any aspersions in mind but simply for the purpose of analysis. We have to admit that the human element in us asserts itself with surprising regularity and it is necessary for us to look out, each individually, that our selfishness does not run away
with us. Therefore, I say, let us look into the facts and determine on a course which is safe and just.

We feel it would be desirable that all cattle at this time should be in an accredited herd or in a similar class, and if I may digress for a moment, would say it is to be regretted that the appropriations set aside for bovine tuberculosis eradication by Congress and Legislatures, are so small. Possibly these bodies were not all to blame. No doubt many stock raisers still wear smoked glasses and are unable to see the ultimate benefits.

You Commissioners of Agriculture and you State Fair Secretaries can render a great service, not only to the stock raisers, but to the health of the people of the Earth, by everlastingly hammering for larger appropriations. Time was when this subject was considered only selfish propaganda by and for veterinarians. Now it is a popular subject for orators. Veterinarians raise few orators. We therefore, place the argument in your mouths and ask you to go forth and preach the gospel of "Better cattle, better and healthier people," and strike the white plague in its solar plexus.

Returning to our original problem, inquiries sent out to the different state departments elicited information from thirty-seven states, and a resume of these show that only four out of the thirty-seven states have no tuberculosis requirement at all for exhibitions. The balance have either a state law or regulation or a Fair ruling, and may be tabulated as follows:

<table>
<thead>
<tr>
<th>State law</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Regulation</td>
<td>18</td>
</tr>
<tr>
<td>Fair Regulation</td>
<td>9</td>
</tr>
<tr>
<td>Special quarters for Accredited Herds</td>
<td>3</td>
</tr>
<tr>
<td>Special attention to Accredited Herds</td>
<td>5</td>
</tr>
<tr>
<td>Cognizance of clean herds other than Accredited Herds</td>
<td>2</td>
</tr>
<tr>
<td>No regulations or laws prohibiting exhibitions without tuberculin test</td>
<td>4</td>
</tr>
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</table>

Most of the officials report very good cooperation, especially the last year. Only three indicate that they have or contemplate separate quarters for accredited herds. There is considerable variance as to the length of time which may elapse after a test on a non-accredited herd before being shown. Many of the regulations are indefinite and difficult of interpretation.

In further discussion of the separate space idea, it appears now that during the 1920 fairs and exhibitions there was due grounds for protest on the part of the owners of clean herds against the health of many of the herds shown, and after the shows were over, a few at least, found substantial evidence of contamination. I doubt that such results will be found from the 1921 fairs and exhibitions.

I am reminded somewhat of a Chicago Irish motorman during the World's Fair here. He was in charge of one of those cars that had a hand brake, the operation of which was much interfered with by crowds. In his exasperation he would kick the release loose and step to one side leaving the brake handle to go round very rapidly and possibly encounter someone's ribs. One lady warned her companion to "look out for the brake." Pat said, "Never mind the brake, it'll take keer of itself."

It seems to me that now the danger is past. That there was a time when there was considerable danger in attending the show circuit, no one will deny. The time is rapidly coming when all cattle exhibited will be from accredited herds, but in the meantime sufficient safeguards can be placed on the other exhibits to insure safety.
I recommend that as soon as possible we should insist on knowing the condition of a herd for the previous six months before allowing any member to mingle with show cattle. At this time such a course would shut many out of the "County Herd" or the "Club" rings. However, a reasonable regulation, and one we must admit safe, when vigorously enforced, is a regulation requiring this latter class to be tested and immediately removed from the herd and kept out until after being shown. More indemnity money will do the rest.

If the state departments can take care of the losses when people are ready to do the right thing and clean up, these things will solve themselves. I hope this triple convention will not adjourn without a resounding memorial to legislators in general asking them not to inquire of Departments how little they can get along with, but rather how much they can spend judiciously on this project during the next biennium.

Rid our herds of tuberculosis and you are helping to take a lot of the misery out of this world. Instead of wasting time over the argument of how much tuberculosis in the human the bovine type is responsible for, let us go forward and serve humanity by furnishing action. There will be plenty of time to discuss the above after the job nears realization.

In conclusion I am submitting a set of regulations which may be of use as a guide in drawing up new ones. These are as they now stand, and operated in Wisconsin during the 1921 Fair. They are the product of many minds and, I think, are fairly explicit.

My experience is that people in general like to obey a law if it is just and so worded that they know how to conform to it without having to go and ask someone about it.

These read as follows:

**TUBERCULIN TEST REGULATIONS**

Cattle Which May be Exhibited at the Wisconsin State Fair:

1. From Accredited herds.
2. From herds with no previous history of tuberculosis, which have passed an entire herd test within one year and which have not commingled with cattle other than those having passed the tuberculin test.
3. From herds having reactors on the first test and having passed a subsequent entire herd test within six months of the removal of the reactors from the herd.
4. Owners of animals from herds not tested in their entirety must furnish tuberculin test charts on individual animals, date of test not to exceed 90 days prior to closing date for entries. The owner of such cattle shall furnish a certified statement that the cattle offered for exhibition have not commingled with untested cattle dating from the time indicated on the test chart furnished. All test charts must be on official forms and approved by State or Federal officials. Test charts properly approved shall be attached to entry blanks, and furnished to the Secretary of the Fair, not less than 20 days before the opening of the Fair. Animals exhibited shall be identified on tuberculin test charts by name and registry number, or ear tag number.
5. Owners of herds under State-Federal supervision, which come within classes 1, 2 and 3, will be furnished necessary tuberculin test charts upon application to the State or Federal officials.
6. Public or common water troughs are forbidden. Each exhibitor shall provide water buckets to be used for his stock only.
7. The herdsman, or man in charge of the exhibit, should provide himself with a properly approved test chart (not to be surrendered) to be
shown to proper officials on demand and from which necessary transcripts may be prepared.

8. The above provisions apply to all cattle brought upon the Wisconsin State Fair Grounds for exhibition or other purposes.

9. The Live Stock Sanitary Board urges the necessity of all exhibitors thoroughly cleaning and disinfecting cars which are to be used to transport their cattle to and from the State Fair. The cattle should have room enough to be fed and watered in transit, and they should not be unloaded or left in stock yards during transit, or loading and unloading. Stock yards and stock cars are exposed premises.

CHAIRMAN ADEE: Gentlemen, the discussion of this paper will be deferred for the present and taken up and led by Director Davidson, of Illinois, after the Secretary's address.

Secretary Wallace, I understand, is in the building. Wherever Secretary Wallace goes in these United States he is in the house of his friends. We farmers rather enjoy the idea that among the President's closest counsellors is one who knows our problems, and not only that, but is in sympathy with us as we confront them. Here Secretary Wallace needs no introduction. It is a great honor to present to you at this time our Secretary of Agriculture, Mr. Wallace. (Applause.)

Address: Hon. Henry C. Wallace, Washington, D. C., Secretary of Agriculture.

Gentlemen:

I feel that the honor is mine, rather than that I am conferring one on you, this opportunity of meeting the men who are active in agriculture from so many different states.

I have no remarks prepared to shoot at you. I was glad to come with your Committee, because we are interested in the same great problems. Perhaps, if you do not mind, I might tell you briefly what we are trying to do in the Department of Agriculture.

As you know, our work naturally falls into four different fields, each one of which imperceptibly merges into your work.

First, the great field of research, scientific research, which is the basis upon which the whole Department is built, and upon which all progress in agriculture rests.

Second, the field of extension, in which the effort is to carry out to the open country the fruits of research.

Third, what we might call the regulatory or supervisory field, in which we administer various laws which have been entrusted to us to administer.

Fourth, the field of service, such as our crop and market estimate work, our grain standard work, and all that character of work in which we are rendering a service distinct from this regulatory work.

If the Department is going to function efficiently in each of these fields, it has got to have the co-operation of the people in the states, because of the efforts the Department makes that merge right into the same efforts which are being made in each of the states, and there must be the closest co-operation.

It is true in some lines of research, for example, the work must necessarily be carried on almost altogether by the Department—I am speaking now of research in pure science, for illustration—but in other lines, research work must be done co-operatively, and when you get into your marketing field, for example, it is impossible for the Federal Department, or for the State Departments to make anything like as much progress independently as they can make working together.
I do not need to tell you of the depression under which the agriculture of the nation is laboring at the present time, any more than to say that it is the most severe agricultural depression we have ever experienced in all our history. It is quite true that in times past some of our crops have sold for prices as low, or perhaps lower, in dollars and cents than they are selling for today. I had personal experience on the farm myself when corn sold for 15 cents a bushel; but a bushel of corn at that time would buy more than twice as much as the bushel of corn which sells at 15 cents will buy today, so that I am sure I am correct in saying that there has never been a time in the history of the country when agriculture was under such a severe depression. I am not saying that to start a clamor, for that is the farthest thing from my thoughts, but we might as well frankly recognize the situation, because if we do not recognize it for exactly what it is, we are not going to make much progress in bringing about relief.

I want to say further that I think we are on the up-grade. We are not clear through this thing. It is going to take more time, because the whole world is upset, you cannot take thirty million men out of the field of faithful endeavor and put them into the field of war, and put guns in their hands and set them to killing their fellow men, and expect to come out of it and resume peaceful occupations, and go on as you did before; so the whole world is upset, and it is going to take it time to come through that; but we are coming through, and when we come through, we in the United States will realize that we are entering an entirely new period, a new era in agriculture.

Our population is growing rapidly. Our land areas cannot be increased. We can add to our cultivated land just as fast as it is justified by better prices, but our large increase has got to come from increased production on the land already under the plow, and you who represent states, as well as we who represent the Federal Government, have got to put ourselves in place of the man who owns this whole country, and here are so many men in the field of industry, sixty per cent of our population engaged in that, the other forty per cent in the field of agricultural production. We have got to survey that field; we have got to work out a plan by which everybody who functions efficiently in his particular field may get a square deal, and a thoroughly just distribution of material benefits to the country.

It is a task that will challenge the very best in all of our minds. We have got to improve our methods of production; we have got to cheapen costs; we have got to increase our yield; we have got to eventually improve upon the methods of distribution; we have got to do that, not in injustice to anyone, not in injustice to the people who stand now between production and the consumer's table, but whenever we find people who are standing there taking a larger share than is fair for the service rendered, we have got to say to them, firmly but gently: "You must step out of the way and let someone who can do that better step in."

We have got to study the game all along, from the farmer's field to the consumer's table, and without any radical measures, without doing injustice to anyone, we have got to put our minds to it to cheapen that cost of distribution, to make it more efficient.

The time when the farmer could be looked upon as a man whose business it is to produce, and having produced, take his produce to the nearest market, the nearest railroad station, sell it for what they are willing to give him and then go back home and produce some more, has gone. The farmer in the future has got to have an intelligent interest in what hap-
pens with that produce from the time it leaves his farm until it reaches the consumer's table.

Now, under such conditions as that, so many people feeling as they do, naturally there are bound to be a lot of visionary schemes presented. A lot of people are ruled by prejudices; a lot of people have half-baked notions that will not work; a lot of people do not profit by the experience of the years past; and it is to such men as you who have had training, who have had responsibility in your services for those people—it is to such men as you that we look to handle this whole thing fairly in the interest of all, and at the same time bring about improvement in distributing. That must be done if we are going to continue to get a fair price for agricultural products.

I want to say to you gentlemen it is a task that is an inspirational challenge to every right-thinking man, and we have got a real job ahead of us during the next 25 years, to put this nation on a self-sustaining basis agriculturally, that will not only feed our people at fair prices, and not only give to the men who produce from the soil a fair return for their labor, for their capital investment, but in addition to that will maintain the fertility of that soil for the generations yet to come.

I say to you it is a challenge to any and every right-thinking man, and I congratulate you upon the opportunities that are before you.

I thank you, Mr. President. (Applause.)

CHAIRMAN ADEE: Secretary Wallace has another meeting that he must attend, and asks to be excused at this time.

We now have a most important subject before us, an excellent paper, one you want to discuss, and the discussion will be opened just as soon as we can have quiet. I hope that everyone who is interested in any of the Associations that are in joint session will be inclined to stay with us.

Mr. Davidson, will you come forward and discuss this paper?

Mr. D. M. Davidson (Springfield, Ill.): Mr. Chairman, gentlemen of the Joint Conference: In discussing the paper of Dr. Eliason, I am going to assume that every well-posted man knows that tuberculosis eradication is the proper thing in this country. To those of you who have not had the pleasure of attending these meetings for the past three days, I am going to say that it was one of the most interesting meetings that I have ever attended. Closer attention was paid by those attending the conference and greater interest taken than I have ever observed in any convention during the year.

In discussing Dr. Eliason's paper, I am going to take the argumentative side of the question, and present to you the facts as I see them, based upon our own experience.

At the Illinois State Fair for the past three or four years we have been gradually drawing in on the lines, and making the rules harder until last year. Last year we had a rule in our program list and we required all our exhibitors to obey that rule, in which every exhibitor of cattle was required to furnish a certificate of health with every animal exhibited. Every animal must show a clean bill of health or be tested for tuberculosis within 90 days of the time of showing; and these certificates, when the animal was unloaded on the fair grounds, were to be delivered to the state veterinarian for inspection; and in the event that any animal was shipped there without a certificate of health, or in case the certificate of health was left by the herdsman at home, or with the owner, we placed those animals in quarantine, we did not permit them to mingle with the other animals, and I do not think there were but
one or two cases—and those cases were in connection with the Calf Club work—where they did not have a certificate of health.

It is very gratifying to us that we did not have a single, solitary complaint on that rule, not one—and Mr. Chairman, and gentlemen of this Conference, we took that position because of the fact that the United States Government have been appropriating millions of dollars to match the funds appropriated by the several states, to the end of eradicating tuberculosis.

The Legislature of the State of Iowa appropriated many thousands of dollars, as well as Illinois, Wisconsin and all of the other states in the union. Then why should we open the door at great state fairs and expositions to the spreading of this disease, when these states and this Government is spending its millions toward the eradication of the same.

The argument as it presents itself to me is very clear as to why the state fair managers of the several states of this union should be very careful in making rules, and they should be iron-clad, and enforced. If the state fairs and expositions are to be an educational institution, and if they are to co-operate with the several divisions of the animal industry of the several states, then I believe it is their duty to co-operate to that extent, to support that rule and recommendation laid down by the several divisions of the animal industry, or follow the rule that was adopted by this conference I think one year or two years ago, in which this conference recommended that all cattle exhibited at state fairs and expositions be required to have a health certificate.

In looking over the statistics of the Bureau of Animal Industry, and the United States Government, I notice that at the present time, up to November 1st, we have 116,519 herds of cattle under supervision at this time, and that there are 27,963 herds on the waiting list. Now, Mr. President, and gentlemen of the Conference, that is a fact, and it shows the interest of the Departments of Health, it shows the interest of the divisions of animal industry throughout the United States which is very convincing that it is necessary to have these rules, and if anyone takes a position to the contrary, I would like to know his argument in the discussion of this question, why state fairs and expositions should not prohibit exhibiting any animal which is not clean, because if our fairs and expositions were not clean, what would be the result?

Take Illinois, and we would enforce the rule, and an exhibitor would show at the Illinois State Fair. Then we would go to some other fair and show. After he had returned home with his herd, within 90 days or six months he would discover that he had tuberculosis in his herd. He would not know whether his herd contracted it at Illinois or some other state. Therefore, I think it behooves all of these general managers of the several state fairs to enforce this rule; and I might add that it is not only necessary to enforce this rule, but it is absolutely necessary to clean up before the animals come into your barns.

As was stated by one of the gentlemen here on Friday in discussing one of these questions, it is just as necessary to have the premises clean as it was to have the animals tested. I think that is true. I do not think that conditions today are what they were a year ago or two years ago or three years ago. The breeders of animals, the exhibitors of animals, are in a different state of mind at this time as I see it. Several years ago if we had attempted to enforce such a rule as this, we would probably have thought that it was unwise because of the great number of exhibitors. But it has come on so gradually that they have become educated to the condition and do not hesitate to enforce that kind of a rule; and I believe that the time has come, that it is here now, when no breeder of pure-
bred cattle will exhibit at any fair or exposition unless he knows that all the animals to be exhibited at that fair will have been tested and furnished with certificates of health. It has come about so gradually that it reminds me of the dream of the farmer from Illinois who first went to Missouri in a dream and was not satisfied. He went on to Kansas and he was not satisfied there and then he moved to Oklahoma and there he died, and he went to hell, but the change was so gradual he hardly noticed it. (Laughter.)*

And so, Mr. Chairman, and gentlemen of the conference, I believe that the majority of the state fair managers at this time see this question as you see it. I think they stand ready today to follow the advice and the recommendation laid down by this conference, as well as the several divisions of the several different states. I thank you. (Applause.)

CHAIRMAN ADEE: I do not believe there is any disposition on the part of anyone to refuse to recognize the advisability of establishing regulations to protect live stock exhibited at state fairs and expositions. This is a good live subject and we would be glad to have somebody discuss this subject further if you so desire. If there is no further discussion we will take up the next subject on the program:


Address:


Mr. President and Gentlemen:

I have on various occasions had the pleasure of addressing the Commissioners of Agriculture and the United States Live Stock Sanitary Association; but I wish to assure you that I never enjoyed a privilege more than this one is, to address this joint meeting. A number of years ago I attended a meeting of the Commissioners of Agriculture, and I know that that Association espoused a cause which, if it had never done another piece of work, justified its existence from that day up to the present time.

More than fifteen years ago the Southern Commissioners of Agriculture took up the plan which was then a visionary one and was called an impractical one, of eradication of cattle tick, and appointed a Committee to go to Congress to obtain an appropriation for that work. The Committee was successful. That work began. That work, extending over a territory of nearly 800,000 square miles, is almost finished; and an association that has vision enough to see a work of that importance and will assume the responsibility of carrying it on and advocating it and supporting it, justifies its establishment; and I congratulate the organization of the Commissioners of Agriculture for that great piece of empire eradication work—the eradication of Texas fever from the United States.

The United States Live Stock Sanitary Association has espoused as many worthy causes as any organization that ever existed. It took up the work of the eradication of cattle tick as well. The United States Live Stock Sanitary Association was organized for the purpose of eradicating this dreadful disease and this terrible parasite. It was organized in Texas a number of years ago, and it has gone through various courses, always advocating things for the upbuilding of the live stock industry, and today it is supporting every measure for the control and
eradication of infectious diseases of live stock, including the eradication of tuberculosis.

I have burdened this Association—and I am conscious of it—many years with thick papers on the subject of tuberculosis, but this year I have left it home, and I know you will be well satisfied with that statement, if no other, that I might utter today.

The eradication of tuberculosis in live stock which seemed visionary to many a number of years ago, or comparatively few years ago, is accepted now by most people as a practical work, and is only a question of how long will it take, and that will depend largely upon the determining factor, how much money is made available for the work.

When it was proven, as it was many years ago, that tuberculosis could be eradicated from a single herd of cattle; when it was demonstrated at a little later period that the disease could be eradicated from a large group of herds of cattle, then was laid the foundation for this campaign which is now being carried on in forty-seven states in the United States. It is not a question of whether you can eradicate tuberculosis today, it is a question of, have you got an organization to do the work, have you got the other elements that must enter into such a campaign in order to make it successful.

There is no law compelling this work to be done. There are no regulations that are driving the live stock owners into this work. There is but one element upon which the whole substance, the foundation and the superstructure of the tuberculosis eradication campaign is dependent, and that is the public sentiment and the support of the live stock interests of the United States. With that support, however, those who are connected with the work believe—and I share personally in their opinions—it is a potent force that is sufficient to permit of this work being carried to a successful conclusion.

As I see the problem today, the most important thing that must be considered is a program of the work in every state, according to the local conditions of the respective states. There is no uniform plan as far as speeding up the work that can be applied universally to all the states. As indicated by Dr. Mohler in the opening address of the Tuberculosis Conference, there are eleven states where tuberculosis exists to less than two per cent. The problem in those states is far less serious than in the few states where tuberculosis exists to more than ten per cent or fifteen per cent. But no matter how much disease there is in a state, in my judgment the plan to be pursued now is for the live stock sanitary officials in that state, in conference with the live stock leaders and the commissioners of agriculture, if they have authority in regulating the control and eradication of the disease—among the breeders of live stock in those states, among the members of the Legislatures, and their leading people in their various commonwealths, to get together, to make a study of the situation, to lay plans that will have in mind the carrying on of the work next year, the following year, and a program that contemplates the entire consummation of the work in those states.

I could name a dozen states where a campaign against tuberculosis in live stock, with a program and an appropriation that would not be enormous, would succeed in eradicating the disease within the next decade; in fact, if I were engaged in a commercial line, I would like to have the contract to eradicate the disease from those states. There are other groups of states where the disease does not exist to more than five or six per cent, where the work could be done in fifteen or twenty years. I believe that the leaders in those states will support any program that
is laid before them for the ultimate and permanent eradication of the disease.

There are a few localities that I will not mention—small localities, small counties—where perhaps tuberculosis exists to such an extent that it is not practical, at this time at least, to go into those territories to undertake to eradicate the disease; and I would suggest that where those conditions prevail, some kind of an arrangement be made to quarantine, if necessary, to control the animals within those areas, districts or townships—and I have not any particular place in mind, but I mean wherever those conditions prevail, to put a quarantine upon those territories and absolutely restrict the movement of animals from the confines of that territory. (Applause.) Because if tuberculosis exists to the extent of 50 or 75 per cent in such an area, who is so foolish or brave, or will take such a gambling chance as to accept animals from such a territory, even upon a tuberculin test?

I have not an idea now how that problem should be solved, but it occurs to me that perhaps at a later date it might suggest itself to those states in which such conditions might prevail, where there were fifty thousand or twenty-five thousand cattle and the disease was known to exist to the extent of fifty, sixty or seventy per cent, and the balance of the state had been cleaned up—that some measure would be taken to purchase all those cattle and get rid of them, destroy them, and to rehabilitate or restock such an area with animals known to be free from tuberculosis from other sections of the state.

One point I believe is of paramount importance. It is a necessity to have a program of work for each particular state. A great deal has been said during the tuberculosis conference about eradicating this disease from certain prescribed areas, from counties, and I believe the question has been asked on numerous occasions, how did this new plan come up, or why is there so much-stress being placed upon this phase of the work? It is not a new plan, it is not a new idea. When this tuberculosis eradication program was promulgated and issued more than four years ago, the second project on that program was the eradication of tuberculosis from certain prescribed areas.

It was deemed advisable at that time not to recommend or to undertake to put such a project in operation. It was known that it was necessary to have the support of the live stock owners, in order to put on any kind of a campaign; therefore, the first project that was advocated was the accredited herd plan. The accrediting of individual herds of cattle created an interest in this kind of a herd over yonder, and this led to the gradual building up of accredited herds. But the plan was in mind at all times that eventually a reasonable, practical, sensible method of controlling and ultimately exterminating and entirely suppressing the disease, was to suppress it among all the herds in any given area, not in five per cent of the herds in a given area.

The question was asked many times: "How would you protect such an area?" Is it practical to place a quarantine around an area that has been cleaned up? Can it be enforced? I have no hesitancy in saying it can be enforced, we believe, with most of the practical measures that could be advocated for the control of the disease, and I base my emphatic statement on the facts that have been established for more than fifteen or twenty years.

Now, I will go right back to the work that I first spoke of, the eradication of the cattle tick. I could give you instances where, for instance, when the tick was cleaned out in the State of Tennessee and it was the logical thing to go into the northern counties of Mississippi, these coun-
ties were not ready, so the work was started down in the central part of
the State, and the tick was cleaned up, and people said: "How are you
going to protect this area?" We got rid of the tick there and regulations
were placed around that county prohibiting the movement of animals into
it, and that county remained free of infection. The laws were enforced,
no animals were permitted to enter into that county, and all because of
the support that was given to it by the people.

We have some areas there in those states, and already plans have been
made and are in operation for protecting such areas. In the State of
Wisconsin, Barron County has been gone over and declared by the State
as a free area, and the State of Wisconsin has issued regulations protect-
ing the animals within that county from the introduction of tuberculosis
from other areas. I consider that the plan in operation in the State of
Wisconsin is a practical plan, and will be a successful one to use in places
where they have occasion to use such regulations.

In the State of North Carolina they are doing this area work, and
the law provides that whenever a county takes up the tuberculosis eradica-
tion work, the law automatically protects that county from the introduc-
tion of animals from outside areas, unless they are tuberculin tested
and found free.

I am going to present to you, just in a suggestive way, and not with
any idea that any adoption is going to be made—I am not going to recom-
mend any adoption—a plan for conducting area tuberculosis eradication
work. It is a very brief suggestion.

1. The control and eradication of tuberculosis of live stock within
a state is authorized by an Act of the Legislature and is governed by the
rules and regulations promulgated and issued by the proper live stock
sanitary officer.

2. Preceding the taking up of active tuberculosis eradication work
on an area basis in a county or other circumscribed area it is recom-
mended that a preliminary campaign should be carried on consisting of
the tuberculin testing of herds in various sections of the area, the holding
of public meetings at school houses and elsewhere in various sections
of the area, the distribution of bulletins and posters; further, there should
be appointed in each township of the county a committee to arrange for
such meetings and other details in connections with the campaign.

3. The co-operation and support of the local county farm bureau
should be obtained and any assistance, financial or other, furnished by
said Bureau should be used in a manner satisfactory to the state live
stock sanitary officer in charge of the state.

4. Before any active tuberculosis eradication work is taken up on an
area basis in a county, an order shall be obtained by the County Board
of Supervisors or similar official county board, from the proper state live
stock sanitary officer.

5. The County Board of Supervisors or similar official county board
shall then appropriate funds to be used in co-operating with the State and
Federal officials in conducting the eradication campaign.

6. The amount appropriated shall be in accordance with the recom-
mendations made by the state live stock sanitary officer, and the funds
so appropriated shall be used in a manner satisfactory to the said state
live stock sanitary officer.

7. At the appointed time when active work is started a sufficient
number of town, county, state and federal inspectors should be detailed
to work in the county to complete the testing of all the cattle within a
reasonable period of time.
8. All the cattle, including calves, shall be tuberculin tested as directed by the proper live stock sanitary official and the Bureau of Animal Industry.

9. The tuberculin tests shall be made by regularly employed county, state or federal veterinarians or a veterinarian appointed by the proper state authority to devote his time to tuberculin testing while the area work is in progress in a specified county.

10. No cattle shall be presented for the tuberculin test which have at any time reacted to the tuberculin test.

11. All herds of cattle shall be retested at a time and in a manner prescribed by the proper state live stock sanitary officer.

12. All animals which react to a tuberculin test shall be immediately branded on the left jaw with the letter "T" and a metal tag shall be fastened in the left ear. All reactors shall be disposed of in accordance with instructions issued by the state live stock sanitary officer.

13. All barns, stables, stalls, and lots having contained tuberculous cattle shall be thoroughly cleaned and disinfected with a five per cent solution of Cresol compound, and no state or federal indemnity shall be paid unless and until said cleaning and disinfecting has been done.

14. Proper regulations to prevent the introduction of tuberculous cattle should be made effective as soon as active eradication work is started.

15. The local township committee should appoint some one to consult with each herd owner, obtain signed agreement, and advise owners when to have their cattle stabled for the tuberculin test.

There are just one or two points that I want to take up in connection with that subject. When the work began, it was purely advocated from an economic standpoint. Shortly after men were sent into the field—at least, the federal men—questions were asked from Texas: Why is it that you emphasize the economic side of the question and say little about the public side of the question? As the work advanced, these questions became more numerous, and it became imperative on the part of those who were presenting the subject to the public, to get whatever facts were known to exist regarding the public side of the question, regarding the communicability of the bovine type of tubercle bacilli to human beings. That phase of the subject was so beautifully presented by Dr. Evans, that I will not dwell a single moment upon it; but I want to take just a little while to speak to you about our responsibilities to the live stock industry from this public health side of the milk question.

My observation is that in every locality in the United States furnishing milk for consumption in large quantities where the tuberculin test, coupled or uncoupled with pasteurization, has been practiced, tuberculosis exists to but a moderate degree; but in the localities where the tuberculin test has not been practiced and pasteurization is practiced, as practically solely the only means of protecting human beings, that tuberculosis exists extensively and in many cases to an alarming degree.

As a live stock worker who is employed by the Agricultural people of this country, I feel that I would be derelict, now that I have knowledge of this, were I to fail to state that in the protection of the public health, as far as milk is concerned, the tuberculin test cannot be dissociated, cannot be discontinued, because what are the results? Where the test is employed and pasteurization practiced—and I have no fight to make upon pasteurization—where it is practiced with pasteurization, in the end you have safe milk and you have a safe live stock industry. Where the tuberculin test is ignored and condemned and not practiced, and pasteurization pursued, you have milk containing tuberculous organisms, even though they be destroyed, even though they are not pathogenic to
the persons who consume them, but you have a destroying cattle industry; you have an industry where those people who maybe have worked for two or three generations in building up a dairy industry have what results? They have animals, that if you try to sell them, who in this great universe will buy a tuberculous animal?

Therefore, I say that as far as the public health side of the question is concerned, this tuberculosis eradication work is certainly a great issue.

It is a great issue further, because last year there were condemned more than twenty-five million pounds of meat, which, taken off the market, raised the price of the balance of the meat for human consumption.

There is no phase of tuberculosis eradication work that is not related in some way or another to public health. I have heard on various occasions or at meetings of this Association, suggestions that we should go slow with this work, be careful and thorough, to be conservative about it, and I was classed perhaps as an enthusiast rushing through with the work. I never entertained an idea of that in my life, but I do believe that this work can be put through on a program outlined in accordance with all the states as they see it, according to their local conditions.

At the present day I see a few clouds in the sky. I see off yonder in the horizon a rather dark cloud arising, and that cloud has in its menacing impulses the plan of over-stimulation of this work. This work now is stimulated to a degree that it would take all of the efforts of this Association, all of the efforts of all the state live stock sanitary officials, all of the efforts of the agricultural industry of the United States, to obtain sufficient appropriations to carry it through on its present scale. I know the amount of money for indemnity is going to be greatly increased, and I say let it gradually increase, and the taxpayers of the United States will find ways and means of supporting it on that basis. But I recommend to all that we should not advocate that it be increased by leaps and bounds. I do not advocate going into states where now they are spending $100,000 and advocate a million dollars. I believe it should grow, but I believe it should grow on a healthy basis, not by over-stimulation, but by the support of public opinion, without which it cannot grow at all; and I greatly fear, in fact, I know that without that public support it will certainly perish. (Applause.)

CHAIRMAN ADEE: I think we will all agree that Dr. Kiernan has presented this subject in a very clear and impressive manner, and the subject will be discussed. I will first call on the Hon. E. C. Brigham, Commissioner of Agriculture of Vermont, to open the discussion.

A DELEGATE: Mr. Chairman, Mr. Brigham performed such arduous work in bringing Secretary Wallace here that he has gone to supply the inner man, but Commissioner Rasmussen of Pennsylvania has finally consented to take his place. (Applause.)

MR. FRED RASMUSSEN (Pennsylvania): Mr. Chairman, Ladies and gentlemen:

It is a very hard position to be placed in, to speak on the subject of tuberculosis to an audience of men who have studied this question and have lived with it for days and years. My viewpoint on tuberculosis has been gained from experience in managing a few tubercular herds, and from knowing of the work which has been done, not only in the state of Pennsylvania, but also in other states.

Dr. Kiernan made a very excellent presentation of the tuberculosis question and the possibilities of eradication. As I look upon it, we have just now begun to demonstrate the possibility of its complete eradication, although before the accredited herd was established, there were individual herds in different parts of the country that had been free from tuberculosis.
The real work is the accredited herd work today, because that work is based upon the close co-operation of the farmer with the veterinarian, and the officials that have charge of this work; and I do not believe that we will ever eradicate tuberculosis until you have every man who has his herd tested for tuberculosis, look upon the tuberculosis question with the same ardent belief and spirit in its eradication as was expressed by Dr. Kiernan. In other words, you have got to have tuberculosis free men, as well as tuberculosis free herds, from the standpoint of their mental attitude towards the work. (Applause.)

If that is the case, it seems to me, although we have advanced thus far at this time, that is one of the most fundamental things that is before us, the education of the individual farmer to an understanding and an appreciation of this work. Prevention is the key-note in all of this work, because we know from experience that we have had in this country and elsewhere in the world, that we have the most unusual things happen in connection with the herds, and that we are going to have, in spite of the very best talent that we can get to put in this work, we are going to have disappointments. We have them in each state all the time. We have to go back to these herds and find that something has happened somewhere that made a new infection, so even with all the tests that we have I do not believe that we have absolutely yet proven that if herds have passed three tests that there might not yet be an infected animal on those premises. (Applause.)

Then also in connection with the prevention is this wonderful work of sanitation and disinfection that we have with us in connection with the work, that to my mind is just as important as it is to inject tuberculin and take temperatures. Do not ever dissociate the sanitary regulations and the preventive measures from the actual work of injecting the cattle and taking temperatures; and I think that is more the great viewpoint that you must give to the farmer,—that with all of the skill that is being supplied, he has the very large part of the responsibility in that work. You only come along once a year, sometimes at wider periods than that, but his work, as far as preventing tuberculosis is daily work, 365 days in a year.

I will tell you, there has never been a more gigantic task before the veterinarians and the live stock people of this country, than the eradication of tuberculosis. I am not a pessimist on this question, not at all, but I do believe that you men who are doing the work still have many things to learn about tuberculosis; that we may make plans; that the work is new; that we may have to modify some of these plans as we go along.

I believe wherever possible that area work is a good thing, and that in the end will be the thing that will be the big thing; but all states are not equally well situated for doing that work. Some states, for instance, like the State of Pennsylvania, have to have a law passed by the Legislature to make it possible for a county to hire a veterinarian and to pay money for this work, so then we have the question of legislation to consider.

Then there is another thing in my mind, and that is the pure bred herd. Isn't it true that today the pure bred herds of this country are the seed distribution points of our live stock industry, and that pure seed, whether it is in the cattle or other product, is fundamental in connection with getting good clean crops or herds? And in spite of the fact that we like to do the work, we feel that the pure bred herd with the intelligent man who absolutely believes in this work—that he is entitled to consideration when we make our plans.
Therefore, as much as we like to go faster I think at this time that efficiency and carefulness and a more intent study of the question of tuberculosis, are all points which need more attention than the testing of a few herds. In other words, we are all looking forward to the day that we may be free from this disease. But I believe thoroughly that the whole question in the public mind will be the results and the accuracy of this work in the next few years, and that will determine the support that we will get from our Legislatures and others in connection with the work.

I thank you for your attention. (Applause.)

(At this point Mr. Crewe again resumed the Chair.)

CHAIRMAN CREWE: I will now call on the Hon. C. P. Norgord, Commissioner of Agriculture of Wisconsin, to continue this discussion.

HON. C. P. NORGORD: It is a great thing to have a great cause and a great leader and a great crew to co-operate, and the speech which we have heard Dr. Kiernan give today tallies with the work which he has done, both of which are excellent.

The eradication of tuberculosis has gone forward with great speed for the last two or three years especially because there has been real work in the states, backed by the Federal Government, which is recognized as the greatest power in the nation, and I think that through the co-operation between these two great agencies, we are going to make greater progress in the next two years in this great problem than we have in the last three years.

I have had the work which has been done in Wisconsin in the last three years put on a couple of maps here to sort of back what I have to say on this question.

We have in Wisconsin 1,393 accredited herds. We started the accredited herd work in Wisconsin in 1915, but we did not make much progress until we brought along the co-operative work and free testing. We were afraid of the free testing, because we did not think that it was quite a fair proposition to local veterinarians, but with free testing and something in sight for the local veterinarians later on, which came with it, the policy was modified so that the testing of the cattle after they were accredited herds was put into the hands of the local veterinarian, then the local veterinarian was given a square deal and could afford to co-operate and he did co-operate and he will co-operate.

We can all co-operate on that first. That is the policy which we had in mind in Wisconsin ever since we started. We tried to start accredited herds by having the local veterinarian do the testing under the supervision of the state first, and the Federal and State Governments afterwards, and the local farmer pay the cost himself; and we only got sixty accredited herds in two years; and it was necessary to have free testing in order to bring the real work across on a large scale such as we have today. So I believe in pressing that plan. But I am afraid that if we were to start the policy of testing for the accredited herds by the local veterinarian on the first test, and making the cattle-owner pay for the first test, we would not get anywhere. I think we have already seen that after the accredited herds have been put on the accredited list, and we have started to turn them back to the local practitioner, and make the farmer pay for testing himself, that herds have gone off the list, and if they go off from the list after that farmer has been educated and stimulated by putting them on the list, how do you expect to get them on the list the first time by making the farmer pay for it, and do it on any large scale?
The first part of Dr. Kiernan's plan—before I take that up I might say that the area test plan has been a plan that Dr. Eliason in our state has thought the most practical plan away back in 1917, and we have had laws passed by the Legislature of Wisconsin in 1917 under which we are operating up to the present time, with a slight modification made in the last Legislature.

We started the scheme in Waukesha County, where there are sixty or seventy herds of cattle, and a large number of them pure-bred herds, in 1918, and we finished up our work in that county in 1919. At the same time we started a little island up here (indicating on map)—that is a little Holstein-Guernsey island. We cleaned it up in 1919, and that has been gone over I think three times at the present time.

In the spring of 1920 we started Barron County, which has 68,000 head of cattle, and cleaned that up by January 1, 1921. We had another one, Lincoln County, which we cleaned up on May 1st, 1921, and we cleaned up Bayfield County on November 1st of this year. We also have Sawyer, Chippewa and Marathon Counties, with some work done in Dore County over here, and some spots over the state where we have tested creamery districts, and so I feel that we have made a fair test of the area policy, and we have I believe proved that in Wisconsin. It is possible to put across the forced test upon the farmers of the state and the farmers of any county when the majority of them shows by signing a petition to state that they want a forced test upon all of the herds in the county.

I must say that we went at that work when my heart was rather faint, and I was afraid that we never would be able to put across a forced period, but I am a whole lot more courageous at the present time, and the Legislature of the State of Wisconsin has stood behind us in the work. We have not had to put on a very big propaganda, but simply go before the Finance Committee, tell them in a business-like way what we proposed to do, and what the chances were in our opinion that we could do, and they furnished us the money.

Last year that Legislature appropriated for the State of Wisconsin $350,000 a year for indemnity money, $50,000 a year for the area test money, and $30,000 a year for the accredited herd money, all to be used in co-operation with the United States Department of Agriculture, Bureau of Animal Industry, and if we do not fail in our trust, I think we should be able to increase that in the future.

The first paragraph of Dr. Kiernan's plan reads:

"The control and eradication of tuberculosis of live stock within a state is authorized by an Act of the Legislature and is governed by the rules and regulations promulgated and issued by the proper live stock sanitary officer."

There was some talk last week about putting across an area test by simply stimulating public opinion. I think that can probably be done, but I believe that, speaking from our experience, it is better to have public opinion backed by local authority and by the State Government. We find that the farmers like to take hold of a proposition like this, and we like to have them do it. We do not propose to force upon the farmers a proposition which will force a test of their cattle by going in there and putting up a great stimulation that may get them to do something in the heat of the campaign that they will be sorry for afterwards, and they come to us and put a stick across our backs because we forced them into something that they did not believe in when they got their calm minds upon what they wanted; so we have been mighty careful when they ask us to come and help to stimulate a campaign for getting
sixty per cent signers of the county signed up—to help them, to stimulate them—we have said:

"Gentlemen, that is your part of the work. When you ask us in the way the Legislature provided, when you have sixty per cent of the cattle-owners signed up on petitions in your County, then we will come and do the work, and we will not touch the work before, unless you want us to come and explain, and that will be by means of a great propaganda."

When we are going to put across a forcing proposition like this, we have got to be mighty careful that things do not come back on us and burn our fingers; and so I think there is danger in this policy in putting on a big campaign, and I believe that the people themselves can put on their own campaign and get the petitions that are necessary under the Wisconsin law, which is sixty per cent of the signers of those people who own cattle, and when they have done that, they have done it themselves, and when they have asked us to come there and serve them, we have done it, as the law requires we should do, which law was also made by the people, and I think it is a safe policy that will not come back on us.

Now, I think that people can put on a better campaign in a county when they have got a law than when they have not got a law, because every time they stimulate their people in the community they get signers, and every time a man puts down his name on a petition that binds him legally, and he cannot decide that he wants his cattle tested today and change his decision tomorrow. When the people in a county put forth a lot of work and put on a campaign, they should know that that campaign is going to stick, and when they get those signers they know that they will stick and they can start the work and put the thing across all right.

So I believe that a law behind the campaign is the best thing to have, and is the surest thing to have to get what the people want. When the people have gone to work and brought about such a campaign and have got the proper number of signers, then they will say to us: "Now, you have the authority, go ahead and do it." But I never start any work in a county until the people in that county have organized and put out propaganda that will support us while we are doing the work.

I believe in that kind of a propaganda. I believe we are engaged in a wonderful piece of work, and I believe that we are coming to look at the relation of this work to the interest of mankind in the right way at the present time. Years ago—and I can remember twenty-five years back—the only argument which was put up for a reason for testing for tuberculosis was the financial argument, that so many hogs were lost, so many cattle were lost, and you would have better herds, and more valuable herds. There is a big argument there. $140,000,000 loss in a year.

We figure in the State of Wisconsin, although we have only six per cent of tuberculosis in the southern area, and between three-quarters of one per cent and one per cent in all of this territory north of here (indicating on plat), that in spite of that the State of Wisconsin loses annually over three and one-half million dollars. But that is not the biggest argument for cleaning up tuberculosis. The biggest argument was presented to us last Saturday by that splendid doctor who came here and spoke of the close relation between bovine tuberculosis and human tuberculosis, and that is real, because when you touch human life and human beings, in the home and in the family, then you will establish a real reason for cleaning up tuberculosis, and that is the reason that we ought to proceed now to clean up this great nation of ours, to make
clean milk and safe milk and happy homes without the disease of the
great white plague.

I thank you. (Applause.)

CHAIRMAN CREWE: The different speakers, you will note, all
present this subject from slightly different angles. We have one more
speaker, the Hon. H. H. Halliday, Commissioner of Agriculture of Michi-
gan. (Applause.)

HON. H. H. HALLIDAY (Lansing, Mich.): Mr. Chairman and Gentle-
men of the Convention: I feel a little bit like the old lady, when the
porter took her grips and put her on the rear car of a train. She sat
down and said to him: "I feel a little bit nervous, because I have heard
that the rear car is a dangerous one to ride in." So I feel a little bit
that way. She further said: "I don't understand why they did not
leave it off." (Laughter.)

I am a freshman, as a Commissioner of Agriculture. I feel that if
I ever become as expert in making addresses as these gentlemen who have
preceded me, that it will have been worth while to have been Commis-
sioner of Agriculture of the State of Michigan.

I heard a couple of fellows discussing one time just where the ark
was made, and the fellow from Arkansas said it was made in Arkansas;
but I am going to tell you some news, it was built right up there in
Michigan, of Michigan pine, floated on Lake Michigan, and it is now over
at Henry Ford's plant, where he is making car wheels out of it. (Laughter.)

Over in Michigan we have been trying to do a little along this par-
ticular line of controlling live stock diseases. I remember well when I
was appointed Commissioner of Live Stock in the State of Michigan some
ten years ago. One of the gentlemen back here that is now Professor of
Bacteriology in Lansing at the Agricultural College, was the State Veter-
inarian. He was paid the magnificent sum of five dollars a day, and he
joined the three Commissioners on this important work when he was
not engaged in teaching. That meant that sometimes he worked on Sun-
days. Since that time, we have built up our work in Lansing and in
Michigan, until we now have a force of veterinarians working on this
particular line of work, and we are proud to say that the people of
the State of Michigan are appreciating the efforts which are being put
forth by the United States Government, and by the states at large.

There are many important factors with us in this work. One of the
most important factors that we have had to contend with was the fact
that the people were not educated to the necessity of cleaning up this
disease. I find that as time goes on that they are clamoring to have
some assistance from the State and Federal Governments in cleaning up
tuberculosis in their herds. Some people look at it from the standpoint
of public health, some people look at it from the standpoint of finance,
but we today are confronted the same as you are with the fact that we
cannot reach the scene of action as fast as they want us. I think we
are all pretty much in the same situation. That work has been created,
and it has been created largely by the accredited herd plan. The people
themselves are talking this, and it has reached such enormous propor-
tions that we must be exceedingly careful that the lid does not blow off.
We have just been carrying on a little campaign, of which many of you
have heard in the states, that of cleaning up the disease in a given area,
and the first county in the State of Michigan was Hillsdale County, and
there are many men in this audience who had an important part in this
work. Some of our surrounding states, some of the local veterinarians
are here, and I want to take this opportunity to thank you all who had
a part in this important work in the State of Michigan. It has added
much to the enthusiasm and to the credit which is given this wonderful work.

We are not worried so much about the financial side of it at the present time, for the reason that our Governor and the men connected with the administration are in sympathy with animal disease control and work. A few days ago I went to the Governor and told him that I was afraid we were going to be short of indemnity funds, and advised him that we had used nearly all of the amount that had been appropriated up to the present time, which was $100,000; and he replied to me: "I believe that that $100,000 was well spent; I believe that that money has saved many thousands and hundreds of thousands of dollars to the State of Michigan, besides saving many lives, and I hope the work will go on. The State of Michigan never contracted a debt that it did not pay."

So I feel encouraged, and I believe that we are going to continue that work under a policy, I hope, which will be sane and conservative, and which will be lasting in its effect.

We may all pursue a policy along those lines—not perhaps the same policy in each state, but a policy which will be sane and conservative, and which will be lasting, which will fit your particular conditions, and at the end we may have not only a clean state here and there, but we may have a clean country, and that the foreign governments will look towards the United States for the stock which they so much need.

I feel very proud to stand here before you and proclaim this work, and to wish that I could do more to assist and to co-operate with you, because that condition still exists, that our co-operation is necessary. It is just as necessary for the states to co-operate among themselves to bring about the results which are desired, as it is for the counties and for the municipalities to co-operate among themselves.

I feel that this work has proven so helpful that we can hardly realize what the end is going to be. A few years ago the eradication of hog cholera was the principal subject of which you talked. Today the real live topic is the topic of eradicating tuberculosis from the herds. I think one of the reasons perhaps is that it is a human problem. We have begun to realize more than ever that it is necessary from a public health standpoint, and I wish every man who is with us here could have heard that magnificent paper that was read yesterday by Dr. W. A. Evans along those lines. Many of you did, and I am sure that that was worth all that it has cost any of you to come here to this meeting.

This subject is one which we can think about, we can write about, and we can study, and yet at the present time the surface only has been scratched, and there are many things that will come up from time to time which we little think of today in this great important work.

I do not believe that I need to take any more of your time. I just want to show you that my heart is in this work; I want to show you that I am heart and soul in favor of better live stock, and better live stock will follow clean areas in each and every state in the Union.

In the County of Hillsdale, of which I spoke, the breeders of pure-bred live stock are turning their eyes that way, and a campaign for better live stock will follow every area where you have cleaned it up.

I thank you. (Applause.)

CHAIRMAN CREWE: This is certainly a very broad subject, and it would seem that almost unlimited discussion could be carried on. Does anyone care to take further part in the discussion of this subject?

If not, we will take up the next subject on the program, which is an address by Don V. Moore, Secretary of the Interstate Fair, Sioux City,
Iowa, and Secretary of the International and American Association of Fairs and Expositions.

MR. DON V. MOORE: Mr. President and Gentlemen:

A number of weeks ago Mr. Norgord, in charge of the program, suggested by letter to me that this kind of a meeting would probably be had, and I enthusiastically endorsed it. Then he wrote me that Henry Wallace would be present to make an address. A little later on he wrote to me and said that Henry Wallace had gone back on him, and he was going to ask me to make a short address of from three to six minutes. Then shortly after that I got another letter saying: "Never mind, we do not need you, Henry is coming." And then here the other day he said he was going to call on me, so I have no prepared address at all.

The President has to be here, on account of his executive position. I can see a little bunch of Iowa, North Dakota, Illinois and Kansas secretaries over there. They have heard a lot of talking of just this kind of stuff, so they take a little nap when the proper time comes, but they are here.

I can remember, gentlemen, when the principal duty of the National Commissioner of Agriculture was to send out seeds, and a large flock of them. The principal duty of the Commissioner of Agriculture of the state in which I have lived since boyhood was to keep track of B. W. Snow and John Inglis, and if they predicted big crops to prove they were liars, and if they predicted small crops to prove they were liars. (Laughter.)

Along about that time neither the veterinarian nor the secretary of a fair, it is safe to say, carried any extra rating from either Bradstreet’s or Dun’s. Nowadays the commissioners of agriculture, I understand, are all gentlemen of education, and most of those positions carry money returns that are very attractive, and the commissioners are of a very high class all the way through. The veterinarian has increased in dignity. Colleges and universities even call members of your profession to chairs. Our own government has seen fit to ask the members of your profession to wear the uniform, and has given them very high positions of trust. Some states have advanced some of their secretaries to Commissioners of Agriculture, and they get well paid.

The balance of us who are still in the game are the butt of the community; only two months in the year, until the last chance for a pass has gone glimmering, and then we are all to the bad again. (Laughter.)

You folks are overlooking a very large field for your propaganda in putting over your ideas. I have been told that this tuberculosis question is full of dynamite, both from your standpoint and from ours; but the only time that we get to learn anything is when Dr. Crewe or Dr. Moore walk in on the second day of the Fair and say: "How come?" "Well," we say "How come." "Well, here is the law." We say: "For God’s sake, did you finally get that over? The last time I heard of this was in 1886, and you have finally got it on the statute books."

There are something like 2,500 county and state fairs in the United States. You must not overlook the county fair when you are talking about tuberculosis control and eradication, because they are more important in my opinion than the state fairs are.

The professional breeder will show at the State Fair. He can afford to keep his herd free from tuberculosis; but the smaller breeder cannot afford to. So do not overlook these 2,500 fairs in the United States.

The Association which we represent is composed of about 76 state and inter-state fairs. We are offering a great opportunity for you folks to get your stuff over to the people. We are a hard-boiled lot, and you
have got to show us, but we are willing to help you, and the only way that
we can ever help you in all the world is to get acquainted with you, and
you cannot get acquainted by coming up here in a room and saying: "How
do you do, Doctor. How do you do, Professor. How do you do, Commis-
ioneer,"
and all that kind of stuff.

My idea of how to get acquainted is this: I belong to an organiza-
tion that once a week at their meetings for an hour and a quarter I have
the pleasure of calling the college professor, Tom, the doctor, Bill, the law-
jer, Joe, and so on down the line, and you cannot get acquainted with
a man until you know his first name.

Those of you who go out on the farm and have the farmer call you
doctor or professor or commissioner will never get anywhere with him.
He has got to know your first name first.

My idea of getting acquainted would be to take some of you off into
a large room and perhaps we would sit there and you would tell me just
'what a hard job you had, and how hard it was to get your ideas across,
and I would listen to you and then I would tell you my troubles, and then
when we get through, we will each know what the other fellow is trying
to do.

I know more about this thing now than I ever did before, and I am
going back home to be a booster for you. If you get eight or ten men that
know your first name in every community in your state, and who call you
by your first name, not Doctor or Professor or Commissioner—you will
get your ideas over quicker. I would like to have you go over the
State and get acquainted in this way, and they will begin to say you are
pretty good fellows. I hope that next year you can so arrange your pro-
gram that we can all just get together and get acquainted, and we will
all be good fellows together. (Applause.)

CHAIRMAN CREWE: Mr. Moore has presented the subject in a
very humorous vein, and undoubtedly his point is exceptionally well taken;
but at this day and age I can assure you there are very few veterinarians
that are standing on their dignity. It is really their ambition to a large
degree to get absolutely down on earth with the ordinary or average stock-
owner, to thresh out his difficulties with him, to sympathize with him, to
help him in the best way possible. I think some of his very pointed re-
marks are very pertinent. We have been in favor of a system of getting
better acquainted amongst the different organizations to a large extent,
and we will continue to strive towards that end.

The next subject will be: "Advantages of Joint Sessions of Regula-
tory and Administrative Forces," by Mr. A. J. Glover, Editor of Hoard's
Dairyman, Fort Atchison, Wisconsin; Member of the Program Committee
of the National Association of Live Stock Sanitary Officials.

Address: Advantages of Joint Sessions of Regulatory and Adminis-
trative Forces.

A. J. Glover, Editor,
Hoard's Dairyman,
Fort Atchison, Wis.

It is a pleasure to meet with those interested in the development of
agriculture. It seems both fitting and wise that there should be this
joint session of the several branches of this great industry. As we pro-
cceed in the development of agriculture, there naturally follows a differen-
tiation of work, but this can be carried too far unless some step is taken
to bring together those engaged in closely allied agricultural enterprises.

The brief time allotted to this subject does not permit of detailed dis-
cussion, but rather a citation, in a most general way, of the advantages and necessity of joint sessions of associations closely allied in their activities.

To specialize is important; it is the only way we can make substantial progress, for the subject of agriculture is too large for the comprehension of one mind. If each branch of agriculture confines itself to its own activities, and shows no interest in the welfare and development of other branches, agriculture will suffer. All phases of this fundamental industry are more or less related, and to create the greatest force for its development, all branches must have a common understanding of what each department or division is doing or attempting to accomplish. Each organization specializing in its field has details to consider which need not be brought before a gathering of this character, but there is no obstacle to prevent giving a general resume of all the work done by the various organizations which meet annually in this city. It is essential that the secretaries of fairs know what the live stock officials are doing, and it is equally important for the Commissioners of Agriculture and the market officials. If each group of men knows what the others are accomplishing, there will be greater harmony and greater progress.

How is all of this to be accomplished without consuming too much time and making a program of this character rather tedious and unwieldy? It seems to me a Commissioner of Agriculture could review the general work of all the Departments of Agriculture throughout the United States. This should be done in the most general terms, but nevertheless it would give everyone a better understanding of why these departments are created and the problems which they meet.

A member of the United States Live Stock Sanitary Association would have no difficulty in setting before a meeting of this character the work of this body. That Association has found it necessary to discharge its duties through committees, as its subjects alone require more attention than can be given by the entire group. They have for example committees on legislation, tick eradication, hog cholera, interstate shipment of swine, differential diagnosis of swine diseases, live stock diseases, abortion diseases, special skin diseases, and tuberculosis. It would be expecting too much to receive reports at a gathering of this kind from all of these committees, but it would not be an insurmountable task for an individual, who has given close attention to the work of this organization, to relate what conclusions his special committee has reached. He would give a general review of the work of the Live Stock Sanitary Association, and much useful information to those engaged in other branches of agriculture.

The secretaries of Fairs, in particular, should be interested as many contagious diseases are disseminated at our fairs. Take tuberculosis, for instance. There is no question in my mind but that no exhibit should be permitted at any fair or show of any kind unless the owner can show, by health certificates, that his herd—not only the animals that he exhibits, but all of them—is free from tuberculosis. Methods could be set forth of preventing the dissemination of other diseases which will be of tremendous value to the live stock industry. We have been too slow in recognizing that fairs are a fruitful source of disseminating live stock diseases.

The subject of better and more efficient marketing of farm products is receiving more attention now than it has at any period in history. Plans have not yet been worked out which are wholly adapted to the marketing of our farm products. The American Farm Bureau Federation has had committees to work out plans for marketing grain and live stock co-operatively, and it has a committee of eleven for the purpose of perfecting a plan for organizing the dairy industry of this country. It is undoubtedly
known to all that there are many forms of milk producers' associations whose function it is to market the producers' milk co-operatively. Some of these associations are successful; others have met with failure.

All persons engaged in the pursuit of agriculture are interested in knowing the general plan of a successful marketing company. This does not mean that those engaged in live stock sanitation will devote their time and attention to the development of marketing companies, but they will have on many occasions opportunity to state the fundamentals of successful organizations. They will not gain this information by reading, but rather by coming in contact with men who have made a special study of marketing.

Let me illustrate, by concrete example, what I have in mind. Last February the Wisconsin—the Extension Department of the Wisconsin College of Agriculture called a conference of all the dairy and farm organizations of Wisconsin, and the Department of Markets to meet at the College of Agriculture for the purpose of determining a plan upon which to organize the dairy industry of Wisconsin, in order that its products be marketed more efficiently and upon a better basis. Committees were appointed, representing the various phases of the dairy industry, and later they met and gave their reports. The results were that a plan was unanimously adopted. In short, it recommended that the creameries be federated into groups and later these groups could be federated into a state-wide organization. The cheese factories were to follow a similar plan. The purpose of federating these 3,700 factories in Wisconsin was for grading butter and cheese, to produce a more uniform product, and to ship in carload lots. By creating larger units of business it was possible to market the products more economically and grade them, and be able to establish a brand for quality products. To do this requires a larger volume of business than any one concern could provide.

One of the fundamental factors in this form of organization is, that it permits the farmer to own and direct his creamery or cheese factory. The establishment of an institution of this character in his community gives him a deeper interest, makes him a better patron, and gives him a larger vision of his own business. Further, if the organization which federates a group of creameries fails, the farmer still has his own plant intact and is capable of carrying on his business, but not to the same advantage as when his factory co-operates with neighboring factories. There is opportunity to give more information regarding the Wisconsin plan of federating her factories, and point out its advantages, but this is not my subject.

It is well, perhaps, to state that after this plan was inaugurated, one farm organization, together with some outsiders, took it upon themselves to bring forth another plan of marketing the farmers' products of Wisconsin. This plan called for a state-wide organization, creating one big buying and selling body, with its offices located at Milwaukee. We have in Wisconsin 189,000 farmers, and anyone who has given this subject any attention can fully appreciate what a difficult, if not an impossible, task it would be to bring these together in one organization. There are too many divergent opinions, too many varied interests to have a plan of this character succeed. I cannot help but think that any man interested in agriculture would be none the less valuable for his own special work if Mr. Edward Nordman, the Commissioner of Markets of Wisconsin, were given an opportunity to discuss the Wisconsin marketing organization before this group of men.

To again point out the necessity of bringing men together for the purpose of considering subjects closely allied with their own fields of
endeavor, I will cite how the Wisconsin dairy industry has been organized into various units.

In 1872 the Wisconsin Dairymen's Association was organized. The dairy industry at that time was just beginning to take the shape of an industry. The men who organized it saw the opportunity for cooperation, and the value of working together. They proceeded and brought about tremendous improvement in the dairy industry of that state. Finally the buttermakers felt they needed an organization and one was formed. The cheese-makers followed them. Then a state breeders' association, including all classes of pure-breds followed, because pure-breds had developed to such an extent that the dairymen's association could not serve their interests as thoroughly as was needed. There naturally followed the organization of state associations by breeds, such as the Guernsey, the Jersey and the Holstein, and recently county breeders' associations representing a particular breed have been formed. Each one of these organizations has been doing splendid work, but there is the necessity of bringing all of these various forces and divergent interests together in one meeting for the purpose of discussing the general needs of a proper dairy development, to create a unity of interest, and to advise all agencies of the magnitude and importance of the dairy industry. This cannot be accomplished if each organization proceeds to work with its own particular problems and wholly indifferent to all endeavor except its own.

The Commissioners of Agriculture, members of the United States Live Stock Sanitary Association, the Commissioners of Markets, and other groups interested directly in the development of agriculture, must or should for the same reason come together in a joint meeting, that they may have opportunity to learn the general work of each association, and gain a general understanding of all the problems of agriculture.

(Applause.)

CHAIRMAN CREWE: Now, this appears to be one of the most important subjects that we have had this afternoon, and it is to some degree going to decide whether joint sessions of this character will be carried on again next year. Is there any further discussion on this subject?

MR. C. P. NORGORD (Madison, Wis.) I am very glad Mr. Glover said what he did say, and I think that he has outlined some possibilities as a basis for a joint meeting of these various associations. I think there are lines of work where there is joint responsibility, and it would be a good thing, I believe, to get together once in a while to have the response and reaction of each of the agencies that are interested, and the responsibilities presented at the same time and place.

The live stock regulations at state fairs interest both the live stock sanitarian and veterinarian, and the state fair people and the Commissioners of Agriculture. That is a sample of that type of interest.

Now, I think that Mr. Glover has illustrated something of the type of interest that would be of interest to the market people, as well as to the people that are here, and that sort of an epitome might have been put upon this program, and in fact those of us who were instrumental in forming this program, tried to put on such a subject somewhere on this program, and found it necessary to eliminate it, because we had to discuss this subject we are discussing now at the first meeting. We could not put that type of subject on the program, hence the market people were not interested very much in this program, and formed a part program, and are having their own meeting. That was why they left early. So I believe there is a place for a summary and discussion of the matters in which we are all interested, which would do us good.
I believe there is another thing which we would be interested in from this standpoint. Live stock sanitarians are handling regulatory work, the state fair people are handling administrative work, and the commissioners of agriculture are interested in both of those types of work. Now, there are other types of control and regulatory work—there is feed and fertilizer work, and others I might mention. The secretaries of those associations and others have already several years back talked about the feeling that they have that they might get together at a joint meeting to consider matters in which they are all interested, that is, both the regulatory and administrative people, who have a tremendous problem.

The live stock people are interested in stock worth millions and millions of dollars. There are a great many policies and pieces of work that they want pushed, and other people related to them also want them pushed. One organization cannot push as hard as two or three. If we can get together these joint interests in a problem of that kind, and all other of the associations of regulatory people that are interested in that piece of work get behind and push together, we will get something done in those particular cases, faster than if one organization had attempted to do the work alone.

I think there is a great field of work right along that line, and I can say that there is already an excellent example of the efficacy of getting together in the meetings of the directors of colleges and experiment stations who are handling educational and research work. They all get together, they meet at the same place, practically at the same time, and they did push across big problems—a big program.

I want to emphasize this point of co-operation and the meeting together of these various groups, like the Live Stock Sanitary Association—which is an association of great power, having been established for many years. It is not the intent of anyone that this Association should be in any way lowered in its dignity or power, or in its ability, but in sort of a co-operative meeting, or joint meeting at the meeting place, having a joint session, but I assure you—and I want to make that very emphatic, and I want to make it emphatic from the standpoint of the Commissioners of Agriculture—the purpose of any program of this kind is to give power to every one of the associations that care to go in on such a joint program, but not to detract from the power or effectiveness of any one.

I do not want to urge this from the standpoint of a Commissioner of Agriculture, but simply to bring this before your attention.

One thought I had in mind in my part of the make-up of this program, and I believe that Mr. Moore, Mr. Burnett and the Secretary of the Market Department, or the Market Association, had that same thing in mind—was simply to bring to you an experiment of what might be done. I think that something far better than what has been done to this time can be done, and I think it would be possible to organize a program committee, consisting of the secretaries or someone else, who might investigate what problems we are all interested in getting together to discuss, and have something that would be far better at another meeting than this.

I thank you. (Applause.)

DR. FELKER: Mr. Chairman, one time up in the State of Maine a hotel became defunct, and a good lady from another section of New England came in, picked up the wreckage, made repairs, and sent out invitations all over the New England area for a name that she could give the hotel. She got a grist of those replies, and it developed that as she was running over the list with a few of her friends, someone suggested: "Argue Not"—"let us call the hotel "Argue Not."
I think we have reached that point here. We have had some splendid arguments in favor of having a joint meeting, and I believe the representatives present from all of these Associations representing organizations over the country agree that a committee should be chosen that should arrange a program that shall be entertaining, and out of which, as with the Secretary of the Fair Association from Iowa, with his pungent wit and humor, we can get instruction as well as entertainment; and if it would be in order, I would move that a committee consisting of the secretaries of each of the allied associations present and others, if there are such, may be appointed by the Chair to formulate a program for next year's meeting, and consider that we are going to have it for the good we can get out of it.

CHAIRMAN CREWE: I am afraid that the Chair can hardly entertain that motion, because this is not an organized body at the present time. This is simply a joint session of various bodies. I think this matter will have to be taken up by each body separately to decide as to which bodies want to join in this movement.

A DELEGATE: Mr. Chairman, you could entertain that motion as the sense of this meeting.

DR. FELKER: Motion duly seconded.

CHAIRMAN CREWE: You have all heard the motion with reference to adopting the resolution as to the continuing of these joint sessions similar to this another year. Are there any marks?

DR. BUTLER: I would like to ask how many days this joint session will last?

CHAIRMAN CREWE: My understanding is this is optional with the Program Committee, by consultation with the different program committees of the other associations.

DR. BUTLER: I want to assure you I have no objection to it as long as it is not too long, but I want to remind the gentlemen with all due deference to them, that this is the United States Live Stock Sanitary Association, we who are in charge of certain regulatory and administrative work, who journey quite a long distance to get the latest scientific data from our fellow-workers, and that we cannot come here to attend market meetings, or any other meeting of such a character when it is our specific duty to come here to get data of a scientific nature, pertaining to our own profession. That is what we are sent here for, and while there is no one here who appreciates more than I do the fact that we are somewhat deficient in knowledge of markets and marketing, still that has a place of its own and it does not belong in the United States Live Stock Sanitary Association at its own particular meeting. If you want to hold a meeting the day following, then that is entirely different.

CHAIRMAN CREWE: Are there any further remarks?

MR. A. J. GLOVER: I want to ask Dr. Butler if he would be willing to have a session of two or three hours every year?

DR. BUTLER: Certainly, or half a day, but I want it distinctly understood if it is a half a day that absolutely I think it would do us all good, but we have to have the Committee understand—the Committee on this program—that we are going to have subjects that pertain to our own questions.

MR. NORGORD: That is one thing that our committee in the forming of this program has constantly in mind. I want to emphasize as I did before, that we are states, and the states are co-operating with the nation. The Secretary of Agriculture represents the nation. He may have a message that he wants to deliver to regulatory and administrative officials.
TWENTY-FIFTH ANNUAL MEETING

of the states, and this would be a splendid opportunity for him to do so, and I think that you will find that we will have a message from the Secretary of Agriculture. I believe he will be glad to come. I want to say at this time, that this year we took this up with the Secretary of Agriculture rather late, and he was crowded with other matters and did not have quite the opportunity that he would have if he knew that such a meeting as this was going to occur next year, and had in mind what he wanted to say to the regulatory and administrative people of the nation.

CHAIRMAN CREWE: Any further remarks?

Dr. Felker's motion was put to a vote and carried.

CHAIRMAN CREWE: This appears to conclude the program of the joint session for this afternoon. I might announce that the regular program of the United States Live Stock Sanitary Association will be taken up again tomorrow morning in this room at 10 A. M.

ADJOURNED.

THIRD SESSION.

November 29, 1921, ten o'clock A. M.

ABORTION DISEASE SESSION

PRESIDENT CREWE: The first subject on the program this morning is the Report of the Committee on Abortion, by Dr. Ward Giltner, East Lansing, Michigan.

REPORT OF COMMITTEE ON BOVINE INFECTIOUS ABORTION

Your committee submits its report with the consciousness that it has worked earnestly to secure new data of real value to present to you, and with regret that it has had indifferent success in this respect. Since your committee is working in harmony with a similar committee of the A. V. M. A. it is not out of place to lay before you the results of the labors of that committee with our endorsement, more particularly since you endorsed their report of last year. The report follows:

"Last year your Committee on Abortion presented as a part of its report a resolution which was unanimously adopted. This resolution was as follows:

"'Be it resolved, That the American Veterinary Medical Association strongly urges that larger appropriations for the investigation of bovine infectious abortion be made by Federal and State Governments and through such agencies as the National Research Council to make possible co-operative work by the institutions engaged in investigating this disease.'"

"Your committee this year has directed its efforts toward carrying out the directions of this resolution. A preliminary meeting was held in Chicago early in December. At this time it was voted that data should be collected as to what institutions were engaged in the study of this disease and what phases of the infection were being investigated. It was also decided to interest, if possible, the National Research Council in the project. Correspondence was begun with Dr. C. E. McClung, who was chairman of the Section of Biology and Agriculture of the Council, also with Dr. G. W. McCoy, chairman of the Section on Medicine. After considerable effort a conference was secured with the representatives of the Council, your committee and a few other investigators. The Council appropriated a sum of money to defray partially the expenses of this conference. This meeting was held in Washington, D. C., August 4, 1921. As a result Dr. McCoy asked that a brief be prepared stating the economic losses resulting from this infection, its importance to the breeding industry, the investigations now being carried on, amount being expended in such inves-
tigations, and the facts which should be known about bovine infectious abortion and the approximate cost of such studies. These data are now being prepared by your committee and will be submitted to Dr. McCoy some time during this month. He will in turn present them before the Interim Committee of the Council. If they approve of the project as a worthy one they will initiate efforts toward securing funds for the study of this disease. These funds will probably be expended at those institutions already engaged in the study of this disease, although this is not at all mandatory. We have good reason to believe that our efforts will be successful in securing additional money to be devoted to the study of bovine infectious abortion.

"The investigations of the past year have not influenced us to alter or amend the report presented to the Association by the Committee last year. You will recall that the report of last year consisted of 14 short paragraphs, each concerning some particular phase of the disease. Among the 14 paragraphs as far as your committee has been able to determine, 13 have received universal approval, and only one, the first, has been reasonably criticized. The paragraph in question is that in which the disease was named 'bovine infectious abortion,' and the adverse criticism is based on the fact that this name is derived from a symptom which may or may not be present. The true character of the infection seems to be a placentitis. In order to meet this objection a subcommittee has been appointed. Dr. Chas. Wardell Stiles, an expert on nomenclature, has been requested to serve as a member. The other members are Dr. E. C. Schroeder and Dr. Ward Giltner. They will report to the general committee on this question some time during the coming year. We believe that next year's report will settle this troublesome question.

"Another point in last year's report which needs clarifying is that relating to the diagnosis of the disease. Another subcommittee consisting of Dr. J. M. Buck, Dr. G. T. Creech and Dr. W. E. Cotton has been appointed to study this question and submit a report with the definite purpose of standardization of methods and technique in order to avoid many embarrassing and confusing discrepancies.

"A careful study of bovine infectious abortion shows that there are many phases of the disease which are still imperfectly understood. Definite information can be obtained only by carefully conducted experimental work. Because of the character of the disease and the species of animal affected, research studies are very expensive and efforts should be directed toward aiding such studies and assisting in solving the problems in connection with bovine infectious abortion, which is of the greatest economic importance to the livestock industry.

C. P. Fitch, Chairman.
E. C. Schroeder.
Ward Giltner.
J. F. DeVine.
Herbert Lothe."

The following statements of the members of the committee explain the situation as it now exists: One member says:

"There seems to be a prevailing opinion among practitioners that the disease may be caused by different organisms. I believe we could do a great deal more good in endeavoring to clear this matter up than we could to pass laws concerning the control of the disease. I have always been a firm believer in the Bacillus abortus (Bang) as being the causative agent and yet we occasionally run across herds in which some other causative agent seems to be at work."
Continuing this line of thought, another says:

"It is my belief that one thing the committee should do this year is to point out with some emphasis that all abortions among cattle cannot reasonably be charged to the Bang bacillus, and, further, that no fully satisfactory evidence has been presented to prove that the other abortions are due to the various microorganisms more or less commonly found in the products of abortions and the reproductive organs of cattle that have aborted.

"While I do not undervalue the importance of the evil for which we have reserved the name, 'Infectious abortion disease of cattle,' it is my impression that abortions due to other causes than the Bang bacillus have received less attention than they merit, and that a study of the relative importance of true infectious abortion and other abortions would throw a great deal of light on the whole abortion question.

"Regarding legislation, I hardly know what to say. I remember what the committee undertook in this respect several years ago, and I also remember how its report was received. You and I, no doubt, are in accord regarding the need for some kind of law to prevent the spread of true, infectious abortion disease of cattle; but, when I think of the often insidious and concealed character of the evil; the discord among investigators as to the worth and reliability of available abortion tests, and the disagreement among investigators as to what should be included under the name of abortion disease in any legislative enactment, I realize that we should be very careful about making recommendations, as laws which lack clearness, or which cannot be enforced, are apt to engender confusion and irritation and to prove worse than useless.

"It would be a good idea if some member of the committee who has the time could determine to what extent existing laws concerning infectious and contagious diseases of animals are serviceable as a means to control and check the spread of infectious abortion disease. A summary of such laws in itself would prove a valuable report."

Another member of the committee says:

"It would be very well indeed for this committee to take up the study of developments in legislation in the handling or control of abortion disease. I think we should make a start along the lines of legislation, though it be conservative and necessarily so in the beginning, it would give us a start, and would help us to form more rigid regulations later on, as the study of other phases of the disease develop.

"Some of the purebred breeders' associations have formulated some rules, which will probably in some instances be impossible to live up to, but it indicates that they are in the proper mood to encourage laws as a means of controlling this infection."

Nearly all the members were agreed on this point and such an investigation has been made and is incorporated herewith. A study of the tabulated results should assist one in deciding whether to agree with the views of another member of the committee who says:

"I am in favor of regulations that would require the reporting of open apparent cases also requiring a herd history of cattle that were to be sold or moved for show or other purposes, of course prohibiting the movement of infected or known exposed animals.

"I am also in favor of the blood test to assist in determining the condition of an animal or a herd. I believe that this disease causes more financial loss in our State than all other diseases of cattle combined and that any honest endeavor to cut this loss is justified.

"What we need most is more knowledge of the disease but until we can acquire such knowledge let us try to control its spread."
A more conservative view is as follows:

"Our knowledge of the disease and its causes is so incomplete that from the standpoint of sanitary regulations I have nothing whatever to suggest.

"Nevertheless it is true that the well-informed and skillful veterinarian is not so helpless in the presence of an outbreak of abortion as he is almost universally believed to be, and it is likewise true that many men whose cows breed regularly will jeopardize an entire herd by introducing one or two breeding animals from some unreliable source.

"Perhaps if these two facts can be emphasized in our report we may aid on the one hand to discourage the practice of selling aborters by showing that it is detrimental even to the one who follows it, and on the other hand to render breeders more cautious in regard to purchasing breeding animals from doubtful sources.

"I regret that I am unable to offer more suggestions, but progress in the study of a disease like abortion is necessarily slow, and the year has brought forth few advances. Perhaps if we were all geologists, to whom, it is said, even a million years is a relatively short time, our progress would seem more rapid."

Practical suggestions are given in this case:

"You may recall that last year in my contribution to the Committee's report, I stated that I would not be adverse to some legislation in the way of requiring a breeding history of an animal when sold, so that the purchaser might at least have some positive evidence in case the animal recently aborted or came out of a herd that recently suffered considerable abortion. so he might take the precaution to isolate the animal for the time being if he so wished, but I cannot see how we can formulate any sensible practical legislation that would be drastic in its application, with our limited knowledge on the many phases of the disease.

"For instance; do we know when an animal is a dangerous carrier, even though she does or does not react to any of the tests; in other words, is there any way to determine positively, when it would be absolutely safe to bring a new animal into a supposedly healthy herd? On the other hand, if we knew by tests and examination of the vaginal and udder secretions, that an animal was actively infected with Abortion Disease, do we know, with reasonable exactness, when such an animal ceases to be dangerous, and then again, do we know of any particular time or condition, when it would be positively safe or unsafe, to take a supposedly healthy animal from a supposedly healthy herd into a new home where the healthfulness of the herd would be questionable? These are the things that worry the purebred cattle owners, and if we can bring definite information on these questions to purebred associations, there will be little need of drastic legislation, with the present dread that the purebred breeder now has of this disease.

"All he would then need would be protection by a definite knowledge of the purchased animal's breeding history and of the herd from which she came; but at present, when a high priced purebred animal is purchased, the only safeguard that we know of to protect, in one case, the herd into which she is to go, or on the other hand, perhaps protect the valuable animal herself, is to counsel complete isolation, but the question is, how long must this be continued and when may it safely end?

"The Committee of the A. V. M. A. is paying special attention to these problems this year and when some of them or most of them are solved with reasonable certainty, it is my judgment, that the question of legislation might then be given more serious consideration."
It is urged that your association continue its interest in this disease to the extent of selecting with care a committee to study its nature and to co-operate actively with the committee of the A. V. M. A. and with any other agency operating to understand and control the disease. Interest in the study of the problem is indicated by the 47 titles of papers on the subject contributed since your last meeting and submitted herewith. We take this opportunity to publicly thank the various state officials who have so courteously contributed to the work of the committee in tabulating the data relative to the present status of legislation and regulations on bovine infectious abortion. The results are encouraging. Progress is being made rapidly and yet sanely. There is reason to hope and to expect that we will soon know what or whether legislation or regulations have value as respects such points as compulsory notifications, making official the serum tests, enforcing isolation and quarantine, restricting cattle sales and shipments intrastate or interstate, and as respects the details relative to suspects, diagnosis, time element in isolation, rigidity of quarantine and the danger spots in the various manifestations of the disease. In short, investigations by the research men, observations by the practitioners, and the slowly and cautiously accumulating experiences of the livestock sanitary officials are surely destined to bring us into the open where the path will be properly illuminated and sufficiently elevated to be safe if not pleasant or easy. It is requested that reprints be made of this report so that all the state officials may have ready access to the table showing the present legislative status of the disease, in order that they may be assisted and guided in their respective efforts.

W. L. Boyd, St. Paul, Minnesota.
E. S. Good, Lexington, Kentucky.
J. F. DeVine, Goshen, New York.
E. C. Schroeder, Bethesda, Maryland.
R. R. Birch, Cornell Univ., Ithaca, N. Y.

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<table>
<thead>
<tr>
<th>STATE</th>
<th>Specific or general legislation on control of abortion</th>
<th>Estimate of value of such legislation</th>
<th>What legislation should be in force</th>
<th>Importance of disease in State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>No specific laws</td>
<td></td>
<td>Not needed</td>
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<tr>
<td>Arizona</td>
<td>No specific laws</td>
<td></td>
<td>Not needed</td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td>No direct or indirect laws. Dairy and Vet. inspectors may exclude cows with chronic vaginal discharge.</td>
<td>Much good might be accomplished by such legislation. Believed possible to check spread of disease if regulatory measures were outlined and enforced generally.</td>
<td>Practically under control now.</td>
<td></td>
</tr>
<tr>
<td>California</td>
<td>No direct or indirect laws. Dairy and Vet. inspectors may exclude cows with chronic vaginal discharge.</td>
<td>Much good might be accomplished by such legislation. Believed possible to check spread of disease if regulatory measures were outlined and enforced generally.</td>
<td>Many large herds, not reporting abortion, largely raised locally with no Eastern or imported cattle introduced.</td>
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<tr>
<td>Colorado</td>
<td>No direct or indirect laws.</td>
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<td>Enforced sanitation and isolation and vaccination in infected herds. Vaccination with live organisms recommended on basis of experience.</td>
<td>Appears quite widespread in pure bred herds.</td>
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<td>Connecticut</td>
<td>No direct or indirect laws.</td>
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<tr>
<td>Delaware</td>
<td>None.</td>
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<td>Regrets lack of legislation.</td>
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<tr>
<td>Florida</td>
<td>No direct legislation. Rules and regulations for contagious diseases in general.</td>
<td>Unable to say</td>
<td>Some kind of legislation should be in force. Notable to say what would be practical and effective and just to dairymen.</td>
<td>Exists to some extent over state, but not alarming.</td>
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<tr>
<td>Georgia</td>
<td>No specific legislation.</td>
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<tr>
<td>Idaho</td>
<td>No direct legislation, livestock law covers all contagious diseases.</td>
<td>No rules or regulations. Special legislation would be of immeasurable value.</td>
<td>A clause designating some definite rule on which to base effective regulations should be enacted and placed in the statutes in order to eradicate and control this disease where positive diagnosis shows it to exist.</td>
<td>There is considerable loss in the calf crop each year. Some plan of co-operation with other states in the matter of rules and regulations covering interstate exchanges in breeding cattle needed.</td>
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<td>Illinois</td>
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<td>Indiana</td>
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<tr>
<td>Kansas</td>
<td>No direct legislation; present laws flexible enough to meet most conditions.</td>
<td>Segregation and sanitation practiced.</td>
<td>No new legislation needed</td>
<td>Quite a little less abortion than for two or three years past.</td>
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<td>Kentucky</td>
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<td>Louisiana</td>
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<tr>
<td>Maine</td>
<td>No direct legislation.</td>
<td>Value of any legislation measured by co-operation and help of those affected. Many cattle owners disposed to consider disease not serious.</td>
<td>If any way could be devised by legislation to prevent passing along of affected cattle and to enforce stable sanitation it would be a wonderful thing.</td>
<td>The loss from this disease is probably much greater than from any other disease.</td>
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<td>Maryland</td>
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<tr>
<td>Massachusetts</td>
<td>No direct legislation; listed with other diseases as reportable.</td>
<td>Provisions of law not complied with, so making it reportable doesn't amount to much.</td>
<td>Legislation or regulations not advisable with present state of knowledge of disease.</td>
<td>Statistics not available; next to tuberculosis in importance.</td>
</tr>
<tr>
<td>Minnesota</td>
<td>General legislation relative to quarantine of livestock in which living virus (vaccine) is used.</td>
<td>Should prove of value in control of abortion at least educationally. Treated animals would be brought to official attention.</td>
<td>Awaiting practical control measures. A quarantine of every infected herd would involve practically every dairy and most beef herds. Quarantine should apply to herds in which a certain percentage have aborted and should continue until abortions cease or the infection becomes dormant. Prevent sales of females over certain age, except for immediate slaughter, if not pregnant or not possessed of healthy calf within nine months.</td>
<td>Next to tuberculosis produces most financial loss.</td>
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<tr>
<td>Mississippi</td>
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<td>Missouri</td>
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<tr>
<td>Montana</td>
<td>Agglutination and C.F. tests are official. Affected animals that have aborted shall not be bred within 60 days after abortion. All dead calves and other matter shall be burned or properly buried.</td>
<td>Regulations do about all that can be hoped under range conditions</td>
<td>No desire for further legislation until more specific and adequate knowledge is available.</td>
<td>Not so very serious except in one or two small herds.</td>
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<tr>
<td>Nebraska</td>
<td>None.</td>
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<td>At loss to know where to start, but action will have to be taken soon.</td>
<td>No reliable statistics exist. In many dairy and breeding beef herds.</td>
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<tr>
<td>New Hampshire</td>
<td>Passed during 1921 session of legislature: Any person who shall knowingly or wilfully sell or let for breeding purposes, any male animal known to be infertile or infected or to have been exposed to any infectious or contagious disease, or any female animal known to be subject to contagious abortion, shall be subject to fine of not more than three hundred dollars or less than one hundred dollars for each animal so sold or let.</td>
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<td>Next in importance to tuberculosis.</td>
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<tr>
<td>New Jersey</td>
<td>None.</td>
<td>Restrictions should be placed on the sale and movement of affected animals. A question how far they could be earned into regulations.</td>
<td>Very important. Entails great loss.</td>
<td></td>
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<tr>
<td>New Mexico</td>
<td>None.</td>
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<td>Important disease, wide-spread, causing great losses to owners.</td>
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<tr>
<td>New York</td>
<td>None.</td>
<td></td>
<td>Important disease, wide-spread, causing great losses to owners.</td>
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<tr>
<td>North Carolina</td>
<td>General livestock laws (only) could be made to apply</td>
<td>Have not been enforced. In order to be of value should be adopted by all the states</td>
<td>No recommendations until more simple method of diagnosis and more definite policies of control and eradication.</td>
<td>Not very prevalent but on the increase, especially where new animals are added from outside the state.</td>
</tr>
<tr>
<td>North Dakota</td>
<td>General livestock laws (only) could be made to apply</td>
<td>Unable to determine any policy that could be reasonably and equitably enforced</td>
<td>Occurs sporadically disappears without particular precautions. Have applied blood tests and Stockman treatment.</td>
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<tr>
<td>Ohio</td>
<td>No specific legislation.</td>
<td>Difficult to formulate just and efficient regulations.</td>
<td>Seems to present more difficult problems than tuberculosis. Immediate monetary loss quite apparent.</td>
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<tr>
<td>Oklahoma</td>
<td>No special legislation except prohibition of importation of affected cattle.</td>
<td>Of no value in keeping out the disease.</td>
<td>Each shipment of breeding animals should be accompanied by an affidavit from owner and veterinarian stating that the herd is free from abortion disease.</td>
<td>Very small percent of herds affected.</td>
</tr>
<tr>
<td>Oregon</td>
<td>No public auction sale without affidavit relative to absence of abortion during preceding two years.</td>
<td>Value of such legislation highly problematic. May be false affidavits, but believed that this regulation prevents distribution of badly infected herds.</td>
<td>Blood testing might be required.</td>
<td>Estimated not over 25% of dairy herds affected. (Blood tests). Range abortion not very important. In many herds disease seems to exhaust itself.</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>None specific.</td>
<td>Present authority deemed sufficient to meet present requirements.</td>
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<td>An economic problem equally important as tuberculosis.</td>
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<tr>
<td>Rhode Island</td>
<td>None specific.</td>
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<tr>
<td>South Carolina</td>
<td>None specific.</td>
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<tr>
<td>South Dakota</td>
<td>Specified law—Unlawful to dispose of any animal affected with contagious abortion except for immediate slaughter or feeding purposes except as provided for by regulation. Fine of $50.00 to $100.00.</td>
<td>Believe in law.</td>
<td>Seems to provide necessary legislation</td>
<td>Seems to be subsiding. Few losses this year</td>
</tr>
<tr>
<td>Tennessee</td>
<td>No legislation, rules or regulations.</td>
<td>Based on our present knowledge, legislation considered worthless.</td>
<td></td>
<td>Considerable losses to dairymen and cattle breeders (pure bred cattle). Efforts at control and eradication of little benefit</td>
</tr>
<tr>
<td>Texas</td>
<td>No legislation, rules or regulations.</td>
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<tr>
<td>Utah</td>
<td>No direct legislation.</td>
<td>Legislation ought to be enacted requiring negative blood test on all pure bred cattle shipped interstate for breeding purposes. Plans to educate cattlemen to necessity of control measures.</td>
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<td>No survey made but one contemplated. Inquiries indicate bad infection in most profitable range sections.</td>
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<tr>
<td>Vermont</td>
<td>No direct legislation.</td>
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<tr>
<td>Virginia</td>
<td>No direct legislation.</td>
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<tr>
<td>Washington</td>
<td>General legislation only.</td>
<td>No value until adequate funds and equipment are furnished.</td>
<td>Not exactly sure how far we should go.</td>
<td>Possibly 25% of herds are or have been affected. Splendid results from educational work, most stockmen use every precaution. Found in range and dairy cattle probably in every section of state.</td>
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<tr>
<td>West Virginia</td>
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<tr>
<td>Wisconsin</td>
<td>No regulations.</td>
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<td>More extensive knowledge of the causative factor before legislation or regulations should be enforced.</td>
<td>Ranks close to tuberculosis, probably actual losses greater.</td>
</tr>
<tr>
<td>Wyoming</td>
<td>If classified as infectious or contagious and if epizootic, quarantines is authorized</td>
<td>Favors legislation or regulations to give sanitary officers power to quarantine, isolate, and absolutely control infected herds.</td>
<td>Never appeared to great extent; has appeared in isolated herds (imported) and caused considerable loss. Not believed to have gained foothold in open ranges. Little vaccine used; some value attached to vaccination.</td>
<td></td>
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</tbody>
</table>
DR. J. F. DE VINE: It has been customary, Mr. Chairman, to have the papers, and have the discussion after all the papers have been read. I move you, therefore, that that procedure be followed.

Motion duly seconded, put to a vote and carried.

PRESIDENT CREWE: The next subject on the program is: "Suggestion for the Improvement of the Reproductive Efficiency of Cattle," by Prof. W. L. Williams, of Ithaca, N. Y. (Applause.)

SUGGESTIONS FOR THE IMPROVEMENT OF THE REPRODUCTIVE EFFICIENCY OF CATTLE

By W. L. Williams, Emeritus Professor, Cornell University

No accurate data have been recorded indicating the interferences in reproduction caused by genital infections in cattle or other domestic animals. If it is attempted to learn the rate of reproduction in cattle, either in the United States or elsewhere, it is surprising and disheartening for the student to find that practically no accurate data are available. There are in the United States 53 states, territories or possessions each of which has one or more agricultural experiment stations operated mostly under joint control of the Federal and local authorities. Most of these stations have herds of either dairy or beef cattle and many of them have both. They are maintained primarily for research for the benefit of the cattle industry of the nation. Many of these herds have been in existence for about half a century but in all that time my attention has not been attracted to recorded data from which the reproductive efficiency of any one of these herds could be determined for any period of time. In addition to the Agricultural Experiment Station herds, there is a far greater number of cattle belonging to Federal, State and Municipal hospitals, reformatories or other public institutions where studies in reproductive efficiency could be made and published with mutual benefit to the institutions and to the public to which they belong but from which no light upon this subject emanates.

Private breeders cannot economically afford to publish accurate data regarding reproduction in their herds because the facts would be misinterpreted and distorted by competitors.

In my official capacity as Research Professor of the Diseases of Breeding Cattle in the Veterinary College at Cornell University, I have for several years taken a keen interest in the problem of interference with reproduction. I have constantly felt that the intelligent study of the problem assigned to me required first of all, a reliable knowledge of the prevalent reproductive efficiency of cattle compared with an ideal maximum, and secondly to learn the nature of these interferences. Three formidable obstacles have rendered the securing of reliable data regarding efficiency exceedingly difficult and discouraging

1. I did not have official charge of, nor have free access to, the breeding records of any public herd except that for a brief time I had a herd in my department, too small to make the data of material value and which was under a series of experiments which rendered reproduction abnormal.

2. The universal reluctance of private breeders to reveal the losses in their herds due to reproductive deficiencies.

3. Even when a private breeder would permit a study of herd records under a pledge of secrecy as to identity, it was found that the accounts of breeding activities were always seriously defective and generally so incomplete as to be worthless for accurate study. This at first seems strange, especially for purebred cattle but it was soon found that breeders of these virtually limited their records to the necessities of pedigree of the off-
spring. If a cow bred to a given bull at a given date was in estrum later, perhaps the prior breeding, recorded in pencil, was erased, and the second service by another bull substituted, thus eliminating forever essential data. Or a cow had retained afterbirth was kept for a year, was bred often to various bulls, then sold, the date of sale or reason therefor not recorded, the various services erased and an essential part of the history of the cow, and of the bull or bulls which copulated with her, effaced.

In spite of these difficulties, I have been able to obtain some data which, although fragmentary and not accurate, nevertheless have a value pending the appearance of records of greater accuracy and completeness.

In a dairy herd of purebred and high grade cows, consisting of 500 females of milking age, it was aimed to grow all heifer calves and at the proper time to place them in the dairy stables. Ideally, it was desired that each cow should give birth to one calf each 12 months or a total of 500 healthy calves per annum of which normally 250 would be females. The heifers were bred to calve at about 24 months. If it is assumed that the ideal duration of dairying efficiency is up to 11 years old, each female should produce 10 calves, of which 5 are heifers. At her eleventh year it would be necessary to replace her by one of her heifers not less than 2 years old, leaving four surplus heifers. That is, 20% of her female progeny would be required for replacement and 80% would remain as surplus. During the 8 years covered by my data, each cow should, upon an average, have produced four heifer calves. There should have been a total for the 8 years of 2,000 heifers, 400 of which should have gone to replacement and 1,600 to surplus. Instead of a surplus of 1,600 females, there was a deficit of 800 which was made up by purchase. Tuberculosis accounted for the elimination of 800 females. Hence the heifers grown in the herd approximately sufficed to maintain the numbers at par except for losses due to tuberculosis but afforded no surplus, instead of 1,600.

Upon the basis which I have suggested as ideal, the reproductive efficiency of the herd was 40%, of which 20% were bull calves discarded for veal and 20% were heifers consumed in replacing old cows. (In this computation the discards for tuberculosis are excluded and balanced against the purchases of new cows.) There is thus revealed a deficit of 60% in reproductive efficiency. The records showed 18 abortions in each 100 pregnancies. But there was much temporary and permanent sterility so that the losses from abortion did not represent 18% out of the 60% of losses. Perhaps the abortions represented 12 to 15% of one quarter of the 60% of losses. About 30% of the calves born died within a few days from sepsis, dysentery or pneumonia. The remainder of the losses were due chiefly to temporary or permanent sterility. As nearly as I can estimate from the extensive and unusually reliable data furnished me by the manager, I think it safe to ascribe the deficit in reproduction to abortion, 15%; calf infections, 25% and sterility, 60%. In other dairy herds where my data are less complete, the efficiency, as measured by the ideal of one healthy calf each 12 months, is sometimes above and sometimes below the preceding. In one large purebred herd the reproductive efficiency over a period of 10 years was 30%. The deficiency was made up approximately of abortion, 15%; calf infections, 25%; and sterility, 60%.

My most favorable data in dairy cattle come from a small herd of purebreds in which the efficiency reached was 75% but just at the time of computation a badly infected bull came in and the efficiency dropped rapidly but I failed to learn where the decline ceased.

I have been able to obtain valuable data of but one herd of purebred beef cattle. At the time of making the computation, there were in the herd 326 females of breeding age and 38 females had died or been killed.
so that data were available for 364 animals. The heifers were ordinarily bred to calve at about 29 months. As in the dairy cows the ideal reproduction was fixed at one healthy calf each 12 months after a female had reached 20 months of age. The data extended over 10 years from the foundation of the herd and comprised a total of 20,442.4 breeding months. The total healthy calves born, with the addition of equivalents of calves comprised in existing pregnancies (each month of pregnancy being computed as 1/9 of a calf) was 105.7 or 62.04% of the ideal. Instead of requiring the ideal of 12 months for the production of a calf, 19.34 breeding months were necessary.

There was consequently a deficit of 38% of healthy calves as judged by the standard chosen. The recorded abortions were 3.1% and a calf mortality of 4.1% or a total for abortion and calf infections of 7.2% leaving 30.8% to be ascribed to temporary and permanent sterility. Apportioning the total hindrances they are relatively 8.1% abortion, 10.8% calf mortality and 81% sterility.

Abortion being largely a question of visibility, the rate would naturally be greater in the large dairy herd where the pregnant cows were kept in their stanchions until parturition was seen to be near and being under constant observation, the expulsion of a fetal cadaver was far more likely to be observed than in the beef cows.

A careful study of my data leads me to conclude that in most herds of cattle there are produced about 50 to 70 healthy calves per 100 cows per annum, or that the efficiency as measured by the ideal of one healthy calf each 12 months ranges between 50 and 70%, rarely passing above or below that figure when the data are sufficiently extensive to comprise 12,000 breeding months which should ideally yield 1,000 healthy calves.

The efficiency is, I believe, higher in small than in large herds. In grade herds where grade bulls are used, the efficiency appears to be higher than in purebred herds, or in grade herds with purebred sires. It is generally believed, and appears logical, that the reproductive efficiency in a herd decreases as the volume of the herd increases.

There is another group of data from which some persons probably draw extremely erroneous conclusions regarding reproductive efficiency. Investigators studying the efficiency of vaccines or other alleged remedies in preventing "contagious abortion" have placed on record the number of cows calving and aborting during a stated period. Outstanding among these are the data of Bland1 of England. In his second report (1911-1916) Bland states (page 15, paragraph 5): "Briefly, in one season the treatment has cut down the number of cases of abortion from above 30% to about 5%." The report does not reveal the date of beginning nor end of the studies nor the number of pregnancies existing at the commencement or at the close. Bland tabulates (on page 15) 13 herds placed under experimentation and shows a total of 1,016 cows. Had they aborted the prior year at the rate of 30% there would have occurred 305 abortions. On page 16 he states that the animals in the experiments contained 160 which had aborted previously or a trifle less than 16%. This total of prior aborters checks accurately with the detailed statements of prior abortions in each of the 13 herds included. It is evidently correct and shows that the percentage of abortions observed among the 1,016 females used in the 1914-1916 experiments had aborted in 1913 at a rate not to exceed 16% instead of the 30% so often asserted. It appears probable that the cattle in the 13 herds in 1913 had aborted at the rate of 30% that year and that 145 of the aborters, almost one half, had disappeared without trace prior to the beginning of the experiments.

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Upon the other hand Bland's records show that between the unnamed date of the commencement of his experiments and their close in June, 1916, the cows which had previously aborted, 160, produced 107 calves. If the duration of time is placed at 2 years, which appears conservative, there were produced by these cows 54 calves were annum. If the original statement of Bland that 30% or 305 of the cows in the experiment had aborted the previous year, and that these produced during the next two years 107 calves, or 54 calves per year, then the breeding efficiency was 18 calves per annum for each 100 cows. If the number actually in the experiment was 160 as seems true, the efficiency rose to 33.7 calves per 100 cows per year. All the 160 had been "immunized" against "contagious abortion" through having aborted previously and 140 of them doubly "immunized" by the addition of vaccines with the result that each cow was kept 36 months for the production of a calf.

Deducting from the 600 cows vaccinated by Bland in 1914-1916, the 140 animals which had aborted in 1913, there remained 460 animals which had calved normally in 1913. These produced, according to the records, 375 calves during 1914-1916, or a total for presumably about two years after vaccination, of 85 less calves than in the one year immediately preceding vaccination or 40.7 calves per year for each 100 cows.

The data of Bland are representative of this group and need not be extended. They one and all fail to show the breeder or veterinary practitioner the most basic fact in breeding economy—the average duration of time required for the production of a healthy calf.

Like my data, it is made clear that reproductive efficiency in cattle is discouragingly low and does not exceed 50% to 70% of the ideal, or the breeder keeps 100 cows to perform the ideal service of 50 to 70. This may appear an exaggeration but it is in harmony with the recorded efficiency in mares where the figures are far more accurate than in any other species. The same rule holds for swine also. The sow discharges at each heat period from 15 to more than 20 ova but these mostly perish and the breeder keeps two sows to perform the ideal reproduction service of one.

From what has been said, it is evident that there is great need for reform in recording and computing reproduction data. It is impossible to consider adequately the interferences with breeding until the operations are accurately recorded and careful computation is made possible.

The estimate of an efficiency of 50% to 70% is based upon the number of calves at 10 days after birth. This is upon the assumption that most fatalities in calves less than 10 days old are due to ante-natal or intra-uterine infections and that the fatalities prior to the tenth day from post-natal infections will approximately offset the deaths after ten days due to intra-uterine infections.

Recorded data are insufficient to afford a secure basis for estimates regarding the relative importance of the ways in which reproduction is retarded. According to the designations commonly used, the interferences are divisible into 3 chief groups, sterility, abortion and calf mortality. The first group includes the death of spermatozoa, and unfertilized and fertilized ova, death of the embryos and those deaths of fetuses in which they macerate or are absorbed, and those in which the fetal cadavers are expelled unseen. In the second group are included the observed expulsion of fetal cadavers. The relative importance of each of the groups will vary according to environment and the intensity of the infection or infections responsible.

As nearly as I can estimate from the data available, the proportions to each other of the interferences with reproduction are approximately sterility 50%, abortion 20% and calf mortality 30%.
I have taken the position that the maximum reproductive efficiency is to be sought by the mating of a sexually healthy female with a healthy male, and that the efforts of the breeder and veterinarian should be concentrated upon this one point.

I have taken the position that the interferences mentioned in the above groups are due primarily to genital infections having an essentially universal distribution in cattle of all ages and both sexes. The number of separate bacteria or other organisms involved is unknown, most studies having been restricted to one, the Bacterium abortus. Some of the infections, like the streptococcus of the viridans group, is recognizable in the cervix, uterus and oviducts of the non-pregnant and pregnant cow, and in the alimentary tract of the fetus and new-born calf. If the young calf is healthy, the streptococcus does not, so far as yet learned, generally escape from the alimentary tract to invade other organs but if dysentery or pneumonia develops and the calf finally recovers, the streptococci are recognizable in the genital tract of both sexes at a few weeks old and remains throughout life. The heifer often reaches breeding age with severe salpingitis (inflammation of oviducts) or other disease which renders breeding doubtful or impossible. The bull reaches breeding age with infection in testicles, epididymis, seminal vesicles or other parts, the bacteria being discharged with the semen at coitus, and causing sterility, abortion or mortal calf diseases, along with peril to the life of the breeding female.

The virulence of the infections vary in individuals and in herds. It is profoundly modified by food and care, by coitus, pregnancy and parturition. In the cow or heifer, when the infection is serious but not sufficient to prevent conception, it tends in some types to become accentuated during advanced pregnancy.

The genital infections of cattle should, therefore, according to my views, be handled as virtually universal in distribution and not subject to total eradication as one may hope for in diseases like foot-and-mouth disease, glanders, or tuberculosis, but rather is amenable to control by lowering the virulence of the infection and advancing the powers of resistance in the animals by sex, and general hygiene. In order to accomplish this, the endless infection-chain should be attacked in force at its most vulnerable points.

1. At the termination of pregnancy, whether by abortion or calving, the intra-uterine infection tends to gather great momentum. The uterine mucosa is largely denuded of its epithelium, thus exposing the tissues to the infections virtually always present, the tissues are abraded in the act of expelling the fetus, the genital canal is dilated, inviting additional infection from the exterior, and every condition is present for the infection to acquire explosive force. The life of the cow is often in peril. Far more frequently the genital organs are overwhelmed by the infection and temporary or incurable sterility established. In severe disease with copious discharges, the cow becomes a menace to associated animals, including her calf. The breeder of dairy cattle and of purebred beef cattle, in so far as economically warrantable, should provide adequate maternity stalls to accommodate all cows in the herd for an average period of ten days after the termination of pregnancy. The stalls should be ample in size and sanitary. The cow should be placed in such stall several days before aborting or calving, or in case of surprise, as soon as possible after discovery and should remain isolated until all notable discharge from the genital organs has ceased, and she is apparently sound.

Veterinarians generally agree in principle that cows seriously diseased at this time should be handled with the greatest possible skill and rapid
and satisfactory recovery favored. Our knowledge of handling them is advancing rapidly.

In extended observations I have found that at the termination of pregnancy the uteri of cows suffer from a mild endometritis with surprising uniformity and if examined at from two to four days after an apparently healthy calving a few ounces of disease exudate is found in the uterus without any exterior indications of its presence. I have reached the conclusion, therefore, that important intra-uterine infection is so common, especially in all herds where reproduction efficiency is low, that it is safer-scientifically and economically to assume the existence of an infection in each cow ample to warrant interference rather than await the attainment of great violence in a large proportion of animals.

I have accordingly followed with great satisfaction the plan of introducing into the uterus (or into the cavity of the fetal membranes if they are retained) within a few hours after the termination of pregnancy one half to one ounce each of iodoform and subnitrate of bismuth suspended in eight to sixteen ounces of liquid petrolatum of white mineral oil. If the membranes are retained, repeat this every two or three days until they come away and then introduce the same preparation into the naked uterus. In the absence of membranes any accumulation of exudate discharges may be douched out with warm physiological salt solution (1 oz. to 1 gal. water), using therefore the bull-douching catheter and a hospital irrigator. This line of treatment should be followed closely, repeating the applications at such intervals as the case may suggest.

Dairymen object to the iodoform because of the repulsive flavor imparted to the milk, but it is a debatable question if it is not best for public health to exclude the milk from such cows until the genital organs are quite clean. Besides, my observations clearly indicate that under this plan of anticipating disease, the dairymen eventually obtains far more marketable milk than by awaiting developments and suffering almost complete loss of a milking period in numerous cows. The application is absolutely non-irritant so that it does not decrease the milk flow in cows it is desired to place on test. Regardless of the iodoform taint in the milk, it is safe for calves and they do not object to the flavor. The iodoform and bismuth are heavy and very feebly soluble so that they drop down upon the floor of the uterus and remain for four to ten days exerting a favorable power over the infection present.

2. Before breeding again, the genital organs should be carefully examined and the animal not bred unless found healthy. If diseased, the disease should be cured promptly, or if found incurable, the cow should be sent to slaughter.

3. The prudent breeder of dairy cattle should provide individual stalls with solid partitions for each young calf, so that it may be kept isolated until its health is fully determined.

In herds where genital infections are severe each calf should be assumed to carry serious infection in its alimentary tract and the chief aim of the breeder should be to clean out the digestive tube before allowing milk to enter, in which the bacteria present may grow. The calf should have no food for 24 hours and the bowels in the meantime emptied with enemas and oil. The calf should then be kept on an extremely low diet of milk for at least ten days and such measures continued as will insure the maximum of health and vigor.

Unless such precautions are taken and the calf is permitted to suffer from digestive disturbances, when it reaches breeding age, whether bull
or heifer, its breeding efficiency is insecure. Healthy calfhood is essential to high breeding efficiency in adult life.

4. The herd bull offers a highly vulnerable point at which to attack the genital infections interfering with reproduction. He offers an especially favorable opportunity for advancement of reproduction in beef cattle where the numbers and wildness of cows and heifers render their individual handling highly expensive or economically impracticable. The bull represents in infection as in pedigree, one-half the herd unit to which he belongs, while numerically he represents only about 5% and hence a thorough examination of him falls more readily within economic bounds.

Observing clinicians and breeders have recently become fully aware that the bull frequently becomes a great peril to reproduction through the ejaculation of semen contaminated with pathogenic bacteria. There is no material evidence to point to B. abortus as the offending organism in these instances but that does not vacate nor ameliorate the economic loss. As an illustration of this point I may mention one instance where in a purebred herd, breeding had progressed satisfactorily until heifers had grown to breeding age and a second bull was secured. Some cows of the old herd were also assigned to the young bull which had not previously been in service. The cows bred to the old herd bull continued to breed normally. The cows and heifers bred to the new bull conceived with difficulty or not at all. Those which conceived mostly aborted, and those which calved had metritis and retained fetal membranes. The two first cows in which pregnancy terminated died from metritis.

Upon examination the bull showed abscess of one seminal vesicle which had ruptured into the rectum. The other vesicle shared in the infection and beyond all reasonable doubt, the semen ejaculated by the bull was full of virulent bacteria. It had cost the institution one thousand dollars to get the bull and five or six thousand to keep him in the herd for a little over a year. While this is an extreme case, similar instances are common.

I have reliable data from the one large beef herd mentioned early in this paper concerning the efficiency of bulls. In a group of 13 bulls my data indicate that the young bulls when first entering service, got 75 to 85 calves per 100 copulations but their fertility began to decrease when caused to copulate frequently until in the final summary there were 100 copulations for each 40 calves. The bulls varied widely in fertility but in all animals it was highest at first and declined with varying rapidity until generally after 7 or 8 years of service they became absolutely sterile. The marked "break" in efficiency apparently followed an active breeding period with a record of 100 or more copulations for the year. In the height of the breeding season such bulls were used as often as two and even three times a day.

I have stated that genital infections constitute an endless chain, from parent to offspring. One of the old bulls of this herd, dead several years ago, was highly prized as an individual and bred heavily. His fertility fell rapidly and finally ceased but he left a large number of females of high individual merit. To this day his female progeny show a decidedly high ratio of sterility and abortion compared with the get of other bulls in the herd at the same time. Genital infections in a herd are like pedigree. They are advanced or retarded year by year or generation by generation in response to the intelligence and devotion of the breeder. One can no more eliminate genital infections in a year than he can the black and white spots of Holsteins in a like period. Sexual health is a matter of intelligent, constructive endeavor.
Recently the importance of the bull as a bearer of infection has become so clear that researches in this field will inevitably increase. The progressive breeder should, so far as skilled veterinarians are available, submit his bulls to examination for the purpose of advancing the breeding efficiency in his herd. In the purchase of high priced bulls the buyer should avail himself of the added security obtainable from a skillful examination as to genital soundness including fresh and stained samples of semen. The services of each bull should be limited in number far below the common practice and confined strictly to a definite group of cows.

5. The general handling of animals designed for breeding should have in view the highest available vigor of every individual in the herd. Any element in management which lowers the physical vigor, whether it be food, water, housing or other factor entering into the sum total of the care, by depressing the resistance, increases the activity of bacteria within the uterus or elsewhere in the female or male genital tract. At one time I was unable to secure a competent caretaker for my little research herd. They were in a good stable and had an abundance of good food but they all became emaciated, weak and depressed. Those not pregnant could not be caused to conceive and soon failed to come in estrum. When a competent man came in, with the same food, stable and surroundings, they improved in condition, estrum appeared and conception was prompt. As nearly as I could determine the cause lay in the fact that my stable was arranged for watering the cattle from a pail while my stableman believed in the automatic water system.

Early in the history of abortion, severe outbreaks were often attributed to a generally damaged condition of hay and grain over a large area. Thus ergot and smut, which largely accompany other fungi and molds on foods, gained an evil repute, not as it now seems, because these decreased the nutritive and hygienic value of the food as such but according to the people of those days to a supposed direct power to cause abortion. There is much practical force in this old belief which the breeder of today should recognize. He cannot have abortion without intra-uterine infection, but a vigorous cow with a given infection in her uterus may give birth to a healthy calf and continue without manifestations of disease herself, but if her vigor is lowered by improper food or care she may well abort or otherwise fail in reproduction.

Long continued close confinement apparently exerts a bad influence upon reproduction owing to the lowering of vitality as is observed in large herds when in late winter the tendency to sterility, abortion and mortality in calves commonly increases.

The plan outlined is comprehensive and pliable. Through the single maternity and calf stalls efficient physical isolation is provided at those times when the seriously diseased individual is dangerous to its associates through ordinary contact. The careful examination of bulls and cows prior to coitus offers safeguards against coital transmission of infection. The care outlined for calves and for cows at calving time gives the greatest known assurance of prompt and safe emergence from the dangers hovering about these periods.

There is ample room under this plan for the use of any drug, or other substance which may be shown to have any beneficial influence upon the reproductive efficiency.

PRESIDENT CREWE: As suggested by Dr. De Vine, if there are no objections we will complete the papers on this subject before taking up the discussion.

BUREAU OF ANIMAL INDUSTRY INVESTIGATIONS ON BOVINE INFECTIOUS ABORTION.

By E. C. Schroeder, Superintendent, Experiment Station of the Bureau of Animal Industry.

My task is a discussion of the investigations of the Federal Bureau of Animal Industry on the common and widespread evil known as Bovine Infectious Abortion. As the investigations have been long in progress and quite active in recent years, it may be well to say in advance that it will be impossible in the time at my disposal to enter into minute detail concerning them. And, probably, it is fair to assume that a minutely detailed account of the arduous, time-consuming and patience-trying technical work that has been done would prove less interesting or useful than a simple presentation of the facts that have been revealed or confirmed, together with a reference to their economic significance, provided enough is said about the evidence on which they are based to show that they are facts in reality and not merely in name.

Efforts to control infectious diseases before their etiology is known, at best, are general and commonly as unpromising as the chances that a marksman, with a vague idea of the direction in which he should aim, will make an effective shot in the dark. If enough ammunition is burned a lucky hit is occasionally made, but, usually the ammunition is burned in vain, and the noise, smoke and confusion, even if stray shots do not prove unintentionally destructive, profit and please no one. What the marksman needs is light, and the light needed to combat infectious diseases is a reasonably clear knowledge of their etiology.

The prime, etiological factor of Bovine Infectious Abortion was discovered by Bang and Stribolt long before the more active investigation of the evil was undertaken by the Bureau of Animal Industry, and the discovery has been confirmed by McFadyean and Stockman in England, and MacNeal and Kerr and Ward Giltner and Good in America. But etiology is more than the recognition of the causative microparasite of a disease, and it remained to be determined how and when the parasite, the Bang bacillus, enters and leaves the bodies of its hosts or victims; whether it occurs elsewhere in nature than in the bodies of its victims; on what natural conditions its multiplication and perpetuation depend, etc., etc.

Though some of the facts were known, so much remained in doubt that the available data led to wholly contradictory conclusions and fruitless controversies, and, consequently, when the question was asked, "How shall we combat abortion disease?"" the answers ranged from a modest, "I don't know," to suggested flushings and douchings that were apt to cost more per animal than the value of ordinary cattle per head, and the enactment of stringent laws and regulations which would have been more annoying and expensive to cattle owners than beneficial to their herds.

Confronted with this uncertainty and confusion it required no prophet to foresee that an investigation of Bovine Infectious Abortion would fail of its purpose unless vigorous efforts were made to amplify and clarify the existing etiological knowledge of the disease, and, therefore, etiological studies were at once planned and undertaken. An abundance of work also was done relative to treatment, general as well as specific, but I will speak of the etiological investigations first.
THE OCCURRENCE OF THE BANG BACILLUS IN THE BODIES OF CATTLE.

The Bang abortion bacillus, like the tubercle bacillus, evidently is an obligatory parasite; it is known to multiply nowhere in nature but in the bodies of its hosts. In culture tubes, carefully sealed to prevent drying, it has been kept alive in the Bureau laboratories nearly three years, and in placentas of aborting cows, exposed under fly screens in shaded places in the woods during the colder months of the year, it has remained alive, in rare instances, as long as four months. In material discharged from the bodies of aborting cows, unless the conditions are exceptionally favorable for its preservation, the bacillus generally dies in less than a month, and its death is greatly hastened by sunlight. The weak resistance of the non-sporeulating micro-parasite against natural germicidal forces implied that it could not perpetuate itself and serve as the cause of a widespread plague unless some special provision had been made by nature for its preservation, and the most reasonable provision to look for was its long-continued presence in a dormant, or a partly-dormant state in the bodies of its hosts.

It was known that the bacillus occurs in the placentas of aborting cows and in different portions of the bodies of aborted fetuses. The investigations of McFadyean and Stockman indicated that it disappeared from the uterus within, approximately, a month after an abortion. The discovery had been made, independently, by the Bureau and Smith and Fabyan, that it occurs in the udders and milk of some infected cows. It remained to be determined how long it persists in the udder, and, more definitely, how long it persists in the uterus and other portions of the reproductive organs. It remained to be determined whether it occurs in other parts of the body than the reproductive organs and the udder, and what its presence in other parts of the body signified. It also remained to be determined whether it occurs in the bodies of calves, heifers and bulls.

Today we know that the Bang abortion bacillus may, in rare cases, persist in the uterus two months after an abortion or a parturition, but that, as a rule, it does not persist more than two to three weeks; that it may persist in the udder and milk for greatly varying periods of time, from a few weeks to six or seven years; that the udders of more than 60% of infected cows at sometime harbor the bacillus; that, when it is present in the udder it invades the uterus in a large proportion of cases during pregnancy and may be very abundant though the pregnancy is seemingly normal and ends in an apparently normal parturition; that it occasionally attacks and can be found in the reproductive organs and seminal fluid of bulls; that it may be present in the stomach fluids, livers and gastro-hepatic lymph glands of newly-born, viable calves, and that all attempts to find it in the bodies of cows elsewhere than their udders, their uteruses during gestation and shortly after an abortion or a parturition, and the lymph glands associated with these organs, have failed.

It does not require much time or many words to state these facts; how much work was required to secure them may be evident to practical investigators, and even they are apt to fall short in their estimates. For example, the short statement, that, "abortion bacilli occur in the bodies of newly-born, viable calves," rests on tests in which eleven calves were used, as follows: The calves were removed from their mothers, abortion infected cows, immediately after delivery, and not permitted to have access to anything that could lead to the postpartum ingestion of infected material; they were killed and sectioned with strict aseptic precautions, and tissues gathered from all parts of their bodies for cultural and animal in-
noculation tests, and later, when positive results were obtained, they were confirmed by the sub-inoculation of experiment animals and culture tubes. If positive results had been obtained with the first two or three calves it would have settled the matter, but this was not the case, and when the results are negative the number of animals examined must be multiplied before the evidence is sufficient to give a conclusion based on its reasonable stability. So with the brief statement that the abortion bacillus occurs nowhere in the bodies of cows but their udders, pregnant or recently pregnant uteruses and associated lymph glands. The Bureau investigators who secured the data that prove this statement can tell about the arduous task it was to kill and section abortion infected cows so that their blood, spleens, livers, lungs, kidneys, serous membranes, synovial fluid, bone marrow, brains, spinal cords, muscles, uteruses, vaginas, fallopian tubes, ovaries, etc., and lymph glands from all portions of their bodies could be tested. Not one or two cows, but a good many of them, because negative results require that the number of subjects examined must be large enough to insure that the exception which often is supposed to prove the rule has been eliminated.

Regarding the calves found to harbor abortion bacilli at birth, two out of eleven examined, it is noteworthy that one was the offspring of a cow that has never aborted and was recognized as a carrier and spreader of abortion bacilli only through the use of biological tests.

The examination of the bodies of calves for abortion bacilli was not confined to the eleven newly-born calves, because the discovery that viable calves may harbor abortion bacilli at birth, made it important to determine how long the calves of infected cows may remain carriers of the bacillus, particularly as the untenable hypothesis, "that abortion bacilli may lie dormant in the bodies of cattle from birth until sexual maturity and then cause abortions," had been widely promulgated.

We know now as the result of a large number of tests that young cattle rarely harbor abortion bacilli in their bodies, and that, when they do so, they react with abortion tests. Many calves react with such tests during the first weeks of their lives, but the reactions rapidly decline and disappear even if the calves are suckled by dams with infected udders, and, if they are protected against exposure to abortion infection after they are weaned, they become normal, healthy producers of calves when they reach sexual maturity.

As far as the Bureau's work has gone, the calves of abortion infected cows, irrespective of whether they did or did not react with abortion tests during the first weeks of their lives, and irrespective of whether they were suckled by cows with clean or with infected udders, if they are protected against infection after they are weaned, are neither more nor less susceptible to abortion disease when they reach maturity than the calves of normal cows. Which would indicate, if herd immunity against abortion disease actually develops, that it is less due to anything calves inherit from their dams or acquire by ingesting infected milk during the milk-drinking periods of their lives, than to a fairly continuous exposure to abortion bacilli from birth until maturity, and, possibly to their exposure particularly during the last two to three months before conception.

The significance of the exposure of cattle to infection with abortion bacilli during presexual life is a line of work that was greatly hampered by lack of funds. It was planned and well under way before our Country entered the war. What happened to the cost of labor and feed after the war was entered is too well known to require discussion here, and what effect this had on the Bureau's experimental investigations may be judged
when it is known that the appropriations made for them did not take the reduced purchasing value of money into account. Work requiring a certain number of animals, planned when hay was plentiful at $20.00 per ton and other forage equally cheap, was impossible without greatly increased funds when hay was scarce at $40.00 per ton and other forage had increased proportionately in cost. The Bureau had no choice; it would have preferred to retain all its experiment animals and to continue its investigations undisturbed, but the pecuniary obstacles were too great to be mastered by scientific enthusiasm, and so it was forced to resort to painfully extravagant retrenchments. Many animals that had acquired great value because of the treatment to which they had been subjected and because their origin and history were fully known, and which it was desirable to keep under observation, had to be disposed of, and, though no one was really to blame, the sorrow and regret this caused will not soon be forgotten.

The work on which the conclusion is based that the nonpregnant uterus is not a habitat of the abortion bacillus, is somewhat varied in character. The first tests dealt with infected cows that had aborted or given birth to calves. Beginning directly after the abortion or the parturition, material was collected periodically on sterile swabs from the uteruses of such cows, and studied for the presence of abortion bacilli. The studies showed, and the number made cannot be stated in dozens and scores as they amount to many hundreds, that abortion bacilli as a rule disappear from the uterus in which they were abundant at the time of an abortion or a parturition in from two to three weeks, though occasionally they persist somewhat longer and in exceedingly rare instances as long as nearly two months.

The second line of tests concerned cows into the uteruses of which cultures of abortion bacilli had been injected; the third, cows that were killed and all portions of their uteruses tested for abortion bacilli possibly hidden beneath the surface, and the fourth, cows that receive copious, intravenous injections of abortion bacilli and the uteruses of which were studied during subsequent estrual periods.

It was reasonable to conclude, though abortion bacilli could not be collected from a uterus on a cotton swab, that they might be present in or beneath the mucus membrane, or somewhere in the cotyledons, fallopian tubes or ovaries, but this did not prove to be the case. Likewise, since the pregnant uterus is the favorite habitat of the bacillus, it was reasonable to believe that special activity of the reproductive organs would better enable it to maintain itself in the uterus, and that, therefore, the estrual period deserved special attention. It is fortunate that this period does not help the bacillus to live and multiply in the uterus, because, if it did, we would be forced to conclude that all cows with infected udders are prolific disseminators of abortion bacilli via their vaginas during a number of days every month.

The discovery that bulls may harbor abortion bacilli in their reproductive organs is also the product of industrious application; that is to say, it was not a fortunate stumbling on a fact. As the belief was widely entertained that infectious abortion is carried from cow to cow by the bull, and that he introduces it at the time of copulation directly into the uterus, it was desirable to determine on what part of his sexual organs the bacilli occurred and how long they remained virulent. Hence, material was collected from many bulls, shortly after they had served cows that reacted with abortion tests and were known to have infected udders, and tested for abortion bacilli. The results in every case were negative, and it was
found that the bacilli did not survive long even when pure cultures were introduced into the bull's sheath. This work was followed by post mortem examinations of reacting bulls, and with tests of all portions of their bodies for abortion bacilli in the manner in which the bodies of reacting cows had been tested, and the organism was finally discovered in an epididymal abscess.

Since then a number of bulls have been artificially infected with abortion bacilli, and studies have been made relative to the frequency with which bulls react with abortion tests, and the frequency with which lesions, chargeable to abortion bacilli, occur in the reproductive organs of reacting bulls; also studies which conclusively proved that bulls with infected reproductive organs may expel abortion bacilli with their seminal fluid.

The studies on the frequency with which bulls react with abortion tests dealt with several hundred bulls sent to an abattoir near Washington for slaughter. The bulls were first tested and then, if they reacted, their genital organs were secured and examined for lesions and abortion bacilli. Approximately 10% of the bulls tested reacted, and approximately 10% of the reacting bulls showed lesions of the reproductive organs from which abortion bacilli were isolated. The value of these studies is not that they give us a measure of the proportion of bulls that react positively with abortion tests or the proportion of reacting bulls that are carriers of abortion bacilli. The number of bulls tested, about 325, is too small to serve this purpose, to say nothing of the fact that bulls removed from herds and sent to the butcher are not representative of those retained in herds to serve cows. Their value lies in the fact that they show that abortion bacillus disease of the bull's reproductive organs is not a wholly unique affection, which, practically, may be ignored, but an important condition, since it has been proved to be associated with the contamination of the seminal fluid, that must be taken seriously into account in our efforts to combat infectious abortion.

**MODES OF DISSEMINATION.**

Precise knowledge of the habitat of a parasite in the body of its host aids greatly in determining how it gets out of one host and into another; or, in other words, if the parasite is a pathogenic micro-organism, how the disease it causes spreads from victim to victim.

The knowledge that the abortion parasite lodges nowhere in the living bodies of cattle but the udders and pregnant and recently pregnant uteruses of cows, the reproductive organs of bulls and the digestive tracts and livers of newly born calves, and the lymph glands more or less intimately associated with the named organs, at once calls attention to the channels through which it is expelled.

From the udder the bacillus is expelled through the teat with milk; from the uterus with aborted fetuses, the placentae and discharges following an abortion or a parturition, and from the sexual organs of bulls with seminal fluid and other discharges. These three modes of expulsion have been definitely proved and no doubt can be entertained about them. That the bacillus also may be expelled with the alvine discharges of infected calves and calves that drink infected milk seems probable but has not been definitely proved. It is a question on which experimental studies have been made, but the data obtained are not sufficient to justify a final answer. But, even if the answer eventually is affirmative, this mode of dissemination could hardly be characterized as important, as it would be confined to calves with infected mothers and would be closely limited to
the time when the mothers are more or less actively expelling infected material from their uteruses.

The udder becomes infected in upwards of 60% of all infected cows, and the time during which it remains infected varies from a few weeks to six or seven years. An important fact about cows with infected udders is that, in a large proportion of cases, the infection extends to the uterus during gestation. Among the cows with infected udders thus far examined about one-half were proved to harbor abortion bacilli in their uteruses at the time of parturition.

An infected udder does not mean that a cow has aborted or will abort, or that she has shown or will show symptoms of abortion disease, but it does mean that she is a dangerous animal to introduce into an abortion-free herd of cattle. Fortunately, after having made hundreds of tests, Bureau investigators have not yet found a cow with an abortion infected udder that did not react in an unmistakable manner with the agglutination and complement fixation tests for bovine infectious abortion.

The expulsion of abortion bacilli from the uterus via the vagina, as has already been stated, is not of long duration. It requires that the products of all abortions and the by-products of all parturitions and discharges following abortions and parturitions should be treated as dangerous material.

The discharges from the male sexual organs may be dangerous when the bull is permitted to run with the herd, and, hence, in the control of bovine infectious abortion it is desirable that he should have a separate pen, away from the cows, and that he should be permitted to serve cows only on neutral ground, or ground to which cattle do not have access at other times than during that of service. It may also be wise to segregate cows after they have been served by possibly infected bulls until all danger that infected seminal fluid may leak from their vaginas has passed, and to fasten them during such segregation in a way that will prevent them from eating anything that may have become soiled with leakage from their vaginas.

These statements concerning the bull may sound curious to those who continue to hold the once widely entertained hypothesis that bovine infectious abortion is transmitted from cow to cow largely by promiscuously used, unclean bulls. Neither the investigations of the Bureau nor other data on the subject support this hypothesis, which, in fact, has little support other than a general inclination to believe that the channels of infection for microparasitic diseases must be the passages through which the attacked portions of the body communicate most easily or directly with its exterior.

It is regrettable that the time is too short to give a detailed account of the work that lies behind the statements this paper contains; if it could be given it would inspire confidence and show why I am privileged to speak with unswerving assurance.

Take a problem, for example, like the recurrence of abortion bacilli in the uterus of a cow with an infected udder at each of several, successive, apparently normal parturitions. Think of the tests; milk tests, blood tests, tests of placental material and uterine discharges, tests of calves, etc. Think of the watchfulness to prevent intercurrent infection from becoming a source of error; think of the experiment animals and culture tubes inoculated; think of the sub-inoculations of animals and culture tubes to validate the use of the results obtained as evidence. And, bear in mind, this work was not done with one or two animals, but with all the accessible cows that could be used as reliable material, until the number
was large enough to justify the conclusion that at least half of all cows with infected udders have infected uteruses at the time of calving.

To reveal facts and to secure their recognition and use requires time and work and money, but facts are eternal things and the stock the world has on record is a criterion of its civilization; and, probably, the conviction that this is true, coupled with a desire to be real agents in the world's progress, has bound many able workers loyally to their poorly remunerated service in research establishments.

CHANNELS OF INFECTION.

Microscopic as well as macroscopic parasites have favorite habitats in the bodies of their hosts, and the location of the habitat in most cases has nothing to do with the channels through which the host is invaded. Though this is a matter of common knowledge, many investigators of microparasitic diseases seem to cling to the fallacy that a close relationship exists between the attacked organs and the nearest channels from the exterior of the body through which they may be reached. Hence, it is not surprising that it should have been assumed, or that the assumption should have gained wide credence, that the vagina is the common portal of entry for the microparasite of bovine infectious abortion, as the favorite habitat of the parasite is the pregnant uterus, where it attacks, primarily, neither the parent nor the offspring, but rather the medium through which the two are in communication.

It was early recognized by Bureau investigators that this assumption lacked proper support, and that, if it was true, the community or association owned, more or less promiscuously used bull would prove an ideal agent to facilitate the spread of abortion disease among cattle. At the same time it was apparent that the use of a relatively small number of well-bred, community or association bulls was vastly more economic than the use, to only a fraction of their capacity, of a larger number of individually owned, scrub bulls. These and other reasons for studying the role of the bull in the spread of bovine infectious abortion were unmistakably urgent, and prompted the experimental tests of which the following is a brief outline. Cows wholly free from abortion infection were given intra-uterine injections of pure cultures of abortion bacilli, placental material from cases of abortion and material obtained from aborted fetuses before they were served by a bull; others were served by bulls which reacted positively with abortion tests; others were served by bulls which had shortly before served cows with infected genital tracts, and others by bulls, both naturally and artificially infected, which were expelling abortion bacilli with their seminal fluid. Quite a number of cows were used, many of which afterwards were proved to be susceptible to abortion disease, but, in all cases the results failed to justify, in the least degree, the assumption that cows are infected with abortion bacilli via their vaginas and uteruses at the time of copulation, or that the bull, through copulation, is an agent in the spread of abortion disease. The cows not only failed to abort, but remained negative to abortion tests. The total number of calves produced was smaller than probably would have been the case if the uteruses of the cows had not been subjected to unnatural treatment and the bulls had not been somewhat deficient in potency because of the diseased condition of their sexual organs; but, the cows that conceived passed through their periods of gestation in a normal manner, and the gestations terminated in the normal births of normal calves. In each case after service by infected bulls seminal fluid was collected from the vaginas of the served cows and tested for the presence of abortion bacilli, and the bacilli were repeatedly found in the seminal fluid of one naturally and
one artificially infected bull. In each case the placentas and uteruses of the cows were tested after parturition, and no abortion bacilli found.

Clearly, the uninjured sexual cavities of non-pregnant cows do not serve the abortion bacillus as channels of entry. Whether infection may occur via the vagina after pregnancy has been established has been given little attention by Bureau investigators, mainly because it is not an economically important matter, as such infection could hardly occur elsewhere than in an environment in which the bacilli are very abundant, and in which they could easily enter through other channels. Work of other investigators seems to prove that the injection of abortion bacilli into the vaginas and uteruses of pregnant cows leads to abortions.

The community or association bull evidently is harmless so far as infectious abortion is concerned, and he is so without elaborate and troublesome disinfection of his genital organs, provided the precautions already suggested, a bull pen, service on neutral ground, etc., are observed.

As the udders of infected cows in many cases harbor abortion bacilli long periods of time, their transference from udder to udder during milking seemed reasonably possible. An experiment relative to the matter was made, but the number of animals used was too small and the time they were kept under observation too short to give the negative results obtained full validity, particularly as it was definitely proved that abortion bacilli introduced into the udder, through the teat with a milking tube, soon reach the uterus of a pregnant cow and cause abortion. This is a line of studies that was interrupted by inadequate funds; but, the problem with which it dealt is one that is not urgently in need of a solution, because the transference of infection from cow to cow through milking would be practically impossible elsewhere than in an environment in which infection through other channels would certainly occur.

The one mode of infection, and I speak in this case of modes that require no artificial practices, that gives positive results, is the ingestion of abortion bacilli. When a susceptible, pregnant cow is permitted to ingest abortion bacilli, either pure cultures or material from cases of abortion, she rarely fails to become a victim of the disease. In a large proportion of cases she afterwards aborts and reacts positively with abortion tests, and a large proportion of the cows that do not actually abort after having ingested abortion bacilli, show other signs of the presence of the evil, such as abortion bacilli in the placenta and the uterus at the time of parturition, the production of a weak calf, the occurrence of the bacilli in the udder, etc.

Ingestion, to judge from the investigations of the Bureau and other available data, seems to be the natural mode of entrance for the abortion bacillus into the bodies of its victims, and other conceivable, natural modes of entrance, though they may not have been definitely disproved, plainly lack experimental evidence that proves their existence.

Letters are received occasionally from cattle owners describing in retail how the introduction of a new bull into their originally abortion-clean herds was shortly followed by a seriously large number of abortions, with absolutely no discoverable source of infection but the new bull, regarding whom it was learned too late that his history could be traced to an abortion infected herd. In cases like this we may feel confident, if all other sources of infection have been fully excluded, quite a difficult thing, by the way, when we deal with a common, wide-spread, insidious evil like bovine infectious abortion, that the bull was not only affected with abortion bacillus disease of his reproductive organs but was also permitted to associate freely with the cows, so that leakage from his penis would lead
to the contamination of their food and drink and to their infection through their digestive tracts.

**TESTS FOR ABORTION DISEASE.**

The control measures indicated by the nature of the abortion bacillus, its habitats in the bodies of cattle, the manner and time of its expulsion and by the channels through which infection occurs, are relatively simple. The real difficulties begin, as naturally would be expected with a disease in which the seemingly healthy carriers of its prime cause are exceptionally numerous, when the distinction between dangerous and safe animals must be made, and this brings us to a consideration of abortion tests.

Among the various tests which have been devised, two, the agglutination and the complement fixation, alone possess a serviceable degree of efficiency, and the Bureau has found, after having made thousands of comparisons, that, on the basis of reliability, there is no choice between the two, but that the agglutination test because of its much greater simplicity, is the one that should be preferred, and this is a matter on which most investigators are in accord.

These tests have been criticised because they do not show that a cow will abort, and because some cows do not react after they have aborted, and for a number of other reasons, but such criticisms lose most of their weight if we view them with a rational comprehension of what the tests are and of the kind of information they can be expected to give.

To expect that an agglutination or a complement fixation test for bovine infectious abortion should indicate that a cow will abort would be similar to requiring of the tuberculin test that it should show whether an animal will succumb to tuberculosis within several months, and to expect that every cow that has aborted should react with infectious abortion tests would be like expecting the tuberculin test to show the presence of any disease with necrotic, caseous or calcareous lesions. An abortion is, strictly speaking, the supreme or superlative event in bovine infectious abortion, and not an essential event. We may reasonably say, as all children attacked by diphtheria do not die, so all cows attacked by bovine infectious abortion do not abort; and, we may also say, as all diphtheroid lesions are not due to Loefber's bacillus, all abortions among cows are not due to the Bang bacillus.

The Bang bacillus may enter the body of a cow so shortly before an abortion that a reaction does not occur until sometime afterwards, and it is not difficult to believe that in rare instances, owing to recondite or abstruse causes, cows infected with bovine infectious abortion fail to react, just as some tuberculous subjects fail to react with tuberculin. But on the whole, if the agglutination and complement fixation tests are properly made, they show with an amazing degree of perfection whether an animal is or has been harboring abortion bacilli in its body.

Some of the noteworthy results obtained with the agglutination test by Bureau and other investigators are as follows: If it can be proved that the udder of a cow harbors abortion bacilli, the reaction will be positive in a dilution of one to two hundred or more; the reactions obtained with, respectively, milk and blood serum from the same cow, though they may be equal, that of the serum usually is a little stronger; colostrum from infected cows often reacts in enormously high dilution; the calves of reacting cows often react, sometimes higher than their dams, but the reactions are passive and do not persist long even when the calves are suckled by cows with infected udders; when two tests are made sometime apart, a declining reaction, particularly if it is below 1 to 200, signifies that the
animal probably no longer harbors abortion bacilli in its body; bulls which harbor abortion bacilli, in all cases so far tested, react positively, etc.

A reaction in a dilution of 1 to 200, or 1 to 25, or 1 to any other number, as the expression is used in this paper, means that the bacilli in a definitely measured volume of a standard suspension of abortion bacilli are agglutinated by adding to it an amount of serum which is proportioned to the volume of the suspension as the smaller number is proportioned to the larger; thus, a reaction in a dilution of 1 to 200 would mean that the volume of the suspension was 200 times as great as the volume of serum added to it, and, in a reaction of 1 to 25, that the volume of suspension was 25 times as great as that of the serum; consequently, if the volume of the suspension was 1 c. c., the volume of serum in the one case would be 1 divided by 200, or .005 c. c., and in the other, 1 divided by 25, or .04 c. c.

Reactions vary greatly with material obtained from different cattle that are known to harbor abortion bacilli, and may reach the enormous height when blood serum is tested of 1 to 3,200, and when colostrum is tested 1 to 25,000. Think a moment of the potency of the specific agglutination agent indicated by these figures. Blood serum and colostrum, chemically, are complex substances of which, at most, a very small fraction can be supposed to be the agglutination agent, and yet, the serum at times agglutinates the bacilli in 3,200 times, and the colostrum in 25,000 times, their own volume of suspension.

What measure of agglutinating power of the blood serum should be regarded as a certainly positive bovine infectious abortion reaction, whether it should be higher than 1 to 50 or as low as 1 to 10, has not been definitely determined, and is a subject on which dogmatic statements would be dangerous before all matters relating to the test have been so standardized that a satisfactory comparison can be made between the reactions obtained by different investigators.

The Bureau investigators are strongly inclined to believe, on the one hand, that even a very low agglutinating property of blood serum for abortion bacilli should be viewed with suspicion; and, on the other, that a declining reaction, particularly if it drops below and remains lower than 1 to 200, indicates that an animal is safe so far as the dissemination of abortion bacilli is concerned.

TREATMENT AND PREVENTION.

Treatment of infectious abortion with drugs or chemical agents, either internally or externally, has given little, or no, or only false encouragement. The Bureau's work in this connection, though not abundant, proves that the more insidious and chronic a disease is, doubtless a matter of common experience, the greater the chances are that those who attempt to treat it may go astray in their valuation of the events that follow treatment, more particularly if the treatment is given under the supervision of a conscientious, capable person who greatly improves the sanitary conditions under which his subjects live, without taking into consideration how much the consequently more hygienic environment may benefit both the affected and the exposed subjects.

Unquestionably it is economical to give cows that have aborted, or that do not clean properly, or that are afflicted with other troubles of the reproductive organs and functions, proper treatment, but such treatment should not include attempts to disinfect the uterine and vaginal cavities by irrigating them with strong germicidal solutions, because such attempts will prove futile, and cannot be made without serious danger of doing
harm. The modern and rational idea of wound treatment should be applied to the treatment of the injured or diseased uterus, and that means the removal of dead and foreign material on which saprophytic and facultative pathogenic micro-organisms can feed and multiply, and not the further devitalization of injured and diseased tissues.

Treatment with abortion bacilli, killed and living, alone and in combination with anti-serum has been tried with varying and contradictory results. The Bureau's work on the subject is restricted to the use of killed cultures among pregnant and living cultures among non-pregnant cattle.

In one large herd numbering over a thousand head of cattle, of which 911 remained under observation one year and 453 a second year, the results from the injection of live-organisms before conception were as follows:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Abortion Rate First Year</th>
<th>Abortion Rate Second Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treated cattle</td>
<td>13.12%</td>
<td>10.29%</td>
</tr>
<tr>
<td>Untreated cattle</td>
<td>17.7%</td>
<td>14.09%</td>
</tr>
</tbody>
</table>

The treated animals in the first year numbered 617 and in the second 311, and the untreated in the first year 294 and in the second 142.

Regarding this herd it should be said that it was located a long distance from Washington, and could not be kept under the close, continuous, personal supervision of those who planned the work that is desirable in an experimental test, and, unfortunately, the uninterrupted services of a trained inspector to immediately supervise it failed for reasons over which the Bureau had no control.

The live-organism treatment, or attempted immunization, however, in both years, though it was not fully satisfactory, evidently was not attended or followed by ill effects. In both years the proportion of abortions among the treated cattle was a little lower than among the untreated, and the percentages of sterility which developed in the two groups during the time they were under observation were practically alike.

An examination of the available data on the use of living cultures of abortion bacilli to secure immunity shows three things; one, that very few tests have been made under strict, experimental conditions; two, that the number of abortions among cattle that have received injections sometime before conception drops with a noteworthy frequency to approximately six per cent, no matter what it may have been before immunization was attempted, and, three, that the per cent of abortions among treated is lower as a rule, than among untreated cattle kept under the same conditions.

In connection with this statement it may be interesting to record the observations made in a large, privately owned herd of dairy cattle, which the Bureau includes among its investigational material, and to give a synoptic account of one, precisely made, experimental test on immunization.

The dairy herd numbers about 200 cattle; it has long been infected with abortion, and the current number of abortions was greatly reduced by raising the heifer calves born in the herd to replace cows as they outlived their usefulness. All the cattle have been repeatedly tested with abortion tests; the proportion of reacting cows is relatively small, and the reacting and the non-reacting animals are not permitted to come into contact with each other. Now, in this herd about 6% of the cows have aborted during the past year, and the proportion of aborting cows among those that react is about equal to the proportion among those that do not react.

We have here this factor of about 6% which is frequent among abortion-immunized cows. Would it not be pertinent to ask whether it is a figure that approximately indicates the number of abortions among cattle that are due to other causes than the Bang bacillus? We might lightly
dismiss this question by saying that we are here face to face with the inefficiency of abortion tests, but let us not be too hasty. It would be surprising if no other causes for abortions among cattle, animals superlatively artificial because of the kind of selection that has been practiced in breeding them for human, utilitarian purposes without giving too much thought to what nature intended them to be, existed than the Bang bacillus, and it would likewise be surprising, when we bear in mind how complex the reproductive functions are, if there were no other causes for abortions among cattle than microparasites.

Some of the Bureau investigators have determined to devote much time and study to this phase of the abortion question in the future.

And now for the test, which does not include a large number of animals, but was made in harmony with true, experimental standards.

Twenty-three cattle, part of a drove of sixty-six, not one of which, according to the tests that could be made, was infected with bovine infectious abortion, were divided into three groups. Eleven received subcutaneous injections of pure living cultures of abortion bacilli, about two months before they were served by bulls; four received repeated injections of killed cultures of abortion bacilli after they had become pregnant, and eight were retained, untreated, as checks or controls. The twenty-three cattle were equally and similarly exposed to abortion infection; the exposure was via the digestive tract, or the kind of exposure that would occur in nature, and the material used for the exposure was obtained from actual cases of infectious abortion.

Of the eleven cows treated with live organisms before conception, ten calved normally in all respects and one aborted.

Of the four given dead organism treatment after becoming pregnant, two calved normally and two aborted.

Of the eight controls, seven aborted.

The cattle of the first group, those which received treatment before they were served by a bull, were kept under further observation until they had produced an additional fifteen calves. They suffered no breeding troubles, such as retained placentae, sterility, etc.

The number of animals in the second group, only four, is too small to permit drawing the conclusion that treatment with dead organisms in some measure protects gravid cows, but the difference of one abortion among eleven cattle and seven abortions among eight, can leave little doubt that a serviceable degree of immunity against abortions can be engendered by subcutaneous injections, prior to conception, of living abortion bacilli.

A SEARCH FOR OTHER CAUSES OF ABORTION AMONG CATTLE.

A search for other specific causes of abortions among cattle has not been neglected, and Bureau investigators could relate at great length stories similar to those other investigators have told about micro-organisms isolated from the products of abortions and the uteruses of cows that have aborted. Bacilli of various kinds, different types of micrococci, and spirilla or vibrio repeatedly have been found, but when their pathogenicity has been tested in accordance with widely recognized and accepted and required bacteriological standards, not one shred of evidence has been obtained to prove them true etiological factors of bovine abortions.

What role such micro-organisms may have as causes of the sequela of infectious abortions, and of other, possibly independent, abnormal processes in the reproductive organs, is far from clear, and merits careful study.
BOVINE INFECTIOUS ABORTION AMONG SWINE.

At times the Bang bacillus attacks sows and causes abortions among them. Attention has been given to this matter, but as yet little progress has been made. The Bureau's work indicates that swine are strongly resistant against ordinary strains of the abortion bacillus, but is not conclusive on the subject. So far it has been able to secure only two strains of the bacillus isolated from outbreaks of abortion among swine, and these strains, though in other respects like those obtained from cattle, are not wholly like them in the lesions they cause in guinea pigs. One of the strains causes lesions much grosser in character, and the other has the peculiarity of causing orbital tumors in a large proportion of guinea pigs injected with it, which lead to a crowding forward and an extreme protrusion and the gradual destruction of the eye. While it is remarkable that both strains of the bacillus derived from swine should vary more from the general type obtained from cattle than strains from cattle vary from each other, we must remember that it is only two strains we have studied. One of the strains caused abortions in both a sow and a cow, and in this case the sow was exposed through ingestion, and the organism was afterwards recovered from her uterus and the aborted fetuses. With seriological tests both strains act precisely like ordinary abortion bacilli.

It will be apparent from what I have said that much work on infectious abortion has been done and that valuable results have been obtained, and it will also be apparent that much remains to be done. The work is peculiarly of a kind that requires time, diligent application, long-sustained interest and considerable expenditures of money. I hope that I have presented an outline of it to your minds that will convince you that what has been accomplished justifies that the work should be continued and liberally financed.

PRESIDENT CREWE: The next paper on this subject is: "Herd Control of Infectious Abortion in Cattle," by T. H. Ferguson, Lake Geneva, Wisconsin.

DR. T. H. FERGUSON: Mr. President, I presume the reason that the Program Committee put a practitioner on this program was to see whether he was acquiring any useful knowledge from the use of his scientific researches that have been conducted. I have prepared a short paper on the plan that I have used for a number of years in controlling abortion disease in herds. I have, like others, used medicinal treatment when I thought it was indicated. I have used bacterins and still use the bacterin treatment, and I think it is well to use living organisms when indicated in herds where you are sure that the Bang bacillus is causing the disease.

To properly carry out the control of abortion disease of cattle one must recognize the fact that this disease is always due to infection and outline the control measures on that basis always remembering that the ideal aimed at is a sound herd.

1st. Examination of the herd.
2nd. Segregation.
3rd. Treatment of herd; cows, heifers, calves, bulls.
4th. Breeding.
5th. Feeding.
1st. Examination of herd.

It is necessary to make an examination of the genital organs of each animal of breeding age in the herd and the result of the examination,
with the breeding history, should be recorded in a book to be kept for that purpose. Due regard for cleanliness and sterilization of instruments and appliances to be used in making the examination should be practiced. The physical examination may be supplemented by blood tests of each animal and their results recorded on the physical examination sheet.

2nd. Segregation.

The examination records will indicate what is best to be done with each animal.

Those that are apparently sound may be kept in the herd, after the herd quarters are thoroughly cleaned and disinfected with a reliable disinfectant and whitewashed with a solution of freshly burned lime. It is well to give each animal an antiseptic bath before stabling in the clean quarters.

Cows and heifers in advanced pregnancy should each receive an antiseptic bath and be placed in a clean disinfected and whitewashed maternity stable and kept there for at least 7 weeks after calving or until they are evidently free from disease.

Cows or heifers in any stage of pregnancy or open ones showing any indication of the disease are to be segregated in comfortable clean quarters that are convenient to maintain clean and disinfected and are to be handled to avoid spreading the infection. The permanently damaged hopeless cases and those of little value should be sent to the slaughtering plant without delay.

Stable and pasture the young stock by themselves, until they are of breeding age at which time they are to be examined and bred, if clean, they then may be kept with the clean pregnant cows or segregated.


The importance of herd sanitation should be impressed upon those having charge of a part of this work, they should be instructed how to properly clean and disinfect the premises and maintain them that way. How to dispose of the dead animals, fetus, fetal membranes and contaminated litter; how to avoid the contamination of food stuffs and drinking water; how to keep the external genitals including the udders clean; to douche the vagina, clean the prepuce and irrigate the sheath of the bull. To maintain in proper shape the common equipment necessary to carry out the treatment.

The cows and heifers in the maternity stable should receive a vaginal douche of an non-irritating disinfectant daily and their external genitals, tail and udder must be kept clean with soap and water. If they calf and clean normally and involution of the uterus takes place promptly and they have no discharge from the uterus, cervix or vagina they may be returned to the herd in two or three weeks. Cows and heifers that have been segregated on account of apparent impending abortion should receive the same sanitary handling and the weekly use of mixed metritis bacterins may be tried. If abortion or premature birth takes place the animal should be isolated with the ones of that class and treated as indicated.

The bull’s fitness for service should be determined by a physical examination and he should be used on sound cows only. His prepuce and sheath should receive proper attention before and after service, regular exercise, proper feeding and moderate use go a long way in keeping him fit. If he should accidentally breed an unclean animal sexual organs must receive prompt and frequent attention until they are apparently normal.

New born calves, after being dried, receiving a dose of anti-white scour serum and a navel treatment, are to be placed alone in clean quarters.
or if kept with other calves they should wear a muzzle. If their feces are normal in twelve to twenty-four hours they may be fed or allowed to nurse the dam, after her udder and teats have been prepared by washing with soap and water and rinsed with a disinfectant and milked out a little. Only a small amount of milk should be allowed twice a day for the first ten days. If at any time there is any indication of white scours omit feeding for a day, wash out the rectum and floating colon with a warm ¼% Lugol’s solution twice daily and administer large doses of anti-white scours serum. It may also be necessary to use anti-acids and stimulant treatments.

The herd should be fed with due regard to the health of the animals. It has long been recognized that high feeding of proteins has a deleterious effect on the breeding powers of animals and a little judicious care in the selection and use of proper feed stuff will help very materially in controlling abortion disease and maintaining the efficiency of the herd.

On motion, duly seconded and carried, the meeting adjourned until two o’clock P. M. of the same day.

FOURTH SESSION.

November 29, 1921, two o’clock P. M.

PRESIDENT CREWE: We are going to take up and finish the program of this morning by the discussion of these various papers on abortion disease, the first one being, “Suggestions for the Improvement of the Reproductive Efficiency of Cattle,” by Prof. Williams of Ithaca, N. Y. Dr. Boyd was unable to be here, and Dr. C. P. Fitch, of St. Paul has kindly offered to open the discussion.

DR. C. P. FITCH (St. Paul): Mr. President and Gentlemen:

In a discussion of this kind, one can carry it on ad infinitum, but in the few remarks which I have to make this afternoon, I will attempt to refer to a very few particular points.

First, there is a great deal of impression, especially among the laymen and the lay-friends, that we know very little, if anything, about bovine infectious abortion; therefore, no control measures can be instituted against this disease, because our knowledge of this infection is too limited. I do not believe that anyone who has heard the papers this morning can leave the room with that impression. There are many phases of this infection which are still very imperfectly understood, but that same thing is true generally in regard to many other infectious diseases, in which we are instituting control measures, and which we are attempting to control.

Anyone who was here at the conference on Friday and heard the discussions in regard to the application of the intradermal test had it proved to them that all things in regard to the eradication of tuberculosis were not perfectly clear.

Now, it is true that many phases in regard to abortion diseases need much further research, but it is also true that we know the fundamental biological factors, which underlie that disease, and have a basis to build on, and to erect a superstructure of good, efficient and practical control.

Second, we have heard this morning a good deal about three different conditions, and I believe that my previous statement is based upon the confusion which exists in the minds of many in regard to those three conditions. We have heard of bovine infectious abortion; we have heard of sterility, and we have heard of diseases of calves. Now, gentlemen, those are just all strictly as etiologically different as any conditions can
Bovine infectious abortion, as defined by the Committee of the American Veterinary Medical Association, refers to that disease which is caused by bacteria abortus Bang, and no other condition is included under that disease. The difficulty is that we have taken a symptom of that infection and called it a disease. Pathologically this is placentitis.

We heard reference this morning to abortion disease in the bull. Now, that is rather a queer thing, when you stop to consider what it actually means. The infection, it is true, exists in the bull, but it is the result of an infection of an organism, and that one symptom is the cause of abortion and that is all.

Sterility has never been shown, by any experimental evidence that I have in mind, at least, to result directly from infection with the bacteria abortus Bang. It is true that bacteria abortus Bang usually paves the way for the introduction and growth of the numerous pyogenic microorganisms which cause the various pathological conditions of the genital tract of cattle and lead to sterility.

Third, diseases of young calves have never been known to be caused by bacteria abortus Bang. Various micro-organisms have been associated with that condition, but in no instance has any serious outbreak of the infection—and only in very isolated instances has this organism been shown to produce a serious condition in the calf. Therefore, when we are considering these conditions we should keep in mind that we are dealing with three ethiological conditions, and not confuse in our minds the various results from these various infections.

There was one point that was made by Dr. Williams, which I cannot entirely agree with him on, and that is in relation to the use of oil, iodoform and sub-nitrate.

He made one rather significant statement, if I understood him correctly, when he said they fall into the uterus—if I am correct, and remain at the bottom. All the infection which exists in the uterus does not remain on the floor of the uterus, and unless that agent is distributed over the surface of the uterus in some way, it certainly does not strike the point where the infection exists; and, second, the researches of Hallman have distinctly shown that the use of irritating disinfectants in the uterus and in the cervix, leads to fibrosis, and to a definite pathological condition. In other words, it is exceedingly difficult to introduce into the uterus an agent which will destroy bacteria, without at the same time injuring the uterine mucosi.

There is just one word that I wish to say in regard to Dr. Schroeder's paper. Dr. Schroeder and I have discussed this paper two days, that is, certain phases of it. If one is to face the control of an infectious disease upon distribution of the virus of that infection, they are introducing an element which is liable to react towards them. As has been pointed out by Edwards in a recent article in the Veterinary Record, based upon the results which were obtained in England, where they have used living vaccines for a period of eight years—last year they distributed more than 30,000 doses from the Government alone—and he states as a result of the work here done that the control of bovine infectious abortion is still far from being brought about.

Again, it was significant in the two experiments that were reported by Dr. Schroeder that in one instance in the herd infected, that very little, if any, effect was noted by the use of the virus; whereas in the herd at the farm where the virus was used fresh, the results were very different.
Personally I have examined test fluids, which is a saline suspension of bovine abortion bacteria, after periods of three, five, ten, twenty and thirty days, and I have found the number of living bacteria very materially reduced after three days even, and often times all dead after ten to fifteen days.

Now, it is very possible that the agents which were made in Washington and sent to Texas have, in some instances, lost their virulence. That would serve to indicate, at least, that if living cultures are to be efficacious, that they must be prepared and used very soon after they get into a saline suspension.

Finally, if virus is permitted to be miscellaneous distributed, all kinds of results may be anticipated. This has been shown in other diseases than bovine infectious abortion. One would better look carefully before a product is advocated for country-wide usage to see whether or not some regulation should not be established to control, or at least supervise, its use. I thank you. (Applause.)

PRESIDENT CREWE: Any further discussion of this paper of Dr. Williams?

DR. A. EICHORN: Mr. President, I came a little bit late, but I had the pleasure of listening to part of the discussion of Dr. Fitch, and I particularly desire to take up the subject on the control of bovine infectious abortion. He referred to the experiments conducted in Texas, and also in the experiment station. In one instance the apparent results were poor and in the other instance the results were good. Dr. Schroeder referred only to those two particular cases, but I am quite sure he is aware of a great number of cases, and I am quite sure Dr. Fitch is aware of a great number of cases, because they have been extensively published, not only in this country, but also in other countries, and why limit it to the result of two experiments when we have available experiments which extend over a large number of animals, I daresay many thousands of animals.

With reference to the danger of abortion, I am fully aware that as long as we propagate disease by furnishing providers that naturally eradication would be very difficult, if at all possible. I fully concur with Dr. Fitch on that point, but we must not lose sight of the fact that abortion disease at the present time, in pure-bred herds, at least, is so widely spread that I do not believe that even where the disease has been cleanly wiped out that we are not in danger of increasing or propagating the disease in the country. I have in mind one particular herd of pure-bred animals, but on account of the existence of tuberculosis in that herd, and the impossibility of eliminating tuberculosis in it on repeated tests, we were asked to conduct some investigations as to one of the animals which it was thought had harmful bacilli in the milk. Consequently, we tested the entire herd, consisting of 38 animals, and made guinea-pig inoculations, and next year it was eliminated to such an extent that it was not considered. We made these inoculations, using two guinea pigs for each animal, and after four weeks posting all these animals, we found that each of these guinea pigs showed distinct lesions of abortion disease. They were carriers, and I believe that if we had used subsequently live abortion organisms, that probably we might have created a few more animals.

These are just facts, and since Dr. Fitch could not offer any other method of control, I cannot see what harm we can do at the present time in employing the best we have at our command, instead of letting the calves be slaughtered right and left, and causing great economic loss among breeders. (Applause.)
PRESIDENT CREWE: Any further discussion on this paper of Dr. Williams?

DR. C. E. COTTON: Mr. Chairman, I hesitate to enter into a discussion with scientific men and bacteriologists, but from a control standpoint, the men connected with the state control have a duty to perform to live stock breeders of their states. Their duty is to protect live stock from diseases in their states.

Now, we are in an age of prevention, and I think now is the time in which we are justified in making some regulatory measures to control the distribution of the living organisms of any of the diseases of live stock, and this is one of them. From our experience with hog cholera virus in this country, we know that it saves animals that are infected; we know it stops losses, but we all know that we cannot control any infectious disease if we cannot control the distribution of the infectious agent of that disease.

In our neighboring state of Iowa, conditions are such that even farmers can use virus. I do not blame any herd-owner, particularly when he has a storm, as Dr. Williams says, for using any of these agents, living or dead; but it does not make any difference what agents you use in this disease, as the disease in itself is self-limiting. In other words, if you single out some particular animal and treat her with this virus, probably the second time thereafter she will not abort, unless there is some pathological condition resulting therefrom, she will continue to be a valuable breeding animal in that herd. It does not make any difference what you use as an agent in that particular case, it is going to get the credit for having produced that result.

Now, gentlemen, what is this going to mean? They advise us to use living organisms in virgin heifers, for non-pregnant animals; to use bacterins or dead organisms in the pregnant animals. We have regulations in our states by which they report the sales of these things, and we call them up and say: "Do you know what you are using?" One man said: "No, all I know is that I have got to give her one shot." They do not read all these things, because they are loaded with propaganda that is being shot at them.

Gentlemen, do not misunderstand me. I feel that the owner of a herd that is infected should have the privilege of using these things, but there must be some regulatory measure whereby he should agree to observe certain regulations, and that it should be administered in the hands of an efficient veterinarian, and under some regulatory conditions, although I do not want to state what they should be. But let us go a little bit carefully in the control measures with these privileges. (Applause.)

DR. E. A. CAHILL (Indianapolis, Ind.) Mr. Chairman, the paper that Dr. Schroeder gave us this morning is probably the most remarkable paper on infectious abortion that has ever been presented to this Association. Were they the first figures of their kind, it might warrant some of the remarks which have been made. However, they come from a considerable review of the literature on the subject of the value of vaccine for the control of infectious abortion, one of which was mentioned by Dr. Fitch, which in itself is only a review; and if one considers that in this report made by Dr. Edwards, he reviews the work of the German investigators, endorsed by the British Royal Commission, endorsed by our fellow worker, Hadley of Wisconsin, and considers that part of the quotation made by Dr. Fitch is correct, but that in addition to that Edwards further states that while there still remains much to be learned regarding vaccine or the value of vaccine in controlling abortion, the fact does re-
main that in the work conducted in Germany and in the work conducted in England, vaccine gave the most encouraging results which have been obtained to date. That is from the same quotation as given by Dr. Fitch.

The work done by Hadley of Wisconsin, recently read before the American Veterinary Medical Association, shows conclusively that in so far as the work has gone the injection of vaccine not only failed to spread the disease, but it actually reduced the percentages of abortions in this country, in England and in Germany from 50 per cent, to something like 12 per cent in injected animals. If we have any better control, if we have any better experiments, or if we have made any progress in this direction, this is the very foundation.

The results shown by the German investigators were not without control. They had almost fifty per cent aborters, and the report they made, and the report of the Royal Commission, conclusively show that the percentage of abortions in the unvaccinated animals, or rather in the animals vaccinated with bouillon had fallen off approximately 50 per cent, compared with approximately 12 per cent in the other animals.

I do not think Dr. Schroeder intended—I do not think anyone with any sense intended to recommend the use of abortion vaccine in non-infected herds; but it certainly is the most valuable thing which has yet been presented to control the disease in infected herds, and nothing, gentlemen, that is available, goes to substantiate the statement that the injection of these organisms results in a spread of the disease.

DR. G. A. DICK (Philadelphia, Pa.) Mr. Chairman, as against the statement that there are no control measures for abortion disease, I want to cite the work done by Dr. Deuber, in Pennsylvania, which I think is conclusive evidence that we do have a method for controlling abortion disease.

Prior to Dr. Deuber's work, which began in 1916, this farm-owner had from 10 to I think 35 per cent abortions. In a year's time he reduced that percentage to three per cent, I think it was—the second year to less than one per cent, and since that time he has had no abortions. At the same time he wiped out calf disease. He recognizes the fact that that is absolutely distinct from abortion disease, but the same control measures used for preventing abortion disease also wiped out the diseases peculiar to the new born.

His method is a simple method of sanitation or isolation of the infected animals. He has constructed on his farm individual box stalls three in a row. Each one is separated from the other by a tight wall, and they are constructed in such a way that the ceilings can be whitewashed and the floors disinfected after every abortion, or if necessary, he can close the building up and fumigate it. By placing an animal that is about to give birth to a calf in this stall, and retaining her there for a few days, until the uterus has involuted, he has been able to wipe out not only abortion disease, but, as I said before, diseases of the new born.

Before that animal goes back to the main herd, she is thoroughly examined—and this is the point that I want to emphasize—the uterus is thoroughly washed out with a very mild antiseptic solution, and if she shows any signs of pus, she is isolated until that clears up. However, he does not douche the bull or use any other control measure at the present time. He figures to keep the calves isolated until they are about to produce milk before they are introduced into the main herd.

It seems to me that that procedure is very simple, something that any man can carry out, and I think because it is so simple nobody has tried to
do it except what has been done in Pennsylvania, towards bringing re-
sults in this way.

DR. EICHORN: Mr. Chairman, I believe the remarks of Dr. Dick
were intended for me, that I made the statement that no control measure
is effective. We know that in all infectious diseases sanitation, especially
intensive sanitation, is of some value. But how can we imagine that
isolation will prevent infection in the uterus? So with the view that such
intensive sanitation is not practical in all instances—if it could be prac-
tical it would be much simpler, but it is not under all conditions—but even
if there is intensive sanitation, from the evidence that has been presented
that will not eliminate infection.

One word in regard to the live organisms suspended in saline solu-
tions. We have made some progress. We shipped live organisms to Kan-
sas City, kept them there for four weeks and had them returned to Pearl
River. A careful bacterial count was made on the suspension before they
were shipped, when they reached Kansas City, and again on their return,
and we found only ten per cent discrepancy in those, and that examination
was made practically six weeks after the preparation of the suspension.

DR. DICK: Mr. Chairman, I don't believe Dr. Eichorn just got me
right. Every animal on the farm is isolated prior to calving, parturition,
regardless of whether she is infected or not, and I think in that lies the
success of this method. Every animal must be regarded as a spreader.

As far as milk is concerned, we know that that is not especially dan-
gerous, and Dr. Barnes, I think, can give me the figures, because we have
recently tested the herd, and we know that we have had infected animals
on this place right along, but in spite of that, with this method of han-
dling, of course, being careful about spreading the milk around, no milk
thrown promiscuously upon the floor, or where susceptible animals can
get it—in spite of that, probably numerous cows were in the herd with
infected udders, and abortion disease has been practically wiped out.
Practically, I mean, because they have not had any abortions for several
years.

MR. J. G. FERNEYHOUGH (Richmond, Va.): Mr. Chairman, I be-
lieve nobody else except these gentlemen that are selling these products
and men who are, like Dr. Cotton, interested in it, have spoken about this.
These men jump up when we say we can produce this result from this
project, they jump up and dispute it. I think they are unduly excited. It
reminds me of a mule that I had, and one day the stable door was left
open and he ran out, and he was snorting and kicking, and kicking and
snorting, and I could not tell whether he was kicking at his snorts or
snorting at his kicks. (Laughter.) So I came to the conclusion that he
was unduly excited and did not know what to expect when that door was
open.

As I understand it, all that Dr. Cotton is against is that he thinks
this organization ought to have some control over these different prepara-
tions. I quite agree with him. Hog cholera virus and serum has proven
a good thing when properly handled, but it is a mighty dangerous weapon
in the hands of an ignorant man; and I think the argument Dr. Cotton
suggested there is a good one, and I, for one, have nothing in criticism
to offer; but I do say we must be careful; we must lay our foundation.

In our State of Virginia we get inquiries from herd-owners as to
whether it is safe to use one of these preparations, and I always tell a
man that he may use it, but he must employ a veterinarian, and I am not
working for the veterinarians.
If you gentlemen who are interested in this thing are not careful, you will overdo it. Don't you know if it had not been that a number of men drank too much—if they had taken a little toddy, we would never have had any use for all this trouble, but they did take too much. What was the result? Nation-wide prohibition, and the first thing you know, if you are not careful, you will have another prohibition act. We want to help you. The good book says—too much learning is a dangerous thing. It does not say that. It says—too much study is a weariness to the flesh, and there is no end of writing books. That does not mean that we do not appreciate these students, because we do. We could not do without them. We could not do without the Department at Washington. I did not mean to criticise, and I do not want to cast any slur or slam; but we must be careful to do what we can to produce results in the best way possible. Hog cholera virus handled by a qualified man is absolutely a good thing. I cannot help but think it is a good thing. But if you want to learn how to deal with your fellow man, before you start read "David Harum." (Applause.)

I would like to endorse all that Dr. Dick has said regarding this herd, and I can say further on the herd, we have a few of the older animals, about fifteen per cent of those that we tested that would react at the present time. I would also like to endorse what Dr. Fitch and Dr. Cotton said, but I would like to go a little further than Dr. Cotton.

I think that we should confine the use of live culture vaccine to experimental farms, confine it to infected farms, to be used only experimentally. I do not believe that we are ready to indiscriminately distribute living culture vaccines for use either on infected or non-infected farms.

We have conducted a few experiments in Pennsylvania along the lines which Dr. Dick has mentioned. We are controlling abortion on three or four herds at the present time by that method, and in other herds we are controlling it by isolation. In one herd in particular, about a year ago, about twelve animals had aborted within two or three months. Those animals were blood-tested and diagnosed positively, and we know that they were immediately isolated. And there has been no abortion in the herd since.

I could give another example where a gentleman purchased four animals. Soon after they were in the herd one of those animals aborted, and the whole herd was tested. The newly-purchased animal reacted and all the others were negative, and there has been no abortion in that herd since then.

I think in recommending the use of living culture vaccine for heifers, we are losing sight of the men who are going to buy these. We do not stop to think that these breeders sell 80 per cent of the heifers to go into other herds.

We conducted a little experiment on that. We took 23 heifers, blood-tested and inoculated ten of them with living culture vaccine, and ten of them we did not inoculate. The twenty were placed in an infected herd, and a calving record and data collected on the twenty. Three of the ten that were vaccinated aborted. The ten that were not vaccinated gave birth to normal full-sized calves, 100 per cent efficiency, with 30 per cent efficiency of the vaccinated animals that aborted.

We are using living culture vaccine on different farms, and we are having different kinds of results. On another farm we have used it, and there has been no abortion among the vaccinated animals, and no abortion among the non-vaccinated animals.
On another farm where we have used it, there has been a higher percentage of abortion among the vaccinated animals than among the non-vaccinated animals. There have been about 130 animals vaccinated on this farm.

We went to another farm and vaccinated six heifers. Two of these aborted and the other four gave birth to normal calves, a larger percentage of the vaccinated heifers aborted than those that were not vaccinated.

In the first herd which I mentioned there were fifty animals pregnant, and during the year twenty-five per cent of the entire herd aborted. Thirty-seven per cent of the vaccinated animals and 100 per cent of the non-vaccinated calved normally.

I think Dr. Schroeder in his paper brought out some very good points, and I would like to emphasize some of them. In Pennsylvania at the present time we have ready for the press material that will constitute a bulletin to be distributed to the breeders in Pennsylvania, in which we have mentioned many of the points mentioned by Dr. Schroeder in his paper. Some of our comparisons have been made exactly alike. For instance, we compare the abortions in animals made by Dr. Schroeder, and agree that not every animal aborts that is infected. Neither do all animals infected with tuberculous bacilli die with tuberculosis. We have made some comparisons along the same line.

I think there are other things that we are forgetting. One of which is the manure pile as a source of infectious abortion. On the farm that Dr. Dick referred to, the manure pile is outside of the exercise lot, and I think that is an important thing.

I think it is important to see all pregnant animals every day, whether in the pasture or in the stable. Often we will be able to see the symptoms of abortion and be able to isolate them.

The bull as the spreader of infectious abortion is another important factor, mentioned by Dr. Schroeder, where they drop some of the semen containing the bacteria, possibly on the premises, on the pastures.

The douching the bull does not seem to me to be very practical, because a bull does not serve a cow with his sheath, and if he is infected with the abortion bacillus, it would do no good to douche his sheath.

DR. FITCH: Mr. Chairman, I hesitate to rise again, but if there is anything an investigator hates to do, or hates to have done, it is to be misquoted by another investigator, and Dr. Cahill has intimated, at least, that I have misquoted Dr. Edwards' paper in the remarks I have made about his paper, so I feel compelled in justice to Dr. Edwards to read to you two extracts from his paper.

The first is the statement in regard to the work done by German investigators. It states:

"The authors admit that with full justice one can assert that a convenient completely efficacious method of inoculation has not yet been discovered."

In regard to the use of the live virus, Dr. Edwards states as follows:

"One feels, therefore, fully justified in reiterating the remarks made by Dr. Bang in 1906, when he stated:

'Whether in the future vaccination will be the chief weapon against contagious abortion or not, time will show. At present, it must be our task to teach the farmers that they can do very much against this disastrous disease by isolation and disinfection. The main thing is that they be made thoroughly to understand the nature of the disease, and the many ways in which it spreads.'"
That is the end of the quotation from Dr. Bang, and Edwards goes on: 
"Even though great advances have been made in our knowledge with regard to the efficiency of vaccination, the discovery of accurate methods of diagnosis of the disease have rendered possible still greater achievements by methods of isolation. At best vaccination suppresses losses due to abortion by continually keeping alive an infection, and methods of isolation aim at a complete cleaning out of the infection."

(Applause.)

PRESIDENT CREWE: Any further discussion on this paper?

DR. J. W. CONNAWAY (Columbia, Mo.): I regret having missed some of the papers in this symposium, as well as a part of the discussion; but I feel that every suggestion that has been made looking toward the ultimate eradication of the disease through measures designed to control and destroy the abortion virus cannot be over-emphasized. I believe we ought to keep an eye on the virus that causes the disease, and to impress upon the herdsman, who have the daily care of the herd, the prime importance of the proper control of the infection carriers.

Under barnyard and field conditions there is practically no other way of transmitting the Bang abortion disease, from an infected to a healthy cow, than by ingestion of infected materials; and, as Schroeder and Cotton have shown, the danger periods from the infected cow are comparatively short periods. That is, at the time an infected cow aborts, or calves normally, and for a few weeks thereafter, or until the discharge of infectious material from the uterus has ceased. The measures of control are after all very simple and practical; namely to find out from the history of the case and by reliable diagnostic tests whether an abortion in a herd is due to the Bang infection. Then to apply the test to all of the mature breeding animals in the herd, so as to determine which are potential spreaders of the infection. This is an easy matter. The two serological tests—"agglutination," and "complement fixation"—will practically pick out all the infected animals in a herd. These tests are at least as dependable for this purpose as tuberculin is for the detection of tuberculous animals. Dr. Schroeder commends the agglutination method; I also wish to commend the complement fixation method as a practical, and certainty as a very reliable test. Both are good, but I believe that the complement fixing test, although a little more difficult, is more accurate, or perhaps I should say more sensitive; and that it will pick out infected animals, in some instances, when the other method fails. But it is also true that the agglutination method sometimes gives a positive result where the complement fixing method has failed. The agglutinating antibodies and the complement fixing antibodies for B. abortus antigen are perhaps quite different substances, and may vary in amount in the blood of an infected animal. Yet the presence of either can be taken as evidence of a present or prior infection with the B. abortus organisms, in the case of adult animals. Both tests should be used as circumstances may require.

An error in diagnosis may occur occasionally from the fact that the blood reaction in a cow which has recently aborted is sometimes negative. The same may also occur in an infected immune cow, which drops a living and apparently normal calf. In such cases the circulating blood, at the time, evidently does not contain sufficient free antibodies to give the specific reaction. It is probable that at this period a maximum of infection is present; and that in the cases mentioned all the abortion "antibodies," circulating in the blood, have combined with the antigen; and no free reacting material, for the time being, is present. This temporary negative state of the blood, however, is not a serious matter, so far as diagnosis is
concerned; since the colostral milk in such cases is always rich in the B. abortus antibodies. In our work we have never failed to get a reaction from the colostrum of an abortion infected cow or sow, even though the blood serum at the time of parturition was negative. The serological test in my opinion is an essential measure in the control of this disease.

When the infected animals in a herd have been detected, their isolation and proper care, in a manner that will prevent healthy animals from ingesting the infected discharges, will prevent transmission of the disease. Practical experience in a number of herds has demonstrated that proper isolation and care of infected animals are not burdensome on the average stock farm. But in herds where it is more difficult to apply even the temporary isolation measures, other more or less effective measures may be used to prevent the healthy cows from ingesting the infected discharges. The simple process of spraying the hind end of the abortion reactors before calving, and for a period thereafter, with a coal tar disinfectant, of sufficiently disagreeable odor and taste, that will prevent other cows from licking the soiled tail and rump, will give some protection against transmitting the disease by the abortion infection carriers. Such measures I believe will afford better protection than vaccination; besides they are cheaper and more easily applied. The herdsman must do these things. He should be taught why they should be done, and how they should be done. It is a part of the professional duty of the veterinary practitioner, who has charge of the herd, to give this instruction; and to do everything possible to prevent infecting other animals in the herd.

We must keep in mind that the Bang abortion organisms is a very persistent parasite in the mature infected cow, whether the inoculation occurs by natural means or by hypodermic injection. We also know that no animal becomes absolutely immune; since reliable breeding records show that an infected cow may abort intermittently two or more times. Moreover, the infection is occasionally transmitted permanently to the offspring, either in utero or through the infected milk. Two cases of such transmission have come under my personal observation in experimental work; and one of the heifers aborted her first calf. Fortunately this method of transmitting a durable infection is not of frequent occurrence, and the great majority of the calves, by proper care, can be reared free from the disease. But the percentage of durable infections of the young would doubtless increase, with the increase of artificially immunized cows. —As the matter now stands the spread of the Bang abortion infection among cattle through the milk is not a very important factor, as compared with the spread of the disease through infection that comes from the uterus at the time of parturition—whether it be at the time of an abortion, or at normal calving of an infected cow.

The dead calf, the live calf of an infected cow, the infected afterbirth, the uterine discharges, the infected stable litter, the soiled tail and rump of the infected cow, constitutes the principal if not the sole sources of infection to which mature susceptible cattle are exposed; and all these sources can be easily controlled on the average farm.

In the matter of susceptibility to abortion infection from natural sources, I wish to say that pregnancy is not essential to acquiring a permanent infection, as we have found in our observations on both cattle and swine. The artificial inoculation of mature non-pregnant females with living virulent B. abortus organisms will add to the number of permanent abortion infection carriers and distributors.

PRESIDENT CREWE: Dr. Connaway, you will pardon me, but we have already spent an hour of our afternoon program on this discussion,
and I will ask you to kindly close your discussion as soon as possible, so that we may continue with the program.

DR. CONNAWAY: I have but little more to say. And perhaps what I have already said is but a repetition of what other speakers have said before I came in. But I wish to make this further comment:

Dr. Schroeder mentioned that in an experiment group of heifers, inoculated before breeding, only one animal aborted out of eleven that were bred. That is practically 10 per cent. He did not, however, tell us how many others in the herd, which were free from infection before the inoculation, became permanently infected and were carriers of the abortion germs. I am quite certain that if a re-test of all the heifers were now made, he would find all of them, or 100 per cent, reactors and potential distributors of the Bang abortion infection. The great danger in this country in efforts at immunization with "live B. abortus cultures," is that, through the unrestricted use of the live organisms, abortion infection carriers and distributors will be unduly multiplied, and that the final results will be disastrous to the breeding business. In my opinion abortion can be controlled and ultimately eradicated without resort to immunization methods, if we go about it in the proper way.

I wish also to add that I am confident that Dr. Schroeder does not regard the results of the experimental work which he has reported, as a sufficient basis for the inference that is sure to be drawn by commercial vaccine producers, that the best way to control abortion is by the extensive immunization of unbred heifers and cows. And, while it was perhaps not pertinent, in the presentation of the results of a research on the particular phase of the problem he was considering, for him to lay special stress on the measures of control which I have tried to emphasize, we all know that he places as high a value on these methods of control, as has been expressed by Bang or Edwards or any of us.

DR. WARD GILTNER: Mr. President, I beg your pardon and Dr. Giltner's also if my remarks on this subject did not come in proper order in the proceedings. I inferred from your question as to whether anyone wished to discuss the matter further, that every one, who had been formally designated to discuss the subject had already done so, and that the whole matter was open for general discussion.

DR. SCHROEDER: Mr. Chairman. I want to say one thing in regard to a remark made by Dr. Dick. I do not know whether he was referring to my paper or not. He might have been. It was a remark in connection with the subject of abortion disease of the bull. I simply wanted to call attention to the fact that impressed me rather as it impressed Dr. Dick—that abortion disease with a bull would be rather a curious thing; consequently, Dr. Dick, I adopted the expedient in speaking about the bull of saying abortion bacillus disease.

I want to say a word or two relative to the use of live cultures in abortion disease. I think we should make a sharp distinction between two
things, one the reduction of losses from bovine infectious abortion, and the other the control of bovine infectious abortion.

I did not quote extensively statistics in my paper relative to the work that has been done in Germany and England and in Canada by live abortion bacillus injection before conception; but I did refer to the work that has been done and I pointed out that it was rather surprising and it was notable that the use of live organisms was followed by a reduction of the number of abortions in a herd, no matter what the percentage was prior to the use of live organisms, to approximately six per cent. That means that by proper methods used in infected herds we can do some real good by the use of live organisms.

On the other hand, I wish to call attention to another thing, that by using proper and rather simple measures we can actually control the disease if we choose to do it.

In this use of live organisms, it seems to me it would be desirable that if we could have a law enacted in every state in the Union, requiring that live organisms should be injected by no person into an animal of a herd until that herd had first been subjected to an official agglutination or complement fixation test, it would be a very good thing. It would be a relatively simple law, and a law which could be easily enforced, and I would put into that law a pretty severe penalty for the individual whom it was proved had injected living abortion bacilli in any herd that was free of the infection. (Applause.)

PRESIDENT CREWE: I will now call on Dr. C. W. Eddy, of Cleveland, Ohio, to lead the discussion on Dr. Ferguson's paper.

DR. C. W. EDDY (Cleveland, Ohio): Mr. Chairman, and gentlemen of the Association:

I do not think there is the slightest need of carrying on this discussion any further. I do not propose to take either side in this argument regarding the live or dead organisms except to say that there were some things brought out here that I think should be discussed from the standpoint of the breeder, and I want to put myself in the standpoint of the breeder, because I am a breeder of livestock.

I am aware that the practitioner is up against a lot of things that do not enter into consideration with me at all. A practitioner oftentimes has to do things which please the owner or please the herdsman. I have to do a lot of things for my corporation, but I do not do anything that my judgment does not direct me to do.

We have been attempting for about six years to eradicate or control within reasonable limits infectious abortion, and I will confine my remarks to the few things that I think have helped us.

In the first place, anyone having a herd containing 500 females, 300 of which are pregnant, to isolate animals previous to parturition would be extremely difficult and expensive—difficult for two reasons. In the first place, you are going to have a very large number of them calve within a very few days of one another. That is almost a weekly occurrence with us, and I know of no way to prevent that or absolutely isolate those animals. We have proceeded on this plan, that all animals approaching parturition are isolated, and are not put back into the herd, until, so far as I can determine, they are in normal condition. Aborters are treated in the same way, but not placed in there with those which we assume to be normal. We regard a cow with a retained placenta as an aborter, and isolate her with aborters, and treat her along those lines. Manual removal of placenta is extremely dangerous practice, and if I were not a breeder I would probably do it a great deal, but personally I do not do it.
I have followed out the recommendation made this morning by Dr. Williams, and I think it gives far better results. I think that is one step that we have made in advance.

I personally have not believed, and I do not believe that the bull has been a carrier of infection, and I have formed that opinion on direct observation. I have no scientific words whatever to substantiate it, but I know of many instances.

In one of our herds, our Guernsey herd, we had a bull that was very valuable because of his ancestry, and that year we had two or three abortions in the herd, and we used the bull freely with the others. We told breeders who insisted on using this bull that we could not guarantee him, and that if they used him they did it at their own risk, it was not safe to do it, we did not want to do it, and they did it at their own risk. For a period of three years I do not know of a single animal that aborted to the service of this bull. Had there been we would have known of it, because we had to sign the certificate of service.

In the other instance we turned out twenty virgin heifers with a young bull that had not served any other cattle during one season. At the conclusion of the summer season these heifers were brought into the barn, 19 of the 20 were pregnant, and 18 of the 19 aborted. But subsequent to this we removed the bull to another herd without any disinfection whatever, and only one aborted. Those two instances I give you for what they are worth. They are merely observations. I regret that I have not the accurate data here.

I have noted this, that females purchased and added to our herd, particularly heifers that were not pregnant, were very much more apt to abort than animals raised on our own place. My observation has been that heifers raised on our own farm have a less percentage of abortion than some other animals. I regret that I have not that data available at this time.

As a control measure we have adopted the policy of adding to our herds when necessary by the purchase of animals in advanced pregnancy. We assume that if they are in advanced pregnancy they are not so likely to abort, and our experience substantiates that.

Regarding the use of vaccines, I would not have the slightest hesitation in using any form of vaccination or immunization that was advocated by anyone whom I thought qualified to advocate it. My experience in the immunization of cattle with living and dead organisms has been confined to forty inoculations with the living organism, and 103 animals with dead organisms, with the abortion of 38. All these animals were heifers. 18 of these heifers were the heifers that I mentioned as being turned out in the field. These observations are too small in number to furnish any particular data that is of any value. That is merely my observation.

But there is one point that I want to emphasize in regard to the control of all these diseases, and that is that all work in these herds, whether institution herds or ordinary farmers' herds, must be done by the veterinarians themselves, not left to the herdsman. The most dangerous fellow that I encounter in my work is the herdsman that has worked with three or four herds and has been intrusted with the administration of vaccine. He is a mischievous fellow.

Several years ago I had occasion to make a trip to the East in regard to the production of certified milk, and incidentally, I looked for information regarding the control of infectious abortion, and the herds in which the breeding efficiency was the highest every time were the herds over
which supervision was exercised by veterinarians, the herdsmen being
directly responsible to the veterinarians.

I think if we ultimately control this disease, it has to be done by a
combination of both methods, by the isolation method, coupled with all
the sanitation possible, together with the proper immunizing methods, and
those of us in the field must look entirely to the research worker to furnish
us with the necessary data and information upon which we can intelli-
gently act.

I thank you. (Applause.)

PRESIDENT CREWE: The next item on the program is the Report
of the Committee on Tuberculosis, by Dr. T. E. Munce, Chairman.

DR. T. E. MUNCE (Harrisburg; Pa.): Mr. Chairman, I would like to
preface this report with the statement that your Committee comes before
you with a unanimous report. The report is in the form of a plan which
may be used as a guidance in future tuberculosis work, rather than a re-
view of the past.

REPORT OF THE COMMITTEE ON TUBERCULOSIS OF THE UNITED
STATES LIVESTOCK SANITARY ASSOCIATION

November 29, 1921.

FOREWORD

Tuberculosis has made deep inroads on the livestock of America. It
was possible for it to gain great headway because of its insidious nature.
Two reasons why tuberculosis should be eradicated, are:
1. Its economic important to the livestock industry.
2. The disease is transmissible to man.
Any plan conceived which contemplates the eradication of tuberculosis
of livestock must of necessity be based upon a dual purpose principle.
The Accredited Herd Plan, which is the only nation-wide plan ever
attempted, should be the basis for the conduct of work in all herds. The
word “Accredited” must be kept inviolate for it means only one thing.
The cattle industry of United States valued at $2,838,656,000.00 as
well as other livestock must be safeguarded against tuberculosis.
The intended purpose of this committee was that tuberculosis may be
dealt with from every angle in a broad and comprehensive manner, that
the committee members may be independent in thought but united in pur-
pose, that they make a conscientious effort to do constructive work and to
render at this meeting a report that would be a credit to the Association
and the profession, and above all, produce something that will be helpful
to the many who are striving to eradicate tuberculosis from our herds and
nation.
At the first meeting it was decided to prepare a comprehensive and
constructive nation-wide plan for dealing with tuberculosis to embrace
not only the Accredited Plan but every other phase of tuberculosis. It will
thus comprise all other factors contributing to an effectual campaign
against this disease.

It was deemed advisable to sub-divide the subject as follows.

Education
Cooperation
Regulations and Regulatory Service
Administration
Prevention
Public Health
Finances
Speaking on general subjects your committee is of the opinion that a report for a final plan cannot be offered at this meeting.

We have attempted to outline the beginning of a constructive plan for dealing with this disease. Constructive things dealing in a large degree with large problems cannot be conclusively accomplished in a short time. One committee of five cannot in a short period deal conclusively with so large a subject. A constructive outline which will be practicable for the future must necessarily be based upon what has been done in the past. Data pertaining to what has been done must be assembled and concisely summarized in its order of sequence. This is necessary as a basis for work by any committee. Tuberculosis in all its phases should be considered as one subject.

EDUCATION

Successful campaigns on disease prevention, control and eradication have been made possible largely as the result of an intelligent appreciation on the part of those whose interests were either directly or indirectly involved. A well defined and comprehensive educational plan is essential to any legitimate and worthy undertaking that may hope to succeed. All persons engaged in cooperative work should be familiar with the Federal laws and regulations and those of the State in which they are employed. The public should know that the object of the tuberculosis campaign is two-fold, namely, conservation of livestock and protection of public health. Therefore, any statements in the form of publicity should be based upon well-established facts.

The nature of tuberculosis is such that it is of vital importance to everyone. The producer and consumer must understand the importance of this question to appreciate its economic significance and relation to public health. When the people have grasped the true meaning of this problem, they will furnish the support essential for its successful conclusion.

The various states have more or less similar agencies practically all of which may be coordinated into a working education organization. All persons taking part must be properly qualified. In the allotment of educational work, the following outline is suggested as representing a well-defined channel through which an educational program may function, permitting such variations as local conditions may demand.

The material to be used for educational purposes and the manner of its distribution may be indicated among the following: Personal Interview, Public Addresses, Bulletins, Newspaper and Magazine Articles, Lantern Slides, Moving Pictures and Specimens.

COOPERATION

A definite plan for cooperative work in each State should be agreed upon by Federal and State officials in advance. They should cooperate in the assignment of work.

The plan should be one that is applicable to the State. There should be a definite understanding between the Federal and State officials. Field and central agents should be permanently stationed so long as their work is satisfactory.

Every agency interested in the livestock industry should be solicited in a tuberculosis eradication campaign, for which adequate funds are essential.

In addition to the Federal and State Government, it will be necessary to obtain financial cooperation from other sources, including counties, townships, municipalities, organizations and individuals.
The following agencies, namely, stockmen; Federal, State, county and municipal authorities; organizations; commission firms; institutions of learning; press; packers; veterinary, medical and other professions and the producing and consuming public should cooperate with the administrative officials and with each other in bringing about enforcement of laws and regulations, education and adequate financial support.

### EDUCATION AND COOPERATION

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Regulations and Regulatory Service

Each state has an officer vested with authority and is held responsible for the prevention, control and eradication of communicable animal diseases. The Federal Government is vested with authority to regulate the interstate movement of livestock. The laws prescribing their duties do

**REGULATIONS**

- **Federal**
  - **Veterinarian**: Approved, Accredited
  - **Quarantine**
    - Accredited Herds, Meats, Dairy Products
    - Health Departments
    - Milk Commissions
  - **Disinfection**
    - Stock Yards
    - Stock Cars
    - Stock Trucks

- **State**
  - **Veterinarians**: Accredited, Approved
  - **Exhibitions**
    - Sales
    - Garbage
    - Reduction Plants
  - **Creameries**
    - Products
    - By Product
  - **Health Department**
    - Meat, Dairy Products
    - Biological Products
    - Line Fences
    - Streams
    - Disinfectants & Disinfection
  - **Tuberculin Tests**
  - **Tuberculosis Tests**
    - Public Sales
    - Private Sales
    - Shows
    - Accredited Herds
    - Private Tests
    - Interstate

- **Counties & Municipalities—Health Departments**
  - **Meat**
  - **Dairy Products**

- **Essentials**
  - **Finances**
  - **Education**
  - **Cooperation**
  - **Administration**
  - **Prevention**
  - **Public Health**

Tuberculosis of Poultry and animals other than bovines should receive equal attention when necessary.

not conflict and thus complete cooperation is made possible. The Federal Bureau within a state is vested with no authority except that conferred by the state officials. It is, therefore, essential for the state to vest Federal Inspectors with the necessary authority. All work pertaining to the pre-
vention, control and eradication of livestock diseases should be directed from the office of the state officials. The states when drafting regulations governing importation of livestock should aim at uniformity and use the Federal regulations as their basic guide. No regulations other than those promulgated by the state should exist within a state except regulations governing the interstate movement of livestock. All agreements entered into by the counties and municipalities should be with the state.

The clinical diagnosis of tuberculosis should be by the use of tuberculin and physical examination. Each state shall have the right to determine the kind of test or tests to be applied which must be in accordance with the Accredited Plan operating under that plan. The application of tuberculin tests must be by duly qualified veterinarians.

A tuberculin test should be required of all cattle offered at public sales or exhibitions and only animals which pass an approved negative test should be eligible. Health certificates and test charts should indicate the health status of the entire herd. Cattle from accredited herds or herds in process of accreditation should be kept apart from untested cattle.

**ADMINISTRATION**

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**Federal**

**State**

**Directors**

**Division Directors**

**District Directors**

**Office Force**

**Laboratory Research**

**Field Agents**

**Stables**

**Yards**

**Stock Yards**

**Car, Wagons, Trucks, etc**

**Ships**

**Crates**

**Storage Places**

**Utensils**

**Materials**

**Animals**

**Show Barns**

**Sale Stables**

**Watering Troughs**

**Other Things**
ADMINISTRATION

Any nationwide plan for dealing successfully with tuberculosis should consist of such harmonizing units as will be inducive to uniformity and should, when necessary, include tuberculosis of poultry and animals other than bovines. Each unit should be modeled over the ideal to the extent that is consistent with good judgment after the local obstacles have been carefully studied by capable unbiased minds.

Whatever the local plan it should be fathomed by a definite easily understandable policy which defines the duties of the many agencies, the manner in which the plan should be operated, regulations necessary for its enforcement and all its other essentials.

Any plan should require that a qualified veterinarian be made its director. The organization of which should be based on a plan as outlined in the accompanying chart.

TUBERCULOSIS FREE ACCREDITED HERD PLAN

The Accredited Herd Plan is a set of uniform regulations and rules formulated by a joint committee of the United States Livestock Sanitary Association and the Pure-Bred Cattle Breeders’ Associations unanimously adopted by the United States Livestock Sanitary Association, approved by the United States Bureau of Animal Industry.

UNIFORM METHODS AND RULES FOR TUBERCULOSIS-FREE ACCREDITED HERDS OF CATTLE

Unanimously adopted by the United States Livestock Sanitary Association, and by representatives of Pure Bred Breeders’ Associations, November 29, 1921, and Approved by the United States Bureau of Animal Industry, December, 1921.

1. A tuberculosis-free accredited herd is one in which no animal affected with tuberculosis had been found upon two annual or three semi-annual tuberculin tests, and by physical examination, applied by a regularly employed veterinarian of the United States Bureau of Animal Industry or of the State in which co-operative tuberculosis eradication work is conducted by the United States Department of Agriculture and the State or one in which no animal affected with tuberculosis has been found upon two annual or three semi-annual tuberculin tests applied by an Accredited and a Federal or State veterinarian in a manner provided in Rule 6.

Section (a). The subcutaneous, intradermic and ophthalmic methods of applying the tuberculin test are approved.
Section (b.) The initial testing in accredited herd work may be by either the subcutaneous or intradermic method, but the ophthalmic method shall only be used in combination with the subcutaneous or intradermic method.

Section (c) A herd which in any previous test shows evidence of infection before being accredited the final test shall be by a combination of all three methods, including the subcutaneous, intradermic and ophthalmic tests, but in case the animals under test are wild and unmanageable (Range Cattle) this plan may at the discretion of the Federal and State authorities in the State, be modified to the extent that one method of testing may be eliminated from the combination, otherwise, the final test on herds shall be by such combination of methods as may be deemed most advisable by the State and Federal authorities.

2. The entire herd, or any cattle in the herd, shall be tuberculin tested or retested at such time as is considered necessary by the Federal and State authorities.

3. No cattle shall be presented for the tuberculin test which have been injected with tuberculin within sixty days immediately preceding, or which have, at any time, reacted to a tuberculin test.

4. An accredited herd in which not more than one reactor is found at a subsequent tuberculin test, may be reinstated to the list if the entire herd passes a successful test without reactors; said test to be applied not less than four months from the date when the reactor is removed from the herd and farm, providing the owner has complied with all the requirements with reference to the introduction of additional animals to the herd, and also all other requirements of the Accredited Herd Plan.

5. No cattle other than those of an accredited herd, shall be added to an accredited herd or to a herd that is in the process of accreditation until they have passed two tuberculin tests applied at intervals of not less than sixty days or more than ninety days by a regularly employed State or Federal veterinarian or by a veterinarian specially authorized by the State and Bureau to conduct such tests. The cattle may, after passing the first test, be placed on the farm or premises containing an accredited herd or one in the process of accreditation, but must not be allowed to associate with said herd until after passing the second test.

6. (a) When a herd has been officially accredited by the United States Department of Agriculture and State, it shall be when ordered by the Livestock Sanitary Officials of the State, tuberculin tested annually by any veterinarian whose name is upon the accredited list of veterinarians approved of by the United States Bureau of Animal Industry, provided that before any veterinarian other than one who devotes his entire time to the work of any State or the Bureau of Animal Industry can be approved for accredited herd work, he shall have passed an examination conducted by the proper livestock sanitary officials of the State in which he resides, and the Bureau of Animal Industry. He then shall be eligible to conduct annual tuberculin tests upon herds which have been officially accredited upon dates approved of by the proper livestock sanitary official and the inspector in charge of the Bureau of Animal Industry in the State wherein the herd is located.

(b) No herd tests can be made by such an accredited veterinarian unless he has instructions in writing from the State officials to that effect. The date of the annual tests for each herd shall be recorded in the State office and, also in the office of the inspector in charge. On any annual test the State and Bureau reserves the right to have a regularly employed
official present on the farm to supervise the testing done by the accredited veterinarian.

(c) The accredited veterinarian shall conduct each test strictly in accordance with instructions issued by the Bureau of Animal Industry to employees engaged in co-operative tuberculosis eradication work. At the conclusion of each test, the accredited veterinarian shall submit to the State veterinarian and the inspector in charge of the Bureau of Animal Industry, a copy of the record of the test.

(d) Any animal of a herd under supervision which may react in any herd tuberculin tested by an accredited veterinarian shall be marked for the purpose of identification in accordance with the regulations of the State in which the animal is located.

(e) Tuberculin tests applied by veterinarians other than those regularly employed by the State and Federal Bureau of Animal Industry shall be paid for by the owner of the herd.

(f) Accredited veterinarians may conduct tuberculin tests under official direction at owner's expense on herds in the process of accreditation in States which approve of this method of testing, until all animals in the herd have passed one negative test; provided, however, that in such herds Federal indemnity shall be payable only when the test is conducted by regularly employed Federal or State veterinarians, and provided further, that the final or accrediting test to be applied by regularly employed Federal or State veterinarians.

7. Before a herd can be accredited the stables and premises shall be placed in a sanitary condition. When reactors are disclosed as the result of any test, they must be immediately removed from the farm and the stables thoroughly cleaned and disinfected before the herd shall be identified as in process of accreditation.

8. Prior to each tuberculin test satisfactory evidence of the identity of the registered animals shall be presented to the inspector. Any grade cattle maintained in the herd, or associated with the animals of the herd, shall be identified by a tag or other marking satisfactory to the State and Federal officials.

9. All removals of cattle from the herd, either by sale, death or slaughter, shall be reported promptly to the said State or Federal officials, giving the identification of the animal and, if sold, the name and address of the person to whom transferred. If the transfer is made from the accredited herd to another accredited herd, the shipment shall be made only in properly cleaned and disinfected cars. No cattle shall be allowed to associate with the herd which have not passed a tuberculin test approved by the State and Federal officials.

10. All milk and other dairy products fed to calves shall be that produced by an accredited herd, or, if from outside or unknown sources, it shall be pasteurized by heating to not less than 150°F for not less than 20 minutes.

11. All reasonable sanitary measures and other recommendations by the State and Federal authorities for the control of tuberculosis shall be complied with.

12. (a) That the requirements for tuberculosis-free area work be similar to the tuberculosis-free accredited herd work and to be applied to all cattle located in said area.

(b) That before any area shall be recognized as tuberculosis-free, after having complied with paragraph (a) of this section, there must be satisfactory assurance of official livestock sanitary police restrictions to prevent reinfection of said area.
13. Cattle from an accredited herd may be shipped interstate, by certificate obtained from the office of the State Livestock Sanitary Officials of the State in which the herd is located or from the office of the Bureau of Animal Industry, without further tuberculin test for a period of one year, subject to the rules and regulations of the State of destination.

14. Strict compliance with these methods and rules shall entitle the owner of a free herd to a tuberculosis-free accredited herd certificate to be issued by the Federal and State departments. Said certificate shall be good for one year from date of test unless revoked at an earlier date.

15. A supplementary list shall be made to the accredited herd list to contain the names of the owners of pure-bred herds that are found free from tuberculosis on two annual tuberculin tests but in which the herd bull reacted. Such herds shall not receive an accredited herd certificate. The reacting bull may be used under the following conditions:

1. He shall have passed a satisfactory physical examination and be kept in isolation and quarantine under State supervision.

2. When it is desired to breed cattle to the reacting bull, such cattle shall be taken to the bull and bred on neutral ground. The bull shall be controlled on a staff or halter.

3. After the bull is no longer used in the herd, that herd may be fully accredited after two successful tuberculin tests applied not less than six months apart.

16. Failure on the part of the owners to comply with the letter or spirit of these methods and rules shall be considered sufficient cause for immediate cancellation of co-operation with them by the State and Federal officials.

PREVENTION

Prevention is essential in dealing successfully with tuberculosis repression.

Any plan which deals with only the infected herds is not sufficient. Our time and efforts should be also partly devoted to guarding the herds and areas which are free from infection.

The stockman can do more than any other agency in tuberculosis prevention.

The practicing veterinarian who is well versed on tuberculosis and pays attention to its prevention can render a great service in his community.

Those interested in tuberculosis prevention, and every person should be, would do well to control its modes of transmission and dissemination by confining animals or things infected or contaminated with the cause, namely, the tubercle bacillus, to circumscribed areas and by guarding areas that are free, and further, they would inaugurate methods to destroy the tubercle bacillus.

Infection most often reaches premises through the introduction of infected animals, namely, infected cattle, horses, swine, dogs, cats, etc. These are either new animals or animals that had been away from home for some purpose (exhibition, breeding, etc.).

Feeds may become contaminated from infected animals (dogs, cats, rats, mice, etc.) sleeping in feed bins, mangers and mows; also by tubercle bacilli disseminated from other infected animals or man. Contaminated animal products, such as milk, cheese, butter and meat are sources of infection. Garbage containing contaminated animal products and human sputum is a means of infecting garbage fed hogs.
Tuberculosis may be transmitted from the disseminating animal to healthy animals by the following as a medium: Stock yards, railroad cars, show barns, shipping crates, trucks, wagons, utensils, manure, streams, watering places, hoofs of animals, clothing of man, poultry, birds, etc.

The aim of stockmen should be to keep their animals free from tuberculosis which requires that the system of herd management take cognizance of the channels through which its cause may reach their premises and give recognition to a perfect hygienic system.

Breeding and raising own stock is a safeguard against outside infection. If any purchase is made the purchased animals should not be added to the herd until their health has been determined. The health of young stock should be guarded by proper housing, feeding, watering, care and management.

The hygienic system in addition to stable construction, sanitation and animal hygiene should give special attention to the source and storage of feed and water, the location of dwellings and other buildings, health and management of their inhabitants, their sewage disposal and surface drainage; arrangement of pastures in relation to neighbors' pastures and buildings; streams of water, sewage, etc., to the manure and urine disposal; and to the health of attendants.

The role of biological products in the prevention of tuberculosis is negligible. Immunizing agents against this disease in their present status are dangerous to use and if there is ever hope for a suitable immunizing agent, it will not be until after considerable more research work has been done.

Tuberculin is the most useful of our diagnostic agents and used in that capacity it is indispensable in prevention of the recurrence of tuberculosis.

Besides the use of tuberculin as a diagnostic agent, prevention of recurrence of tuberculosis requires that infected animals be immediately removed and either quarantined or disposed of; that the premises be promptly and thoroughly cleaned and disinfected and be safely guarded against reintroduction of infection.

Regulations pertaining to prevention of tuberculosis should include the following requirements: Tuberculin test of all cattle exhibited or offered for public sale; private sale of cattle for addition to other herds to be similarly controlled; a system of identification of sale animals; frequent disinfection of stock yards, show and sale stables, loading and unloading stations; disinfection of common carriers after being used for transportation of animals before being used for any other purposes, ex. railroad cars, ships, and trucks used for public service; and similar requirements for private carriers, ex. wagons and trucks.

Federal and State officials should so familiarize themselves and become so conversant that they can, through the proper channels, cause the recognition and dissemination of knowledge pertaining to the principles of tuberculosis prevention from veterinary and medical schools, agricultural colleges and other institutions of learning; hospitals; organizations; all professions; nurses, extension departments; breeders; the press; and the public at large.
# TWENTY-FIFTH ANNUAL MEETING

## Animals
- **Infected**
- **Contaminated**

## Modes of Transmission
- **Infected Direct**
- **Contaminated Indirect**
- **Milk Food Products**
- **Garbage, Hay, Grain**
- **Other Feed**
- **Streams, Water Troughs, Show Barns, Public Barns, Manure, Utensils, Stock Yards, Stock Cars, Other Vehicles.**

## Hygiene
- **Water Supply**
- **Storage**
- **Contamination**

## Herd Management
- **Herd Attendees**
- **Health**
- **Disinfectants and Disinfection**

## Physical History
- **Owner**
- **Practicing Veterinarian**
- **Herd Records**

## Clinical Diagnosis
- **Tuberculin Tests**
- **Subcutaneous Intradermal Combination**
- **Ophthalmic**
- **Macroscopic Animal Inoculation**

## Disposal of Affected Animals
- **Isolate**
- **Regulations Offsprings—Products**
- **Bang Method Adjacent Herds**
- **Slaughter Disinfection**

## Education
- **Institutions of Learning, Press, Association, Meetings, Motion Pictures, Extension Service, Health, Department, Physicians, Hospitals, Nurses, Veterinarians, Owners.**

## Essentials
- **Administration, Regulations, Public Health, Co-operation, Finances.**

## PUBLIC HEALTH

The more serious consideration of Bovine Tuberculosis as a public health question was greatly inspired through the activity of those who questioned the remarks of the late Dr. Robert Koch that the danger to man from bovine tuberculosis was negligible. Had such a statement been made by a less notable person, we might still be lacking in much of the already
acquired valuable knowledge on this great question. Coming as it did, there developed a determination throughout the scientific world, especially among those who had held an opposite opinion, to obtain more definite information regarding the possibility of its transmission. Observations made since that time have given no support to the doctrine of Koch, but, on the contrary, have established more firmly than ever that the transmission of the bovine type of tuberculosis to man is not of uncommon occurrence. Consequently, the guarding of public health against such sources of infection becomes a public duty and justifies the calling upon any agency that might be of service in this campaign. If it would mean the saving of only a single human life, the effort would be worth while. In the past we have had many instances of more or less indifference to this problem on the part of public health services, but when an educational campaign is directed toward such departments, and, if need be, through public opinion, there invariably comes a change in attitude.

One, if not the most effective stimulus for a more general recognition of this question from a public health standpoint, would be greater activity coming from our Federal State and local Public Health Departments. There is evidence, however, of increased interest from these sources and we may hope for more enthusiastic work and co-operation in the future.

Since the danger to man is practically confined to the meat and milk supply, a supervision in the production, handling and distribution of these products constitutes an important function of our public health service. Whether it be Federal or State departments, it is essential that there be embodied in these organizations an acceptable system of meat, milk and dairy inspection under the direction of a qualified veterinarian. There are some who would attempt to solve the problem of milk contamination by pasteurization and while this may be practical under certain conditions in isolated localities, it will never become general nor will it solve the question of Bovine Tuberculosis Eradication. Our educational program, if properly executed, will no doubt be the means of greatly extending and making more efficient the sanitary supervision of our meat and milk supply, especially in those quarters where such work is incomplete or not at all in operation. As was suggested in discussing an educational policy, it is equally true that there should be greater co-operation on the part of the regulatory forces operating within the State for the protection of public health. As we analyze and go into the details of this great campaign on Bovine Tuberculosis Eradication, aiming, as it does, to protect human life on one side and animal life on the other, its functions are more or less inseparable for we cannot give an effective service for one without the aid of the other.

Educational campaigns on the relation of animal tuberculosis to public health should be conducted by health authorities. The health authorities should be provided with such information as will stimulate them to reach the public through educational departments, educational institutions, veterinary and medical colleges, veterinary and medical professions, other professions, hospitals, nurses, the press, bulletins, organizations, public speeches and all other conceivable channels. It is the duty of the above agencies rather than ours to do educational work pertaining to public health. It is our duty to produce reasons why this should be done and to disseminate knowledge and do educational work pertaining to the health of livestock as an economic feature and to find the ways and means of preventing loss to the livestock industry. If we can show that the danger to public health can be corrected and other good reasons for using that feature as a means of correcting its cause, then the health organizations un-
doubtlessly will properly inform the public, which in turn will stimulate the voluntary support of stockmen in a tuberculosis campaign.

The following outline represents the services operating in practically every state and upon which the community must depend for the protection of public health.

**PUBLIC HEALTH**

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FINANCES

The campaign for the prevention, control and eventual eradication of tuberculosis is the most gigantic of any ever undertaken against livestock diseases. To carry it through to a successful conclusion, large sums of money will be required annually.

To adequately finance the proposition a well organized financial system should be devised, and to do this the best financial minds of the country should be enlisted.

In most states the organization charged with work on tuberculosis also must function in the performance of their duties pertaining to many other transmissible diseases, some of which, from an economic standpoint, are equally important. Moneys appropriated for prevention, control, and eradication of transmissible animal diseases must not be used too far in excess for tuberculosis alone, that the prevalence of other diseases will be allowed to increase. However, if funds were appropriated for the operation of this work in ten or even one hundred times the usual amounts they could be used to advantage and would be money well expended. The premium paid would be a low rate of insurance to livestock and public health.

Funds which have been obtained for work on tuberculosis have usually been supplied by the Federal and State Governments, and in a few States, by counties. These funds have been expended for operating expenses and the payment of indemnity.

States should be uniform in the amounts of indemnity paid for condemned livestock.

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AMENDMENTS

Any proposed Amendment or Amendments of this report shall be referred in writing to the Tuberculosis Committee of this Association and shall then be presented by said Tuberculosis Committee to the United States Livestock Sanitary Association, for approval. If approved by said Association such Amendment or Amendments shall become a part of this report.

Any proposed Amendment or Amendments involving the Tuberculosis Free Accredited Herd Plan, shall be referred in writing to the Tuberculosis Committee for the joint approval of said Committee and a similar Committee of the Pure-Bred Cattle Breeders' Associations shall then be presented by said Tuberculosis Committee to the United States Livestock Sanitary Association, for final approval. If approved by said Association such Amendment or Amendments shall become a part of this report but before becoming operative must in addition, be approved by the United States Bureau of Animal Industry.

J. A. Kiernan,
M. Jacob,
W. J. Butler,
C. E. Cotton,
T. E. Munce, Chairman.

RESOLUTIONS

REPORT OF ADVISORY COMMITTEE TUBERCULOSIS ERADICATION CONVENTION

Chicago, Illinois, Nov. 25-26, 1921.

WHEREAS, It has been established by uncontrovertible investigations made by recognized authorities, that bovine tuberculosis is transmitted to the human family through the medium of milk and its products to such an extent that it must be recognized and prevented, and

WHEREAS, The eradication of bovine tuberculosis is for the two-fold purpose of preventing the dissemination of the disease to the human family and to perpetuate the livestock industry upon a sound and healthful basis,

BE IT RESOLVED, That in the production of milk whether for consumption in the cities or in rural homes, the tuberculin testing of cattle should be by all means insisted upon as an indispensable measure of preventing the dissemination of tuberculosis.

SALVAGE AND APPRAISEMENTS

In view of the necessity of conserving State and Federal indemnity funds we heartily commend the action of the Institute of American Meat Packers in recommending that all packing companies and local butchers, pay as much for re-acting cattle that pass food inspection as healthy cattle of the same quality sold on the open market and urge also that conservative appraisement be made on all reactors.

INDEMNITY

The payment to the owner of indemnity for tuberculosis cattle is a justifiable procedure which has the endorsement of this conference. However, we recognize that no practice should be followed which places any premium on diseased animals.

We unqualifiedly endorse and recommend that the strictest attention be given to the conservation of all funds appropriated by counties, states,
the Federal Government and any other agencies contributing to the tuberculosis eradication campaign.

Unanimously recommended,

T. E. Munce, Chairman.

Lester W. Howard.

E. M. Ranck.

PRESIDENT CREWE: The next subject on the program is—there has been a little change made—"The Result of a Project to Determine the Comparative Value of Subcutaneous and Intradermal Temperature Tests," by Dr. Bruner, of Pennsylvania.

*RESULT OF A PROJECT TO DETERMINE THE COMPARATIVE VALUE OF THE SUBCUTANEOUS-INTRADERMAL TUBERCULIN TESTS.


Instructions to the eleven (11) agents-in-charge of districts and the field veterinarians are issued by the Bureau of Animal Industry, Pennsylvania Department of Agriculture, in the form of Service Letters, and the following is a copy of Service Letter No. 18, dated December 13, 1920:

PLAN TO TEST THE EFFICIENCY OF THE INTRADERMAL TUBERCULIN TEST AS COMPARED TO THE SUBCUTANEOUS TEST.

The Federal Bureau of Animal Industry has declared the intradermal test as an official test for tuberculosis in accordance with the authority conferred upon it in Section One of the Accredited Plan, as well as for testing interstate cattle subject to the regulations of State of destination.

The belief exists in some quarters that Pennsylvania should adopt the intradermal test and proceed to use it as an official single test. On the other hand, many of our best authorities on bovine tuberculosis, as well as breeders, take the position that we should continue the present policy by using the intradermal test only in combination with the subcutaneous and ophthalmic as a check test.

In order to determine the efficiency of the intradermal test as compared to the subcutaneous test, it has been decided to execute the following:

The project on each herd used is to begin with the initial test. All reactors, regardless of the test employed, are to be handled as such as at present. Tests are to be assigned to State agents in charge of districts, and Federal inspectors, in proportion to the number of men available for testing, and the applications from the districts in which the herds are located. Report of all tests will be recorded on special blanks prepared for that purpose.

GROUP A

150 herds. First test to be the intradermal. Both free and infected herds are to be retested with combination subcutaneous and ophthalmic tuberculins sixty days from date of first (intradermal) test.

GROUP B

150 herds. First test to be the subcutaneous. Both free and infected herds are to be retested with combination intradermal and ophthalmic tuberculins sixty days from date of first (subcutaneous) test.

GROUP C

150 herds. First test to be the ophthalmic. Both free and infected herds are to be retested with combination subcutaneous and ophthalmic, or intradermal tuberculins sixty days from date of first (ophthalmic) test.

*Presented at the annual meeting of the United States Livestock Sanitary Association, 1921, Chicago, Illinois.
Upon completion of testing of herds under Group A, the testing of Group B will be begun. Upon completion of testing under Groups A and B, the data will be compiled and further consideration given to project C.

The seat of injecting intradermal tuberculin is to be the caudal fold, and the dose two to six drops. Inject the intradermal tuberculin into the deeper layers of the skin. Observations are to be made at the 48th, 72nd and 96th hours following the injection.

The following code will be used in recording the intradermal test:

- N means Negative
- P means Positive

1. Animals showing no reaction shall be recorded at each observation as—N (negative).
2. Reactors shall be recorded as follows:
   a. For circumscribed swellings, pea size (diameter 3/16 inch), shall be used as the basic standard. Larger swellings shall be recorded as P2, P3, P4, P5, etc.
   b. For diffused swellings, thick 2X shall be used as the basic standard and signifies a diffuse swelling in which the injected caudal fold is twice as thick as the normal fold. Larger swellings shall be recorded as thick 3X, thick 4X, etc.

In connection with the application of the sixty day retest under Group A, the sensitizing disc or tablet is to be instilled in the left eye three days prior to the application of the subcutaneous tuberculin test. Upon completion of the usual number of pre-injection temperature measurements, inject the subcutaneous tuberculin and instill two ophthalmic discs or tablets in the same (left) eye which received the sensitizing tuberculin. Resume the subcutaneous test. Take the first post-injection temperature measurement at the sixth hour and continue at regular two-hour intervals up to, and including, the eighteenth hour, or longer if the temperature measurements are ascending, or remain stationary above normal.

The following code will be used in recording the ophthalmic test:

1. Animals showing no reactions shall be recorded at each observation as—N (negative).
2. Reactions shall be recorded as follows: Small amount of pus, P 1; much pus, P 2; abundant pus, P 3.

Final judgment, before the report is submitted to the central office covering each animal, is to be recorded either positive or negative.

Agents in charge will receive further instructions as to the number of tests that are to be conducted in their districts in connection with the testing of herds under Group A.

(Signed) T. E. Munce, State Veterinarian.

The project was started January 1st of this year and the testing of Groups A and B was completed November 1st, 1921. Thirty-five (35) Federal and State field agents conducted the tuberculin tests in connection with the project. Previous to the start of the project, each man was given the best available information as to the technique and interpretation covering the use of the three tuberculins. Federal subcutaneous and intradermal tuberculin was used. In connection with the ophthalmic tuberculin test, State four and eight per cent ophthalmic tuberculin was used in the testing of possibly one-third of the animals on which the ophthalmic was combined with either the subcutaneous or intradermal. On the other two-thirds, Federal ophthalmic discs were used.

The tests in connection with the project were tests of herds under the Accredited Plan and in practically all cases the first or initial tuberculin test under each group covered herds which had never before been subjected to a tuberculin test.

The result of the project under Groups A and B is indicated as follows by charts number 1 and 2.
### Chart No. 1
**Project No. 1**

#### Group A—Free and Infected Herds

<table>
<thead>
<tr>
<th>Test</th>
<th>No. Herds</th>
<th>No. Cattle</th>
<th>No. R.</th>
<th>%</th>
<th>Autopsy</th>
<th>Tkd. %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ind.</td>
<td>150</td>
<td>2,356</td>
<td>319</td>
<td>13.5%</td>
<td>282</td>
<td>88%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35</td>
<td>10%</td>
</tr>
<tr>
<td>S. &amp; O.</td>
<td>150</td>
<td>2,009</td>
<td>38</td>
<td>1.8%</td>
<td>31</td>
<td>81%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>5%</td>
</tr>
</tbody>
</table>

#### Group A—Infected Herds

<table>
<thead>
<tr>
<th>Test</th>
<th>No. Herds</th>
<th>No. Cattle</th>
<th>No. R.</th>
<th>%</th>
<th>Autopsy</th>
<th>Tkd. %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ind.</td>
<td>70</td>
<td>1,486</td>
<td>319</td>
<td>21.4%</td>
<td>282</td>
<td>88%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>31</td>
<td>10%</td>
</tr>
<tr>
<td>S. &amp; O.</td>
<td>70</td>
<td>1,156</td>
<td>32</td>
<td>2.7%</td>
<td>27</td>
<td>84%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>8%</td>
</tr>
</tbody>
</table>

#### Group A—Free Herds

<table>
<thead>
<tr>
<th>Test</th>
<th>No. Herds</th>
<th>No. Cattle</th>
<th>No. R.</th>
<th>%</th>
<th>Autopsy</th>
<th>Tkd. %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ind.</td>
<td>80</td>
<td>870</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S. &amp; O.</td>
<td>80</td>
<td>853</td>
<td>6</td>
<td>70%</td>
<td>4</td>
<td>66%</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>34%</td>
</tr>
<tr>
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<td></td>
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<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Chart No. 2

**Project No. 1**

#### Group B—Free and Infected Herds

<table>
<thead>
<tr>
<th>Test</th>
<th>No. Herds</th>
<th>No. Cattle</th>
<th>No. R.</th>
<th>%</th>
<th>Autopsy</th>
<th>Tkd. %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub.</td>
<td>150</td>
<td>2,813</td>
<td>501</td>
<td>17.8%</td>
<td>493</td>
<td>98%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>69</td>
<td>13%</td>
</tr>
<tr>
<td>I &amp; O</td>
<td>150</td>
<td>2,308</td>
<td>65</td>
<td>2.8%</td>
<td>62</td>
<td>95%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>9%</td>
</tr>
</tbody>
</table>

#### Group B—Infected Herds

<table>
<thead>
<tr>
<th>Test</th>
<th>No. Herds</th>
<th>No. Cattle</th>
<th>No. R.</th>
<th>%</th>
<th>Autopsy</th>
<th>Tkd. %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub.</td>
<td>96</td>
<td>2,019</td>
<td>501</td>
<td>24.8%</td>
<td>493</td>
<td>98%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>69</td>
<td>13%</td>
</tr>
<tr>
<td>I. &amp; O</td>
<td>96</td>
<td>1,558</td>
<td>60</td>
<td>3.8%</td>
<td>58</td>
<td>96%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>10%</td>
</tr>
</tbody>
</table>

#### Group B—Free Herds

<table>
<thead>
<tr>
<th>Test</th>
<th>No. Herds</th>
<th>No. Cattle</th>
<th>No. R.</th>
<th>%</th>
<th>Autopsy</th>
<th>Tkd. %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub.</td>
<td>54</td>
<td>794</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>I. &amp; O</td>
<td>54</td>
<td>750</td>
<td>5</td>
<td>6%</td>
<td>4</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20%</td>
<td>0</td>
</tr>
</tbody>
</table>
As will be noted under Group A, the intradermal was the initial test applied to

150 herds, comprising 2,356 cattle,
319 or 13.5% were classed as reactors,
282 or 88% of the 319 reactors showed lesions on autopsy,
37 or 12% of the 319 reactors showed no visible lesions on autopsy,
35 or 10% of the 282 positive animals were tanked.

As stated in the Service Letter, observations in connection with the intradermal test were made at the 48th, 72nd and 96th hours. Of the 319 reactors, of the

279 of the 319 were classed as reactors at the 48th hour,
310 of the 319 were classed as reactors at the 72nd hour,
319 of the 319 were classed as reactors at the 96th hour.

All animals that were positive at the 48th hour and 72nd hour were positive at the 96th hour. However, there were nine (9) animals 2.8% classed as positive at the 96th hour that were negative at the 48th and 72nd hours.

Sixty (60) days following the intradermal test, the 150 herds were retested by the subcutaneous and ophthalmic tuberculin tests, exclusive of those which reacted as result of the first or intradermal test. On the retest of the

150 herds, comprising 2,009 cattle,
38 or 1.8% were classed as reactors,
31 or 81% of the 38 reactors showed lesions on autopsy,
7 or 19% of the 38 reactors showed no visible lesions on autopsy,
2 or 5% of the 31 positive animals were tanked.

As the result of the initial test of the 150 herds under this group, 70 herds were found infected and 80 herds were given credit as having passed the initial test.

You will note by the chart that we have divided the 150 herds under Group A into two (2) classes, i.e., those herds in which tuberculosis was found as the result of the first test and those herds which passed the first or initial test. The 319 reactors as indicated above actually came from 70 herds, comprising 1,486 cattle, and the percentage of infection in the infected herds was 21.4%.

On a retest, by the subcutaneous and ophthalmic method, of the 70 herds which were infected as result of the first test, exclusive of the 319 reactors, of the

70 herds, comprising 1,156 cattle,
32 or 2.7% were classed as reactors,
27 or 84% of the 32 reactors showed lesions on autopsy,
5 or 16% of the 32 reactors showed no visible lesions on autopsy,
2 or 6% of the 27 positive animals were tanked.

Of the 32 reactors, 20 reacted to both the subcutaneous and ophthalmic tuberculin tests; all showing lesions on autopsy. 2 were tanked.

9 of the 32 reactors reacted only to the subcutaneous and on autopsy 5 were positive and 4 were negative.
3 of the 32 reactors reacted only to the ophthalmic and on autopsy 2 were positive and 1 was negative.

The eighty (80) herds of the 150 herds that were classed as having passed the initial intradermal test were retested 60 days following the intradermal test by the subcutaneous and ophthalmic tests. Of the 80 herds, comprising 853 cattle,
6 or .7% were classed as reactors,
4 or 66% of the 6 reactors showed lesions on autopsy,
2 or 34% of the 6 reactors showed no visible lesions on autopsy,
Of the 6 reactors, 3 reacted to both the subcutaneous and ophthalmic tests and on autopsy 1 was positive and 2 were negative.
3 of the 6 reactors reacted only to the subcutaneous test and on autopsy were negative.
6 reactors came from 5 of the 80 herds.
Referring to chart No. 2, Group B, in which the subcutaneous test was the first test applied to the 150 herds, it will be noted that of the 150 herds, comprising 2,813 cattle,
501 or 17.8% were classed as reactors,
493 or 98% of the 501 reactors showed lesions on autopsy,
8 or 2% of the 501 reactors showed no visible lesions on autopsy,
69 or 13% of the 493 positive animals were tanked.
Sixty (60) days following the subcutaneous tuberculin test, these 150 herds were retested by the intradermal and ophthalmic method, exclusive of the 501 which reacted to the initial or subcutaneous test. On the retest of these
150 herds, comprising 2,308 cattle,
65 or 2.8% were classed as reactors,
62 or 95% of the 65 reactors showed lesions on autopsy,
3 or 5% of the 65 reactors showed no visible lesions on autopsy,
6 or 9% of the 62 positive animals were tanked.
As the result of the initial test of the 150 herds under this group, 96 herds were found infected while 54 herds were classed as having passed the test.
You will note by the chart that we have divided the 150 herds under Group B into two (2) classes, i. e., those herds in which tuberculosis was found as the result of the first test and those herds which passed the first or initial test. It will be noted that the 501 reactors as indicated above actually came from 96 herds.
On a retest of the 96 herds, which were infected as result of the first test, by the intradermal and ophthalmic method, exclusive of the 501 reactors, of the
96 herds, comprising 1,558 cattle,
60 or 3.8% were classed as reactors,
58 or 96% of the 60 reactors showed lesions on autopsy,
2 or 4% of the 60 reactors showed no visible lesions on autopsy.
6 or 10% of the 58 positive animals were tanked.
Of the 60 reacting animals, 49 reacted to both the intradermal and ophthalmic tuberculin tests and were positive on autopsy.
10 of the 60 reactors reacted to the intradermal test only and on autopsy 8 were positive and 2 were negative.
1 of the 60 reactors reacted to the ophthalmic test only and was positive on autopsy.
The fifty-four (54) herds of the 150 herds that were classed as having passed the initial subcutaneous test were retested 60 days following the subcutaneous test by the intradermal and ophthalmic tests. Of the
54 herds, comprising 750 cattle,
5 or .8% were classed as reactors,
4 or 80% of the reactors showed lesions on autopsy.
1 or 20% of the 5 reactors showed no visible lesions on autopsy.
Of the 5 reactors, 4 reacted to both the intradermal and ophthalmic tuberculin tests and all were positive on autopsy.
1 of the 5 reactors reacted to the intradermal test only and was negative on autopsy.

5 reactors came from 5 of the 54 herds.

It is a well established fact that the greater the infection in herds as disclosed by initial tests, regardless of the kind of tuberculin used, either alone or in combination, the less chance there is of removal of all the tuberculous animals in the infected herds. However, at times the first test applied will remove all the tuberculous animals and in other herds upon completion of the first test a certain number of tuberculous animals are left in the herds. This belief has been confirmed in the testing of herds under Groups A and B. Following are examples:

1. In one herd, under Group A, in which the intradermal test was applied to 19 animals, 16 reacted and on autopsy all showed lesions. The balance of the herd, or 4 animals, passed a negative subcutaneous and ophthalmic retest 60 days following the intradermal test.

2. Another herd, under Group B, comprising 35 animals, on which the subcutaneous was the initial test, 32 animals reacted and all showed lesions on autopsy. 60 days following the subcutaneous test, the balance of the herd, or 3 animals, passed the intradermal and ophthalmic tuberculin tests.

3. Another herd, under Group A, in which the intradermal test was applied to 26 animals, 20 reacted and on autopsy all showed the disease. The balance of the herd, comprising 6 animals, was retested in 60 days by the subcutaneous and ophthalmic tuberculin tests, with the result that 3 of the 6 animals reacted. On autopsy all showed lesions and 1 animal was tanked.

4. Another herd, under Group B, the subcutaneous test was applied to 52 animals of which 29 reacted, all showing lesions on autopsy. The balance of the herd, or 22 animals, was retested in 60 days by the intradermal and ophthalmic tests, with the result that 5 of the 22 animals reacted and on autopsy all showed the disease.

To determine the comparative value of the subcutaneous and intradermal tuberculin tests, two (2) points were taken into consideration:

1. The number of animals that were classed as positive on which the disease could not be demonstrated on autopsy or laboratory examination.

2. The number of tuberculous animals left in the herds.

Basing the efficiency on autopsy findings;—Group A, intradermal test 88%; Group B, subcutaneous test 98%, a difference of 10% in favor of the subcutaneous test.

The efficiency of the subcutaneous test is further proved by statistics in a report of the Federal Bureau of Animal Industry for fiscal year ending June, 1921, as follows:—In three states which employ the intradermal test, 4,474 cattle condemned by said test of which 891 or 19.91% no lesions were observed. While in Pennsylvania in the disposal of 5,110 cattle which reacted as result of tests under the Accredited Plan, we were unable to demonstrate the disease on 422 animals or 8.02%, or a difference of 11.89% in favor of the work done in Pennsylvania.

Point 2.

(a) A retest of the 70 infected herds in Group A, 32 reactors out of 25 herds were disclosed. In other words, the intradermal test left infection in 35% of the 70 herds.
(b) A retest of the 96 infected herds in Group B, 60 reactors out of 37 herds were disclosed. In other words, the subcutaneous test left infection in 33% of the 96 herds.

The above shows an actual difference of 3% in favor of the intradermal test. However, Group B contained 26 more infected herds and 182 more reactors than Group A, showing that the subcutaneous test was used on more extensively infected herds.

In conclusion,
1. The subcutaneous and intradermal tests are about equal as initial tests.
2. The subcutaneous test is superior to the intradermal test, based on autopsy findings.

PRESIDENT CREWE: The next item on the program is: "Methods by Which Tuberculosis is Spread," by Dr. James S. Healy, of Madison, Wis.

DR. JAMES S. HEALY (Madison, Wis.): Mr. Chairman and Gentlemen:

It was a pleasure and privilege to listen to Dr. Schroeder on the work carried on at the experimental station in tuberculosis control work, but in the fore part of his discussion I had a feeling like that which possibly came over a young man who came into our office a short time ago, and said that he represented the D. O. C. people. I said: "Who are the D. O. C. people?" He said: "D. O. C. is a cure for hog cholera." I said: "Young man, you have more courage than Daniel possessed when he entered the lions' den."

I have somewhat of that kind of a feeling after listening to Dr. Schroeder's discussion, but after the discussion proceeded I felt very much relieved, and I wish to state that the promises on which this paper is based, which I had in mind when I wrote this paper, were that the problems that confront us are clear, and that I ought to bring them to your attention in giving reasons for certain outbreaks, feeling that they are logical and that we have exhausted all the means in our hands in accounting for such outbreaks.

METHODS BY WHICH TUBERCULOSIS IS SPREAD

Dr. James S. Healy

The topic assigned for this paper is certainly broad and one need not complain of not having a wide range in preparing one. However, second thought conveys the idea that the summing up of the methods by which tuberculosis is spread would result in one word, environment, environment in this instance meaning contiguity to contaminated food, premises and infected animals.

Since livestock sanitarians have become interested in the control and eradication of bovine tuberculosis, "Rules and Regulations" have been promulgated from time to time for the guidance of breeders in order to prevent the spread of tuberculosis in their herds.

The various states cooperating with the Bureau of Animal Industry, United States Department of Agriculture, have for the guidance of the breeder "Uniform Rules and Regulations" for accreditation of tuberculosis-free herds. The plan is a practicable and workable plan, based on the principles of sanitation and disease control; it incorporates the necessary regulations to safeguard the breeder's interests and assists him in maintaining a tuberculosis-free herd.

However, the observance of the spirit of the agreement does not presuppose that tuberculosis may not gain entrance to the herd. In fact,
the agreement premises the possibility of the converse as it provides for the reinstatement of herds in which tuberculosis has been found. It is such herds, where the owner has lived up to the spirit of the agreement but where the final analysis furnishes a logical reason for the infection, that take us away from the field of the commonplace in mode of infection to a more interesting and compelling field.

In citing the various modes of transmitting tuberculosis it is not with the thought of imparting any new ideas, but with the hope that the paper will evoke discussion which will reflect the necessity for closer attention and applied regulations to matters deemed of minor importance, but which have proven retarding factors in the field of tuberculosis eradication.

The methods of spreading tuberculosis are so closely allied to cases wherein difficulty is experienced in eliminating tuberculosis from a particular herd or premises, that the writer claims the privilege of mention of the relationship.

When we consider the spread of tuberculosis and the question obtrudes of why it spreads more rapidly and extensively under apparently similar conditions, we must consider the question of the relative virulence of strains of tubercle bacilli. We find in certain sections strains of bacilli that appear to be a virulent type, found in reactors to the test but wherein laboratory diagnosis is necessary to demonstrate the bacillus. Animals which were reactors two to five years previous to the test on which they were slaughtered have failed to harbor "visible lesions." The sanitarian, to insure success, must disregard the question of relative virulence.

"Cleaning and Disinfection of Premises" is a factor of great importance in the elimination of tuberculosis and retarding its spread. In most instances little attention is paid to the barnyard, its drainage and disposal of manure—all important factors. When we consider that a particle of dust floating in the atmosphere is capable of carrying six bacilli, we realize the necessity for the thorough cleaning of walls of cobwebs and dust. Ponds receiving the drainage of the barnyard to which the cattle have access are permitted on our best farms. Lawrason Brown, writing in the August number of the "American Review of Tuberculosis," states, "The sewage of Saranac Lake empties into Sananac River below the village. Mr. Puroff, Dr. Heise and myself found tubercle bacilli at all levels of the river at the sewer's mouth, but they grew less as the mouth receded to disappear at a distance of four miles down the river, which flows about two to four miles per hour."

At a place where a bad outbreak occurred and where it was difficult to account for the extent of the outbreak, manure was collected in the barn yard and removed every week. The cattle had access to the pile and post mortem examination revealed an animal that had active generalized tuberculosis, the uterus being a mass of tubercles.

The maintenance of reactor animals on premises is a contributing factor where healthy cattle are kept and cared for by the same employees. The employees view the animals in apparent health and in many cases do not consider them dangerous, hence are prone to neglect the ordinary precautions relative to clothing, feeding utensils and disinfection of person.

Tuberculosis is often introduced into a clean herd by placing too great confidence in a sixty or ninety day retest wherein the history of the herd from which the importations originate is bad or obscure. The value of a sixty-day retest should be to determine if infection took place between date of sale and retest. Many inexcusable contaminating in-
fluences surround the class of animals sold subject to sixty-day retest and militate against the seller; animals brought to sales pavilions which are commonly used as testing barns, reactors frequently found and no cleaning or disinfection practiced; animals held in stockyards pending shipment and shipped in stockcars that have not been cleaned and disinfected. So many reactors have been found on sixty-day retest that could be accounted for on no other logical basis, as the test history and herd history in connection with the animals was of the best.

Auction sales where untested cattle are sold contribute more largely to starting new centers of infection than any other factor at present. Something should be done toward regulation of such sales. One case in point—the owner sold subject to seven-day retest. At the time no tuberculin was procurable and a test made about the twelfth day termed every animal a reactor. Twelve new centers of infection would have been started had the test been waived.

Other factors in spreading the disease are pure-bred sales which accept consignments from breeders of questionable integrity and herds in which a large percentage of reactors has been found; handicapping the test by retesting reactors; failure to remove reactors with low amplitude of reaction; disposing of animals with reacting temperatures as suspects to be held for retest; calf brokers, those who advertise in our leading agricultural journals and send out “gold brick” follow-up letters, who refruit calves from our central stockyards; owners of tuberculous herds who advertise and sell progeny. The condition brought about by this calf trade will be partially overcome by the enforcement of Regulation 7, B. A. I. Order 273.

Recent statistics indicate a surprisingly large number of calves are reactors to the test. In two instances the adult cattle of herds whose first test was clean passed the second test, but the calves reacted. Inquiry developed that the calves were fed unpasteurized milk from the creamery. This is one of the greatest factors in the spread of tuberculosis in hogs.

Experiences within the last year have emphasized the danger attending fairs and exhibitions. Exchange of feed and utensils at such places are contributing factors. Considering the breeder’s investment and ready means for obtaining a herd test, I see no legitimate excuse for accepting cattle from herds not tested in their entirety. Still, exhibits are accepted from known tuberculous herds.

Faulty watering systems in barns contribute to the spread of tuberculosis. In a few instances in order to eliminate tuberculosis it was necessary to clean and disinfect all feed and pipe lines of the system. The underfeed system is a risky proposition and should be discouraged.

Some feel that pasturing contiguous to a diseased herd is of negligible moment, but circumstances attending the introduction of tuberculosis in certain herds point so plainly to this method of infection, that to me it is logical and acceptable.

Contiguity of uninspected slaughter houses and garbage or offal feeding stations and the drainage therefrom should merit our attention.

Field reports indicate that the elimination of tuberculosis from herds has been contingent upon or simultaneous with the removal of chickens from the barn. This raises the subject of transmissibility of avian tuberculosis to the bovine, with most of the scientific evidence against such a premise. The maintenance of smaller animals about the premises should be considered in relationship to spreading the disease. Twenty-two reactors were recently removed from a herd of thirty-seven cattle. The barn goat was injected, reacted, and post mortem findings
were "generalized tuberculosis." Had we left the goat, what bearing would it have had on the future health of the herd.

A recent test on an accredited herd revealed forty reactors out of sixty head tested. The history of this herd being of unquestionable character, no additions having been made with the exception of the herd sire who had been kept isolated, we naturally looked for some method of infection out of the general rule. Attention being attracted to the chickens on the farm by their physical appearance, it was found that a large number had died, fully 50% of the original flock. On posting one of the afflicted chickens it was found to have generalized tuberculosis. Attention was then called to a slaughter house about thirty rods distant from the barn, from which drainage crossed a lane which leads from the barnyard to the pasture. This slaughter house is of the character found in small towns, is very insanitary with no manner of disposing of the offal except feeding to hogs which run in the lot. Slaughter houses of this character which are not under supervision attract the class of animals which will not stand shipment to larger centers and whose owners feel they will not pass the ante-mortem inspection conducted in the regular stockyards.

Attention was called to the fact that a cat with a litter of kittens occupied that compartment of the horse barn wherein the calves ranging from one month to nine months of age had all reacted to the test. The cat made frequent visits to the slaughter house bringing back offal to feed the kittens. Later the cat and kittens left this part of the barn and moved to the bull stall where the bull was kept and which later reacted to the test; leaving here the cat with her kittens moved to the main barn where all but three mature cows reacted to the test. The cats at this time were about two-thirds grown and prior to moving to the main barn it was noticed that the old cat was becoming thin and emaciated, this being thought due to the fact that she had not weaned the kittens. Subsequently all the cats became emaciated and died.

The animals that passed the test were eight heifers between two and three years old which were kept in a compartment which was at no time occupied by the cats. These were the only animals on the farm of that age. There were also nine calves born subsequent to the moving of the cat and kittens from this compartment to the bull stall and which commingled with eight calves which reacted to the test, which did not react. The compartments were of matched or close fitting lumber and there were no communicating doors. Twenty-eight of these reactors have been slaughtered to date, all showing lesions, none of which were of long standing but were of the progressive, acute type.

The maintenance of farms of the class of animals known as "feeders" contributes toward the spread of tuberculosis, but where the necessary state quarantine regulations are enforced it does not reach any very large proportions. Reactors which reach central stockyards without being properly identified by reactor tag and brand on the jaw very often lose their identity on arrival at the yards and in many cases are sold as straight cattle, starting new centers of infection at destination. It seems that veterinarians engaged in tuberculosis control work should endeavor in every way possible to brand reactors on the left jaw regardless of the lack of regulations calling for such action. A good brand on the jaw is about the only way to safeguard against losing identity of the reactor.

Certain institutional herds have caused us considerable worry. On each test we find reactors to individual tests and all tests in combination. Post mortem findings indicate recent infection. The herd at the Hay-
ward Indian School was due for accreditation when the test returned four reactors. Attention was called to the fact that an Indian boy who was tuberculous was working in the barn. He was transferred to other work. The herd is now accredited.

Tuberculosis in swine will automatically be eradicated with eradication from the bovine and methods of transmission are too obvious to mention.

The phrase, “transmissibility to the human” I feel will have been fully discussed at the conference preceding this meeting.

PRESIDENT CREWE: The next subject is: “Control of Anthrax,” by Dr. A. Eichorn, Pearl River, N. Y.

THE SIMULTANEOUS VACCINATION AGAINST ANTHRAX WITH SPECIAL REFERENCE TO ANAPHYLAXIS

A. Eichhorn, Pearl River, New York

In accepting the invitation to address this Association on the control of anthrax by the simultaneous method, it seems that from the inauguration of this form of preventive treatment in the United States in 1916 the method has been brought to the attention of the veterinarians both in addresses and publications and therefore it appears superfluous to describe in detail the procedure. Since its introduction the simultaneous treatment continuously gained in popularity and it may be safely said that at the present time over 90% of the animals in anthrax districts are being vaccinated with the simultaneous treatment.

Previously to the development of the simultaneous method, the Pasteur treatment was almost uniformly employed. The fact that the Pasteur treatment as employed failed to give good satisfaction and also on account of its requiring more than one handling of the animals, stock owners as well as veterinarians realized the advantages of the method which would not only assure a more effective control but also was simpler in its application. The superiority of the simultaneous treatment, however, cannot be laid altogether to the simultaneous injection of the serum and virus, but to a great extent to the more effective vaccine which has been developed and which is being used in conjunction with the administration of the serum. As a matter of fact it is now greatly recognized that the spore vaccine in its present form must be considered as the most important advance attained in the control of the disease. It not only insures a more uniformly standardized product but also a uniformity in dosage as far as the number of organisms introduced into the animal is concerned. The advantages of the spore vaccine were soon recognized in almost every country where anthrax is a prevalent disease, so much so that in the South American countries the spore vaccines have entirely supplanted the old time Pasteur vaccine, at least as far as its production in the respective countries is concerned.

With the advent of the spore vaccine it is no longer necessary for anxiety whether the product possesses the necessary potency, as we can be assured that the spore vaccine if originally well prepared will maintain its effectiveness for a long period of time. This was not the case with the Pasteur vaccine, which being an ordinary broth culture containing mostly the vegetative forms of the anthrax bacilli was subject to deterioration even when kept under favorable conditions. In the spore vaccine, therefore, we have a product which makes the control of anthrax more effective.
The serum which is used in conjunction with the spore vaccine is intended primarily to overcome the reaction produced by the vaccine and protect the animal during the time its immunity is being established. It is natural that such serum must be carefully prepared, tested for potency and purity. By administering the serum simultaneously with the vaccine, it is possible to inject the animal with a large dose of somewhat attenuated anthrax organisms, which without the serum would unquestionably endanger the animal's life.

The preparation of the serum does not differ in its essentials from the production of other antitoxin or antibacterial sera and in fact before an animal's serum is considered of sufficient potency, it receives injections of tremendous quantities of most virulent suspensions of anthrax bacilli. This is a splendid proof for the high degree of immunity it is possible to produce in this disease. Serum producing animals receive for a single injection the washings of several agar bottles having a surface of $4'' \times 8''$ and if we consider that a part of a platinum loopful of the same culture is sufficient to kill a susceptible animal, we can readily realize the high degree of immunity that hyperimmunized animals possess.

For the production of immune sera it has always been a practice to utilize horses, provided they were suitable for the purpose. This has also been the case in the production of antianthrax serum. In 1919, however, reports came to the writer in which a condition was described resulting from the vaccination which suggested the development of anaphylactic reactions in the vaccinated animals. The first report of this kind came from Texas, later from Connecticut, New Jersey and from various South American countries. The anaphylactic or serum reaction appeared usually in animals which were vaccinated at least two times in consecutive years and on the third injection a certain percentage of these animals developed the reaction.

A careful study was made of the anaphylactic reaction and it was found that it is very typical in its manifestations. The animals developed from five minutes to two hours following the vaccination a pronounced uneasiness, a starey look with protruding eyes, swelling of the anus and vagina, urticaria-like eruptions over a part or the entire body and in very severe cases complete prostration. The appearance of the animals during the reaction is very alarming and one cannot blame, those who had the occasion for the first time to notice such a condition to undergo considerable worry and be at a loss to explain as to the cause that might have brought on such a remarkable condition following the innocent vaccination.

As already stated, the reaction does hardly ever develop before the third vaccination of the animals and only occurs in cattle, due to the fact that with the previous injection they have become sensitized to the horse serum. Such anaphylactic reactions, however, last only a short time and usually disappear within two to four hours after their appearance. In some very few instances the animals died from the reaction.

Inasmuch as the great proportion of vaccinations are undertaken on meat producing animals, we have learned in most instances of the occurrence of these anaphylactic reactions only in cases where dairy herds have been repeatedly vaccinated by the method. A striking instance of this kind occurred in dairy herds maintained in the Panama Zone and these cases were carefully described by Dr. Taylor in a recent issue of the Journal of the American Veterinary Medical Association. Similar reactions were observed in large numbers among working oxen kept on plantations in South America. In these instances
the animals are kept principally for draft purposes and are being vaccinated from year to year in order to protect them from the exposure to anthrax.

Inasmuch as a similar condition has been observed to occur following the injection of horse serum into human beings, as for instance in the treatment of diphtheria with antitoxin, a great deal of attention has been devoted to the study of this condition with the possibility of eliminating the unpleasant and at times even dangerous reactions. It will not be necessary to enumerate the various methods which have been tried and recommended for the elimination of such reactions but the most effective appears to be the method known as the desensitizing of the individuals.

The desensitization consists of the administration of a very minute dose of the serum and after an elapse of two to three hours should be followed by the injection of the entire dose. This method has also been recommended for the purpose of eliminating reactions in animals to be vaccinated against anthrax. While these precautions have to great extent reduced the number of reactions and also the severity of them, it has not entirely eliminated their occurrence.

More recently Besredka recommended the treatment of the serum with sodium hyposulphite which is supposed to desensitize such serum and after such treatment that it may be safely administered into the sensitive individuals. We have conducted a series of experiments to test out this method and found that it possessed no superiority whatever over the desensitizing injection. Other methods have also been tried with no better results. It appeared, therefore, essential that in order to entirely eliminate such serum reactions, that cattle to be immunized by the simultaneous treatment should be given serum whichis prepared from the bovine species. This naturally would entirely eliminate an anaphylactic reaction in the bovine species, but on the other hand if bovine serum would be repeatedly used on horses they would naturally become sensitized to the bovine serum. It is suggested, therefore, that animals which are to be vaccinated only for two consecutive years can be given the horse serum. Cattle on the other hand which have received serum injections on at least two previous injections should be given the bovine serum.

The bovine serum is prepared along the same line as the horse serum and it is possible to prepare from cattle, serum of the same potency as from horses. As already stated, in a great majority of vaccinations with the simultaneous treatment, the ordinary serum and vaccine could be used. In cases where danger of anaphylaxis from the horse serum exists, cattle should be given bovine serum.

The results from the prophylactic vaccination on the whole are very satisfactory. At times deaths will occur among the vaccinated animals but when we consider that millions of animals are now being vaccinated by this method the losses while deplorable are not comparable with the tremendous destruction caused by the disease among unvaccinated animals. It must be recognized that it is impossible to confer upon the animals by the usual form of vaccination a very high degree of immunity and if the exposure is extraordinarily heavy or the virulence of the virus is of an unusual high degree, the vaccination does not prove invariably effective in preventing the disease and these facts account for the occasional losses of animals in vaccinated herds.

In order to overcome such losses and to increase the immunity in animals, particularly in notorious anthrax districts, a stronger vaccine has been prepared which is intended to be used after the simultaneous
vaccination. This vaccine when administered in from 10 to 21 days following the vaccination increases the resistance of the animal against anthrax to a marked extent. In other words, the injection of this stronger vaccine may be compared with the first step practiced in the hyperimmunization of the animals used in the production of anthrax serum. If we could continue and keep on injecting the animals with organisms of stronger virulence and large dosage, we would eventually produce an immunity which would protect them against the injection of mass cultures of virulent organisms. Of course, such a high degree of immunity is not necessary under natural conditions in the field as the exposure under such conditions cannot be compared with the injection of a great number of organisms as is practiced in hyperimmunization.

The ordinary vaccination should be sufficient to protect the animals from ordinary exposure and only under unusual conditions should the animals be vaccinated with the special vaccine in order that their resistance may be increased.

Time and again it has been said that danger of vaccination against anthrax will result in creating new centers of infection. Such statements should be refuted inasmuch as it has been conclusively established that the injection of an attenuated vaccine even if causing death of the animal will not endanger other animals. In other words if the anthrax organism is attenuated according to the principle laid down by Pasteur it will not regain its virulence under any conditions. We may inject such attenuated organisms into animals repeatedly and they will not regain their virulence. This has been conclusively established and therefore the danger from such sources should be entirely discounted.

Wherever anthrax exists it becomes necessary to protect the animals by vaccination and this should be undertaken without hesitation. Such procedure will not only protect the vaccinated animals but also keep the disease confined to a certain area whereas if such protective measures would not be followed the disease would spread and create new centers of infection. From the extensive data available, we may summarize that in the past years great advance has been made in the control of anthrax by prophylactic vaccination and that with the present method of preventive vaccination it is possible to control the disease and keep it restricted within confined areas.

PRESIDENT CREWE: The next item on the program is the Report of the Committee on Skin Diseases, by Dr. C. G. Lamb, Chairman,

DR. C. G. LAMB (Denver, Colo.): Mr. Chairman and Gentlemen:
My apologies are due the members of this Skin Disease Committee, and also to the Association for having been extremely negligent in attending to my duties in this respect. I have not gotten in communication with the members of the Committee, and this may be considered a one-man report, very hastily written, on account of the fact that previous to my coming to Chicago I neglected to attend to it as I should have done.

We find by examination of the Government reports of the inspection and dipping of sheep for scabies in the various states that during the period from November 30, 1920, to October 31, 1921, there were dipped 2,044 bands of sheep in which were 2,414,120 infected animals. This compares with 2,084 bands containing 2,069,060 infected animals during the same period of the preceding year, a decrease of 40 bands and an increase of 345,160 infected animals. During the same period there were dipped for mange this year 1,282 herds of cattle containing 337,009 animals compared with 1,483 herds containing 375,014 animals for the previous year, a decrease of 201 herds dipped and a decrease of 38,005 of animals dipped.
An examination of these reports shows that a very large percentage of the sheep and cattle scabies exists in the range states and in spite of the hard and persistent work of both government and state men it persists and each year your committee is obliged to report a large number of infected animals and it would seem as though it was destined like the poor to always be with us—but Why? It is a disease that is well understood by stockmen as well as veterinarians. It is easily cured, and every stockman knows how to cure it—and the question is why don’t they do it. I confess I have not been able to solve the riddle after 20 years of active experience in fighting it. Indifference is one factor. While it does cause loss it does not cause severe enough loss, in most cases, to seriously affect the pocket nerve.

Carelessness and Slipshod Methods is another factor. A stockman if induced to dip his cattle or sheep, and this applies more especially to cattle men, will gather and bring to the vat a certain proportion of his cattle varying from 50 to 75%—very seldom a larger proportion. Then unless the dipping is done under official supervision, they are run through a dip of improper strength—improperly heated—and are run through so rapidly that they are not even thoroughly wet—replenish dip if a certain percentage are found infected. They are not held in the dip a proper length of time and if any are returned for a second dipping, only about half are returned, and in many cases if the number is correct, they are not the same animals. After the dipping they are returned to the same old range bedgrounds and corrals to again become infected—and then they wonder they do not get results.

In many cases a little scab, especially sheep scab, is a good thing for the sheepmen in controlling range. If there is a certain portion of the range he covets, he can keep other sheepmen off by having some scab in his flock—they will keep away from him. Theoretically this is a very easy matter and with the cooperation we should receive, the disease should be very quickly eradicated. The observance of a few cardinal principles is all that is necessary. (1) The presentation of all cattle or sheep for dipping. (2) The dip must be of a proper strength and temperature and kept so during the dipping. (3) The animals must be kept in the dip a proper length of time. (4) All infected animals should be redipped in 10 or 12 days or better, all animals in a herd in which any infection is found should be redipped in 10 or 12 days. (5) Proper disinfection of all sheds, or corrals which have contained infected animals. As I have said, theoretically this is simple but practically it is what Sherman called war, and many of us have brought grey hairs to our heads and our minds to the verge of insanity in trying to accomplish the desired result and so far have not been eminently successful.

And now we are confronted with another disease of the skin that promises to require much attention, study and investigation and which promises to be much more serious than the disease caused by the scab mite. I refer to tuberculosis of the skin as presented in the paper and by the exhibits of Dr. Day but we will leave to future committees on skin diseases, to more fully report on this disease when it has been more fully studied.

PRESIDENT CREWE: The next item on the program is: “Methods of Eradicating Scabies in Sheep,” by Dr. M. J. Butler, of Helena, Mont.

METHODS OF ERADICATING SCABIES IN SHEEP

The eradication of scabies in sheep is without doubt one of the most difficult problems that confronts the livestock sanitarian. Difficult, not
on account of any mystery about the condition or of any unknown etiology of the disease, but difficult on account of its seeming simplicity.

Theoretically it is a simple problem; all you have to do is to gather the affected and exposed sheep and dip them in a standard dip. Practically it is a most difficult problem.

There are numerable details that must be observed with infinite care; the non-observance of any one of which may result in a fresh outbreak in from sixty to ninety days or even longer. If the re-infection was immediately visible, or if there was any quick method of determining whether or not the disease had been eradicated, it would not be so bad; but there is no such method. All we can do is to watch and wait, and you all know that "watchful waiting" is not exactly satisfactory.

Whether it is dipping only a few sheep or dipping a hundred thousand sheep, a slip in some small detail may undo all our work. If one scabby animal is missed or if one little scab mite or egg is permitted to live on any one of the hundred thousand sheep being dipped, or in any corral or shed or bed ground, re-infection may occur and the entire dipping have to be done all over again.

Very often sheep men and others will be met who have had very little or no experience with sheep scab who will say, "Poof, there is nothing to cleaning up sheep scab; all you have to do is to dip them." Shun such talk as you would a plague for it is to be distinctly understood and remembered that the eradication of scabies in sheep is most difficult. We know of no problem or disease that is looked upon with more dread by livestock sanitary officials in large sheep states than an outbreak of sheep scab. Infinite care and attention to every minute detail must be observed by all employed if success is to be obtained.

There are fundamental principles that must be observed in eradicating sheep scab no matter whether the disease is in a few pasture sheep or in a hundred thousand sheep grazing over a thousand square miles of open range.

Methods mentioned in this paper are applicable in the main in all districts. There are, however, some details of identification that will not be necessary in small outbreaks. This paper is written from the viewpoint of one dealing with large numbers of sheep.

The first requisite is to obtain a complete history of the outbreak. This should include: the origin of the diseased sheep; also (if sheep were shipped by rail) the location of exposed stockyards and stock cars, so they may be cleaned and disinfected; the trails and range and corrals and sheds and water holes which the diseased sheep used and a list of sheep herds directly or indirectly exposed to the diseased sheep or which used the same range or trails or sheds or corrals or water holes.

All diseased sheep and all directly or indirectly exposed sheep and all exposed range and all sheep within that range should be immediately quarantined. The quarantined range should be designated with red flags and a description of the quarantined range should be published in the local papers and stock papers of that section.

The safest procedure is to dip all sheep within the exposed range just as if they were actually scabby. This, however, is not always practical. There may be some sheep that have never been out of a pasture and there may be some within the quarantine range where exposure was very remote, and which are difficult to get into the dipping vat. If it is not practical to dip them then they must be quarantined for not less than ninety days and until reinspected and found free from disease by a sanitary official; and they must be quarantined in such a manner as to not interfere with the range of other sheep.
A survey of the range must be made and dipping plants provided for the different districts. Before dipping is actually started the trail and range to be used by each band of sheep must be designated.

The vat should be built sufficiently long to handle the sheep to be dipped without having to hold or handle the sheep too much while they are in the swim. If a number of sheep are to be dipped, a vat 100 or 110 feet long should be used. With just a little retarding it will take a sheep two minutes to swim that distance. The vat should be built in such a manner as to be easily drained and cleaned and filled. Never build a vat in a sump where it cannot be drained. If you do you will find that it will not be cleaned as often as it should be or if it is, the time consumed in cleaning will interfere with the second dipping. It is equally essential to have a good heating plant. A poor heating plant will delay dipping and may very easily make a poor dipping out of what might otherwise have been an effective one. It is a safe plan never to start dipping until all plans have been arranged; a good heating plant with plenty of fuel on hand and the vat and corrals in proper condition.

The selection of the dip depends upon climatic and geographic conditions. Under range conditions the only dips which we have found safe to use are the lime and sulphur dips and the nicotine dips.

Herders and camp tenders should have specific instructions when to have the respective bands under their charge at the vat and the trails, and range and bed grounds to be used during the interim dipping should be specifically designated and understood.

Each band as it comes into and while in the corrals should be carefully inspected and all visibly diseased animals cut out and held so as to be hand treated and dipped after the balance of that band have been dipped. The sheep after they have been dipped and while in the dripping pens must be accurately counted and paint marked with a distinctive mark. All sheep in each band should be marked alike but each band must be marked differently.

The inspector in charge of the vat should take personal supervision of the preparation of the dip. He should see that it is kept at proper strength and temperature at all times and the vat cleaned and replenished when necessary. In addition to this he should work the sheep over when they come in; cut out the bad cases and attend to their hand treatment and their dipping in the vat. He should have an assistant to supervise the handling of all other sheep in the vat and see that orders relative to marking and counting the sheep are carried out. He or his assistant should also visit the different camps and bed ground to see that the herdsmen follow the designated trails or route and camp where instructed. If a number of sheep are being dipped this range work will require the services of an extra assistant.

The owners of the sheep must furnish sufficient help to do the actual work of getting the sheep into and through the corrals and dipping vat. They also should furnish a competent man with an assistant to mark and count the sheep after they are dipped.

With reference to the strength of the dip it should be kept at slightly more than minimum strength. The temperature should range from 105° to 110° F.

Every effort should be made to have sheep of the same age and strength dipped at the same time. Lambs will not stand as much dipping as strong ewes or wethers. If lambs and weak sheep are dipped with stronger animals ineffective and disastrous dipping is more than likely to occur. When a band comes in for the second dipping they must be counted and inspected to see if the proper number are there or if any
sheep bearing a different mark have mixed with and gained entrance into that particular herd. If any animals have died during the interim of dipping the herder should skin them and bring their pelt in as evidence of their death. If sheep from another band are found and their dipping will not come within the 10 to 14 days limit, then a third dipping should be ordered.

All sheep dipped should be quarantined for not less than ninety (90) days to date from date of second dipping. Before being released, they should be subjected to a thorough corral inspection. This to guard against the spread of the disease should the dipping have been ineffective or re-infection occur.

To prevent the straying of sheep and their mixing with other bands movable wire corrals into which the band is placed every night have proven most effective.

It may be said the plan we have outlined is too much trouble and is really not necessary. True such a plan was not always necessary when there was plenty of range and sheep could be herded long distances apart, but today with our very limited range and even more limited watering places such a plan is necessary. It is much more economical to take a little extra trouble and precaution and make one double dipping effective than it is to have a slip occur and find after the expiration of some sixty or ninety days that the work has to be done all over again.

Equally essential as the dipping is the cleaning of all diseased and exposes premises. This requires just as much care and thoroughness as the handling and dipping of the sheep.

The floors of all sheds and corrals should be scraped and sprinkled with lime. The refuse should be burned. Sheds and corrals including the movable wire corrals and all other material of any kind around sheds or corrals or bed grounds should be sprayed with efficient disinfectant into which has been placed sufficient lime to show where the disinfectant has been applied.

As a closing remark, to show the absolute necessity of cleaning and disinfecting sheds and corrals, I quote you an extract from the 1920 Annual Report of the Nevada State Sheep Commission:

"The fifth outbreak occurred among some three bucks kept on a ranch in Humboldt County. During the past season these bucks were kept on this ranch, and had access to a corral where scabby sheep had been kept some five years ago. The history and movements of these bucks for the past three years are known, and it is reasonably sure that they could not have become infected in any other manner than by having had access to this corral where scabby sheep had been kept five years ago. These three bucks are the only Nevada sheep that developed scabies during the past fiscal year that had not been directly exposed to the infection which had recently been brought in by sheep from adjoining States or through the medium of infected cars.

"This incident of these three scabby bucks furnishes us additional information of how long scabies infection will exist under favorable conditions in corrals that have not been properly cleaned and disinfected."

### SHEEP SCABIES

**November 30, 1920, to October 31, 1921**

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Psoroptic Scabies in Cattle
November 30, 1920, to October 31, 1921

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1,282                              337,009

PRESIDENT CREWE: The next item on the program is the Report of the Committee on Tick Eradication, by Dr. C. A. Cary, Auburn, Ala

REPORT OF THE COMMITTEE ON TICK ERADICATION

During the year, 1921, cattle tick eradication has progressed quite well over many parts of the infected areas, but in some states and many counties very little has been done in active tick eradication.
The U. S. Department of Agriculture will soon release from Federal Quarantine:
1. 16 counties in Georgia.
2. 23 counties and parts of 3 counties in Texas.
3. 2 parishes and 2 parts of parishes in Louisiana.
4. 1 county and one part of a county in North Carolina.

Owing to discontinued local efforts to complete our clean up infested premises and cattle in counties released from Federal quarantine, the United States Government requarantined during the year:
1. 6 counties in Arkansas.
2. 6 parishes in Louisiana.
3. 4 counties in Texas.
4. 1 county in Oklahoma.
5. 1 county in Georgia.
6. Parts of counties in Alabama, Arkansas and Louisiana.

These backward steps came from lack of local co-operation, lack of funds, deficient enforcement of the State and Federal laws, depression in the price of cattle and hard times. It may be stated here that in many counties of the several states have been released from Federal quarantine, with too many left-over infested premises and cattle. It is very difficult to clean up left over infested centers when a county is released from Federal quarantine. As an example of this, we refer to the early release of the State of Mississippi. There were a large number of infested centers in range counties at the time of release. At present some of these counties in South Mississippi are badly re-infested and should go back in quarantine or into active work. There are also counties in Alabama, Arkansas and several other states that are out of Federal quarantine and yet have badly infested premises and cattle. As long as there are few or many centers of infestations in a state, and as long as some states (for example Florida) are badly infested, or a large part of a state is seriously infested with cattle ticks and no active eradication work is being done, and as long as tick infested or quarantined cattle can be shipped inter-state for immediate slaughter, so long will there be re-infestation of clean territory, and consequent indefinite delay of tick eradication.

Sixteen years of Federal, State and County co-operative tick eradication has succeeded in releasing from Federal quarantine, 523,837 square miles, or 73%, of 729,852 square miles, leaving 206,015 square miles under Federal quarantine. In other words 28% or slightly more than one fourth of the original quarantined area is still under Federal quarantine. The cost of this great work up to date has been borne largely by the county of the different States, and also at no little expense to the respective states and to the Federal Government. In some of the states, the people are becoming weary of this long drawn out fight and the local costs. However, this saving and the multitude of good results have fully justified the trouble and the cost. Tick eradication has made, and is making, the cattle industry possible, profitable and safe in the South. It has paid a ten-thousand fold dividend.

During the year 1921 an amendment to the law of 1884 was introduced in the House of Representatives by Congressman McDuffie of Alabama. This amendment, if passed, would permit the Secretary of Agriculture to stop the Inter-State Movement of tick infested and tick quarantined cattle for any purpose whatever. The bill has never been reported out of the committee to which it was referred. No one has been to Washington to push it. Such a bill will not work itself in Congress. Active work at Washington is required. Either a special committee should be sent to Washington by this organisation and possibly other organisa-
tions should do likewise, or this work should be taken up by the Legislative Committee of this organization. Therefore the Committee on Tick Eradication urgently recommends that the Committee on Legislation be directed by this Association to make a strong effort to get the McDuffie bill passed by Congress at the earliest possible date.

The passage of this bill will cut down the appropriation for tick eradication and save expenses to the states and counties and speed the time for finishing the great work of tick eradication and leave the field clear for tuberculosis eradication especially in the South.

C. A. Cary, Chairman.
E. P. Flower.
J. W. DeMilly.
W. K. Lewis.
J. H. Bux.

PRESIDENT CREWE: We will now go back and take up the Report of the Committee on Tuberculosis.

DR. J. G. FERNEYHOUGH (Richmond, Va.): Mr. Chairman, I would like to suggest to you that since the time is getting late, and a lot of us are deeply interested in these subjects, and I am prone to talk too much unless somebody stops me, I think that it would be very good if we would limit these discussions to five minutes in order to cover the subject.

PRESIDENT CREWE: If there is no objection, we will limit the discussion to five minutes.

DR. ELIASON: Mr. Chairman, I move the adoption of the Report of the Committee on Tuberculosis.

Motion duly seconded and carried.

PRESIDENT CREWE: That concludes the report of the Tuberculosis Committee. We have Dr. Bruner's paper on the result of his project. Is there any discussion on that?

DR. ELIASON: In regard to the finding of the tuberculin test, I will say that our State also finds that the difference in the efficiency of the test varies considerably in different parts of the State; in other words, it varies in each district. In the northern part of the State, it does not make any difference what test you use, with the exception of less than one per cent, you are going to have a number of animals react, in which it puzzles you to find lesions. We have always done that since we started tuberculin tests, and we do not believe any more in the theory that a reactor which does not show a lesion is a non-tubercular animal.

DR. BRUNER: In answer to Dr. Eliason our work up to November 1st covered work under the accredited plan, and also with herds tested under the artificial plan, and indicates that as the disease decreases the inefficiency of the test increases. I might say that in 95 per cent of those no lesion cases, in practically every case lesions or glands that were commonly affected, were sent to the laboratory, and a complete examination of those specimens made. When we got a report back that an animal showed no gross lesions, on a laboratory examination, we considered that animal a negative animal. We considered those animals were not affected with disease. We had both Federal and State men in this work, and we are just as capable of holding an autopsy as anyone in any other State. Dr. Turner and Dr. Quinn, in our State, have opened up a number of carcasses, and we were unable to find lesions.

As far as the accuracy of those figures is concerned, we have the records down there at Harrisburg, and we will be glad to have you come down there and let you see them. They are right there, recorded as they came in.
DR. MOORE: Mr. Chairman, I would like to ask Dr. Bruner in those cases where those large number of no-lesions are shown, if those animals had previously been tested by the subcutaneous method to any extent; in other words, is there any possibility of their being a reaction?

DR. BRUNER: Dr. Moore, as to the two initial tests, covering the 150 herds tested by intradermal and 150 herds tested by the subcutaneous, those were initial tests of herds under the accredited plan. As far as our records go, that we were able to find, in those 300 herds, there were very few instances, I would say less than three per cent, of infection before the tuberculin test.

MR. TURNER: Dr. Thomas asked a question that Dr. Bruner partly answered. Dr. Bruner, you remember, did not claim any more for one test than the other. He claimed inefficiency. The inefficiency in the first group was about the same, and the same way in the last group. You notice there was 98—95, and in the second group 96. In the other group it is 88, 81, 84. Therefore, I think that Dr. Bruner has proved with the charts, that one test is more efficient in one place than the other; but on the post mortem he has proved the inefficiency in one applies in another.

DR. KIERNAN: I think the big thing—at least, it appeals to me—is to look at Group B, free herd, and Group 9, free herd, 80 and 54 respectively, that shows they are clean herds. I think that is the big thing, that you actually clean up herd tuberculosis, no matter what the tests are.

PRESIDENT CREWE: Any further discussion on this subject? If not, we will take up the paper of Dr. Healy. The discussion will be led by Dr. C. E. Cotton, of St. Paul.

DR. C. E. COTTON: Mr. Chairman, I think it might be well if we would consider Dr. Cary's statements relative to tick eradication on the area plan and his warnings of the weakness of this plan when applied to tuberculosis eradication by areas, as a part of the discussion of Dr. Healy's paper, and that we should proceed a little carefully.

Dr. Healy brought up the subject of cleaning and disinfecting. I know that as a result of the work in Minnesota in the past year, we are getting the proposition of cleaning and disinfection discussed, disinfection particularly. We find it a very good way of not only educating the people, but of getting results and destroying the infection. We refuse to pay the owners any indemnity until they disinfect, and we must have in our files official information that the premises have been cleaned and disinfected before State indemnity will be paid them for animals that have been slaughtered.

Dr. Healy spoke of the sewage proposition, but let us not forget in this work that we must be practical control men. Let us not make serious mistakes and regret it. We know that there is danger in running streams from one infected pasture to another. We know that, but in our enthusiasm let us not interfere with the work of the Division of Sanitation of some of the State Boards of Health and the local boards, that have made years of study of the water supply.

In my State we have had three or four lawsuits resulting from veterinarians advising owners to bring suits against municipalities as the result of their sewage disposal, which brought us into trouble with the other State authorities.

It has been proven conclusively that the sewage from municipalities if properly diluted, by discharging it into running streams, that the infection resulting is practically nil. Let us be just a little bit careful in taking up work of this kind where this has been proven conclusively.
Dr. Healy raised one point that we should give a great deal of thought to: That of shipping animals interstate, if fifty per cent of the animals in the test are reactors. The health certificate should disclose the number of reactors in the herd from which cattle originated, so that the purchaser could take precautions after purchasing the animals.

If we purchase cattle that go through public sales, we should take the precaution of isolating these animals, particularly if they are going into accredited herds. I had a conversation the other day with the manager of the National Dairy Show, and he tells me that in 1923 their Executive Board has decided that they will allow no animals to be shown unless they know that they originate from Federal and State accredited herds. We at least should insist that the purchasers should now know the percentage of reactors in the herds from which animals originate.

Gentlemen, let us not ignore the warning from our experience following the National Dairy Show, and the Waterloo Show in the fall of 1920—which was a sad one—particularly in Minnesota. We had seventeen herds break. We are satisfied that it must have been a very virulent infection. On our first test of a herd which had consigned cattle to these shows we had eight animals react. I have forgotten how many carriers, but we did not get all the carriers. We got eleven reactors on the next test. In another herd that had consigned four heifers only, we found two heifers, and we went back in four months and the other two reacted. We got practically 100 per cent of all the cattle consigned from Minnesota by the State Holstein Freisian Association.

This has not been our experience in the past with these sales, perhaps due to the non-virulent form of the infection. I know one clean herd that we had on a Bang farm for seven years, and in the seven years we only had one calf fall down. In the face of that, the herd exhibited at the International Show every year, and at various fairs, behind rotten Short-horn herds, herds that were known to be tuberculous; so we must not put our stamp of disapproval on these shows, or we will interfere with their success.

Dr. Healy spoke of the pasteurizing of milk by creameries. Let us not forget that in any herd where the first test discloses a percentage of reactors, that we are not doing our duty if we do not insist on pasteurization of milk from the remainder of the herd that did not react, until the herd can be subjected to a second test.

Relative to the transmissibility of human infection, I am in no position to question Dr. Schroeder’s statement, but our experience in Minnesota with State herds in the past fifteen years is a serious one. We may think we have them cleaned up one year, and then find two to three per cent reactors in the herds the following year. We as a rule kill them on the place, because they want to use the carcasses there for food, and we inspect them there at the time of slaughter.

They tell me that 85 to 90 per cent of the inmates of the state institutions are affected with human tuberculosis. In these herds, if it is of the bovine type of infection, we do not find lesions, but we do constantly find reactors.

PRESIDENT CREWE: I will call on Dr. H. W. Turner of Harrisburg, Pa.

DR. H. W. TURNER (Harrisburg, Pa.): I will only spend a few minutes on Dr. Healy’s paper, because I did not know I was going to discuss it until last night or this morning. I very strongly approve of Dr. Healy’s paper, because it comes under the line of prevention.

In considering tuberculosis, or the infection of tuberculosis, I think that we should consider both the direct and the indirect infection. If we
consider the direct infection, it will narrow down to practically the nurs-
ing calf, or the nursing young; but if we consider it in the broad sense
of food that is contaminated, then we can consider it under the other re-
lations as being direct infection by any material which is directly infected
and passed on to another animal, for instance, hogs feeding behind cat-
tle. Now, our indirect methods of infection as they have mentioned are
through dairy products, through feed, hay and water infection.

We have just recently had a stream infection from a creamery in
which we took a certain number of samples of the water and demonstrated
the tubercle-bacilli in almost all of these samples. I think it is an impor-
tant infection, not only the skim milk, but the waste water from the cream-
ery, where there is a flowing stream.

I do not think that I will say anything more. I want to say that I
am glad to see this tuberculosis eradication work is being taken up by
prevention, because we cannot eradicate tuberculosis if we do not take up
preventive measures.

DR. C. E. COTTON: Mr. Chairman, may I inflict myself upon you
once more? I hope I do not have the impression that Dr. Bruner wanted
to leave with you. I feel just exactly as Dr. Bruner does. I am satisfied
that where a stream is running through one pasture into a lower pasture,
all those things should be watched. But let us not in our enthusiasm put
our experience against years of experience by the Division of Sanitation
and other control bodies. Let us not go too far and make damned fools
of ourselves. (Laughter.)

DR. ELIASON: Mr. Chairman, the fact is we have demonstrated, I
think, that regular tests of a herd and a reasonable supervision of herds
will bring us results.

There has been some question with regard to the area work. Do
not misunderstand me, I just want to clear up this one thing, that there
is no idea in the heads of the Administration of this law that we are
going to declare any of these areas free, until we are amply justified; and
I also want to emphasize that I believe that areas having less than one
per cent cannot be tested any too quick; so I cannot see where any of
these areas, where there is so little tuberculosis, there can be any reason
for sitting on the brake, except for lack of funds. That is the trouble in
our State, the funds are used up in area work, but rather in the other
part of the State.

Now, as to quarantine, I would say that our experience has, on the
whole, been rather encouraging. The only trouble with the quarantine
farm is, you cannot make anybody see it if there is any stock cattle really
necessary for his finances; but even under rather poor management, men
whom you would not believe capable of such supervision, the work has
been satisfactory.

Now, as to indemnity requirements, we will say that we have re-
fused to pay indemnity on it and no animal can be introduced into a herd
where indemnity is paid unless that cow has been tested. If he buys that
cow without a test he does it at his own risk, and receives no indemnity
in case it falls down.

PRESIDENT CREWE: Any further discussion?

DR. SPENCER: Mr. Chairman, we have had the same difficulty in
our State of Nebraska that Dr. Cotton speaks of. Recently we had a ship-
ment of nine reactors into the Omaha market from one of the State insti-
tutions. None of these nine reactors showed lesions until the second ex-
amination, and out of the nine there were four that showed well marked
lesions, some of those lesions as large as a walnut. We have had con-
tinuous trouble with that particular herd ever since.
For the past eight or ten years we have had reactors in the herd every
time they were tested, and practically the same result as Dr. Cotton has
stated, many of them showing no lesions at all.

Discussing Dr. Healy's paper a little, it seems to me that the matter
of handling reactors in the stockyards is one that should be looked into.
Many of the stockyards are yarding the reactors in pens that are used for
yardsing other cattle—cattle that are used for stocker purposes, and that
go back to the country, are fed, and hogs follow those cattle.

Recently I noticed a shipment of 85 reactors in one of our public
stockyards, in which 25 of those reactors were condemned. A number of
those reactors were held in the yard for a period of four days, and then
some stocker and feeder cattle were immediately put into these yards
without proper cleaning, and you can readily see what a condition of that
kind is going to mean when those feeder cattle go back to public yards.

One of the papers brought out very clearly the fact that there was
infection where the infection was the closest through drinking tanks. If
some method could be worked out whereby reactors could be ordered in
separate quarantine pens in public stockyards, it would mean a lot towards
preventing the spread in this country. Prevention of tuberculosis is the
thing that we are trying to do, and that is one of the important ways of
preventing the spread.

DR. CONNAWAY: I believe something was said in the paper in
regard to tuberculosis of poultry in relation to bovine tuberculosis. Some
of our veterinarians have a notion that bovine tuberculosis is transmissible
to chickens. I believe Dr. Moore will bear me out in the statement that
these are entirely different diseases, not transmissible from one of the
species to the other. As to the transmission of bovine tuberculosis to
chickens, as far as that is concerned, I have tried my best to transmit it
by feeding them tuberculous material, and I have never been able to trans-
mit it. If we were to feed the same material to hogs or cattle, we cer-
tainly would transmit the disease, but chickens, so far as I am able to de-
termine, do not take this disease, and are not a factor in the control of
this infection in cattle; but it is a matter that is increasing—it is a dis-
ease that is increasing among the poultry herds of a good many of the
States, and it is a matter that should be looked after, and I am glad to
see it on this program.

DR. McNEIL (Trenton, N. J.): In connection with the statements
that have been made, I will say we have had some experience with the
State institution herds in New Jersey. Two of the institution herds we
examined and successfully tested for tuberculosis, and the suggestion came
to us that possibly the animals were contracting the human form of tu-
berculosis, so we collected a number of lymphatic glands of different cases,
and sent them to the laboratory and had inoculation tests made, and the
reports that we received from these laboratories confirmed that suggestion.

I do not know just what the state of affairs is, but it is generally
recognized that the bovine or human type is readily transmissible to the
human, but as a result of this we have eliminated that portion of our
method or the rules in the eradication of tuberculosis from these herds,
and have finally decided that it was our inefficiency, or the inefficiency
of the tuberculin, to get the reactors out of the herd.

PRESIDENT CREWE: The next discussion is on the paper of Dr.
Butler on the Eradicating of Scabies in Sheep, led by Dr. Davis of Wyo-
mimg.

DR. ELIASON: Mr. Chairman, in the Chippewa Falls herd, consist-
ing of about 250 head, we had considerable tuberculosis in it some years
ago, and we took out 30 head, and the other day after leaving the herd
alone two years, we had a test and we found only 5 reactors out of 250 head. I think that is rather encouraging.

DR. B. F. DAVIS (Cheyenne, Wyo.): Mr. Chairman, Dr. Butler's paper appealed to me very much. I live in a range country, in a State that has about three million sheep, and I have to do with all other livestock except sheep and goats. Years ago I did have experience in handling sheep scabies, but I cannot add anything of value to this paper. To me it appeals very much, and I think it will appeal to all who have to eradicate this disease under range conditions.

PRESIDENT CREWE: Any further discussion? If not, we will take up the Report of the Committee on Tick Eradication.

DR. BUTLER: Mr. Chairman, I move that that report be accepted, and that we give the Committee our most hearty support and co-operation in every way in accordance with the request made by Dr. Cary.

Motion duly seconded and carried.

PRESIDENT CREWE: This concludes the evening's entertainment.

And thereupon, the meeting adjourned to Wednesday, November 30, 1921, at ten o'clock A.M.

FIFTH SESSION.

November 30, 1921, 10 o'clock A.M.

SWINE DISEASE SESSION.

PRESIDENT CREWE: The first subject on the program this morning is—Report of the Committee on Infectious Swine Diseases, by Dr. C. H. Stange, Ames, Iowa, chairman.

REPORT OF THE COMMITTEE ON DIFFERENTIAL DIAGNOSIS OF SWINE DISEASES

Your Committee believes that much harm has resulted from failure of veterinarians to recognize hog cholera in their attempts to make a differential diagnosis of swine diseases. We believe that these errors result for the most part from a misconception of swine diseases, and of the means which we have to combat them. Of all the maladies peculiar to swine, hog cholera stands alone as a sweeping, destructive disease.

In the light of our present information, it appears that there exists in this country also two other diseases which are of sufficient importance to warrant their separate consideration, namely: Infectious Enteritis, (Necrotic Enteritis,) and the so-called Hog "Flu." This last-name does not seem to be properly descriptive of the condition which is in effect a severe bronchitis with pneumonic complications in some instances. The mortality of this disease is low.

Of these three diseases, we know the definite etiological agent of but one, namely hog cholera. It is likewise true that we know of effective biological means of controlling but one of these diseases and that is hog cholera. Though perhaps unnecessary, it may be said in passing that of these three diseases hog cholera is of preeminent importance.

In view of these facts it is evident that practitioners must avoid confusion of these conditions, particularly must they avoid mistaking hog cholera for either of the other two. We urge upon them the importance at the same time of not assuming when they find hemorrhagic lesions at autopsy or perhaps pneumonias and various enteric lesions that they have to deal with so-called hemorrhagic septicemia or mixed infection. In hog cholera we find usually the lesions of a hemorrhagic septicemia. We
likewise frequently encounter pneumonias and intestinal disorders of varying kind and degree.

Your Committee would not be understood to mean that hogs are not at times subject to infection with bacteria of the pasteurella group, for we know that this does occur, but the mere occurrence of this organism and even the fact that it may in association with other infectious agents produce severe lesions does not alone establish the existence of a true infectious disease caused by that organism. We recognize that a pure infection of swine with a member of the pasteurella group occurs in rare cases. It is sporadic in nature, and rarely, if ever, appears as a herd disease.

The term "mixed infection" in swine has in recent years come into extended use. So far as your Committee is able to determine, this term is not properly applicable as a name for any known disease of swine. It is true that many of the known diseases of swine rarely appear as a pure infection, by the primary etiological factory. We need but turn to the disease hog cholera as commonly found to have a splendid example of a disease for a number of organisms may be found in the tissues. More serious errors in field diagnosis have resulted from the belief of veterinarians that there existed independent diseases which they call hemorrhagic septicemia or mixed infection than from perhaps any other single cause, and it would not be difficult for any observant official to point to scores of cases in which disastrous losses resulted from the diagnosis of mixed infection for hemorrhagic septicemia, and the administration of mixed infection or hemorrhagic septicemia bacterims in cases of hog cholera.

Finally, we believe as already indicated that there has been a very marked tendency to ascribe the lesions of hog cholera to causes other than the filterable virus. This fact is becoming apparent even to the layman. Some of the most influential agricultural papers in the country are already warning their readers against the veterinarian who diagnoses strange diseases and administers new remedies while the hogs die of cholera. We therefore urge the members of this Association and veterinarians in general to remember that beside hog cholera all the other diseases of swine pale into insignificance. No veterinarian should take the responsibility of foregoing the prompt application of hog cholera serum in a herd where an infectious disease prevails, unless he can positively and without question exclude the presence of cholera.

C. H. Stange, Chairman.
M. Dorset.
R. R. Birch.

PRESIDENT CREWE: We think perhaps it will expedite matters to continue the reading of the various reports, and then take them up in regular order for discussion. The next report is that of the Committee on Hog Cholera Control, by Dr. T. P. White, Washington, D. C. Dr. White is not here, and Dr. Spencer will present the report.

REPORT OF THE COMMITTEE ON HOG CHOLERA CONTROL

In the time elapsing since the last report of the committee on hog cholera control of this Association factors have obtained which have had a rather detrimental effect on the hog cholera situation. Reports received by members of the committee indicated that up to the first of July of this year the number of outbreaks of hog cholera was far less than in the preceding year. Since that date, however, a wave of the disease has been felt in practically all hog raising areas, particularly in the corn belt States, and while your Committee has no definite number of out-
breaks to present it feels, that with the knowledge available, cholera has been far more extensive in the year 1921 than in 1920.

Perhaps the chief factor responsible for the increase of hog cholera losses in the last half of the year has been the failure on the part of swine owners to immunize their herds against the disease earlier in the season.

ESTIMATED NUMBER AND VALUE OF SWINE ON FARMS AND LOSSES FROM HOG CHOLERA 1920—1921.

- **Note:** In computing the losses from hog cholera, it is estimated that 90% of losses from all causes is due to this disease.

Partly owing to financial conditions and partly due to a false sense of security in the belief that hog cholera was no longer to be feared, hogs have been allowed to remain susceptible and at the usual period when the plague becomes rampant the unprotected animals have become victims and some serious losses have resulted. However, the fact that outbreaks are being checked by the prompt use of anti-hog-cholera serum speaks volumes for the value of the product. Judging from previous experiences...
1921 should have been a peak year in the seven-year cycle of hog cholera losses, and without the serum treatment it is reasonable to believe that the destruction of hogs by cholera would have been an appalling repetition of 1913-14. Nevertheless, the monetary loss from the disease for the year ending April 30, 1921, amounted to over $33,000,000. The figures showing losses for each State and the United States are given in attached table.

Your Committee wishes to lay particular stress on one of the factors heretofore mentioned as having had a detrimental effect on the control of hog cholera, and that is the false security into which the farmers and others have lulled themselves as to the recurrence of hog cholera losses. In many sections of the country the sentiment prevails that hog cholera has been eradicated, and upon that assumption the usual precautionary measures are disregarded to the danger of the swine industry. This Association can do a great service through its advice that hog cholera is just as dangerous today as at any time in the history of the disease. The infection is just as virulent and the nonimmuned hog as susceptible as they ever were. Any instruction to swine owners citing the lessened danger of hog cholera without at the same time giving the essential methods of protection against the disease is ill-advised and misleading. This phase of the situation has been recognized as a likely source of trouble, and being strongly of the same opinion, your Committee has deemed it proper to have inserted in its report the resolution adopted by the Institute of American Meat Packers at its last annual meeting in August, and addressed to the Chief of the Bureau of Animal Industry, U. S. Department of Agriculture, under date of August 16, 1921.

HOG CHOLERA

"Whereas the Bureau of Animal Industry, United States Department of Agriculture has made possible the control of hog cholera in the United States through the use of an immunizing serum which was discovered and perfected within the laboratories of the Bureau, and

"Whereas the proper use of this serum, combined with other sanitary practices recommended by the Bureau, has made possible a great reduction in losses of swine as a result of cholera, and

"Whereas reports to the Institute of American Meat Packers indicate that excellent results already obtained in controlling this disease appear to be cause for many swine raising communities to consider the disease as practically eliminated, and

"Whereas there is grave danger of this attitude resulting in general outbreak of cholera, causing great losses to our livestock industry and adversely affecting the good work already accomplished by our Federal Bureau Industry, State Livestock Sanitary Boards and others.

"BE IT RESOLVED that the Institute of American Meat Packers through its secretary, refer this matter to the Bureau officials at Washington with a request that such steps be taken as they deem necessary for the purpose of directing attention of our farmers to the possible dangers involved through failure to properly guard against the ravages of this disease."

(Signed) C. B. Heineman, secretary.

PROGRESS OF CONTROL WORK

Under a greatly reduced appropriation the United States Bureau of Animal Industry continued cooperative work in hog cholera control with 31 States as follows: Alabama, Arkansas, California, Colorado, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louis-
iana, Maryland, Michigan, Mississippi, Missouri, Montana, Nebraska, North Carolina, North Dakota, Ohio, Oklahoma, South Dakota, South Carolina, Tennessee, Texas, Utah, Virginia and Wisconsin. A force of approximately 52 veterinarians was maintained for the fiscal year ending June 30, 1921. An increase in funds for the Bureau's present fiscal year covering hog cholera work has made possible the addition of about 30 veterinarians. The State officials are cooperating to the best of their ability with the funds provided by legislative bodies for that purpose. Even with the efforts that are being made to control losses, there is still a woeful lack of intelligent cooperation on the part of swine owners in carrying out the advice and applying the measures prescribed for the prevention of hog cholera. Farmers are the ones vitally interested in the problem, and it would seem that they would willingly lend their assistance to the work that is being pursued for their benefit. Since the failure to eliminate centers of infection is a constant menace to the surrounding communities a stricter interpretation should be placed on the laws, rules and regulations governing the cleaning and disinfecting of infected premises. Similarly, the laws dealing with the traffic in sick hogs should play its part in the control of outbreaks. The lack of attention to this latter restriction has been one of the contributing factors in the spread of hog cholera infection. During the month of September, in one of the leading hog producing States of the Middle West, there were shipped to market hogs from 62 sick herds. In the same State during October there were shipped hogs from 56 sick herds. Out of an adjoining State for the same month there were shipped hogs taken from 67 sick herds. These shipments were made to points where Federal inspection is maintained from which sources your Committee was able to secure data. There are reasons to believe that the movement of sick and infected hogs is carried on to a far more extensive degree than mentioned in this report and that it is being practiced in practically all States where hogs are raised.

THE IMPORTANCE OF TRUE DIAGNOSIS

Your Committee finds that the hog cholera situation is still suffering from incorrect diagnosis of swine diseases. Whether as a result of ignorance or indifference does not alter the condition. We are faced with the problem of differentiation between the various ailments and conditions that affect swine, and the many instances of incorrect judgment coming to public attention relating to diagnosis and treatment have to a considerable extent shaken the confidence of owners in the ability of the veterinarian or the value of the treatment. The so-called "break" or recurrence of cholera in herds following the use of serum and virus is still the puzzle the solving of which causes worry and dissatisfaction to the practitioner and his client. Unfortunately, there is too often a tendency in these cases, to overlook the predominant factor of hog cholera for the sake of simplifying the second treatment of ailing herds and to escape criticism of the services performed or the products used. Mistakes of this kind, whether through ignorance or for ulterior motives, are vital, and considering the monetary value involved, this Association should seek to emphasize the importance of taking into account all possibilities of cholera invasion before eliminating that factor in complicated cases of swine diseases.

Since the elimination of hog cholera infection through sanitation and disinfection seems to be beyond general adoption, so far as swine owners are concerned, your Committee recommends a more definite system of herd immunization in communities to safeguard the economic prosperity of the swine industry. True, there is the weapon of quarantine to protect against the spread of infection, but that, too, is being disregarded, therefore,
animals likely to be exposed, whether in transportation, in sale or exhibition, or through feeding material, should carry immunity from hog cholera, in so far as serum and virus applied under scientific principles can assure such protection.

In the work of controlling hog cholera, the greatest hindrance, perhaps, has been the tendency on the part of farmers to attempt the diagnosis and treatment of swine diseases, or else, call in an untrained layman who does not recognize the ailment and advises wrong procedure in the handling of an outbreak. It is not always an easy matter to differentiate hog cholera from certain other diseases as its symptoms are sometimes obscure, and due to the fact that pneumonia, tuberculosis, worms and other ailments at certain stages of their progress resemble somewhat hog cholera, training and experience are necessary to tell one disease from another. Successful results of treatment depend largely on true diagnosis, and it is important that hog owners should realize the value of professional services and advice in dealing with diseases of swine.

SERUM TREATMENT AND FAKE REMEDIES

As stated in a previous paragraph, the serum treatment for hog cholera continues to be the greatest boon to the swine industry. While there are from time to time a few cases in which, from some unexplainable causes, it fails to give satisfactory results, it is as yet the only recognized method of immunization against hog cholera. Some criticism has been aroused among farmers as to the charges made by practicing veterinarians for the administration of serum and virus. Instances are given of so-called profiteering on the part of practitioners and this finding its way into fertile channels of dissemination has laid the foundation for the propaganda that laymen should engage in the work of treating hogs for cholera. The ethics and general interest of the veterinary profession call for efficient service and equitable fees which constitute fair dealing with clients. In justice to all, veterinary organizations, farmers' associations, biological houses, and other agencies should make public all cases of exorbitant charges, so that the profession as a whole might be in a position to deal with such matters in a way that will bring approbation. Unless action is taken to correct the unfortunate situation brought about by a few unscrupulous individuals there is strong indication that laymen will make heavy inroads on the revenue derived by professional men, to say nothing of placing a valuable industry in jeopardy.

There continues to be foisted on the unsuspecting farmer a number of so-called hog cholera cures and preventives. Some of these fake remedies are boldly advertised as such, others are offered as tonics and fatteners with a veiled implication that the use of the preparations will render hogs less susceptible to hog cholera. Whatever value these compounds may have as "system builders" they possess no virtue in the least as immunizing agents or cures for hog cholera. It is within the province of this Association to expose such practices and protect rural communities against fakers of this character.

SUMMARY

To recapitulate: Hog cholera is still a menace to the swine industry, as shown in the table of losses for the year ending April 30, 1921; antihog cholera serum alone and in combination with hog cholera virus is the only recognized immunizing agent against hog cholera; the detrimental factors hindering the suppression of losses consist of a false sense of security that hog cholera has been eliminated, high cost of serum treatment, the use of fake remedies, allowing traffic in diseased swine, disregard of quarantine measures, lack of cleaning and disinfecting, mistaken
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diagnosis and improper treatment, and insufficient appropriations to carry on control work by State and Federal authorities. All these are phases that may well enter into the program of this Association to attempt to rectify in order that the scourge of hog cholera may be banished from American farms.

T. P. White, Chairman.

PRESIDENT CREWE: The next item on the program is Report of the Committee on Inter and Intra-State Shipment of Swine, by U. G. Houck, of Washington, D. C.

REPORT OF THE COMMITTEE ON REGULATIONS FOR THE INTER AND INTRA-STATE SHIPMENT OF SWINE

Variations in laws and regulations governing the inter and intra-state movement of livestock is a subject that has been discussed on a number of occasions at the meetings of this Association.

Mr. W. J. Carmichael, secretary of the Swine Breeders Association, read a paper before this Association in December, 1919 in which he showed the wide differences in the requirements of different States in regard to the movement of swine and the effect of such variations upon the swine industry. I also presented a paper at the same meeting on "The Progress in Hog Cholera Control," in which I referred to the desirability of more uniformity in laws and regulations governing the inter and intra-state movement of livestock. Repeated discussions of this important subject finally led to the appointment of a "Committee on Inter and Intra-State Shipments of Swine." In connection with the report of this committee at the meeting a year ago, a motion was passed providing that a committee of state regulatory authorities, representing the swine raising sections of the United States, be appointed and instructed to prepare a draft of tentative regulations for the inter and intra-state movement of swine, and to present their report at this meeting of the Association.

I have the honor, as Chairman, to present the report of your Committee. As the variations in State laws and regulations governing the movement of livestock have been repeatedly brought to the attention of this Association, there seems to be no necessity at this time for discussing the subject at length. We seem to agree in opinion that uniformity is desirable, and your Committee has prepared a draft of tentative regulations which it is believed could be made adaptable in any State. These tentative requirements are based on regulations that exist in some of the States. There seems to be no good reason why laws and regulations that have been found necessary to protect some States against the introduction and spread of hog cholera should prove objectionable in other States. It may be that in some instances there would be some differences of opinion among livestock regulatory authorities in regard to the details of any draft of regulations that could be prepared by any committee or other body. It is realized that exactly the same conditions do not exist in all sections of the country—they never will.

If we are ever to have any uniformity in the laws and regulations governing the movement of livestock, the livestock sanitary authorities of some States must bend their views slightly to fit the general pattern. This Association can approve regulations, but it cannot require any State to adopt them. It can submit a copy of the approved regulations to each State as a suggestion in the revision of their laws and regulations. It can even request them to follow the suggestions, but it is for the States to decide whether or not there shall be uniformity in our regulations governing the movement of swine. It is pleasing to note in revising regulations during
the past year some States have accepted suggestions from the report submitted by the Committee on Inter and Intra-State Shipment of Swine at the meeting of this Association a year ago. Your Committee presents for your consideration a draft of tentative regulations as follows:

STATE REGULATIONS GOVERNING THE MOVEMENT OF SWINE

Definitions of terms used in these Regulations.

1. Public Stockyards,—All stockyards where animals are bought, sold or yarded.
2. Official Stockyards,—All stockyards where the U. S. Bureau of Animal Industry maintains inspection.
3. Certificates of Health,—Such certificates are acceptable only when issued by an authorized veterinarian. Certificates of health shall be issued in duplicate, the original copy to accompany the shipment and the duplicate to be sent to the State Veterinarian or other designated official at destination, as soon as the inspection is made or treatment is completed.
4. Affidavits of Owners,—Such affidavits shall be issued in duplicate, the original to accompany the shipment and the duplicate sent immediately to the State Veterinarian or other designated official at destination.
5. Authorized Veterinarian,—A veterinary inspector of the B. A. I., a veterinarian in the employ of the State, or a licensed veterinary practitioner acting under authority from the proper regulatory authority of the State.

SWINE INTENDED FOR IMMEDIATE SLAUGHTER.

Reg. I. To be IMPORTED into the State:—

Sec. 1. Swine intended for importation into the State for immediate slaughter shall meet the requirements of the Federal regulations, both in regard to health and manner of shipping.

Reg. II. INTRA-STATE MOVEMENTS:—

Sec. 1 Healthy, unexposed swine,—This class of swine may be shipped to market and to slaughter centers without restriction.

Sec. 2. Diseased swine,—Swine affected with hog cholera, swine plague, or other infectious or contagious diseases, shall not be moved from the infected premises for any purpose.

Sec. 3. Exposed swine,—Swine exposed to hog cholera or swine plague, but which on physical examination by an authorized veterinarian show no symptoms of hog cholera or other contagious or infectious disease may be shipped to recognized slaughter centers within the State of ......................................................... on permit from the State Veterinarian or an authorized deputy. Such exposed swine shall not be driven or trailed on public highways; if they are loaded into cars through pens and chutes, the pens and chutes used shall be thoroughly cleaned and disinfected immediately after the exposed swine are loaded. Shipments of such exposed swine shall not be diverted en route for any other purpose.

SWINE INTENDED FOR STOCKER, FEEDER OR PUBLIC SALES PURPOSES

Reg. III. To be IMPORTED into the State:—

Sec. 1. From Official Stockyards,—Importations of swine from official stockyards into .......... for stocker or feeder purposes shall be made in accordance with the provisions of the Federal regulations. Such swine shall be held in quarantine, apart from other swine, at destination for 3 weeks.

Sec. 2. From Points Outside of Official Stockyards:—

(a) Swine from public stockyards other than official stockyards, ——Such swine shall enter the State only on permit issued in advance
by the proper State official; they shall be inspected, immunized, disinfected and shipped by or under the immediate supervision of an authorized veterinarian in the same manner and under the same conditions as similar shipments are handled at official stock yards. Swine which are positively known to have been immunized before arrival at the yards may be shipped after disinfection without treatment.

(b) Swine immunized at a point of origin outside of official or other public stockyards.—Such swine shall enter the state only on permit issued in advance by the State Veterinarian or other designated official; they shall be accompanied by a health certificate issued in duplicate by an authorized veterinarian in the state where they originate, showing that no hog cholera or swine plague existed on the premises where they originated at time they were examined for certification, and that they were immunized, prior to the date of shipment. The original health certificate shall accompany the shipment and the duplicate copy shall be forwarded to the State Veterinarian at destination. Such swine shall be dipped or sprayed in a 2% solution of cresol compound within 24 hours prior to loading; they shall be transported in cleaned and disinfected cars, loaded and unloaded through specially provided or freshly cleaned and disinfected pens and chutes, not unloaded enroute, and held in quarantine at destination apart from other swine for 3 weeks.

(c) Swine allowed to be imported without immunization at point of origin.—Importations of such swine may be made in case of emergency on special permit secured in advance from the State Veterinarian or other designated official of. The swine shall be accompanied by a health certificate issued in duplicate by an authorized veterinarian of the State in which the hogs originate, showing that the swine are free from hog cholera, or other contagious or infectious diseases. Such swine shall be hauled in wagons and loaded direct from the wagons into cleaned and disinfected cars, or through specially provided pens and chutes; they shall be unloaded in the same manner at destination, but not unloaded en route. The original health certificate shall accompany the shipment and the duplicate shall be sent to the proper state official at destination immediately when the inspection is completed. Such swine shall be immunized within three days after arrival at destination and held in quarantine apart from other swine for 3 weeks.

Reg. IV. INTRA-STATE MOVEMENTS:

Sec. 1. Swine originating at Official Stockyards.—Such swine shall be immunized by an authorized veterinarian and handled in the same manner as similar interstate shipments.

Sec. 2. Swine originating at public stockyards other than official stockyards.—Hogs for stocker or feeder purposes may be removed from such stockyards only on permit issued in advance by the proper State official or his authorized agent. Such swine shall be inspected and immunized by an authorized veterinarian, disinfected and shipped in the same manner as required for similar interstate shipments and they shall be held in quarantine at destination for 3 weeks.

Sec. 3. Swine originating on premises within the State other than stockyards.—The requirements for shipping such swine intra-state are the same as for importations of the same character. Special instructions will be given by the proper State authority in instances, where deemed necessary, for moving such swine short distances by wagon or truck.

Reg. V. SWINE INTENDED FOR PUBLIC SALES:

Sec. 1. The regulations governing the inter and intra-state movement of swine for stocker and feeder purposes shall apply also to the movement of swine to be sold at public sales.
UNITED STATES LIVE STOCK SANITARY ASSOCIATION

SWINE INTENDED FOR BREEDING PURPOSES

Reg. VI. To be IMPORTED into the State:—

Sec. 1. Swine shipped loose in cars,—The regulations governing the importation of swine in cars for stocker and feeder purposes shall apply to swine imported for breeding purposes.

Sec. 2. Swine shipped in crates,—Such swine shall be accompanied by either a health certificate issued by an authorized veterinarian or by the affidavit of the owner stating that no hog cholera or swine plague existed on the premises where the swine were kept for 60 days prior to the date of shipment, and that they were properly immunized either with serum alone within 21 days of shipment, or by the simultaneous treatment not less than 21 days prior to the date of shipment. The swine and crates in which they are shipped shall be disinfected with a 2% compound cresol solution immediately before shipment and the swine shall be held in quarantine at destination apart from other swine for three weeks after the date of arrival.

Reg. VII. INTRA-STATE MOVEMENTS:—

Sec. 1. Swine shipped loose in cars,—The regulations governing importations shall apply also to intra-state movements.

Sec. 2. Swine shipped in crates,—The regulations governing similar importations shall apply also to the intra-state movements.

SWINE INTENDED FOR EXHIBITION

Reg. VIII. Sec. 1. To be IMPORTED into the State:—Such swine shall be accompanied by a health certificate issued by an authorized veterinarian or by an affidavit of the owner that no hog cholera or swine plague existed on the premises where the swine were kept for 60 days prior to the shipment; that the swine were immunized by serum—alone within 21 days, or by the simultaneous method not less than 21 days prior to the date of shipment; that the swine were dipped or sprayed with a 2% compound cresol solution within 24 hours before loading, and that the crates or cars in which they were shipped were disinfected immediately before loading.

Reg. IX. Sec. 1. Intra-state movements:—The same regulations shall apply as for interstate shipments of like character.

U. G. Houck, Chairman.
O. E. Dyson.
P. Malcolm
J. H. Mercer.
D. F. Luckey.

PRESIDENT CREWE: Next is Factors Influencing the Control of Swine Diseases, by Dr. Edward A. Cahill, Indianapolis, Ind.

FACTORS INFLUENCING THE CONTROL OF SWINE DISEASES

By Edw. A. Cahill

Public cooperation and confidence in the methods used to control disease are two of the factors vitally necessary to successful sanitary control of any disease. From the time of Dorset’s discovery of anti-hog cholera serum until comparatively recently the profession has enjoyed the confidence of the public in its efforts to prevent hog cholera by the simultaneous method of immunization. During the past three years troublesome factors having an undesirable effect on the results of vaccination have become aggravated both in type and number. During this time while sanitary officials have been unable to agree as to the reason for these
changed conditions losses of animals have increased and confidence in immunization has diminished in certain sections. As a result there is now portrayed a reversal of opinion and loss of ideal public confidence at the expense of the profession and sanitary official which is more noticeable than for several years. It is obvious that while losses continue, swine owners remain discouraged and practitioners are in a state of diagnostic chaos, that public cooperation will be difficult to regain.

After the epoch making discovery by Dorset and his coworkers of the cause of hog cholera and a successful method of immunizing against the disease a spirit of intense optimism prevailed, since it was felt that if this disease were controlled other swine diseases would have little or no significance. The disastrous results following lay vaccination, due to erroneous diagnosis or faulty technique became well known and so thoroughly was the public impressed with the fact that these losses could be eliminated by placing this immunizing procedure in the hands of properly trained individuals that the use of serum and virus was quite generally restricted to the veterinary profession. The extreme wisdom of this policy has been too thoroughly demonstrated to require more than passing comment. These efforts were then carried to a higher level by laws which placed under governmental supervision the production of serum and virus as well as the testing of these products for the protection both of the owner of the animals upon which they were used and the veterinarian administering the same. Justification for these gradually acquired precautions has not been wanting since hog cholera immunization has been more universally successful than any other method of immunizing animals. Notwithstanding these good results there has always been a certain percentage of cases in which undesirable results followed vaccination or where vaccination failed to check the losses although the products used were known to be fully potent. Since these represented but a small percentage of the herds treated the cause was seldom investigated in a manner which would allow of definite scientific or proven conclusions as to the cause. As these cases became more and more numerous many different causes were ascribed by various investigators. Some there are who designate all trouble cases, subsequent to vaccination, as cholera breaks, others recognize these as swine plague or necrotic enteritis, diseases which several years ago were considered significant but the importance of which was later minimized in so far as they affect swine immune to cholera, while still others diagnose “flu,” botulism, and other diseases which have been recognized in other species but not in swine.

These differences of opinion have lead to discussions which although acrimonious in nature have had little tendency to clarify the situation. Special committees have been appointed by this and other associations to study swine diseases but because of the very nature of things little has been accomplished beyond a comparison of views and a review of the literature. In the meantime confusion has become rampant. Not a few veterinarians have lost confidence in their ability to diagnose and control swine diseases while many swine owners openly declare their lack of confidence both in disease control measures and in the ability of the diagnostician. This loss of faith on the part of the swine owner combined with a lowered monetary value accounts to a large degree for the unusual number of susceptible swine encountered during the present epizootic of hog cholera which under normal conditions would have been previously immunized. It is quite obvious that in certain sections of the country, these conditions have become chaotic. The livestock owner and the practicing veterinarian looks to such organizations as this to come to the rescue not by words or by reports, the phraseology of which are time worn.
and venerable but by investigations and firm statements of practical facts as they appear in the field rather than at our desks. Failure to reassure the swine owner and to assist the veterinarian along practical lines will only intensify the bewildering chaos which now exists and the resulting loss of confidence will constitute a menace since it will result in large numbers of susceptible swine which would otherwise be immune to hog cholera—the most serious of swine diseases.

Saneness and moderation is apparently a virtue as rare and desirable in medicine as in other spheres of activity. Over enthusiasm has characterized almost every discovery in medical science. This leads the profession in its first flush of enthusiasm to ascribe to the discovery possibilities which are not in keeping with realities as they later develop. That this well recognized failing of medical men should be the cause of the present unprecedented confusion regarding swine diseases seems hardly conceivable yet our present attitude allows of no other conclusion.

Results following the early use of anti-hog cholera serum and hog cholera virus were so universally successful and so little trouble was experienced for a decade that many individuals came to the conclusion that hog cholera was the only serious disease of swine and that if swine were immunized against this disease others would be of no significance. Just why hog cholera serum should be expected to act as a panacea for all ailments is difficult of understanding. In order to arrive at such a highly improbable possibility it would be necessary to overlook certain facts recognized and appreciated in all epidemiological investigations. It has been conclusively demonstrated by Topley (1) that the virulency of most pathogenic organisms fluctuates in waves or cycles and that the intensity of the disease for which these organisms are responsible depends upon the stage of these cycles. With increased virulence of the etiological agent the disease becomes acute and cases ordinarily considered typical are the rule. As a lower stage of the cycle is reached decreased virulence of the causative agent is marked and the typical cases become the exception. Instead the manifestations become so markedly atypical that they may not be recognized or may be considered as a complication of other diseases. It has been further demonstrated that the reverse may be the rule and as large numbers of individuals are immunized against one disease evidence of other diseases becomes more pronounced. Conditions which had formerly been considered secondary now assume primary importance resulting as shown by Topley (2) in their being frequently mistaken for atypical cases of the previously recognized disease.

The condition just described is obviously the one with which we are now confronted in swine disease control. We can no longer maintain that the immunization of swine against hog cholera prevents the appearance of symptoms and lesions of other diseases. Either previous or subsequent to immunization there may be observed a disease syndrome which to a certain extent resembles hog cholera but in which the filterable virus cannot be demonstrated. These conditions are apparently caused by bacteria which were at one time considered capable of causing specific diseases but with the discovery of anti-hog cholera serum they were denied this distinction. As a higher stage of their cycle is reached we are forced to conclude that their significance has been underestimated and that they do cause pathological changes even though not associated with hog cholera virus.

Many investigators have found it advisable to reinvestigate field conditions during the past few years. An analysis of these findings shows that some officials and practitioners are hopelessly discouraged regarding swine disease control while others still continue their efforts with considerable
success. The persons in the former class are divided into two groups, one a radical who will never diagnose cholera if he can find some other real or mythical condition, and who ignores atypical cases; the second an ultra-conservative who still maintains that cholera is the only disease to which swine are heir. It is difficult to determine which view is responsible for the larger number of incorrect diagnoses but it is certain that individuals who adhere to either erroneous view have had an unhappy time attempting to satisfy the public.

The second class embraces both officials and practitioners who realize not only that cholera is the most serious of all swine diseases but also that atypical cases of cholera may resemble other diseases; also that diseases other than cholera do exist and present a serious problem which cannot be evaded. Individuals holding these views have arrived at the same by considering the practical as well as the laboratory or scientific aspects of the problem and evaluating each. The main difference between the two groups mentioned seems to lie in their interpretation of certain pathological changes observable at necropsy.

The ultra-conservative view is that the presence of petechia on either the serous or mucous surface of various organs may be construed as proof that the animal was affected with cholera. That persons holding these views should experience considerable difficulty in attempting to control disease is not surprising if one reviews the literature and considers our present knowledge regarding petechia. It has been demonstrated that petechiation of various parts of the body denotes a septicemia which may or may not be cholera since this phenomena is observed alike in cholera, hemorrhagic septicemia, streptococcal septicemia, parasitic infestations, plant poisoning, dietary disturbances or may be caused by the ingestion of excessive amounts of oily or acid materials. More recently Birch and Benner (3) have shown that petechia are observed following the injection of bacillus pyocyaneous, Proscher (4) that B. paratyphosis or B. coli infection causes the phenomena, while Bibb (5) has shown that petechiation is a common characteristic in individuals after having been subjected to the devitalizing influence of excessive cold or heat. In view of the above it seems inconceivable that any diagnostician should maintain that hog cholera can be safely diagnosed if autopsies on swine show the presence of petechia. It is known that persons attaching such undue significance to petechia fail to afford sufficient recognition to the history and symptoms which must constitute a large portion of the syndrome and which are even more important than post mortem findings.

It is to be regretted that this knowledge is so frequently ignored by the very persons who should be best fitted to recognize the various conditions under which petechiation occurs. Not infrequently practicing veterinarians confronted with the necessity of making a differential diagnosis call into consultation persons who because of their affiliation are automatically considered experts. The conservatism possessed by some consultants is legion. In order to maintain their conservatism a diagnosis of hog cholera is invariably rendered and a treatment in keeping with the diagnosis advised. This may be an excellent way to prevent overlooking an occasional case of atypical hog cholera but when the results fail to confirm the diagnosis it intensifies the chaos already existing in the minds of the veterinarian and the owner. If the consultant were to remain and share the criticism which the practitioner receives in cases where petechiation was due to causes other than the filterable virus there would be fewer who believe that all acute swine diseases are cholera. These cases are sufficiently numerous that such experience would convince the ultra-conservative that a close study of history and symptoms does allow of a dif-
ferential diagnosis which is conductive of better end results than to diagnose cholera on general principles.

A similar condition arises when autopsy reveals the presence of so-called button ulcers in the intestinal tract. Some still consider these as certain evidence of the presence of the filterable virus of hog cholera notwithstanding the fact that button ulcers are known to be present in animals which were apparently perfectly healthy at the time of slaughter. It must be realized that button ulcers may be present alike in immune, cholera sick or susceptible swine and that they are evidence not of the action of the filterable virus but of the pathogenic effect of bacillus suipestifer.

In order to accurately appraise the different conditions encountered in swine subsequent to immunization one must be cognizant of the fact called to the attention of the profession by Benner (6) and appreciated by many field investigators that swine possess to a greater extent than other animals the uncanny ability of harboring extensive and chronic pulmonary and intestinal infections without showing any symptoms of disease. Persons having an opportunity to conduct autopsies on numbers of apparently healthy animals are impressed at the large percentage which show chronic lung involvements or an intestinal infection characterized by congestion and thickening of the lumen and tending to necrosis. Since apparently healthy swine harbor such unusual conditions, to a greater extent than for several years, it would be strange indeed if they could be immunized by the simultaneous treatment without a certain percentage of undesirable results. That both pre and post vaccination troubles do exist to a greater extent than formerly is too well appreciated by swine practitioners to brook discussion. That a certain percentage of these cases are low grade hog cholera made possible by conditions not as yet clearly understood should also be well appreciated. Conversely in many herds where the animals are harboring chronic unobservable pathological processes the superimposed stimulation afforded by hog cholera virus causes an acute attack of disease in much the same manner as it might be brought about by other devitalizing influences. In such cases autopsy reveals these chronic pulmonary or intestinal lesions admixed with acute petechiation in the same or other organs. When such a clinical picture of diseases appears within ten to fourteen days after vaccination it is to be expected that the blood of such animals should contain the filterable virus of hog cholera. However when this syndrome becomes apparent from one to several months subsequent to vaccination an entirely different condition exists, and it becomes necessary to conclude in such cases that petechiation which is present is due either to causes other than cholera or that immunization conferred only a passive immunity. Investigations conducted upon hundreds of such cases by investigators in various walks of professional activity has proven that the filterable virus can be demonstrated in but a very small percentage, necessitating the conclusion that in many such cases a condition other than cholera is being dealt with.

It is urged that neither radicalism nor ultra-conservatism dominate our efforts to control swine diseases. The writer yields to no man in his regard for the value of laboratory knowledge and data. It is difficult to conceive of any other institution which could reveal in the same period of time so many truths as have been revealed by laboratory workers in the last decade. Yet even this wonderful work has had its drawbacks since the preponderance of laboratory work has largely dominated the professional mind, at times to the exclusion of important clinical or field observations.
Swine diseases would not be nearly so complex if the art of close observation was cultivated and as much study applied to small details pertaining to differential diagnosis as is applied to the study of a laboratory phase of the same subject. Our animals are themselves each a laboratory in which actions are followed by reactions, an understanding of which would do much to control disease. We attempt to understand thoroughly the action and reaction of all biologics which are prepared for the individual and then to a large extent ignore the reaction and pathological changes which occur subsequent to its use. Some consider that these are the same now as they were twenty years ago, but if we are to advance we must listen to the clinician who insists that conditions have changed and attempt to confirm or correct his observations with laboratory data.

In closing it seems hardly necessary to reiterate that hog cholera still continues to be the most important disease of swine and the one with which we are most vitally concerned. Our entire defense against this disease depends upon the confidence which the veterinarian and the swine owner maintains for the simultaneous treatment. This being a specific treatment it will confer immunity only against hog cholera and being antigenic it may be the means of focusing our attention on conditions the presence of which was unsuspected at the time of vaccination. If trouble becomes apparent subsequent to vaccination each of these factors must be considered and its true significance evaluated. It must be considered in arriving at a diagnosis that petechia, the only lesion attributable to the filterable virus of cholera, are also symbolic of other diseases and conditions. This factor makes a correct diagnosis inseparably dependent upon thorough consideration of the history and symptoms. When these support a diagnosis of hog cholera it is imperative that anti-hog cholera serum be administered regardless of any previous treatment. However when petechiation or the presence of button ulcers is unsupported by the balance of the syndrome, viz: the symptoms and history, a diagnosis of cholera with the administration of serum will frequently be devoid of results and will reflect upon the ability of the diagnostician. Continued results of this kind will enhance the difficulties of sanitary control since the confidence of the public will be severely shaken.

PRESIDENT CREWE: We will now take up Dr. Dorset's subject—

Reports of Experiments with Suipestifer Bacterins.

REPORT OF EXPERIMENTS WITH SUIPESTIFER BACTERINS.

By M. Dorset, Washington, D. C.

Long before modern bacteriological science was placed on a firm basis by the fundamental work of Pasteur, Koch and their contemporaries, medical practitioners were employing the viruses of infectious diseases to induce a state of immunity in human subjects. But it was only after the report of Pasteur's success in immunizing chickens against fowl cholera with attenuated pure cultures of the fowl cholera bacillus that any marked progress was made.

Bacteriologists then endeavored to produce vaccines for various diseases by Pasteur's method but they did not stop with the use of attenuated micro-organisms, they used the filtered toxins of bacteria as well as the bacteria themselves after they had been killed by heat or by chemicals. During the forty years that have elapsed since Pasteur's discovery, the so-called "biologics" have come more and more into use to prevent and cure disease. This period is marked by many brilliant achievements, and unfortunately also by many failures. Even the failures have served a useful purpose, for they have taught us that success in combating in-
fectious diseases of animals cannot be attained by following any simple, single route. Each disease is a problem in itself. Success in one case may of course indicate a way of attack in another, but success in one disease by no means assures success in another by the use of the same or similar methods. We thus have a curative serum for diphtheria, an immunizing serum for tetanus, an attenuated vaccine for blackleg and a successful immunizing bacterin* for typhoid fever, but we cannot immunize against blackleg with a bacterin and we have no curative antiserum for typhoid fever.

These facts seem clearly to indicate the necessity for a careful study and appraisal of every new remedy or preventive if we are to avoid disappointment and waste. But, in their eagerness to overcome the ravages of disease, veterinarians and practitioners of human medicine alike have been quick to grasp at and to employ newly exploited methods, particularly if they are clothed with the mystery which surrounds the action of the biologicals.

The past decade has been notable for the widespread use of bacterins for the prevention and cure of all manner of diseased conditions of both men and animals. This widespread use of bacterins had its immediate beginnings in the work of the celebrated Sir Almroth Wright, but it is interesting to note that the lamented Dr. James Law, a veterinarian, was apparently the first to attempt to produce immunity with a killed virus, when, in 1880, he injected pigs with heated blood to protect them against swine plague.

Again in 1886 Drs. D. E. Salmon and Theobald Smith demonstrated that immunity could be induced in pigeons against Bacillus Suipestifer by giving them repeated injections of killed cultures of that micro-organism.

Recently in swine practice two kinds of bacterins have been used extensively, (1) Hemorrhagic septicaemia bacterins and (2) Mixed infection bacterins. The hemorrhagic septicaemia bacterins are all made exclusively from B. Suisepticus, though the number of killed organisms per dose varies widely. Under the name "mixed infection bacterins" there are sold a wide variety of dead bacteria mixed together in varying proportions. In one commercial mixed infection bacterin, we find 4 varieties of killed bacteria, B. Suisepticus, B. Suipestifer, B. paratyphosus B, and B. coli. In another we find 9 varieties of killed bacteria, B. Suisepticus, B. Suipestifer, B. pyogenes, B. coli communis, B. coli communior, Staphylococcus aureus, Staph. albus, hemolytic streptococci, and non-hemolytic streptococci. Moreover, the variations in commercial mixed bacterins are not confined to the kinds of bacteria used in producing them, they vary enormously in the numbers that are recommended for injection at a single dose. In one the dose is 16 billion while in another it may be as great as 4 trillion, 400 billion.

Practically without exception these mixed infection bacterins are recommended for the prevention or treatment of "mixed infections in swine."

Under the above recited conditions it will be readily understood that the investigator who desires to study the mixed infection bacterins from the standpoint of their effectiveness in combating swine disease is confronted with a puzzling situation. In the first place, the very condition for which these bacterins are recommended as preventives or cures is ill-defined and certainly not to be differentiated from the well known diseases of swine by any method available to the veterinary practitioner. In the second place the etiology of "mixed infection" is evidently in as nebulous a state as the disease itself, even in the minds of those who recommend

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*The term "bacterin" is used to indicate a suspension of killed bacteria.
the use of mixed infection bacterins as witnessed by the fact, as already explained, that these bacterins vary widely with respect to the bacteria which compose them.

For these reasons, in formulating plans for a study of mixed infection bacterins we were forced to give up the thought of testing the effect of mixed infection bacterins as such. Inability to define and reproduce any independent disease of swine that could properly be designated as "mixed infection" precluded the possibility of experimental study in the manner usually employed. It occurred to us, however, that information of value might be secured by a study of bacterins made solely of the individual bacteria which are commonly found as components of the "mixed infection bacterins." In the experimental work to which I shall now briefly refer, there have been associated with me, Dr. W. B. Niles, Dr. C. N. McBryde, Dr. J. H. Rietz and Dr. George Kernohan.

With the above ideas in mind, bacterins were prepared from a number of different strains of B. Suipestifer, which organism is found in all mixed infection bacterins. The antigenic power of these bacterins was then tested on guinea-pigs by giving the experimental animals two or three subcutaneous injections of the bacterins at intervals of 5 to 7 days. Usually within 10 to 14 days after the last injection of bacterin the treated guinea pigs, together with a certain number of controls, were given a lethal dose of live Suipestifer culture subcutaneously. The results of these tests are shown in tables I and II.

Table I
IMMUNIZING ACTION OF SUIPESTIFER BACTERIN AGAINST LIVE CULTURE OF B. SUIPESTIFER.

<table>
<thead>
<tr>
<th>G. P. No.</th>
<th>Bacterin No.</th>
<th>Dose of Bacterin</th>
<th>Live Culture No.</th>
<th>Dose of Culture</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>320</td>
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<tr>
<td>5403</td>
<td>320</td>
<td>100</td>
<td>250</td>
<td>500</td>
<td>320</td>
</tr>
<tr>
<td>5404</td>
<td>320</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>320</td>
</tr>
<tr>
<td>5405</td>
<td>320</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>320</td>
</tr>
<tr>
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<td>320</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>320</td>
</tr>
<tr>
<td>5571</td>
<td>None</td>
<td>320</td>
<td>1/10 c.c.</td>
<td>Died 12 days</td>
<td></td>
</tr>
<tr>
<td>5411</td>
<td>407</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>407</td>
</tr>
<tr>
<td>5412</td>
<td>407</td>
<td>&quot;</td>
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<td>&quot;</td>
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<td>&quot;</td>
<td>407</td>
</tr>
<tr>
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<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>407</td>
</tr>
<tr>
<td>5572</td>
<td>None</td>
<td>407</td>
<td>1/2 c.c.</td>
<td>Died 10 days</td>
<td></td>
</tr>
<tr>
<td>5419</td>
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<td>&quot;</td>
<td>&quot;</td>
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<td>416</td>
</tr>
<tr>
<td>5570</td>
<td>None</td>
<td>416</td>
<td>1/5 c.c.</td>
<td>Died 9 days</td>
<td></td>
</tr>
<tr>
<td>5427</td>
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<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
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<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
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<td>420</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
<td>420</td>
</tr>
<tr>
<td>5573</td>
<td>None</td>
<td>420</td>
<td>1 c.c.</td>
<td>Died 10 days</td>
<td></td>
</tr>
</tbody>
</table>

Table I shows that Suipestifer bacterins, in amounts as low as 50,000,000 killed organisms, served to protect guinea pigs weighing approximately one pound, absolutely and without exception against a fatal dose of the homologous culture.
From Table II we see that the bacterin treatment protected also against a fatal injection of a heterologous culture even when that culture differed in some respects culturally from the one used in preparing the bacterin. These results serve to corroborate the results reported by Salmon and Smith many years ago. Suipestifer bacterins protect guinea-pigs absolutely against lethal injections of the live culture. But it is important to remember that in these cases we were dealing with a pure infection of Suipestifer. What is the action of the Suipestifer bacterin in mixing infections? As we all know, B. Suipestifer is not uncommonly found together with other bacteria in the blood and tissues of hogs affected with cholera, although that micro-organism when isolated does not usually produce disease in hogs except by artificial methods of exposure, or by the administration of overwhelming doses. As we were in possession of bacterins which were remarkably efficient in protecting guinea-pigs against pure B. Suipestifer infection it was confidently expected that by immunizing hogs with these bacterins and then exposing them to cholera we would repress the Suipestifer infection, which is so common, and thus obtain a
clinical and post mortem picture of true hog cholera in which the filtrable virus alone was concerned. Unfortunately our hopes were not realized.

For these tests two series of hogs susceptible to cholera were used. The first series received no treatment whatever. The second series was given two injections of Suipestifer bacterins, five days apart, 40 billion organisms being administered at each dose. Ten days after the last injection of bacterins, each hog in both series was given an injection of filtered hog cholera blood which was proved by careful bacteriological examination to be free from B. Suipestifer.

The results of these tests are given in Table III.

It will be observed that the prior immunization with bacterins did not serve materially to ameliorate the severity of the disease, nor did such bacterin treatment prevent invasion of the hog’s body by B. Suipestifer. Indeed, as may be seen from Table III, B. Suipestifer was found in 70% of the treated hogs at autopsy while it could be demonstrated in only 42.8% of the untreated animals. The greater frequency of Suipestifer in the bacterin treated hogs is not, on account of the comparatively small number of hogs in the experiment, regarded as proof that the bacterin treatment resulted in increased susceptibility to Suipestifer when associated with the filtrable virus; but it seems to demonstrate very clearly that the immunity of these pigs against Suipestifer, if indeed any immunity followed the injection of the bacterin, was entirely dissipated in the presence of the filtrable virus.

Since there was some doubt concerning the immunity against Suipestifer that may have resulted in hogs from the bacterin treatment and in order to ascertain whether the submergence of Suipestifer bacterin immunity was induced by infections other than the filtrable virus a lot of 20 guinea pigs was immunized by injecting them with a mixed bacterin, composed of equal amounts of killed B. Suipestifer and B. Suiseppticus organisms. Two injections were given. The first dose was 1 billion, the second 2 billion. These guinea pigs were then divided into three lots. The first lot of 6 pigs was injected with 1/10 cc. of the live Suipestifer culture from which the Suipestifer bacterin was made.

The second lot of 6 was injected with 1/10 cc. of the live culture that was the source of the Suiseppticus bacterin, and the third lot of 8 was given the mixed cultures, 1/10 cc. of each.

The results were that the 6 guinea pigs given the live Suipestifer culture alone all survived in perfect health. Those that received the Suiseppticus culture alone all died, the average life being 9½ days. The third lot that received the mixed live cultures all died, the average life being but 3½ days, and at autopsy Suipestifer was obtained from the organs of every one. The very early death of this last group of guinea pigs, together with the presence of Suipestifer in the organs, shows that in the presence of a Suiseppticus infection the bacterin immunity against Suipestifer was destroyed.

In view of these findings it was deemed wise to determine whether the immunity against hog cholera which is induced by serum and virus might likewise be overcome through the simultaneous attack of the filtrable virus and some of the common pathogenic bacteria. This seemed especially desirable since repeated trials had shown that when susceptible hogs are injected simultaneously with the filtrable virus of hog cholera and live cultures of B. Suipestifer, the disease which ensues is much more acute than that which follows the injection of filtered virus alone. In such cases, the hogs usually die within 5 to 7 days, whereas the filtrable virus injected alone generally requires 15 days to cause death.
In order to test the resisting power of immunized hogs to this severe mixed infection, twelve pigs that had been previously treated with serum and virus were each inoculated simultaneously under the skin with a mixture consisting of 4 cc. of filtered hog cholera virus, 1 cc. live culture of B. Suiphestifer and 5 cc. live culture of B. Suisepticus. The results of this injection are shown in Table IV.

<table>
<thead>
<tr>
<th>Hog No.</th>
<th>Treatment and Dose</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>Injected with 4 c.c. dilute filtered virus and a 6 c.c. mixture of 5 c.c. Suisepticus Culture and 1 c.c. Suiphestifer Culture.</td>
<td>Remained well</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
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<tr>
<td>25</td>
<td></td>
<td></td>
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<tr>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>107</td>
<td></td>
<td>Slight reaction</td>
</tr>
<tr>
<td>108</td>
<td></td>
<td></td>
</tr>
<tr>
<td>109</td>
<td></td>
<td></td>
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<tr>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>111</td>
<td></td>
<td>Remained well</td>
</tr>
<tr>
<td>112</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is clear that the simultaneous injection of B. Suisepticus, B. Suiphestifer, and the virus of hog cholera was not sufficient to disturb or "break" the immunity which had been conferred on these pigs by a previous simultaneous injection of serum and virus.

As a preface to a resume of these experiments I wish to say that in my opinion, in no line of endeavor is the old adage that "the proof of the pudding lies in the eating of it," more applicable than in bacteriological research; for, as I have already indicated, in this line of endeavor it is the facts that count, and the closer the research worker sticks to his facts and the warier he is of sweeping conclusions and theories, the safer he will be from mortification and embarrassment. Notwithstanding a very keen appreciation of these truths, I shall nevertheless venture a partial interpretation of the experiments I have just described.

1) In the first place the experiments demonstrate clearly that guinea pigs may readily be protected against otherwise fatal doses of live Suiphestifer culture by prior treatment with Suiphestifer bacterins.

2) It seems reasonable to assume that hogs, treated with Suiphestifer bacterins in a way analogous to these guinea pigs will be protected against a pure infection with B. Suiphestifer. There is, however, as yet no actual proof that this is true, and we have no information as to the duration of immunity, if it is produced in hogs as we assume. There is nothing in these experiments to indicate that Suiphestifer bacterins would be of any value to treat sick animals even though they might be suffering from a pure infection with Suiphestifer.

3) Immunization with Suiphestifer bacterins will not protect hogs against B. Suiphestifer when the hog is at the same time attacked by the filterable virus of hog cholera.

4) Guinea-pigs immunized with Suiphestifer bacterins lose that immunity when subjected to simultaneous attack by B. Suiphestifer and B. Suisepticus.

5) These experiments strongly indicate that Suiphestifer bacterins are unlikely to afford protection against B. Suiphestifer in the presence of mixed infections, other than hog cholera.
There can be no doubt that hog cholera virus vastly increases the susceptibility of hogs to Swinepestifer. Immunization against hog cholera, therefore, lends protection against Swinepestifer by removing the virus as a possible agent in breaking down the natural resistance of the hog to B. Swinepestifer.

PRESIDENT CREWE: We will now have the Report of the Committee on Livestock Diseases. Dr. Van Es is Chairman of this Committee, but I believe he is not here.

DR. MOORE: I have here the report which Dr. Van Es has prepared for this committee. In view of the time and of the necessity for discussion of the papers on hog cholera, I would suggest to the Association that this report be received and printed in the proceedings of the Association. I will make that as a motion, Mr. President.

Dr. Moore's motion was duly seconded and carried.

PRESIDENT CREWE: We will now take up the first subject on this morning's program—The Report of the Committee on Infectious Swine Diseases. What do you desire to do in connection with this report?

On motion, duly made, seconded and carried, the report was accepted and ordered printed in the proceedings.

COMMITTEE ON LIVE STOCK DISEASES.

REPORT.

It is both obvious and wise that the U. S. Live Stock Sanitary Association devote special attention to certain animal diseases which by their wide distribution and great economic importance have become problems of a national interest. Such subjects as tick eradication, tuberculosis, abortion and hog cholera certainly warrant the existence and activities of special committees devoted to their thorough consideration. It would, however, be negligent on the part of our organization if, in its desire to make headway against those diseases, it were to overlook the existence of a number of others perhaps of less momentary prominence, but nevertheless endowed with an enormous potentiality for mischief. It is perhaps that the Association had this in mind when it created a committee on live stock diseases, even if the fact was never definitely stated or that the committee mentioned was ever specifically instructed in regard to its duties.

The committee assumes thus that it is to deal with diseases and problems of suppression and eradication not specifically entrusted to other committees, with the labors of which it is in the most perfect accord. Yet it feels at liberty to make special mention of the efforts made in regard to the eradication of tuberculosis and of the cattle tick and the disease it transmits. The committee of live stock diseases recognizes the great value of those undertakings, but above all it welcomes them as unmistakable evidence that we are beginning to think in terms of eradication rather than in terms of mere control. Disease control is, even at its best, a Sisyphean task, while eradication is final and after all finality in disease management is the ideal which should never be lost sight of. It is the sincere wish of this committee that the eradication idea will be extended to other diseases and that plans and policies will develop to bring about its realization.

It does not seem impossible to accomplish it in the case of hog cholera, which in spite of the efficient means now available still remains a very prevalent disease which manages to maintain itself as a more or less
permanent incubus on our hog industry. It is true that a great number of swine are annually saved by immunizing methods, but we are not getting rid of the disease and the cost of its mere control, repeated from year to year, is no mean burden to be carried by the industry.

Control measures have efficiently reduced the occurrence of glanders, yet the disease is not totally eradicated and new infection foci are discovered from time to time. With the disappearance of the livery stable and the public feed stable from our rural districts as clearing houses of infection and the great reduction of the horse population of our larger cities, it seems that the time is here to accomplish the final elimination of this disease.

It is largely due to the lack of up-to-date statistical information sufficiently encouraged and that our efforts in dealing with communicable diseases should be given this direction in preference to all others.

Some years ago the committee on live stock diseases called attention to the great need of a central statistical agency prepared to collect and to distribute information pertaining to the incidence and occurrence of the communicable animal diseases. It recommended that the U. S. Live Stock Sanitary Association give this subject consideration and if possible take steps to bring about the establishment of such a statistical agency. Reliable and promptly available data on the occurrence of disease are recognized as indispensable to intelligent public health efforts and this pertains to the management of animal diseases as well. We have at no time a recent and reliable view of the animal disease situation in our country.

We believe this to be defect of our own disease fighting machinery and hence this committee again recommends that the U. S. Live Stock Sanitary Association take the necessary steps to bring about a statistical service pertaining to the communicable diseases of animals.

It is largely due to the lack of up-to-date statistical information that it is impossible to give a correct picture of the incidence of those diseases not covered by slaughter house statistics or those pertaining to tuberculosis and tick eradication, and even those are not usually promptly available.

The committee is informed that anthrax and blackleg are found to occur in regions where those diseases were not known before. It hears about the rapid spread of abortion disease and of outbreaks of rabies and of other diseases, but there are no figures or data to show the actual situation or to show the need or nature of preventive measures taken.

However, even without the support of specific statistical data a few facts regarding animal diseases may be brought to the attention of this association:

Swamp fever in horses, which attracted so much attention a few years ago and which caused no small amount of alarm in many sections of this continent, is apparently on the decline in practically all the infected areas. One or two states report, that while some new areas of infection have been brought to light during the last few years, there has been an even greater decrease in the disease in the previously infected districts. In the greater number of the states, where the disease is or has been more or less prevalent, the veterinary workers do not consider it of sufficient economic importance to warrant further investigational work at this time.

It is the opinion of the committee that the investigations of this disease be not discontinued and that research be undertaken with a view of establishing a specific and practical method of diagnosis, and also that further studies be made regarding the nature of the causative agent and its means of spread.
A new problem in disease has arisen with the discovery of botulinus intoxication as a not uncommon cause of death among farm livestock. The apparent wide distribution of the botulinus bacillus or closely allied species in a great variety of situations or substances may be a means of explaining at least a part of the unaccountable deaths among farm animals occurring annually in a large area of the country. The most striking discovery in this respect is that of the possible occurrence of the botulinus organism in anti hog cholera serum and in the hog cholera virus sold for immunizing purposes. The committee urges further and more extended investigations relating to animal botulism and especially such as are designed to make possible a prompt and accurate diagnosis either in the cadaver or in the living animal. Without this we would still be helpless in the face of this intoxication, while without the means of a dependable diagnosis there would be considerable danger that the farmer be made to pay for expensive immunizing agents without having any certainty that they are the ones which are required for the protection of his animals.

The part played by the gross parasites of animals is receiving attention of many investigators and facts of unquestioned, practical importance are gradually coming to light. This committee is especially gratified that some of our most competent investigators are applying themselves to a study of life histories of many helminths and that the efficiency of time honored vermicides and vermifuges is being challenged by exact experimental methods. This work is pregnant of most important results.

Attention has been called during the past year to the importance of certain intestinal parasites of horses and it was learned that there are many species of those worms which were previously grouped under not more than four distinct species. The ravages of this group of parasites (strongylidae) seem to be increasing. Control measures are not easy to carry out, but sanitary officials should bear in mind that losses resulting from infestation with this group of worms are not inconsiderable and be governed accordingly.

Recent researches, by American workers especially, have demonstrated the importance of swine ascaris as a cause of pneumonia. Not only does the migration of the larva of these worms cause irritation, but it leaves a convenient pathway for the dissemination of various bacteria which may be present in the bronchi. It has further been shown that the lot which is used for keeping swine, year after year, is a rather hazardous plot of ground. Such premises are thickly seeded with the eggs and embryos of swine parasites and even if the hogs are treated with various alleged worm remedies, the losses caused by these parasites are not insignificant. Rotation of the hog lots is even more necessary than the changing of pastures in the control of stomach worms in sheep.

Several outbreaks of sarcoptic mange in cattle have been reported this year. This is not remarkable in itself as this type of mange in cattle has been described from time to time. The prevalence of the condition seems, however, to be increasing. Because of its usually mild symptoms in the beginning of the outbreak, it often gains considerable headway before the true significance of the condition is realized. Microscopic examinations of deep scrapings are often necessary in order to establish a diagnosis. Cattle lice seem to be increasing in prevalence. These parasites are not difficult to control when animals are treated at the proper time of the year. If, however, a breeder waits until the rigors of a northern winter are at hand, a real task presents itself. Spraying with a coal tar disinfectant, or still better, with kerosene emulsion, on account of its cheapness, is the treatment to be recommended.
The importance of poultry diseases is becoming more and more conspicuous and it seems strange that this subject has so long been neglected by livestock sanitary authorities when the enormity of our poultry industry is given consideration. Tuberculosis is eating its way into our poultry wealth at a rate which should be truly alarming to those especially interested. In many sections fowl cholera is destroying the farm yard flocks, while roup and pox, fowl typhoid, white diarrhea, black head and other diseases are constantly taking a more or less heavy toll. At the present time no other field seems to offer more promising prospects to the scientific investigator and the practical sanitarian than the one pertaining to poultry diseases.

Among the diseases of swine, hog cholera continues to be the most prevalent and to be the chief source of loss. Swine are however, susceptible to a number of other infections and while many of those are probably unknown or not liable to prompt recognition, it seems now possible to differentiate with a certain degree of accuracy, the necrophorus infection known as "bull nose," pneumonia due to the migration of ascaris embryos into the lungs, the para typhoid infections and an infectious pneumonia with which many veterinarians and swine growers have become acquainted under the name of "hog flu."

With the exception of the latter disease and hog cholera, there is considerable warrant to classify the diseases mentioned as filth diseases in the same manner as we apply this designation to typhoid fever and hookworm disease of men. Under ordinary farm conditions, the same piece of ground is used for swine for a long period of years and each generation of swine is promptly confronted with the parasite embryos and eggs and pathogenic bacteria left behind by the previous ones. The soil of many hog lots amounts to concentrated sewage and our public health experience has taught us that neither man nor beast can escape disease for any length of time when kept in constant contact with its own sewage.

Rotation of hog lots and the subsoil drainage of the same seem to be the obvious means to combat the disorders concerned rather than the haphazard use of alleged immunizing agents which are so frequently proposed.

It is probable that the disease, called "flu" is not a new disease, but it appears safe to state that only during the last three or four years it has assumed a truly epizootic character. As during this time it has frequently appeared in connection with fairs, exhibitions, etc., the latter have been held primarily responsible for the infection. The fact that the disease is not uncommonly found on farms without any contact with exhibitions, seems to show that the hypothesis of the disease being purely a fair disease is not entirely tenable. There is no question, however, that fairs, where infection is introduced by incoming swine, constitute a wonderful means to further disseminate the disorder. A recent inquiry revealed some interesting facts concerning this point. Of the 132 swine exhibitors at a large fair, not less than seventy reported the disease in question among their swine, either during the fair or immediately following the same. Of the seventy exhibitors reporting disease among their swine, forty-six reported that the hogs returning from the fair communicated the same disease to the home herds shortly after their return. The seventy exhibitors had taken 679 hogs to the fair and of those 338 sickened and eighteen died.

Another observation pertains to a herd of about 250 swine, none of which had been away from the premises. Some swine were purchased at
the fair and when introduced into the herd, one of those, a young boar, proved to be sick, but was not isolated. Within ten days approximately 200 swine of this herd had sickened with a morbidity of from seven to ten per cent.

As a rule the mortality is not high, in most cases, ranging from five to ten per cent. In some instances large numbers of swine sickened, without a loss, but there are also reports of fifty to one hundred per cent mortality.

The disease seems to have a predilection for the younger swine and there are indications which show that swine exhibitors only showing animals of the age of one year or over will experience a relatively small amount of trouble.

The principal loss caused by the disease is due to the interference with growth, to the susceptibility to secondary lung lesions and to cardiac weakness and to the great number of animals apt to be involved in the disorder.

There are indications that the time has arrived for livestock sanitary specialists to take cognizance of the facts revealed by more recent investigators of animal nutrition. The part played by the undetermined food factors, often known as vitamins, not only has a very direct bearing on animal growth and well being, but their more or less constant absence from the ration seems to have an important bearing on the etiology of a number of diseases, known as deficiency disease and avitaminoses. Many investigators are now occupying themselves with this question already and there are indications that the result of their labor will have an important bearing on the rearing of livestock and on the prevention of certain diseases.

It is probable that diseases like rickets are far more common than is commonly suspected, while scurvy and the neurites due to faulty feeding do possibly also occur. The occurrence of a disease among cattle of certain districts of the southwest and which has a considerable similarity to the "lamziekte" of the South African veld is of extreme interest in this connection.

One of the members of this committee and his associates have already reported on a nutritional disease of poultry in California. This disease was characterized as manifesting weakness, emaciation, formation of a white film or masses of yellowish-white caseous material in the eye, a discharge from the nostrils of a watery or viscid fluid and the formation of yellowish-white pustule-like lesions in the mouth, pharynx and esophagus. The most prominent visceral lesions are found in the kidneys. These organs are usually pale, swollen and marked by fine, white hair lines due to the tubules being filled with urates. All attempts to incriminate a bacterial agent as the causative factor of the disease have failed. In further experiments it was shown that fowls receiving no greens in their rations developed the nutritional disease in question with but few exceptions, while of the fowls receiving the greens, only one sickened with this disorder.

This work is a valuable contribution to our understanding of some of the puzzling diseases of livestock and it is hoped that it will be extended in other directions.

Your Committee of livestock diseases observes with great satisfaction that in the matter of animal diseases, more emphasis is given to prevention and eradication. The faith in cures is still alive and especially among the laity they are still regarded as of prime importance in all
forms of disease, but there is a new public interest in prevention which augurs well for the future.

It seems a long step from the time when we were doping animals with saltpeter, aconite and belladonna and filing horse's teeth for the relief of all kinds of ailments to the days of tick eradication, anti-tuberculosis campaign, and hog cholera serum, but the step has been made and is in a forward direction.

We are willing to go further in the direction of livestock hygiene and sanitation and should begin to prepare for future development in this field.

Your Committee has a clear vision of a comparatively near future, when there will be an urgent demand for trained leaders in this field of animal disease prevention and public livestock sanitation. It believes that the time is here now that our veterinary teaching institutions might begin to supply training facilities and opportunities for the veterinary health officers of the future. In addition to the need of a high type of veterinary practitioners, there will be one for specially trained sanitary specialists to guide and direct the work of the new era which is bound to come. Would it not be possible at this time for a few of our veterinary institutions to consider the possibility of a post-graduate year, especially devoted to general and special hygiene and the preventive management of the communicable diseases of domestic animals and livestock sanitary administration?

PRESIDENT CREWE: Next is report of the Committee on Hog Cholera Control. What is your pleasure in regard to this report?

On motion, duly made, seconded and carried, the report was accepted and ordered printed in the proceedings.

PRESIDENT CREWE: We will now take up the report of the Committee on Inter and Intra-State Shipments of Swine. What is your pleasure regarding this report?

On motion, duly made, seconded and carried, the report was accepted and ordered printed in the proceedings.

DR. R. R. BIRCH (Ithaca, N. Y.): I would like to make a suggestion in regard to this report. I do not believe that anyone by hearing that report once can get an adequate idea. I think that is something that requires study rather than reading, and I think, although there is nothing in the report to which I have the least objection, in the future those reports could be passed around to the members of the Association in advance, and that in our discussion here we could get a little farther on what we are trying to do with the reports.

DR. ED. A. CAHILL (Indianapolis, Ind.): I do not think a report which entailed as much work as this report should be passed up in this light manner. It means a great deal to everybody here to have some action taken on this Committee's report. I believe there should be some opportunity to allow this to go over as unfinished business, and give everybody an opportunity to study the regulations, and have it come up under next year's new business.

DR. DORSET: As I understood Dr. Birch, his comment was that it was difficult at this meeting to grasp the full meaning of the reports; that any action of this Association would necessarily be without proper consideration, if it came to adopting. It seems to me that the motion to accept this and to print it in the proceedings gives it to the officials to study and to take final action on it perhaps at the next meeting. As Dr. Cahill has suggested, you would not adopt it until we understand it.
DR. CAHILL: The custom of this Association is that if a report goes by the accepting stage, that is generally the burying stage. It very seldom comes up again the next year unless left as unfinished business.

DR. DORSET: I do not know how to put the motion, but I make the suggestion that some machinery be arranged whereby this report will be brought up for attention and action at the next annual meeting of the Association. It will then have been printed, and perhaps it could be put on the program for action. I move that the report be put on the program for action at the next meeting, if that is a proper motion.

PRESIDENT CREWE: I believe we already put through the motion for the acceptance of the report and the printing of it in the proceedings. Now, this, as I understand it, is the regular procedure for handling these reports. As has been stated here, no one can grasp all the different features of this report from hearing it read hurriedly, and there is no time to give it thought, and that is the object of getting it into the proceedings. It seems to me if there are important outstanding points, those who are interested are going to bring them out in the succeeding meeting of the Association. It would appear to me it is hardly necessary to make a Resolution. Those who are interested ought to bring those particular features out at the next meeting, or arrange with the Program Committee to bring them out.

DR. MOORE: It seems to me this is of sufficient importance to have the Association take some action, and after the matter has been carefully studied I would move that the incoming President appoint a special committee to consider and report on this report. If it goes back to that same committee, it will be exactly what happened this year.

Dr. Dorset's motion was duly seconded and carried.

PRESIDENT CREWE: We will now take up the discussion of Dr. Cahill's paper, Factors Influencing the Control of Swine Diseases—the discussion to be opened by Dr. George E. Convin, Hartford, Conn.

DR. GEORGE E. CONVIN (Hartford, Conn.): Mr. Chairman and gentlemen:

I have been very much interested this morning in the reading of the reports of the different committees regarding the diseases of swine, and I have received a great deal of valuable information from them. I do not think I could discuss this subject in any other manner, except in a complimentary way, and perhaps in a co-operative way. Dr. Cahill in his paper has brought out some very important facts. One, the importance of diagnosis, and the other, the importance of control of hog cholera and kindred diseases. The importance of diagnosis in my opinion is a very great factor in influencing the control of hog cholera and kindred diseases. You are well aware of the fact that hog cholera can be controlled by the proper use of hog cholera serum and virus, and if we can control hog cholera, we have controlled a great part of the diseases to which swine are susceptible. But there are other things to consider. There are other diseases today, which in order to make the swine industry profitable, must be controlled. One of these diseases is hemorrhagic septicemia. There are other diseases, which are of some importance, but in my mind this is the most important disease. We have found in Connecticut, where we are very much interested in the control of swine diseases, to the extent that we have appropriated and do appropriate each year, large sums of money for the control of these diseases. Our last appropriation, I think, was $20,000, and we control it in every way. We control the use of hog cholera serum and virus, and anything that is used as treatment in connection with it, or with kindred diseases. We also require that pigs com-
ing into the State of Connecticut shall have been previously treated, and that they shall not only have received anti-hog cholera treatment, but treatment against kindred diseases and hemorrhagic septicemia. We also require permits to bring into the State, and also require a notice of arrival of these animals, and the animals are held in quarantine until released by the Commissioner of Domestic Animals, or his agent.

I just want to speak a minute on the treatment of hog cholera as it appears in the field. About four years ago the swine industry in Connecticut was not very extensive, but we found during the war time that we did not have pork enough to feed our own people, so large importations of swine were sent in, and a great many of those came from apparently infected areas, or from stockyards, and were shipped in stockyards' cars. At that time there were no regulations requiring treatment against hog cholera. We found that when these pigs arrived they soon became sick, and proceeded to treat them accordingly. At that time hog cholera was considered the only real fatal disease of hogs, and the treatment by hog cholera serum and virus was given. We found we did have a great deal of success by the use of hog cholera serum and virus, but not to the extent we wanted. The treatment was continued for about a year, and after that we inaugurated plans whereby no pigs should be vaccinated, either by the serum only, or by the simultaneous method, except they be given serum and septicemia vaccine at the same time.

Since that time we have had splendid results, and we have not had any of the so-called hog cholera breaks. We can treat and do treat by the simultaneous methods, at the same time we give an injection of septicemia bacterin. In five days another injection is given, and perhaps a third injection. By treating our pigs in this manner we do not have many of the so-called hog cholera breaks, but after about three weeks, or I will say from a month to two months, conditions may arise in these herds which has been diagnosed as hog cholera, and again the serum treatment has been applied without results. In these so-called breaks after a month or two months, we use hemorrhagic septicemia bacterin, or in some cases hemorrhagic septicemia serum.

We come now to the importance of kindred diseases, or importance of diagnosis, and I would suggest that further study along the line of kindred diseases be given. I think hemorrhagic septicemia is one of our most fatal, and most prevalent, and most important kindred diseases, after hog cholera has been controlled. We cannot control this disease, though, without the use of hog cholera serum and virus. I would also like to say that I am a firm believer in the administration of hog cholera serum, and virus, and any of the biologicals which are used for the prevention of swine diseases, but to be used by men who are efficient and capable of doing the work, in other words, a registered graduate veterinarian. In Connecticut our work is done by a band of men perfectly qualified to do the work, men who do try and do make a differential diagnosis, and no layman is allowed to have or use any of the preparations used in the control of swine diseases.

I thank you. (Applause.)

PRESIDENT CREWE: The discussion will be continued by Dr. B. F. Edgington, of Columbus.

DR. EDGINGTON: I have no proven facts to add to this program, and owing to the lateness of the hour I will not impose myself upon you by giving any hypothesis or personal opinions. Therefore, I am going to give way to somebody who has some facts to offer.

PRESIDENT CREWE: Any further discussion?
DR. C. H. STANGE (Ames, Iowa): In view of our experience in Iowa, I do not feel that I should let these suggestions go by. I want to say to you gentlemen frankly that I believe the propaganda that has gone forth in regard to hemorrhagic septicemia, has done more damage in connection with swine diseases in the State of Iowa than any other one thing. We have been and still conduct a laboratory for diagnostic work. One man devotes his entire time to this library diagnosis work. These specimens come from all over the State. There is not a week goes by during the fall and late summer but what we get specimens from herds that are reported as being infected with hemorrhagic septicemia. Now, I want to grant to you that you can find micro-organisms in these cases, and if that is as far as you go with your examination, you can diagnose hemorrhagic septicemia, but in practically all of these cases, where a careful examination is made for hog cholera virus, we find that present.

I want to say to you that in only one single animal during the last three or four years have we been able to demonstrate to our satisfaction that the animal was suffering from hemorrhagic septicemia, and that was not a herd disease. It was simply a single animal that was brought to our attention.

Now, I feel that we have a hog cholera virus in some herds that is not as virulent as we ordinarily make hog cholera virus, and sometimes your injected pigs will not come down as rapidly and with the typical form of hog cholera, but if you carry that along, you almost invariably find you have hog cholera present.

I think we must come to one other conclusion, and the sooner we do that the better off we will be throughout the central west, and that is—just because a herd has been vaccinated with serum and virus, that it is forevermore impossible for its hogs to have hog cholera. We have demonstrated repeatedly that you find hog cholera virus present in herds that have been vaccinated, and we have come to the point where we are telling the veterinarians that they must not say to the stock men—if you use serum and virus you will not have hog cholera again, because we know from our experience and from our investigations of these cases, that it is possible for these hogs to lose their immunity, for reasons that we cannot explain fully just why it happens, but it does happen, and therefore it is very important to us that where you find a disease of swine, even though they have been vaccinated, that is spreading rapidly and shows characteristics of contagious or infectious disease, that you be mighty sure you have not hog cholera present before you call it hemorrhagic septicemia or something else. A great deal of trouble is given because of the fact that hog cholera lesions, as the veterinarian ordinarily thinks of them, are rather insignificant; that is, they consist of hemorrhages, and sometimes only a few of those, and on account of the great emphasis that has been placed on enteritis, hemorrhagic septicemia, and these other conditions that are claimed to exist, the veterinarian when he conducts a post-mortem examination, finds pneumonia, or finds enteritis, and looks no farther. He finds infection and he proceeds to use vaccine.

I will give you an example of one herd out of many that have come to our attention the last two or three years especially. I remember one herd especially, because it was near Ames. A herd had been properly vaccinated, so far as anybody could determine, with serum and virus made by a reliable concern, under Government supervision. Those hogs became sick. A veterinarian made an examination and diagnosed hemorrhagic septicemia. He vaccinated, he vaccinated again, and he vaccinated again. It
was a purebred herd, and the owner was getting rather anxious. He came up, and we found the lesions were beautiful lesions of hog cholera, and all tests indicated the presence of cholera. That is simply one example of a great many, and I want to say to you that the agricultural papers in our section of the country are taking this matter up, and they are telling us that you fellows at the experiment stations have been keeping still too long. You have been letting somebody else do all the talking about these diseases, and we are compelled now to go into this matter, and some of these papers have conducted a survey through the Farm Bureaus of these instances, and we are getting in bad shape. I want to tell you that frankly in Iowa, because of the extensive diagnosis of hemorrhagic septicemia, we have lost thousands of hogs and for that very reason. (Applause.)

DR. CONVIN: Perhaps I did not make my statement just clear. Perhaps I should have had it, that in no instance where hemorrhagic septicemia is diagnosed is the hemorrhagic septicemia bacterin or serum used without hog cholera serum in unvaccinated pigs. I do not think that I brought that out. I wish that understood, that we do not believe we can get along without the use of hog cholera serum and virus. We recognize its use and we recognize its qualities, but we do think, and we know we must control hog cholera before we can control other diseases.

DR. DORSET: Mr. Chairman, there was one remark of Dr. Stange's that I believe I should perhaps say a few words about. Dr. Stange stated that we must get from our minds the thought or the belief which we had that hog cholera serum and virus treatment confers a permanent immunity. Now, it is undoubtedly true that many hogs reported to have received the simultaneous method under practical conditions in the field later developed hog cholera. There is no question about that. That has been amply demonstrated. But, Mr. Chairman, I feel that we should take this in mind, and that is, that it depends on the way the simultaneous inoculation is applied. You hear of field treatments, simultaneous injection of virus, but what was the condition of the virus, for example, that was used in that simultaneous inoculation? In our experience with many thousands of hogs given the simultaneous inoculation at our experimental farm, I cannot recall a single instance of later susceptibility to hog cholera. We inject six cubic centimeters of hog cholera serum into the ear vein, and we have yet to find a death from that treatment. Gentlemen, I think that is the thing you want to bear in mind. It is true that because in the field a herd has been given what is said to be and believed to be by the veterinarian a simultaneous treatment that the herd is not necessarily immunized against hog cholera. We have not yet determined the causes of these things. Why should our results be different from those we see in the field? We are making some studies along this line, and we hope perhaps later to have some results to explain, but I just want to bring out that particular point. Do not say that the simultaneous inoculation does not produce a permanent immunity, but say simultaneous inoculation as practiced ordinarily in the field, may not always result in a permanent immunity.

Now, before I take my seat I cannot resist the temptation to say a word with regard to hemorrhagic septicemia in swine. As you all know, I have been engaged in work related to hog cholera and swine diseases for more than twenty-five years, constantly associated with it, and it is only within the last few years I ever heard of hemorrhagic septicemia in hogs. We have heard, of course, of swine plague or infection of hogs by the Bacilli Suipestifer. I believe that the name—hemorrhagic septicemia, if by that name you mean infection with the Bacilli Suipestifer—is a very unfortunate term. I do not believe it describes a disease that exists in the
field among hogs, caused by Bacilli Suipestifer. I do believe we have independent infections caused by B. Suipestifer, but that these infections as a rule are not hemorrhagic septicemia. The great trouble with the use of the term hemorrhagic septicemia is that hog cholera often presents a picture of hemorrhagic septicemia. There is no question about that, and that there is no other disease of hogs that I know of in the United States that presents that picture so typically to the veterinarian. It seems to me the use of the term hemorrhagic septicemia leads inevitably to confusion on the part of the veterinarian. Many, many cases of hemorrhagic septicemia have been diagnosed in the field. We took particular pains some years ago to collect specimens of blood and tissues from herds in which such condition was diagnosed. In the vast majority of these herds we found virus of hog cholera. We were not sure in it, because it might not have been there in attenuated form. Dr. Niles, whose opinion I respect, and whose judgment, I believe, is as good as that of any other man who has considered swine diseases in the United States, tells me that he, in all of his lifelong experience with hogs, never saw an attenuated outbreak of hemorrhagic septicemia. (Applause.)

DR. A. B. NIVEN (Crawfordsville, Ind.) I would like to make a few observations from the standpoint of a man who has raised hogs, and has treated hogs. I have been raising hogs and treating hogs a great many years. First, as to this mixed infection question, I believe one trouble is we have a label on the bottle that will not work out in practice in the field. I have examined one hundred thousand hogs, and every time we diagnose in the field, we have trouble. Call it what you may, it is trouble, and serious trouble. At times I found serum did not help, and vaccines were used with very good success. I wanted some more information at this meeting. If we keep the labels off the bottles and see that the hogs are treated by men who are competent, and not let the farmer use the preparation according to the label on the bottle, I believe results will be more satisfactory. I tell them that I am doing the work, and ask them to keep their hands off. I have no trouble in my locality, except with a few. The trouble is we are not giving enough serum, and the resistance of the animals is lowered, and some other infection sets in and we have trouble.

Another thing we are doing, in fact I did it myself for years, is trying to control hog cholera by sanitary measures. Sanitation has nothing to do with hog cholera. Why not tell stock men the only thing to stop hog cholera is immunization.

Another thing, if you immunize hogs before shipment, the immunization takes effect during the trip. If you ship hogs free from infection at the start without immunization, they ship better than if you immunize first.

One other point was shipping hogs interstate. I would like to make a few observations on that. There is no living man can look at a hog and tell whether he is well or not. The temperature may be all right one day and the next day the hog is dead. If you know hogs have been immunized, let the shipment be made, and cut out all this expense. It costs money for all these things. I think we ought to hold it down to immunization. All this other red tape makes a lot of expense and nothing is gained by it.

PRESIDENT CREWE: It has reached one o'clock. I think, we had better adjourn now. We will conclude this discussion immediately after convening again at two o'clock.

And thereupon an adjournment was taken to two o'clock p. m. of the same day.
UNITED STATES LIVE STOCK SANITARY ASSOCIATION

SIXTH SESSION.
November 30, 1921, Two o'clock P. M.

PRESIDENT CREWE: We will now continue the discussion of Dr. Cahill's paper. Dr. Skidmore asked for recognition just as we adjourned.

DR. SKIDMORE: I do not know whether I understood Dr. Strange's remarks correctly or not, but I have the impression that perhaps some of the other gentlemen present have misunderstood what he really intended to say. It seems to me that the impression might be gathered that the simultaneous use of serum and virus might not confer permanent immunity in many instances; in fact, we might expect breaks after such treatment. I have personal knowledge of some instances where there are loopholes in the treatment. A personal friend told me he was afraid to give virus, and that he often gave serum only, to lead the farmer to believe he was giving simultaneous treatment when he was not. Now, I have knowledge of other instances where similar action has been followed. In that case, of course, the hogs did not get the simultaneous treatment, and in other instances I am sure that insufficient doses of virus are given. Also, the virus may not be as virulent as it should be, for reasons which we do not need to discuss here. Carelessness on the part of the vaccinator surely must be taken into consideration, or some difference or equation he may not have control over. I have in mind an incident that came to our attention the other day, where a man who happens to be located in Iowa wrote a letter to us reporting satisfactory results he had following the use of simultaneous treatment. Upon getting the history, in fact, he voluntarily gave it to us in a letter, he said that he had recently treated a herd of about 150 hogs, which had been shipped from some small stockyards in Iowa, from what he said was free area, where no hog cholera existed for 25 miles. I cannot conceive of that area in Iowa, but he gave that as a reason. Notwithstanding the fact they were loaded through a small stockyards in Iowa, and shipped to destination, he treated them with 20 cc. of serum for pigs 40 to 60 pounds in weight, an average of 27 1/2 cc. for each hog. The hogs continued to die, and they lost about 75 per cent, approximately. I wrote back what the possibilities were, and the circumstances, and that certainly he had not given enough serum, not as much even as is prescribed by the label on the serum he used. That label prescribed a minimum required of 30 cc. for pigs weighing 30 to 40 pounds. He had used 20 cc. for pigs weighing a great deal more than that. He then wrote back and said, in view of the fact that our regulations prescribed a test in which the pigs should be protected with 10 cc. he should be able to procure satisfactory results, even though he only gave 20cc. in spite of the fact the recommendation on the label of the serum he used prescribed a minimum of 30 cc. I just want to point these possibilities out as loopholes in the vaccination. We must consider this in the control of hog cholera.

I want to give our point of view as to why we issue licenses covering factories, if that is in order, at this time. The law prescribes that licenses shall be issued for biological products intended for the treatment of domestic animals if they are not worthless, dangerous or harmful. On that ground we issue licenses, unless we know that they are worthless. Unfortunately, down to date, there has been little convincing data that they are absolutely worthless. If somebody brings them forward, and shows this, we will see that proper action is taken. Now, a new product comes up for consideration, like abortion vaccine, or vaccine for treatment of swine. Research workers pointed out yesterday splendid results in their research work. Three or four men perhaps may report that they have pro-
cured results more satisfactory than ever procured under similar circumstances by any other treatment. It certainly is in order for us not to stand in the way of progress in that direction, if it is properly made. It is up to the user of the product, the veterinarian or State officials, to say whether the man shall use that product upon his herd. We have absolutely no control over the herds in the State. (Applause.)

DR. C. H. STANGE: I would like to ask Dr. Skidmore a question. I would like to ask him what research worker reported those satisfactory results?

DR. SKIDMORE: I could not answer, Dr. Strange, but no research worker has told us up until this time that they are worthless. That has not actually been demonstrated, unless by Dr. Dorset's research, and I have not had time to study that yet.

DR. CAHILL: If I may have just one word before the discussion closes, I believe the discussion has, to a certain extent, gone very far beyond the mark intended when I presented my paper.

It was not, Mr. Chairman, to try to settle the question as to what the diseases are, nor the value of the products that are advocated for use. My object was to try to present to this Association a serious condition with which the profession is confronted. You may have one opinion regarding the cause of this trouble, and I may have another, and we may have twenty if we have twenty men. We will thresh this thing out. The practitioner is becoming more hopelessly entangled in a variety of opinions, more particularly in the cases where one man says all is hog cholera, no other disease, while the radical man says it is all hemorrhagic septicemia. That is not what the practitioner needs. He does need an acknowledgment of the fact that we have something other than cholera. If governmental and private experts go out and are in a position to say to the swine owner, I believe your animals were properly immunized, or were not properly immunized, as the case may be, and that this is a case of hog cholera, but this other herd has not broken with hog cholera or some other disease, we are going to do much to save this valuable immunizing check. If we fail to do this, while the laboratory men are discussing this thing among themselves; if we still attempt to convince the swine practitioner and swine owner, we have nothing but cholera, we are going to be hopelessly entangled, and it will take us a long while to get back where we were two or three years ago. Dr. Stange's remarks were most worthy, and they will apply to every State in the union. There are a lot of cases of cholera, due at times to faulty diagnosis, due at times to the product used, and then at times due to conditions that nobody can explain, but that does not upset the fact that we have other diseases than hog cholera breaks.

For the sake of the record, I would like to state to you that Purdue University is on record on two different occasions, consisting of these field cases, so-called breaks, which the State of Indiana, and Indiana University have examined, they have found a filterable virus in less than fifty per cent of cases. Purdue University is just as eager as the Iowa State University, or any other university to help clarify the situation, and put the swine practitioner, the veterinarian and the swine owner on a basis that not only will make clearer these trouble cases, but will at the same time retain the confidence which we must have if the simultaneous treatment is going to be continued in preventing hog cholera. (Applause.)

DR. M. DORSET (Washington, D. C.): I do not want to take the time of the Association, as I have already spoken several times, but I thought perhaps I might say just a word concerning the matter Dr. Skidmore spoke of; that is, what position does the Bureau of Animal Industry occupy with respect to the various products that it licenses, and I might-
make it clear that the Bureau of Animal Industry does not endorse and recommend all the products that are licensed. Perhaps that is already clear to you from what Dr. Skidmore has said, but that the Bureau is in position of being required by the law to issue licenses in many cases for products, the value of which it does not know, and that that is the position of the Bureau, so the license on the label is not to be taken as indicating that the Bureau of Animal Industry endorses and recommends the use of the product. In many cases it is because the Bureau has not information concerning it. (Applause.)

DR. CONNAWAY: In regard to the statements of Dr. Skidmore and Dr. Dorset concerning the licensing of biological products, it seems to some of us that it might be a good plan for the Federal Bureau and our State authorities, in cooperation with the biological and drug houses to first establish beyond question the therapeutic or immunizing value of a product before it is sold in such enormous quantities to the confiding and unsuspecting veterinarians and stock raisers. When a worthless article through skilful advertising propaganda gets into large use it is hard to stop its sale. It seems to me that it would be easier to keep a worthless product off the market than to get it off after a powerful sale propaganda has been launched. I believe laws can be enacted and sufficient money provided to carry out proper tests. Dr. Dorset has demonstrated to us here today that proper tests can be carried out. Money spent in this way is well spent, since it is for the protection of the public.

The biological houses could not do better than to spend a larger proportion of the money they collect from the people in thoroughly testing the value of every product before it is offered for sale. Less would be required for sales propaganda.

Federal or State licensing presumes that the product offered to the public is an honest product, and no subterfuge should be permitted that deceives the public and defeats the purpose of the law. If Federal licensing is defective in any respect the regulations should be amended, and enforced.

In connection with this, let me say a word about the "bacterins" which are being promoted for treatment of swine ailments. I am glad that Dr. Cahill took a second hitch at it on the defensive; it shows their lines are weakening. These promoters are fighting very hard; but I think that the death of their propaganda is not far off. And especially when the propaganda has to be bolstered up by such an untenable theory as that the more effective hog cholera immunization becomes, the greater the susceptibility of swine becomes to other swine ailments or secondary infections. As Dr. Stange has shown in his report, and as I can verify from the good results of the proper use of anti-hog cholera serum in my State, we need not worry greatly about the mortality in the swine herds from any other infectious malady than hog cholera. None of us will deny that hogs may suffer from influenza affections comparable to the common colds of the human, and that ordinary secondary infections associated with cholera may aid in producing serious lesions; but we have yet to be shown that preventive inoculation against these secondary infections have proven to be of value. Moreover, such conditions can be prevented in great measure by proper hygienic care of the herd.

I have yet to find an outbreak of the so-called hemorrhagic septicemia in swine that could not be controlled by the injection of liberal doses of potent anti-hog-cholera serum. The bad results which some veterinarians have had in handling outbreaks of disease among swine has been due to faulty diagnosis; and to their failure to vaccinate promptly with anti-hog cholera serum, or failure to give sufficient serum, or in other cases suf-
cient virus to insure a durable immunity. The blame for this rests largely upon the unwarranted semi-scientific propaganda put out by the veterinary biological houses, represented by highly capable commercial veterinarians like Dr. Cahill and Dr. Kinsley. The report of the Committee on Differential Diagnosis of Swine Diseases, presented by Dr. Stange, will render the swine industry, and the veterinary profession a great service in correcting false notions. It should have wide publicity.

Something over a year ago I wrote a bulletin for distribution among the swine raisers and veterinarians of my State—bulletin No. 174—the purpose of which was to urge the early and thorough immunization of swine intended for feeding purposes, in anticipation of a large crop of late "soft corn"—and the increase of cholera which usually attends such crop conditions. In this bulletin I discussed the diagnostic points of hog cholera, and the development and relation of secondary lesions; pointing out that the secondary lesions, in the great majority of cases, were dependent upon primary hog cholera lesions, and would not occur if the swine were well immunized against hog cholera. In other words that the so-called "Hemorrhagic Septicemia of Swine," "Necrotic Enteritis," "Mixed Infections," etc., need not be taken seriously; and that it was very questionable whether preventive inoculation other than anti-hog cholera vaccination was of any service in preventing these secondary lesions.

The commercial literature, and papers such as Dr. Cahill has presented at this meeting, which attempt to magnify the role of secondary infections, and place them in the position of important primary causes of contagious swine ailments, have caused great confusion in the minds of veterinary practitioners. And the efforts of the latter at differential diagnosis in the field have led many into trouble. The practitioner in the field must decide quickly, and apply remedies and preventive measures quickly. And if he mistakes so disastrous a disease as hog cholera, for some mythical infection, or a secondary ailment, his clients will soon lose faith in him. I recall the case of a veterinarian who lost his practice with one client because he refused to vaccinate the herd with anti-hog cholera serum, believing the trouble to be hemorrhagic septicemia; but, unfortunately for him, the bacterins which were injected did not check the disease, while the anti-hog cholera serum, which a neighboring veterinarian subsequently injected, did check the disease and stopped further losses. The first veterinarian was absolutely honest in his opinion and procedures, but he was not well informed; in fact he had been misled by the "bacterin propaganda."

For practical field diagnosis, the safe course for the practitioner to follow is to keep in mind that the probabilities are large that an outbreak of disease among swine is hog cholera, if the history shows it to be a spreading disease, with fatalities. Let him also keep in mind that hog cholera is a septicemia, and that hemorrhages are of common occurrence, and that these hemorrhages may occur in any part of the body. If therefore he finds hemorrhagic septicemia lesions in a hog, it will be safe to conclude, in the vast majority of cases, that these primary lesions were produced by hog cholera infection, and not by the Bact. bipolaris suis—an ever present hog-lot microbe, which is harmless, except perhaps in a secondary role associated with cholera. It will be of great practical help to the veterinary practitioner, in arriving at a safe diagnosis, to regard the pneumonic areas, in the various lobes of the lungs, as simply an advanced stage or sequel of the primary hemorrhage, in the lung tissue, caused by the cholera infection.

A like interpretation should be made in the case of "button ulcers," and the diphtheritic or necrotic areas found in the intestines. Prior to
the formation of these lesions, cholera infection produces a primary lesion or rupture of the capillary blood vessels in the intestinal mucous membrane. Then all sorts of fecal or dirt bacteria find easy access to the injured tissues; and the irritation results in the ulcerative processes. When such conditions are found, let the diagnosis be hog cholera, and give prompt treatment with potent anti-hog cholera serum to all the hogs of the herd which are not yet infected. Neither hog cholera serum, nor bacterins, will be of service in the treatment of a pig in which serious lesions have already developed. Nor in my opinion will the hemorrhagic septicaemia bacterins, and mixed infection vaccines, be of any service in the prevention of the secondary lesions, when given to the healthy hog. I may be wrong, gentlemen, in these opinions, but I know that those who are following the advice I have given are having good results, and I also know that the bacterins have failed time and time again. (Applause.)

DR. A. B. NIVEN: I would like to ask the Doctor what to do with a case where you use anti-hog cholera serum and still the break continues, there is still a loss of hogs?

DR. CONNAWAY: The probabilities are, in such a case, that the herd had become so badly infected with cholera, and secondary lesions had developed to such an extent, that nothing on earth could have saved the herd. Such results, however, can be prevented by giving the immunizing treatment while the herd is healthy—administering liberal doses of potent serum. And when prolonged immunity is desired also administering an adequate amount of an active virus. But in many instances the veterinarian is not called until the herd is infected. He should therefore use the thermometer as a guide in giving serum and virus. His prognosis will then be better, and his results will be better. I am glad to know that the views of the Bureau men engaged in hog cholera control work are not different from my views, on the matter of hog cholera breaks and their prevention.

DR. NIVEN: May I ask another question? How do you account for the fact that time and time again hogs are treated and then separated into different pastures—hogs from the same herd, and given the same treatment—and one herd will break and another won't? I have seen cases of mixed infection.

DR. CONNAWAY: I do not question the fact that the Doctor has seen the lesions attributed to "mixed infections." But I doubt seriously whether he has seen these lesions apart from hog cholera, though such lesions do develop occasionally apart from cholera. I recall a case where a bunch of pigs were gorged on spoiled tankage. The irritation of the intestinal tract, by this improper food was followed by button ulcers and a necrotic enteritis. These pigs were fed in a pen provided with a "creep" to keep the larger hogs out. The larger hogs with which the pigs ran did not contract cholera or mixed infection from exposure to the sick pigs. Dr. V. A. Moore reported a similar case many years ago in hogs, in which the alimentary tract was unduly irritated by kitchen slops impregnated with washing powders.

The so-called mixed infection microbes are secondary wound infections, and do not cause contagions that spread through a herd.

In regard to the case mentioned by Dr. Niven, in which one lot of pigs "broke" after vaccination, while other lots in different pastures did not—all the different lots having been treated alike—the most plausible explanation is that some overlooked factor came into play in the case of the lot that "broke," and lowered the resistance of this bunch, and the virus got the upper hand of the serum and caused an acute attack of cholera in some of the pigs. But as we do not have all the facts, we can
only speculate as to the cause of the break. There are a good many factors to be taken into consideration in successful vaccination; and, important among these are: the condition of the animals when vaccinated, and the care of the animals after vaccination. The questions might be asked: Were the hogs in the several lots healthy thrifty hogs when vaccinated? Were any of the lots of pigs infested with worms? Were all the bottles of serum and virus of good quality? Did all the hogs receive a sufficiently large dose of serum, and a proper dose of virus? There is the possibility that the fault lay somewhere among these factors. But we will assume that it did not. The trouble may have arisen from some fault in the after-care of the hogs, or of the lot that became ill. The vaccinated animal is not safe from a relapse or "break" within two to four weeks after vaccination; and any condition that lowers the resistance of the animal may result in a "vaccination break." As for instance, the lot of pigs that became sick may have been put in a pasture where a lot of badly worm infested hogs had previously run; and the feeding grounds, water pools, and hog wallows may have been badly infested with embryos of the Ascaris; and the vaccinated pigs may have become heavily infested. We have been told that the ascaris embryos are very tenacious of life, outside the host, and live for months in an infested hogyard. We have also been told that when these embryos infest the pig they migrate from the intestinal tract into the blood vessels, and into the lung tissue, and back again into the alimentary tract. Such migration, in large numbers, certainly causes considerable distress to the host; and must lower the resistance of the pigs to so active an infection as hog cholera virus—and it is quite possible that an acute attack of cholera, or vaccination "break," might occur under such conditions in serum-virus treated pigs.

In such a case the sensible procedure is to re-vaccinate the hogs with a liberal dose of anti-hog-cholera serum, to reinforce the defenses against the cholera virus. It will not destroy the worms but it will counteract the cholera virus to some extent, and save some of the hogs. A clean pasture would have prevented the "break." Experience has shown that mixed infection vaccine is not an effective substitute for the sanitary conditions which should be provided.

DR. KINSLEY: I would like to ask Dr. Connaway how he accounts for "button ulcers" in a seven day virus pig?

DR. CONNAWAY: In a seven day virus pig?

DR. KINSLEY: Yes, sir.

DR. CONNAWAY: Well, let me ask you a question. (Laughter.)

DR. KINSLEY: Dr. Connaway is from Missouri. I do not want to have to answer him. I have asked him a fair question, and I would like to have it answered.

DR. CONNAWAY: The Irish, you know, often answer a question by asking one. And the question I would ask is: How many perfectly healthy pigs have you seen button ulcers in?

DR. KINSLEY: Well, I would like to ask the Doctor what he means by health or healthy?

DR. CONNAWAY: There is evidently an Irishman on the other side. And I must go back to the original question and reply: That I have never seen a button ulcer in a seven day virus pig—and by virus pig I mean one that was perfectly healthy or free from cholera infection when selected for inoculation. In our serum work we have never found what you describe in a seven day virus pig. I can say that. But we are careful in the selection of virus pigs to exclude any in which there is doubt concerning their health.

DR. KINSLEY: Did you look for it?
DR. CONNAWAY: Yes.
DR. KINSLEY: Fine.

DR. CONNAWAY: Experiments which we have made with virus pigs will illustrate the development of the button ulcers and other secondary lesions. We have selected healthy pigs for virus production, and for testing serum, and after inoculating with virus only we have killed pigs on the seventh and eighth day—showing a high temperature—and in a careful examination of the viscera, we have never found the button ulcers. In fact in some of the virus pigs, killed on those days, and showing a high temperature, scarcely any macroscopic lesions were found. Dr. Kinsley used to call it a lesionless disease, you know. Other pigs however, killed at the same time, showed engorged lymph glands and petechial hemorrhages in various organs; that is, the lesions that are regarded as typical of acute uncomplicated hog cholera. But, in our experiment, we allowed some of the pigs, which had been injected with the same virus, to go several days longer before killing, and we allowed some of them to linger and die. The autopsy in these cases showed, in one or more of the animals, all the lesions that have been attributed to the hemorrhagic septicemia and mixed infection microbes. This to my mind is evidence that these conditions are secondary developments superposed upon the primary cholera lesions. The evidence is made stronger by the fact that in the serum tests, carried out at the same time, with the same cholera virus, the serum treated pigs did not become sick.

DR. KINSLEY: Now, you are coming to the point.

DR. CONNAWAY: Well, we have gone further. In another experiment we filtered the virus, and presumably removed all organisms except the hog cholera filtrable virus—that is, we removed the so-called hemorrhagic septicemia and mixed infection microbes, if any were present; and we got the same results when this filtered virus was injected into healthy pigs;—namely, the development of the secondary lesions, button ulcers, etc., if the pigs were allowed to run beyond the period of the primary cholera lesions. That is, it seems evident that button ulcers, necrotic enteritis and necrotic pneumonia are caused either directly by the uncontaminated cholera virus, or that the common bacterial flora that is always present in the alimentary and respiratory passage of swine, but usually harmless, penetrate into the numerous primary cholera lesions, and as wound infections produce the more gross microscopic lesions. Sound therapy and prevention place emphasis on the primary causes.

I believe there are men here who can verify my statements. Dr. Birch here is smiling—he is nodding his head approvingly.

I have perhaps talked longer than was needed upon this point; but if there is any further question that I can answer that will help you, I will be glad to answer it, as best I can.

DR. KINSLEY: Mr. President, he has absolutely evaded my question. He did not answer it.

DR. CONNAWAY: Well, perhaps I am very dense, and did not fully understand the question. Let us see,—what was the question?

(Laughter.)

PRESIDENT CREWE: I will let Dr. Kinsley ask it.

DR. CONNAWAY: I never evade a question intentionally. It was this:

How do I explain the presence of a button ulcer, in a virus pig?

DR. KINSLEY: Seven days?

DR. CONNAWAY: Seven days. That reminds me of a story of Ben Franklin when he was Ambassador to France. He proposed this question: "Why is it that if a pail is filled to the brim with water, and a
fish is let down into it very gently, the water will not overflow?" The French savants, so the story goes, offered a number of ingenious explanations. But finally Ben said: "Let us try it, and see what happens." They filled the pail to the brim, let down the fish very gently—and the water flowed over.

(Laughter.)

So in answer to the Doctor's question, as he has mentioned the fact that "I am from Missouri," "I will have to be shown" that button ulcers occur in a seven day virus pig before I attempt an explanation. (I mean a virus pig that was healthy,—namely, free from cholera,—at the time the virus was injected.) I do not think this is an evasion—and especially so in view of what I have said concerning the development and relation of button ulcers and other gross lesions associated with cholera.

(Applause.)

I hope that we have not wandered too far from the subject of the paper which we are supposed to be discussing; or at least that what I have said is pertinent to the question of licensing the hemorrhagic septicemia bacterins, and mixed infection vaccines, that are being used in the treatment of swine ailments.

PRESIDENT CREWE: Is there any further discussion on this subject?

DR. STANGE: I would like to just say one or two words. It seems to me there is a little misunderstanding as to what I had in mind when I discussed the so-called loss of immunity, or breaks resulting after the simultaneous treatment. I did not mean to give out the impression that that treatment had failed, or anything of the kind, but what I had in mind was some of our experiences. For example, we were called to investigate the cause of trouble in a herd that had been vaccinated by a very competent veterinarian, as far as we could tell, with good serum and virus, and still the hogs were dying. Our investigation revealed the presence of hog cholera virus, and we recommended re-vaccination. The matter was taken up by the veterinarian with the serum company, and he came up there and abused us for finding virus in these pigs. Now, here is my point. I am not blaming the serum plants for these breaks. I know the veterinarian makes mistakes in some cases. As I told you this forenoon, there are some cases we cannot explain. We do not know just why, but when they develop hog cholera later, I think we ought to be honest and admit that they have hog cholera, and that the time has come when serum plants must not take the position that if a herd breaks they must have something else. I think we have got to be honest in this. I do not mean to infer these breaks are common things, but they are common enough to cause us trouble in a State where we have nine or ten million head of hogs. Those are the things I had in mind; not to even infer it was a failure, for, as Dr. Dorset has explained to us, a thing that will produce permanent immunity when everything is right, there are some times when things are not right, and we do not always know just what the thing is that is wrong, so that we must, in my estimation, if we are to be successful, and retain the confidence of stockmen, not say: "Here now, it is impossible that these hogs have hog cholera, because they have been vaccinated once." That is the point I was trying to make, but not give out the opinion that simultaneous treatment was a failure, as some of them I talked with during the noon hour inferred from my statement. I want to make that explanation, Mr. Chairman.
DR. R. R. BIRCH: Dr. Cahill in his paper referred to the other influences which produce lesions which are practically indistinguishable from hog cholera, and I was quoted as having reported lesions of that kind, or cases of that kind. Now, I have seen that these lesions can be produced under some circumstances experimentally. There is not any question about that. A hemorrhage, you might say, is a condition rather than a disease, and it can be produced by other influences than hog cholera virus. Dr. Cahill, though, left an impression that he probably did not mean to leave, and which it would be unfortunate, I think, if anyone should carry it away with him, and that is this:

The man in the field, when he finds a swine disease, and when cholera is suspected, when he finds these hemorrhages in the kidneys and in the mucous of the bladder, and in the serous membranes, he is confronted with this condition: He knows that the chances are 99 to 1, I believe—I know it is safe to say that in the State of New York, and I was much gratified to hear Dr. Stange say what he did, because I had heard so much about these other things producing hemorrhages of this kind, but I think it is safe to say in 99 cases out of 100, where you have those lesions and where there is anything like the history that does not positively preclude hog cholera, that we have to handle that just the same as if we knew that it was hog cholera. That is a clinical observation, coupled with a laboratory finding.

A MEMBER: Mr. Chairman, at all these meetings, we have arguments about these bacterins, and in most instances it is superfluous. Experimental work now being conducted, and the reports turned out today by the Committee, and also by Dr. Dorset, I think prove conclusively what we may expect from such products, and we should follow such suggestions as come from such sources. Of course, it is difficult to carry on sufficient propaganda to convince everybody, especially so when we have here practitioners who claim they do get results from bacterins. We even heard this morning that the State requires us to use bacterin in connection with vaccination. So we would not get anywhere in the face of such contradiction by such arguments. I think we have to accept these things at their face value, and not continue arguments which will lead us nowhere. I think real work is a good foundation, and the experimental work that should be conducted, should be accepted, and the veterinarian should accept what they have to say on this matter, and I think that we will get somewhere. (Applause.)

PRESIDENT CREWE: Any further discussion?

DR. KOEN: A few years ago it was the common consensus of opinion, I believe, that there was but one disease of swine, that of hog cholera, and that the serum and virus treatment was a panacea to take care of all conditions in swine. The pendulum had swung as far as it could in that direction. It was not long until veterinarians in the field attempting to apply the serum treatment to overcome and combat all conditions in swine, found that under certain circumstances and for certain conditions, serum and virus treatment did not produce favorable results. Then there came an effort to separate or differentiate between the conditions that serum and virus would not control and overcome—that of hog cholera. A little later came hemorrhagic septicemia and bacterins, and then, as is the feeling of a lot of us, we swung from one extreme to the other. We thought in bacterins we had a panacea for all the ills that hog cholera serum would not overcome. Unfortunately there were mistaken diagnoses galore, and bacterins were used where they were never intended, and too many in the field accepted that bacterins were a panacea for all the ills
of swine, and undertook to correct them with them, with the result that there were many failures, and then bacterins begun to be discredited. Has it not been the abuse in the application of the serum treatment that has brought the disastrous results in many instances? And has it not been in the abuse of the application of the bacterin treatment that has brought disastrous results in many instances? And is it not the experience of those who have had extensive opportunity to apply both treatments to know that under certain conditions they are justified and will produce favorable results? It seems to me that any effort that has for its object the discrediting of serum or virus is harmful. On the other hand, the effort that seems to prevail in some instances and in some sections that bacterins are absolutely worthless and must be excluded, and that again we must revert to hog cholera serum as a panacea for every ill of swine, I think, too, is harmful. What is needed is some enlightenment, if it is possible, that the various conditions that affect swine may be recognized and proper treatment administered. In all of the discussions today I have heard but one man suggest lesions that might indicate hog cholera or any other condition. Would it not be better, as far as trying to determine what lesions might indicate hog cholera, and if they are negative to hog cholera, point them out, and if the serum and virus treatment will correct the conditions, after they have been found, then surely that is the treatment to depend upon following such findings. I am not of the opinion that hog cholera is a lesionless disease. Neither am I of the opinion that it prevents obscure and indefinite lesions. I believe that there are characteristic lesions of hog cholera that can be recognized and that should be recognized, and when recognized if serum and virus is used, it will correct the condition. The result will be in direct proportion to the advancement of the disease, or the condition of the herd under treatment. The first lesion that indicates hog cholera, to me, in making an autopsy in the field—of course, lesions alone are not sufficient to warrant a diagnosis; you need the history and you need the symptoms, but these lesions are the guiding marks for the veterinarian who has a herd to treat, and we cannot wait to send to the laboratories for their findings to corroborate our findings in the field. The herd is sick; it requires treatment. What are we going to do? That is the proposition before the veterinarians. That is the problem the swine owner expects us to meet. The first lesion that confronts us is that of the hemorrhage in the lymphatic glands, and these in cholera are in the tissues of the periphery of the lymphatic gland. A second lesion is that of ecchymosis of the lungs. Probably that is a characteristic finding more than any other. The third one is spleen involvement. In hog cholera the spleen is usually involved. In other diseases it is not so frequently, or seldom involved. These three lesions will be supported by the other lesions that have been recognized. All these things are indicative of hog cholera. One of these three lesions will be predominant, but they will be supported by other lesions. When they are not present, then I think you can begin to look for some other source of trouble and the application of some other remedy.

DR. NEVIN: Under what circumstances specifically do you recommend the use of bacterins?

DR. KOEN: I believe the experience of most men in the field who have used them, will verify the statement that in most infected herds bacterins aid serum and virus as an adjunct treatment. Now, when to use them as a separate, individual treatment, I cannot describe to you just when I would use them. I believe that this experience is probably indicative of when they should be used:
We observed, following the importation of stock hogs from the public stockyards, that unfavorable results frequently followed. Sixty thousand hogs treated in Louisville yards after they had received serum, virus and bacterins, were reported as having a loss of one per cent out of the sixty thousand. There were no other yards in the country offered as favorable results. Why? Surely there is some evidence there that the bacterins were justified. On farms that have been badly infected, and where hogs are kept in the same runs year after year unfavorable results followed, not necessarily continuously but almost continuously, in the wake of vaccination. The use of bacterins in conjunction with serum and virus prevented these conundrums in the larger number of cases that I have had an opportunity to observe. In infected herds, and in herds affected or badly infected premises, I believe their use is justified. Now, as to pointing out some specific condition, and to say that the use of bacterins, when you find necrotic enteritis, and that in all instances it will protect it, I cannot do, but I believe in some cases it has given valuable results. In pneumatic complications, to say mixed vaccines will in every instance protect it, I do not believe. I do not believe we have 100 per cent results anyway. In any event, we should not lose sight of the large majority of results that we get. The unusual things are the ones that confuse us, but they should not warp our judgment so that we will not accept the thing that is not the ordinary experience following the use of either bacterin or serum and virus.

PRESIDENT CREWE: Any further remarks? If not, we will take up the discussion of Dr. Dorset's paper. This discussion is to be led by Dr. A. T. Kinsley of Kansas City. Is Dr. McNeil in the room? Will you take the chair, Doctor, please.

(Dr. McNeil took the chair at this point.)

DR. A. T. KINSLEY (Kansas City, Mo.): Mr. Chairman, and gentlemen of the Association: I presume you are getting hog weary. I unfortunately was not privileged to hear all of this discussion. In reference to Dr. Dorset's paper, I will say that I believe we are all pleased and gratified for the privilege of having the reports of the experiments conducted reported to this organization. I do not know whether we could all agree as to the deductions given by Dr. Dorset. We will at least have to say that he has been privileged to study those experiments, and is therefore in a better position to deduct than anyone else. We will accept that, but one peculiar thing that we find in these experiments is that these particular experiments seem to conflict in some ways with some other experiments conducted elsewhere.

For instance, the experiment in which the Swinepestifer bacterin did not protect. In other words, it failed to protect, and the pigs died, seemingly indicating that these organisms are actually virulent. And again, if I correctly interpreted the results, it would seem that the Swinepestifer organism can be readily protected against with bacterin when those organisms occur as a specific infection. Are we to infer that the results then are in favor of a mixed bacterin that will upset the virus infections that might occur simultaneously? In other words, there are various ways that deductions can be arrived at in such experiments. I am positive that the Doctor will give us further light, if not at this time, further experiments will be carried on, and results quoted. Now, in that relation, let me say that I do not believe I am alone; in fact, I have heard several others make similar remarks. I personally was sorely disappointed in the report of the Committee on Differential Diagnosis of Swine Diseases. If I understood the report correctly, the name of the Committee had best be changed. I did not hear any remarks concerning the differential diagnosis. It was
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a proposition of reporting the condition, that is, I believe, universally ac-
cepted, that hog cholera is the prevalent disease, but it is admitted in
the report that there are other diseases of swine. That was admitted in
the report. Then in contradiction to that again, we have another com-
mittee report presented this morning, in which regulations were offered,
preventing the dissemination of swine plague which I presume is the same
as designated by hemorrhagic septicemia, and which is not recognized by
some of the speakers, at least, that have followed.

Now, gentlemen, why is it that we have such divergence of opinion?
It would look to some one, some individuals, like on one side here we
have a group of experiment station workers that are attempting to offset
the influence of the commercial man. In other words, they are antago-
nistic in their discussions; they seem to bring out that point that one is
trying to upset the other. That is absolutely the wrong attitude. These
men ought to and should work hand in hand. On this committee, there
is represented four men from experiment stations, and those stations
should be ashamed of sending these men here with a report such as they
brought here this morning to this Association, from what I would think
of as experiment station men, experiment station workers, without any
evidence.

Gentlemen, after all, our purpose is the conservation of livestock,
and in this case, of swine. I do not believe we have hit the mark today.
We apparently have not been correlating our ideas to conserve swine, and
bear in mind the hog producer is striving to have you help him, and we
are apparently dodging the issue. I do not believe there is a commercial
man on earth, and I am satisfied there is not a practitioner but what will
welcome results properly controlled from any experiment station, but how
many of such results have we, and we have been in this quandary for the
last ten or twelve years?

That is just the way it has appealed to some of us. It is getting to a
place where we should have action. If you men have not the funds at your
station, then I believe other men should be placed on that committee that
have funds available to do this work and make the necessary report, that
is, for the findings that can be reported.

Now, gentlemen, I hope that I have not assumed the wrong attitude.
What I wish to leave with you is this: We are not doing what is within
our power and our grasp for the swine industry in this country, and,
further—now, don't any man succeed me, commercial man or research—
and say it depends on the research man altogether, or on the commercial
man. You fellows get together. You are too far apart. You are too antag-
onistic.

I thank you. (Applause.)

DR. R. R. BIRCH: There are several things that could be said in reply
to an attack on that report of the Committee. As far as changing the per-
sonnel is concerned, I think all of the Committee themselves would be
very glad to see it changed. I do want to say, and I am not involving the
Committee in any way, but I do want to say that in shaping the report of
the Committee, what little I had to do with it was done from the stand-
point of a practicing veterinarian. That is not only my duty at the experi-
ment station, but part of my duty is to hunt up this trouble and see what
can be done to prevent it, and if we want a Committee on differential diag-
nosis to start in and name all of these diseases, and say exactly how we shall
tell one from the other, and not include the fact these diseases run togeth-
er, we will have to change the personnel of it, if we get a report of that
kind. I think the other members of the Committee will back me up in
that.
In regard to the report for the regulation of hog cholera and swine plague, I wish Dr. Houck would state in regard to that. We find the same regulation in meat inspection regulations. Those things do not in themselves imply the separate existence of a sleeping infectious swine disease, known as swine plague. We do not imply that at all. We simply imply if we get lesions associated with either one of these diseases, handling them as rapidly as we do, those lesions have to be grouped together in handling that specific case. We cannot wait for a laboratory examination, although they are getting along rather rapidly at the present time. They diagnose septicemia in a few hours, but there are times when we cannot wait two hours.

PRESIDENT CREWE: We will listen to Dr. Dimock.

DR. W. W. DIMOCK (Lexington, Ky.): Mr. Chairman and Members of the Association:

The discussion rambled around so, I hardly know how to start in. I realize when I stop to think that I am to discuss Dr. Dorset's paper. I have been making some brief notes, and in order that I may be brief and make my point, I will just follow these notes.

I would like to say this: That the United States Sanitary Association is the one Association where all who are interested in livestock can meet and discuss the numerous and varied problems regarding disease and disease control that are constantly before us as an obstacle to the full success of the animal industry. And because of this, it is always a great pleasure to me to be able to attend these meetings. It has seemed to me that practically all of the papers presented at this meeting have been most carefully prepared and presented in such a spirit as to unmistakably show that the author or authors have given us the facts so far as known, and that those facts may be utilized for the best interests of all concerned.

In regard to the work of Dr. Dorset in particular, it would appear from the experiments reported by Dr. Dorset that the immunity from bacterins is perhaps of a different order from that which results from the action of living micro-parasites. The serum is different from virus immunity. The bacterin immunity which results from typhoid vaccination is certainly not to be compared with the immunity which results from small-pox vaccination. In the latter, we may have life immunity, and it generally is absolute protection, while the typhoid vaccination is generally admitted to confer but a relative immunity, being overcome by any live infection, and in this connection I wish to cite a little incident that was told me about the way that medical officers look upon the results of typhoid vaccination in the army.

It seems there was in the medical corps of the army a man riding out in the country with other officers, and one of those other officers dismounted and was about to take a drink from a brook, and the medical officers observed that this brook or spring was not a clean spring; that it was apparently contaminated or polluted in some way, and they advised him not to drink from that spring. The officer replied, "Why, I have been vaccinated against typhoid." I suppose he was perfectly satisfied to expose himself to what they would class as the mass infection.

Now, just one or two other things I have written down here. We are all interested in the work, and live in the hope that new methods and new remedies will be found out in the country with other officers, and one of those other officers dismounted and was about to take a drink from a brook, and the medical officers observed that this brook or spring was not a clean spring; that it was apparently contaminated or polluted in some way, and they advised him not to drink from that spring. The officer replied, "Why, I have been vaccinated against typhoid." I suppose he was perfectly satisfied to expose himself to what they would class as the mass infection.

Now, just one or two other things I have written down here. We are all interested in the work, and live in the hope that new methods and new remedies will be found out for the more satisfactory prevention and control of those diseases that are giving us trouble. Whatever is found out from research, investigation and from practical experience is readily made available, and the commercial institutions and livestock owners are going to derive most of the benefit. Therefore, the presentation of a paper before this Association that tends to point out certain methods previously
shown to have little or no value, should not be taken that anyone is in any way attempting to stifle progress, but rather that we have progress with reason, and it seems to me that they suggest in the kindest way possible that we avoid making extravagant and misleading statements. We should be very careful in advising an owner to expend money for something that is not as yet on a definite basis.

Now, that does not mean that we might not under certain conditions use these things, but it does mean, I think, that we must be very very careful, or this whole thing is going to come back and serve to discredit the wonderful efforts our Association is trying to make. I thank you.

DR. DORSET: Mr. Chairman and Gentlemen: This is the second year I have served on the Committee on Differential Diagnosis of Swine Diseases. Last year I was on the Committee. Dr. Kinsley was also a member. I must say that I have not noticed any marked improvement in the condition of the swine in the country since the last report was issued. I do not know that there will be very much betterment of the result of the present report. Members of this Committee, as Dr. Kinsley has pointed out—it so happens those who were present all happen to be officially employed by State or Government institutions. Perhaps I might suggest that that fact at least might indicate the disinterestedness of the members of the Committee. I was very pleased indeed to hear the remarks of Dr. Gorman, because he expresses exactly the view that I myself have held. I am sure that nothing has given those of us in the National Bureau of Animal Industry greater pleasure than to be of service and of aid to reputable commercial houses. We consider that part of our duties, and it is done with pleasure. I believe that the producers, commercial producers of hog cholera serum render a real service to the country. Without this commercial production of hog cholera serum, the farmers would have no source from which they could derive their serum and virus.

I believe, however, that this Association and that the commercial producers should realize that these official workers are trying to find the truth. That is all we are looking for, is the truth, and that we should have the co-operation of the commercial producers of biological products. I believe that with regard to many of the biological products, the same is true in human medicines, that the use of them has been sustained, and in many cases these products are used without any knowledge as to their value. I cannot help but feel that Dr. Kinsley is rather a little previous. It seems to me if he wanted to know what these various sundry products on the market would do, it might have been well to find out before putting them on the market, and selling them.

PRESIDENT CREWE: Is there any further discussion?

DR. CONNAWAY: I would like to make a personal explanation. Sometimes when I get on the floor I get excited and say things that may appear very venomous, but I have the same attitude toward commercial work that Dr. Dorset has expressed. I do not think we could get along without them. There are excellent products put out by these biological houses. I have used them myself, used some from Dr. Kinsley's laboratories, so the remarks I have made are not against the death of biological work, or commercial biological work, but the death of that spirit which exploits things that have not proved to be good and useful.

(At this point President Crewe resumed the Chair.)

DR. STANGE: Mr. Chairman, as Chairman of the Committee on Differential Diagnosis, I think I ought to say just a word on that. In your absence Dr. Kinsley suggested the Committee should be discharged, on account of this report that has been handed in. I am very sorry to hear Dr. Kinsley say that. I appreciate, perhaps, that our report was not en-
tirely in sympathy with the views of some others, but I want to make this observation, that only yesterday and the day before, I consulted a number of commercial men present at this meeting, and asked them to give me their conception of a differential diagnosis of hemorrhagic septicemia, and mixed infection, and in each instance I was referred to somebody else. I could not run a man down who would give me that, so I want to simply say we consulted the commercial men and attempted to get this differential diagnosis.

The Committee met and considered this report most of the afternoon, and we felt the kind of report we ought to hand in was a report that we felt we knew a little something about, and not report something that we were not fairly sure was a fact. I want to simply say this for the Committee. We did the best we could in considering the situation as it exists today. I would be very glad if somebody else could take the responsibility from now on, but I want to say for the other members of the Committee who are present here, that we spent most of the afternoon yesterday trying to formulate something that we thought would be consistent with the facts so far as we knew, and still be useful to this Association. If the Committee has failed, Mr. Chairman, I am very sorry, but I want to assure you that the Committee has made an honest effort to render a report that will be of value to this Association. (Applause.)

PRESIDENT CREWE: While I did not hear Dr. Kinsley's remarks, my understanding of the situation is that this Committee is automatically discharged at the conclusion of this session, and that it is entirely put up to the new president.

DR. KINSLEY: I beg the gentleman's pardon. I did not ask this Committee be discharged. I suggested the name should be changed; and that the name of Differential Diagnosis was not a factor; simply that the name of the Committee should be changed.

PRESIDENT CREWE: That, of course, is entirely in the province of the incoming administration. If there is no further discussion on this subject, this will conclude the morning's program, and we will take up this afternoon's program.

BUSINESS SESSION

PRESIDENT CREWE: The first subject is Report of the Treasurer.

UNITED STATES LIVESTOCK SANITARY ASSOCIATION.

1921.

Cash on Hand January 1, 1922.

Jan. 1. Cash Balance for 1920 .......... 987.74

Total receipts—Memberships dues

and Reports .......... 1,235.21

$2,222.95

Expenses.

Mar. 1. 5,000 Envelops .............. 37.50
5,000 Letter Heads ................ 32.50
5,000 Cards ...................... 20.00
800 Copies 24th Annual Report .... 1,048.50
800 Labels to mail reports ...... 4.00
Nov. 4. 1,175 Circular Letters ........ 7.50
Nov. 17. 4,500 Copies Program 1921 meeting .. 85.00
Nov. 22. 700 Membership Cards ........ 3.50
Nov. 24. Adcraft Mfg. Co. Metal buttons .. 68.00
Dec. 6. LaSalle Hotel Room—6 days ..... 48.00
Dec. 6. Stenographic work 1921 meeting ..... 4.65
Dec. 6. Murray J. Brady reporting meeting . . . . 208.75
Dec. 6. T. E. Munce Committee Expenses . . . . 8.80
Dec. 6. Postage, telegrams, express and telephones for one year . . . . 145.00
Dec. 6. Clerical work and closing books . . . . . 50.00
Dec. 6. Bank charges for drafts and clearance . . 65.20

Total Expenses 1,845.40
Cash Balance $ 376.55

PRESIDENT CREWE: You have heard the report of the Treasurer. What is your pleasure?

DR. CONNAWAY: I move it be accepted and approved.

Dr. Connaway's motion prevailed.

SECRETARY PURNETT: Mr. Chairman, I understand the book next year can be printed cheaper than last year, on account of the reduction in price of paper, but if you get out a hard-bound book, you will not get it out short of $800. Dr. McNeil, of the Executive Committee, is going to present some plans to you in regard to how we can raise this money.

PRESIDENT CREWE: We will now hear the report of the Executive Committee, by Dr. McNeil.

DR. J. H. MCNEIL (Trenton, N. J.): Mr. Chairman and Gentlemen of the Association: I will make a few remarks, and go over the matter as we have studied it in the Executive Committee, and give you as briefly as possible the position that we are in at the present time regarding our finances, and also respecting some changes which we think should be made.

Now, we have on the membership roll, practically 825 members. I get from the secretary that 268 of the membership have paid up; that there were 31 new members who paid, so that leaves practically 60 to 70 per cent of the members that are inactive. Now, we also know, after consulting the list, a great many of the members have been in arrears four years, a large number three years, and still a larger number two years. Now, we believe that we should change, or would recommend such a change in the By-Laws, whereby if a member has been in arrears two years, that he be dropped. That will give him a chance to pay up, and if he does not pay up, drop him.

We have recommended here a change in the By-Laws that will read: "That the revenue of this Association shall be derived as follows: Each member shall pay annual dues of $2.00, payable in advance, and shall be entitled to a copy of the annual report upon such payment,"—and then insert at that point: "Any member in arrears two years shall be dropped from the membership roll."

Shall I take these up in order, and adopt them, or read the whole report?

PRESIDENT CREWE: I think we will just take up the report as a whole and then discuss it.

DR. MCNEIL: Another point has been brought to the attention of the Executive Committee, and that is the changing of the days of meeting. A great many of them seem to feel that they come to the live stock show at the same time they come to attend the Live Stock Sanitary meeting. As it has been previously explained, the Tuberculosis Conference has taken two days of the weeks previous. That is a portion of the meeting that is very important. Now, they have to leave their work in the middle of the week, stay over in Chicago over Sunday, and then the first days of the week they are busy with this Association, or association work. It prevents them from attending the stock show, prevents them looking over the ani-
mals, and staying a sufficient length of time during that week to look over
the awards and derive a great deal of benefit from the show and the Asso-
ciation.

Now, the suggestion we make is that we recommend to the Association
that the time of the Annual Meeting be changed to begin on Wednesday
of International Week, instead of Monday. That will allow two days for
the Conference on Tuberculosis—and Wednesday, Thursday and Friday
for the Live Stock Sanitary meeting.

That simply goes in as a recommendation to the Association.

PRESIDENT CREWE: To the incoming Executive Committee.

DR. McNEIL: To the incoming Executive Committee, yes. I may
say in regard to this, that I have consulted probably twenty, whom I con-
sider representative men of the Association, and they seem to think that
it would be a wise procedure to make these changes. However, that is
for you and the incoming Executive Committee to decide.

Now, as a result of the joint session, in order to plan or lay down
some line to follow in financing the Association, we have made certain
suggestions. We thought it would not be pertinent to put them in the
form of recommendations, but simply make the suggestions, and let you
fight these out on the floor and decide what you want.

There are certain facts that must be considered in the matter of
printing and which should be taken up by those who are familiar with that
phase of the matter. Now, we know that we are facing a deficit. We sug-
gest these means of raising funds sufficient to finance us. First, raise the
dues; the annual dues now are $2.00 payable in advance. Now, whether
you would consider the proposition of raising the dues to $4.00 or $5.00
or letting them remain as they are, or adopt a plan of receiving selected
advertisements for either the program or the printed volume of the re-
port. As I understand from some of the older members who have received
the Report longer than I have, the advertising feature has never been in-
cluded in the bound volume of the report, but that up until possibly two
years ago they did adopt a plan of receiving selected advertisements for
the program. Now, we have conferred with several who are in the print-
ing business, and in the advertising business, and we did not receive a
great deal of encouragement along those lines, because they said that in
order to get these advertisements it costs about as much as it was worth.
However, you can decide that for yourselves.

We have been advised, too, that in the binding of the book, if we
leave off the cover and put on a paper cover, that we would probably save
$500. Now, there is no way to get this money at the present time. You
cannot increase the dues if you cannot collect the dues that are in arrears,
and you would have to accept advertising matter for the printed volume
of the proceedings, or finance it in some other way that you gentlemen
may suggest. I think that is all, Mr. President.

DR. CONNAWAY: May I ask a question? Are these reports sent to
all these men that are in arrears?

SECRETARY BURNETT: No.

DR. CONNAWAY: Or are they sent simply to the people who pay up?

SECRETARY BURNETT: They are sent only to paid-up members,
but you see we have sent out a circular, and we printed a book for almost
every member in the Association last year, thinking, you know, that the
dues would come in, and then we would have to have books to give them.
You could not print the book twice; you had to print it once, so we printed
practically as many books as there were members of the Association, just
a few less, for the very reason that whenever a man did pay his dues, he
was entitled to a book, and we had to have them. That is what we have been doing continuously, as I understand.

DR. STANGE: Wouldn't it be up to us to set a date on which dues must be in?

SECRETARY BURNETT: Yes, but we cannot set that this year. That has to lay over until next year. Last year a good many members of the Association were averse to taking in a lot of new members, saying that the Association was big enough, so I made no attempt in the way of circularizing for new members. We just accepted what came. The disposition of the members I talked to about this, was not to make the Association too large. The only income this Association has today, gentlemen, is the $2.00 annual dues, and that will not print the book. That is all that they pay, and it would not print the book. I knew all the time this deficit was coming; it was unavoidable. Then the question of advertisement came up when I got out the program. I wrote to several members, and they were opposed to advertising on the program. It is all right to be opposed to things, but sometimes you have got to get the money. Now, the question is to get the money to print the next report, because I know I feel like I want one, and I know the rest of the gentlemen here feel like they want one. The next thing to do is to either kick in with more money, or put in advertising, or do something so we can print this report. That is all there is to it.

DR. ELIASON: Dr. Burnett, are there any books left of last year's report?

SECRETARY BURNETT: Yes, over a hundred. I would not say just how many, but I would say over 175.

DR. ELIASON: What approximately is the cost of printing?

SECRETARY BURNETT: This book?

DR. ELIASON: Yes, those that are left over.

SECRETARY BURNETT: I would have to get the figures on it. The last book cost almost $2.00.

DR. ELIASON: Why wouldn't it be a good thing for the members to go out and sell that book. We can dispose of a number. I think I can sell at least fifty in our State.

SECRETARY BURNETT: How is the Secretary going to anticipate you are going to sell them? You are going to elect another secretary today. He will have to anticipate this next book. I had to anticipate some last year myself. The next fellow is going to anticipate a lot more than I did, quite a lot more. Now, the question is, how are you going to get the money to publish the book? You cannot raise the dues this year, that is impossible. You cannot print another program this year, because the meeting is over, and while I know it is going to meet opposition, I am frank enough to say that I would put advertising in the report enough to print the book, and then if they did not want to read the advertising they wouldn't have to. I do not mean to put anything in the book except ethical advertising. I do not mean to put in advertising that would be unethical. I think you will have judgment enough to elect a secretary that would not put an advertisement in the book that was not regular.

MR. GLOVER: Perhaps, I look at it a little differently from some of you professional men, because if I didn't I would not be holding the job I do today. An agricultural paper cannot run without advertising. This Association is not to be wholly considered a professional organization. It has a good deal of the commercial in it. It does not hurt it any either. I think that it helps. I can see no objection to taking the advertisement of good responsible companies and incorporating it in your annual report. I will say to you that I think your annual report will be
better. Just this last week an inquiry came to us from one of our subscribers, stating that he had two cows treated by a veterinarian for milk fever, and now both the cows were suffering from udder trouble. Our veterinarian without hesitation said that he had a fine case of mammitis. Upon investigation, we learned the veterinarian used an automobile pump. I do not believe it would hurt the veterinarians in this country to read the advertisement of where they could buy the proper instrument for inflating a cow’s udder when suffering from milk fever. (Applause.)

I, of course, would not approve of putting in Condill’s abortion bacterins, because apparently that has been condemned by this body. We cut them out. It is costing us about $600 a year, so I would hate to see those advertisements go in the report. But there are many forms of manufactured wares that are helpful to the profession, and they are just as anxious to build up this great livestock industry as the men that are engaged in it professionally. Therefore, I see no reason why, if we need money, we should not take advertising.

Now, in reference to the number of reports, you are not going to save a great deal of money, whether you print a thousand reports or 1,500. The setting up of the report, typing it, proof-reading it, constitutes your fundamental cost. You could print 5,000 for a little more than you could print your first 700. The paper and the labor of running it on the press is very small compared with setting it up and proof-reading it.

DR. HUGHES: I am a stranger here. The first time I have had the pleasure of coming to this meeting. I was surprised to hear you say there were only about 800 members in this organization. The State of Indiana has over 1,200 veterinarians. How do they expect to get something unless they put their shoulder to the wheel and help. I have never been here before, and have never been asked for dues. I thought it was a good excuse. I thought, I would just wait, and that would kind of bear on me, and I would be sure to come. I was waiting on a man’s cow yesterday morning, and he said: “For God’s sake, Doc, go; get my cow attended to, and go and learn all you can, and come back and tell me.” He says, “Come back and give me a report.” There is a man I could sell a report to. He did not want me to come until I got his cow attended to. I got here this morning at eight o’clock. Now, I have paid but two dollars a year for these dues. I laid my check on the table this morning. You do not have to wait on me until next year to raise my dues. I will give you five dollars today extra. I want to see this thing go. There ought to be some good done to us, and as far as the advertising, I cannot see anything wrong with it, if you get good wholesome advertising, and not crooked advertising. It won’t hurt anybody, if they don’t want to read it, let them go, as the gentleman just stated. If you do not get those advertisements, and want to raise that money, see each member, and see if he won’t shake a little loose change out of his pocket and donate it. I never got any good out of anything unless I paid my money; that is the only way I could get it. There ought to be more members in here than 800. Think of the veterinary surgeons in the United States, and only 800 belong to this Association, that is trying to benefit the whole United States. It looks funny. They ought to come and join this crowd, because it will help them, as well as it will help us. Now, if you do not get your money by advertising, if you take it to the members and want to raise it, count me in for an extra five. I have got the money right here to pay you. I thank you, gentlemen.
MR. MERCER: Mr. Chairman, how soon do you have to have the information as to the printing of these reports? Is there any requirement in the Constitution for the printing of the report of this meeting?

PRESIDENT CREWE: I do not understand so, Mr. Mercer, but the policy is to issue them just as early as possible.

MR. MERCER: It is a self-evident fact that the incoming administration will not have the money to print these reports. Now, it has got to be left to them to provide the money if it is not raised here today. That is the way I look at it.

PRESIDENT CREWE: Yes, sir.

MR. MERCER: Well, I would imagine that most every member of this Association, especially every enthusiastic member that comes here in attendance, wants the report of this meeting, and it seems to me the members who are here today should make some provision to financially support or stand back of our organization management in the expenditure of money to print these reports. I believe that if I were one of the managing officers of this organization and it was left to me without an endorsement of some kind, or an assurance of some kind, that I would not print it, because it is going to entail, as you say, and as the reports show, something like $1,000 or $1,200. I do not believe much in the advertisement scheme, that has been suggested here. I believe in advertising, however, but I believe that once you commenced this, and solicited this crowd for advertising, it will cost you all it will amount to. It costs money to solicit advertising, and it will take months to do it. I would rather be one of a hundred men here today that will give to this Association ten dollars to financially support it for the coming year, at least, and then I think the suggestion as made by the Executive Committee, to drop, every member that will fail to pay his dues after two years is a good suggestion. I believe it would be a pretty good idea for the Secretary to draw a sight draft on every member who has not paid, with a notice to the bank not to allow it to go to protest. I will make the pledge that I will be one of a hundred men that will either guarantee to the managing officers of this Association the deficit in the printing of this report, or will advance now ten dollars for the payment of the printing of the report, and also later I will want to make a motion that the Secretary notify all members in arrears that unless they pay their dues on or before a certain date they will get no report, and then have the report printed up to that number, instead of printing a thousand or twelve hundred—print five or six hundred, or four hundred, or whatever number is necessary to supply the members who are in good standing, but first I would think this organization ought to take some action here this afternoon, guaranteeing to these officers the payment of the cost of the printing of this report, or else say to them, let the report go for this year, and that would be an unfortunate thing.

MR. GLOVER: I understand that when this Association was turned over a few years ago, the sum of $3,000 was in the treasury, and that from that date until now the reports have been published without any advertisements. I wonder could any of the members here point out how those advertisements injure the report? Now, if the Association is able to start and accumulate a fund of $3,000 and publish the report, and the advertisements of good firms, I cannot see wherein it would hurt to take up the advertising and go on with it. I would have some hesitancy, unless the men absolutely signed papers saying they were going to pay, or raise the money right here, in saying to the officers, go ahead and create the indebtedness, because I have had something to do with voluntary organizations, and I find it is very easy to offer to pay, but I want to see the money in
the future before I create an indebtedness of any Association. Notwithstanding there are a number of men here who pay, there are not enough.

PRESIDENT CREWE: I might clear up that matter. There never, as far as my knowledge goes, has been any advertising matter in the report. The revenues have been secured from the advertising matter in the programs, but that time has gone by. We cannot utilize the programs now, and the only thing available is the report.

DR. BIRCH: Mr. Chairman, I do not believe there are very many of us that want to give up the idea of having the report printed, and of course, it is a condition and not a theory that confronts us, so I move that this be referred to the Executive Committee, giving them power to act, and to levy an assessment if necessary, so as to print this report, as we have been in the habit of receiving it; that is, they may advertise or not, as the Executive Committee sees fit.

Motion duly seconded.

PRESIDENT CREWE: Gentlemen, it has been moved and seconded that the matter be left to the incoming Executive Committee to use their judgment as to the securing of revenues for the publishing of the coming report, using their discretion as to advertising matter or otherwise. Are you ready for the question?

DR. COTTON: It seems to me we ought to get an expression from this body at this time, and I would like to make an amendment to that motion, that if there is nothing in our Constitution and By-Laws that will prevent the use of advertisements in our annual report, or in our program, that the Secretary be instructed to go on and get the advertising, and have it properly censored, in order that both publications can be taken care of financially. I would make that as an amendment.

PRESIDENT CREWE: Dr. Cotton, if it is true there is not anything in the Constitution or By-Laws, that amendment will not be necessary. We have gone over the Constitution and By-Laws pretty thoroughly, and in fact the reports too, and we cannot find anything in the reports as to why that advertising was stopped.

DR. COTTON: I will withdraw that part of my amendment. I move the Secretary be instructed to invite advertisements, properly censored, to be used in the publication of the annual report, and also in the program.

Motion duly seconded.

PRESIDENT CREWE: You have heard the amendment to Dr. Birch's motion, leaving the authority in the hands of the Executive Committee, and this amendment provides that it is within the discretion of the Secretary. Are you ready for the question on the Amendment?

The motion prevailed.

Are you ready for the question on the Amendment? The motion was put and carried.

The question is now on the original motion. Are you ready for the question?

MR. MERCER: I understand now, Mr. Chairman, that by his motion, this motion in full, leaves it with the Secretary to finance this project by advertising, if he can. Is that the way this question reads? I think we are dumping a whole lot onto our incoming Secretary that I would not want to accept if I were Secretary.

PRESIDENT CREWE: Well, they just voted it.

MR. MERCER: You have to pay the bill, and how are you going to get it in the future?

DR. BIRCH: We are giving the Secretary power to levy an assessment if after he has done what he can to meet the expenses there is still a deficit. This motion gives him power to levy an assessment.
DR. MOORE: For a good many years we paid our dues, I think it was then a dollar, and we paid a dollar for the report afterwards. Now, in the change of conditions, the financial situation, and so forth, I see no reason why we should not buy the report this year, even if the dues are two dollars, which would be exactly in harmony with Dr. Birch’s motion.

DR. CAMPBELL: I have a little doubt as to the need of that instruction to the secretary. At least, it ought not to be mandatory. I believe the motion was that he be instructed to do it. I believe it should be left optional with him. I have had considerable experience in publishing reports of this Association. It is in the neighborhood of ten years since I was first on the Publication Committee, and so far as having a balance of $3,000 is concerned, we never had money enough to publish that report. We always had some delinquent members in those days. Prof. Ferguson used to write and tell them we needed the dues so that we might get out the report. Of course, it did not cost much at that time, and then later, the cost kept running up and running up, and got up to two or three hundred dollars a year, and reached its peak year before last. You will notice the last report cost a couple of hundred dollars less than the one the year before. It went in on paper at 19 cents a pound, which is just a single item. That paper can be bought at 7½ cents a pound now. The next report will cost perhaps $300 less than the one last year. We have quite a number of members who will pay up their dues if they get a letter telling them they must. I come to the meetings year after year. I sent out sight drafts in the old Association, and they paid it. I never had a fight over it. I do not think the Secretary gets in any trouble doing that.

Now, a word about the advertising. A good many years ago the advertising in our program was the source of a good deal of revenue. It did not cost much to print the program in those days, and we got $600 or $650 gross out of it. That kept dropping down until the last year we put advertising in the program it amounted to only $400, and it cost a good deal of effort to get that. It does not come by invitation; it had to be almost forced. At that time the cost of publishing the program had become very high. There was little left. If you get out a little program like we have now, it is very inexpensive, instead of getting out a 6 by 9 in two colors. So unless we should get more than $400 in advertising at this time it would not more than pay the extra cost of printing the program.

Now, as to putting advertising in the annual report, I cannot say off-hand what advertising would do, but it is my belief—and I have at least a personal acquaintance with every advertiser you could get—it is my belief, it won’t raise very much money, but will be a good deal of burden, and the secretary could get in the same amount of money from delinquent members with much less work, and it will be just a little bit more desirable when he gets it.

Now, in the matter of why we are short of funds, there is only one reason. It is because this Association does not want more members. In two annual reports, I stated I could have got 2,000 applications for members. The Executive Committee told me at that time 200 would be enough to grow in a year, and we brought in 200. A new member amounts to a little from a financial point of view. It is better to let him drop out and come in again. However, the membership in this Association is very low. I never saw any Association where they paid so well. What I am trying to convey is, I do not believe it is necessary. I believe we have funds on hand, and accounts receivable amply sufficient to take care of the coming report, which is going to cost at least $250 less than the one did last year.
DR. ELIASON: How much of the proceedings of this meeting is it necessary to print in this report? Is it necessary to have all the conversation included in it, or is it, as a matter of fact, censored anyway? Probably somebody could tell me offhand. Dr. Campbell, is all of the matter which is talked about here necessary to be published in the report?

DR. CAMPBELL: No, it is not.

PRESIDENT CREWE: The discussion is sometimes more important than the papers. (Applause.)

MR. MERCER: I want to offer as a substitute for the pending motion the following: That the matter of printing the annual report for this year be referred to the Executive Committee of this organization, with the authority to act in their own discretion, and in case of shortage of funds, that they be authorized to borrow money and present their report on the first day of our next annual meeting for adjustment.

The motion prevailed.

PRESIDENT CREWE: That would appear to dispose of the financial feature of the Executive Committee's report, but we still have the matter of this change of the date of the next meeting of the Association.

DR. DE VINE: I understand the recommendation of the Executive Committee was that the date be left to the incoming Executive Committee. Am I right, Dr. McNeil?

DR. McNEIL: Yes.

DR. DE VINE: I therefore move the adoption of this report.

Motion seconded, put by the Chair, and carried.

PRESIDENT CREWE: That disposes of the Executive Committee's report.

We will now have Report of the Advisory Committee, by Dr. Modler of Washington, D. C.

A MEMBER: Haven't we lost sight of the Executive Committee's recommendation regarding the change of our By-Laws?

PRESIDENT CREWE: That is already incorporated.

SECRETARY BURNETT: We do not have to change the By-Laws to change the date.

PRESIDENT CREWE: That is past history. The Report has been disposed of now, unless you want to reconsider it. That is in the Executive Committee's report, and that has been disposed of. Dr. Mohler is not in the room, I believe. Dr. Torrence, I believe, is on that Committee. I guess they have not got any report.

Report of Committee on Grievances—Dr. Eliason.

DR. O. H. ELIASON (Madison, Wis.): I move we dispense with that, because we have not had any grievances.

PRESIDENT CREWE: Report of Committee on Credentials. I believe that report simply refers to the examining of applications. Now, we come to admission of new members.

SECRETARY BURNETT: We have the following new members that have been O. K.'d by the Credentials Committee, and passed by the Executive Committee.

UNITED STATES LIVE STOCK SANITARY ASSOCIATION

List of New Members—1921.

Dr. John D. Adams, Boise, Idaho.
Dr. M. F. Barnes, 39th and Woodland Ave., Philadelphia, Pennsylvania.
Wm. L. Bleecker, Fayetteville, Arkansas.
O. V. Brumley, Columbus, Ohio.
Leo E. Davis, Columbus, Ohio.
Lucien B. Ernest, Kensington, Maryland.
Dr. W. H. Frakes, Waupaca, Wisconsin.
J. N. Gould, Worthington, Minnesota.
Greene Co. Children's Home, R. R. No. 10, Xenia, Ohio.
Dr. C. D. Grinnells, Brookings, South Dakota.
Dr. N. S. Heaney, R. F. D., Lombard, Illinois.
Reuben Hilty, 106 Walnut St., Toledo, Ohio.
W. J. Houser, Carthage, Missouri.
Capt. Wm. H. Houston, 1819 West 39th St., Chicago, Illinois.
L. B. Huff, Aurora, Illinois.
S. R. Johnson, Lansing, Michigan.
H. L. D. Lackie, 4225 South 26th St., Omaha, Nebraska.
W. H. Lane, M. D. V., Camden, Indiana.
M. P. McCellan, V. S., 227 Angus Crescent, Regina, Sask.
C. D. Meredith, 521 Virginia Ave., Joplin, Missouri.
Dr. J. H. Mills, Russiaville, Indiana.
John A. Munn, Carman, Manitoba, Canada.
J. P. Niederauer, 425 Jefferson St., Pierre, South Dakota.
H. W. Norton, Jr., Lansing, Michigan.
L. C. Pelton, Department of Agriculture, Olympia, Washington.
H. W. Peterson, Stratford, Iowa.
L. H. Phipps, Winnebago, Minnesota.
J. B. Reidy, Augusta, Maine.
A. G. G. Richardson, Athens, Georgia.
R. W. Smith, Concord, New Hampshire.
G. M. Rommel, 2 West 45th St., New York, N. Y.
Wm. A. Stephensen, Salt Lake City, Utah.
Dr. E. J. Tansey, Monrovia, Indiana.
E. O. Thomas, R. F. D. No. 2, Iowa City, Iowa.
J. Traum, 101 Budd Hall, Berkeley, California.
F. R. Woodring, 2322 South 16th St., Lincoln, Nebraska.
C. M. Wright, Carthage, Missouri.
Oscar O. Zehring, Germantown, Ohio.

PRESIDENT CREWE: Gentlemen, you have heard the names which have been approved by the Credentials Committee, and recommended by the Executive Committee. What is your pleasure in this regard?

DR. PIERCE: I move the secretary be instructed to cast one ballot for the names as read.

PRESIDENT CREWE: Dr. Pierce's motion prevailed.

DR. ELIASON: This might be under the head of new business. What is the Association's attitude to be in the acquirement of new members? Do you want us to go out and get as members most of the veterinarians in the different States? If we were clear in this matter it would be a whole lot easier. Now, we have been talking membership, and the reason we have not got more up in our own State is the fact that we have not solicited them. If somebody would clear up that matter, I believe we could get more members.

PRESIDENT CREWE: Any other remarks?

DR. C. W. EDDY: It is not quite clear to me just who are eligible to membership in this organization. If we go out and solicit practicing veterinarians, we could find quite a number of those, or should we confines our efforts to those engaged in sanitary work? Perhaps our Constitution provides for that.

PRESIDENT CREWE: Yes, the By-laws provide that anybody engaged in Federal, State, Territorial, and so on down the line, livestock
sanitary work—or anybody else that is interested in livestock sanitary work, may become an active member by being recommended and voted on by the Association.

DR. C. W. EDDY: Do you construe that to include the ordinary practitioner?

PRESIDENT CREWE: Yes, certainly. He is interested in livestock sanitary work. He does not necessarily have to be active, if he is interested. It appears to me that here is a subject that should come up for some disposition, that is, with reference to the proposed joint session of the next meeting. This session, as you know, was a sort of experiment at this time, and was placed in this program, and as I understand it, it has been left to the different Associations that joined in this joint session to decide as to whether they wanted a future joint session, and it would appear our Association should go on record in the matter at this time, so that the secretary could be authorized to take action in arranging the next-year program.

DR. DE VINE: I move that a half day be set aside for a joint session, such as we had this year.

MR. MERCER: I want to offer an amendment to that motion, that we set aside an evening’s meeting, instead of a half a day; that the joint meeting proposed here, be held at an evening session, rather than disturb any of the meetings on the three days we meet here. I offer that as an amendment, that it be left to the Program Committee to arrange for this Joint Conference or meeting, at an evening’s session.

DR. DE VINE: I accept that.

Motion duly seconded and carried.

PRESIDENT CREWE: If there is nothing further in the way of new business, we will have the report of the Committee on Resolutions—Dr. J. I. Gibson, chairman.

DR. GIBSON: The report is somewhat short. I have but one Resolution, on the subject of tuberculosis. If there are any other Resolutions that should come before the body, our Committee has not heard of them.

I move its adoption.

The motion prevailed.

PRESIDENT CREWE: We have now come to that portion of our program providing for the election of officers. We must bear in mind that only those that are in good standing, and members of this Association are entitled to a vote. Nominations will be in order for the election of a president of this Association for the coming year.

DR. BUTLER: I am a member of the United States Livestock Sanitary Association. A year ago you honored the West by electing as your president a representative of a Western State. I wish to assure you that the West appreciates that honor. Therefore, as one who represents the Western States, I desire to place in nomination the name of a man whose mind is open to all matters which we discuss, one who believes in the fundamental principles of this Association, one whom I know desires nothing but a free, honest and comprehensive discussion of the principles that pertain to this Association, principles that pertain not only to the Association, but to the practicing veterinarian. I therefore take pleasure in placing in nomination the name of Dr. T. E. Munce, of Pennsylvania.

DR. FITCH: I desire to second the nomination of Dr. Munce, as president of this organization, and in doing this I wish to call the attention of the Association to just one feature. This organization is made up of a number of different classes of men. One class is composed of those engaged in the enforcement of sanitary regulations, another one practitioners, and another class, those who are engaged in research. I happen
to belong to the latter class, and if anything has been demonstrated during this meeting, it is the necessity for fundamental research. I wish to say that all research is not done in the laboratory with a test tube or a chemical; that a great deal of valuable information may come from statistical and from other observations or carefully working out the regulations which come under the enforcement of a sanitary official. Those of us who are interested in research, and I think that includes us all, realize the efficient and the worth of the work which has been done under Dr. Munce's direction in tuberculosis eradication in Pennsylvania, and I wish to thoroughly second the nomination of Dr. Munce. (Applause.)

PRESIDENT CREWE: Are there any further nominations?

A MEMBER: Mr. President, as an Eastern representative, I would like to second all that has been said by the two preceding speakers, and I think it would be serving this Association very faithfully if we elect Dr. Munce as president, and I would like to move the nominations be closed.

The motion prevailed.

DR. KINSLEY: I move the secretary cast the unanimous vote of the Association in favor of Dr. Munce.

The motion prevailed.

PRESIDENT CREWE: Dr. Munce, you have been unanimously elected as President of the United States Livestock Sanitary Association for the ensuing year, and I will be pleased if you will kindly come forward and take your Chair, or make a speech, or anything that you care to do. (Applause.)

DR. MUNCE: Mr. President and Gentlemen: The office to which you have chosen me is one of honor and responsibility. I appreciate the honor which I feel I am not entitled to. The responsibility I assume, but in doing so I want to say that I am ready for service, and I propose to put the best that is in me in this work during the coming year, and I want you to do the same. If I do my best and you give in return to the Association the best that is in you, I am quite certain there will be no question as to the outcome. We should make this the most effective, the most profitable year, that this Association has ever had. There is much work to be done. There is in this Association the brains to do it, and we are going to do it, with your help.

I thank you. (Applause.)

PRESIDENT CREWE: I am not just clear in my mind whether I have any further authority. I have asked Dr. Munce to take the Chair. He is the president.

DR. MUNCE: I will ask Dr. Crewe to finish up this meeting.

PRESIDENT CREWE: To get through with this, the next item on our program is the election of five vice-presidents. It is now in order to place in nomination five names for vice-presidents. Nominations are in order.

The following were placed in nomination:

Dr. W. H. Simmons, State Veterinarian, Kentucky;
Dr. W. J. Butler, State Veterinarian, Montana;
Dr. O. H. Eliason, State Veterinarian, Wisconsin;
Dr. B. F. Davis, State Veterinarian, Wyoming;
Dr. Edward Record, State Veterinarian, Nevada;
Mr. J. H. Mercer, Live Stock Commissioner, Kansas.

MR. MERCER: I would like to have the man who placed me in nomination withdraw my name. I had that honor once; I do not seek it any more.

A MEMBER: It was on account of his efficiency in that line that brought him into my mind. I think he ought to serve.
DR. BUTLER: I ask leave, with the consent of the seconder, to withdraw my name.

A MEMBER: I move that the nominations be closed, the rules suspended, and the Secretary be instructed to cast one ballot for the entire five nominees.

Motion seconded, put by the Chair, and carried.

PRESIDENT CREWE: The Secretary is so instructed, and I declare the five gentlemen elected.

We now come to the election of Secretary of the Association. Nominations are in order for Secretary of the Association for the ensuing year.

DR. BURNETT: I wish to place in nomination the name of Dr. O. E. Dyson.

Nomination seconded.

PRESIDENT CREWE: Any further nominations for Secretary?

DR. FITCH: I move the nominations be closed, and the Secretary instructed to cast the unanimous vote of the Association for Dr. Dyson.

Dr. Fitch's motion prevailed.

PRESIDENT CREWE: The motion prevails, and Dr. Dyson is elected Secretary for the ensuing year.

Is there any further business to come before this Association at this time? If not, it would appear a motion to adjourn would be in order.

Upon motion duly made, seconded and carried, the meeting adjourned sine die.

OFFICERS AND COMMITTEES—1922

FINANCE

Dr. Cassius Way, New York City, Mr. Mitchell Harrison, Nokesville, N. Y. Va.

LEGISLATION

H. R. Smith, Chicago, Ill., Chairman.
John A. Bell, Jr., Pittsburgh, Pa. H. E. Babcock, Ithaca, N. Y.
W. S. Moscrip, Lake Elmo, Minn. J. M. Whittlesey, Hartford, Conn.
Tait Butler, Memphis, Tenn. D. S. White, Columbus, Ohio.

CREDENTIALS

R. C. Reed, Baltimore, Md., Chairman.
O. H. Eliason, Madison, Wis. W. H. Simmons, Frankfort, Ky.

RESOLUTIONS

L. H. Howard, Boston, Mass., Chairman.
George Hilton, Ottawa, Canada. J. G. Wills, Albany, N. Y.

PROGRAM

O. E. Dyson, South St. Paul, Minn., Chairman.

TICK ERADICATION

C. A. Carey, Auburn, Ala., Chairman.
Peter F. Bahnsen, Atlanta, Ga. E. Pegram Flower, Baton Rouge, La.
TWENTY-FIFTH ANNUAL MEETING

HOG CHOLERA CONTROL

C. H. Stange, Ames, Iowa, Chairman.
L. Van Es, Lincoln, Neb. W. W. Dimmock, Lexington, Ky.

GRIEVANCE

J. G. Ferneyhough, Richmond, Va., Chairman.

ADVISORY

W. F. Crewe, Bismarck, N. D., Chairman.
Fred Torrance, Ottawa, Canada. J. R. Mohler, Washington, D. C.

LIVESTOCK DISEASES

J. Traum, Berkeley, Cal., Chairman.
V. A. Moore, Ithaca, N. Y. A. F. Schalk, Fargo, N. D.

INFECTIONOUS ABORTION

C. P. Fitch, St. Paul, Minn., Chairman.
J. F. De Vine, Goshen, N. Y. R. R. Birch, Ithaca, N. Y.

INTERSTATE SHIPMENT OF SWINE

B. H. Edgington, Columbus, Ohio. R. C. Julien, Indianapolis, Ind.

SPECIAL SKIN DISEASES

B. F. Davis, Cheyenne, Wyo., Chairman.
C. G. Lamb, Denver, Col. J. P. Iverson, Sacramento, Cal.

TUBERCULOSIS

M. Jacob, Knoxville, Tenn., Chairman.
W. J. Butler, Helena, Mont. C. E. Cotton, St. Paul, Minn.

SPECIAL COMMITTEE ON FOOT AND MOUTH DISEASES

E. S. Bayard, Pittsburgh, Pa., Chairman.
A. J. Glover, Fort Atkinson, Wis.