PROCEEDINGS
Twenty-Ninth Annual Meeting
of the
United States Live Stock Sanitary Association

HOTEL LASALLE, CHICAGO, ILL.
December 2-4, 1925
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WEDNESDAY MORNING SESSION
December 2, 1925

The first session of the Twenty-ninth Annual Meeting of the United State Live Stock Sanitary Association, held December 2-4, 1925, at the Hotel LaSalle, Chicago, Illinois, was called to order at 10:40 o'clock by the President, Dr. J. H. McNeil, of Trenton, N. J.

PRESIDENT McNEIL: Gentlemen, come to order, please. This morning, in opening the session of the Live Stock Sanitary Association, we have with us Dr. Bundesen, the Commissioner of Health of the city of Chicago. He will address us on a subject pertaining to his duties as Commissioner of Health in the city of Chicago.

DR. H. N. BUNDESEN: There is nothing that is of greater importance to the individual than health, because upon health depends one's attitude toward life and one's relationship toward one's fellowmen; the man who is healthy is successful, and the man who is sick and diseased is usually unsuccessful. It is the duty of local health authorities in every community to keep the citizenship as healthy as possible by adopting every reasonable safeguard.

Now, a person should never try to sell something to somebody else if he doesn't believe in it himself; if he hasn't the courage of his own convictions, he will have great difficulty in trying to convince someone else of its merits.

There is something fascinating in following an occupation that does good to humanity. You men who are here are in a business that is an essential and vital service to the human race. There is no one of you who, on seeing a little child in front of a railroad train, or on
seeing a child in the street before an automobile, would not risk your own life to snatch that child out of the way. It is spectacular, it is something dazzling, and some sudden impulse of the moment makes you do that. But why isn't it of equal importance to take part in the saving of life in other ways?

What are the essentials for the growth of a strong, wholesome, healthy nation? I wonder if somebody will not answer that question for me. What is it in this country that is the basis of prosperity and development? It isn't the interest on money that supports a country at all; the thing that makes a country is the farmer and the farmer's products, provided those products are safe.

Here we have a group of fine milkmen. I said to your chairman as I came in: "Haven't I made a mistake? Why the water on the table? Is this a delegation of men selling water?"

He said: "No, why?"

I said: "What is the matter? I see you are advertising water. Why not supply milk for drinking?"

One of the finest things a person can do is to drink milk that is safe. Now, on my table here I have at my request a glass of milk, and it is some of the milk that comes into the city of Chicago daily. It is part of the 1,250,000 quarts of milk that came into the city today. This milk, we feel, is reasonably safe, so safe that I have the courage of my convictions to drink milk instead of water. I hope in the future whenever you meet as an organization of men interested in dairy products, you will have the courage of your convictions and drink milk instead of water at the table. I deliberately set that water aside. It gets me damned sore every time I come to an ice cream banquet or milk banquet to see them set out the water as though they were afraid to let anybody see wholesome milk. Water has chlorine in it, is iced and irritates the throat. Milk is smooth and palatable; it gives you a lot of vim and energy, and enables you to put your talk over. After talking fifteen minutes I would be in a state of collapse if I didn't have some fine nourishment to bolster me up and put my ideas over.

I have said these things for a purpose. In the city of Chicago at the present time we are in the midst of a rather bitter argument. How far that argument is going to go, the Lord only knows, and He won't tell. You might be interested in knowing what we are trying to do, what will be done, because, after all, this isn't my battle, but a fight that is going to win or lose on its merits. I believe that it is going to win. I think there is nothing that can stop it. I think that public sentiment is absolutely behind the principle for which we are fighting, and that principle is what? That principle is to provide safe food for all.

The time has passed when a health officer gets excited about leaky roof gutters or loose plaster on the wall or the fly specks on a window. That isn't a public health officer's concern. It is the major duty of the health officer to safeguard and make safe all the milk, all
the food, all the water, and all the air, and those are the things we are striving for today. We have a hard job confronting us at the present time.

This morning, unfortunately, there appeared in the daily press certain statements, undoubtedly well meant but ill considered, regarding conditions that are alleged to exist in the city of Chicago. As a consequence of this, enthusiasm has carried some people to make statements beyond the realm of actual fact.

In the first place, let me tell you this: We are receiving in the city of Chicago 1,250,000 quarts of milk a day. That milk is all pasteurized, and it is pasteurized as efficiently as the human equation makes it possible to pasteurize.

In trying to accomplish something, I believe in doing it in a constructive way rather than in a destructive way.

Some nine months ago an outstanding man in the city of Chicago came to me (I have been requested not to mention his name at the present time, but I will be glad to do so when the matter comes out), pointed out certain definite conditions that existed and said that certain definite things ought to be done to remedy those conditions. We went over the subject carefully and at that time formulated some plans, which we believed were within the realm of reason for the milk-consuming public, for the milk-producing farmers and for the milk dealers. We had hoped, and still hope, to be able to put our plan through on that basis.

I think that one of the most monumental pieces of work ever done in this country was the conception and passage of the Chicago pasteurization ordinance by Dr. William A. Evans. I think that he did a fine piece of work, and I have no quarrel with him on the subject. I have no quarrel with the work that Dr. Robertson, my predecessor, did when he required that all the milk in the city of Chicago, except that which is certified, be pasteurized, which meant that 98 per cent of all our milk was to be pasteurized from 1916 on. That is one of the reasons for our low death rate now, and we have a very low death rate indeed. But pasteurization doesn't purify milk; pasteurization was never intended to take care of an excessive amount of contamination.

So our plan contemplated that we should require every bit of milk that comes into the city of Chicago to come from healthy cows. (Applause.) A newspaper boy this morning said: "I presume, Doctor, in the face of obstacles that you won't be able to tell us your position." I will be glad to, and I will think it out slowly and carefully and definitely, and I hope these newspaper boys and the stenographers will get it all just as I say it, because I am perfectly willing to be responsible for what I say. Here is what I am requiring, here is what I am going to insist on, here is what I have said before and what I am repeating now: If it is the last damned thing I do, every bit of milk that comes into the city of Chicago is going to come from healthy cows, and there isn't any power this side of hell that is going to stop me. That is
my platform. (Applause.) That is what I intend now, and that is what I am perfectly willing to stand or fall by.

Now, the battle doesn't seem nearly as hard as some of our well-meaning friends are trying to make it appear. I have in the past had some difficulty in keeping our own milk people, the milk dealers in the city of Chicago, in line, but the milk dealers now aren't fighting me in the city of Chicago. They are constantly saying: "We are with you; we are more interested that you are because our whole investment depends on a wholesome product and we are going to see that every bit of milk that we handle in Chicago is safe. We have just as much of a responsibility at stake as you have, and we also are going to see that every bit of milk that comes into the city of Chicago is safe." Without exception the milk dealers in the city of Chicago have said that, and they have also said: "Doctor, this is going to hit many of the farmers hard. We are trying our utmost to safeguard the milk supply of the city of Chicago, and we want you to be reasonable in giving the farmer time for compliance."

I said: "Well, suppose we give them about thirty days?" I thought that it would take perhaps nine months, but that if I said thirty days we would have some margin to bargain with, don't you see? The time actually set was some time between April 1 and July 1, 1926.

The effect of unfavorable publicity on an industry is very injurious. This morning the Health Department has been literally flooded with telephone calls asking, "Where can we get safe milk?"

We tell the people of Chicago that the milk is reasonably safe to use, but that we are trying to make it even better. We take this attitude in the face of those who are unfriendly, in the face of those who have utilized the things I have done and said, against me, who hold that "If it is right to do it on the first of next July, why the hell doesn't he do it today?"

I have said I want to be reasonable with the farmers; I want to give them an opportunity to do the things that we are trying to get them to do, without bankrupting them; and in the face of the attacks that will be made on me for what I have said here today, I am telling you that today I am going to issue a public statement to the citizens of Chicago not to be alarmed; that every man, woman and child should drink a quart of milk a day; that we are safeguarding the milk as much as is humanly possible; that the milk in Chicago is reasonably safe, but we want to make it better; that we want the most ideal milk supply of any city in the country; that we don't want milk from cows sick with streptococcus infection or foot and mouth disease or udder disease or any other sickness; that we want to have safe milk from healthy cows.

Now, you men know that from the first, pasteurization, although it has been a wonderful life saver, was never intended to make dirty milk pure, and that milk from a cow that is sick, no matter what that sickness is, isn't as healthful as milk from a cow that is healthy.
We know that we have the element of human equation in the operation of any mechanical device. Some of these streptococci that cause streptococcus sore throat and other diseases may get by the pasteurization process, in consequence of which we might have epidemics, and for that reason we believe that every health officer, every veterinarian, and in fact all of you men, are interested in the principle for which we are fighting, and that principle is safe milk.

I think the citizens of Chicago have a right to demand safe milk. It was a fine thing when one of our largest dairies thought enough of the test, thought enough of healthy cows, to offer a bonus yesterday of 25 cents a hundredweight for milk from healthy cows to reimburse the farmers. They have the interests of the farmer at heart just as we have. We appreciate what the farmer is doing; we appreciate that the farmer is the backbone of the nation, and we appreciate the fine, magnificent support that we are getting from most of the outstanding dairymen all over the United States. We feel that we are asking nothing unreasonable.

I have six youngsters at home and each of them drinks a quart of milk a day; I am paying $43 a month for milk, and I think that it is the best single investment I am making, but I want that milk to be absolutely safe. I want that milk to be 100 per cent safe, just as I want the milk for all the seven or eight hundred thousand children in the city of Chicago to be safe.

Now, we will get along satisfactorily if we can keep our feet on the ground, if we can keep down the influences that would make people stop drinking milk. In advising everybody to continue to drink a quart of milk a day, we need your cooperation and backing. I don't think there is anything that is going to stop this movement. I don't think that public sentiment will permit us to have milk from cows that are unhealthy. I don't think I would be considered a good health commissioner if I didn't safeguard all our food supply, as I am endeavoring now to do.

I am earnestly pleading with every one of you men that, if you feel I am right, if you feel that this principle is right, you get behind this movement in the interest of safe milk. If I am not right, I hope that somebody can show me wherein I am wrong. I have studied the subject night after night and day after day. I think that fundamentally we are on safe ground. I feel sure, absolutely sure, that this proposition is going to go over, but I want it to go over in a way that will be fair to the milk dealers, to the milk consuming public and to the farmers. I don't hold anything against the farmer. Somebody offered the other day in one of the country dairies to show a man around and introduce him to one of the farmers as Dr. Bundesen.

The fellow said, "No, no, no, don't do that, don't do that."

Now, I am sorry that some of the farmers have that feeling. I have a kindly feeling toward the farmer, but I also owe a duty to the citizens of the city of Chicago. I hope this body before leaving here today will decide to help me put over the thought that we should
advise everybody to continue drinking a quart of milk a day, and that we must safeguard the milk in every way.

Our plan is this, so that you may know where we stand: Because of the Shurtleff law in Illinois we are not requiring and cannot legally require tuberculin testing of cattle, and we are not doing that. What we are doing (and this will be my closing statement by way of repetition so that you people may get it down definitely; so that you may know that I have enough intestinal fortitude—guts—to stick to what I have said), is fighting for safe and wholesome milk. Some may say, "Well, Bundesen is going to back down, he can't stand the pressure." But it is too late now for Bundesen to back down. I have been smashed at, and fought at, day after day until when night comes around I am too tired to eat supper, but somehow or other I seem to have an extra supply of thyroid secretion. You know thyroid secretion is the thing within a fellow that drives him forward. Sometimes the milk dealers in Chicago think I have a little bit too much thyroid secretion in my system, but at least I have enough to enable me to go through with what I start. In closing, let me tell you this again: If it is the last damned thing I do I am going to see that every bit of milk that comes into the city of Chicago comes from healthy cows, and there isn't any power this side of hell that is going to stop me.

I thank you. (Applause.)

DR. A. T. KINSLEY: Mr. President and Gentlemen of the United States Live Stock Sanitary Association: It certainly is refreshing to have the privilege of listening to such an address as we have just been privileged to hear.

Gentlemen, we have had with us a man who certainly has the courage of executing his convictions, and to show him our unqualified endorsement of his stand on pure milk, I move you that we unqualifiedly endorse Dr. Bundesen's plan for a clean, wholesome milk from healthy cows for human consumption.

DR. J. I. GIBSON: Mr. President, I rise to second the motion made by Dr. Kinsley. I think that we have had a splendid address here and it has been filled with some of the pep that we need in this Association.

I think I appreciate the situation in which Dr. Bundesen is placed in Chicago, and I think I can assure Dr. Bundesen before we call for a vote that every man here stands back of him in his determination to produce safe, wholesome milk for Chicago, and I would like to have Dr. Bundesen go away from here this morning feeling that he is in the highest calling known to man when he stands between the diseased dairy cow and the innocent child of Chicago.

We are back of him, I know we are, every man of us, officials and private citizens, and I hope this vote will be made unanimous by rising to our feet and rising strong and upright.

PRESIDENT McNEIL: You have heard the motion. Those in favor will please rise.

(The motion was unanimously carried by a rising vote.)
DR. BUNDESEN: I thank you for that. Up to the present time I haven't needed any stiffening in my spine, but if I do and things do get too hot, I will just remember the faces of you men when you got up and indorsed me in this movement. Anybody who would not stick to his program after receiving the encouragement of this fine group of men would be a coward, and I am sure that I won't come under that classification. (Applause.)

PRESIDENT McNEIL: Gentlemen, I am sure we have all enjoyed and appreciated the address by Dr. Bundesen. The thing that he is doing is what we are all thinking of and doing the best we can and I am certain that he appreciates the recommendation which has been given him; it will prove of material assistance, we hope, in his work in putting over what he is attempting to do.

I appreciate the great privilege you, as members of the Association, have accorded me in electing me President, and while we are here primarily to listen to prepared and extemporaneous addresses arranged and delivered by experts in their special lines, committee reports and discussion of the different phases of sanitary control work, I desire to present to you briefly for study several points which have occurred to me as being important and I hope will assist in crystallizing our thoughts along the lines in which we are working.

In the arrangement of the program, it has been the desire of those who have had this in charge to present the most important subjects relating to animal diseases, their control and, where possible, final eradication.

During the past year the representatives of the Federal Bureau and the several states have effectively dealt with two outbreaks of foot-and-mouth disease and we believe suppressed European fowl pest, brought into this country by laboratory workers and accidentally introduced into the flocks in the United States, causing extensive losses to the poultry and allied industries until finally brought under control.

A close check on car lots and express consignments of poultry arriving at the eastern railroad terminals during December, 1924, and January, 1925, demonstrated that a large number of diseased birds were arriving and it was necessary to institute a systematic inspection as a protection for the live poultry industry of the east.

It may be of interest for you to know that at the several railroad terminals in Newark, Jersey City and Elizabeth there is received annually about 10,000 cars of mixed live poultry, each car containing about 4,000 head, representing approximately 40,000,000 birds.

During the month of September, this year, there arrived at the terminals mentioned 1,007 cars, all of which were inspected by a veterinarian before they were released. Car inspection is carried out for the protection of commission men at destination points, and also to prevent the movement of diseased poultry to local markets and the flocks on the farms within the state.
UNIFORM REGULATIONS

There is great need for the adoption of more uniform regulations and a better understanding between live stock sanitary officials, breeders and veterinarians to whom is entrusted all of the agencies leading to the control of contagious diseases of live stock and poultry.

The Federal Bureau prescribes regulations for the control of the interstate movement of certain classes of live stock and with the cooperation of the sanitary officials in the different states there is being developed a tendency toward uniformity, and this should be practiced as far as local conditions will permit. Each state has its individual problems and many of the agencies which have operated contrary to the interests of the true breeding industry have been eliminated and sanitary officials are fast assuming the responsibility for the health of the animals moved interstate.

The cooperation of sanitary officials with the representatives of the Federal Bureau of Animal Industry is desirable and absolutely necessary in order that they may function properly and obtain the best results in sanitary control work.

It was evidently the intent of Congress to prohibit the interstate movement of diseased animals when in 1884 it enacted the law as in Section 6, approved May 29, "That no person, firm or corporation shall move or permit to be moved interstate any animal affected with any contagious, infectious or communicable disease, except that cattle infected with the Texas fever tick may be moved for immediate slaughter."

It is the impression of many that had the law prohibited the interstate movement of ticky cattle that adequate provision would have been made to have destroyed this parasite promptly, and we would not have tick infested areas to deal with at the present time.

Nutritional Diseases.

The program on nutritional or deficiency diseases will, we hope, prove of interest to you all. It is an important subject and has a direct bearing on all animal life and development.

Foot-and-Mouth Disease.

The recent outbreak of foot-and-mouth disease has fully demonstrated that we, as representatives of the sanitary boards, should promptly and fully cooperate with the Federal Bureau of Animal Industry in the control of this and other diseases of an infectious nature.

The plan which will be presented by the Committee on Uniform Regulations I believe embodies the best information obtained as the result of handling several outbreaks of foot-and-mouth disease, and is worthy of trial.

As pointed out by Dr. Mohler in reviewing the conditions surrounding the last outbreak of foot-and-mouth disease in Texas, the Texas
fever tick may be an active factor in the spread of foot-and-mouth disease, either through the infection carried by the engorged female or the agency of seed ticks hatched from eggs deposited by the infected tick.

As foot-and-mouth disease has existed in tick infested areas of Texas, we believe that all reasonable measures should be taken and encouragement given to a program leading to the destruction of the Texas fever tick in all infested territory.

A modification of the present regulations prohibiting the interstate movement of cattle from quarantined areas for any purpose would speedily remedy this situation. Such action would not only be beneficial to the industry in the tick infested areas, but would permit the shipment of both purebred and grade dairy and beef cattle from the northern sections of the United States to the cleaned areas of the southern states where better cattle are required.

The increased valuation placed on slaughter cattle in stock yards where animals from clean areas and those from tick infested areas are being handled but in separate sections should be argument sufficient to prove that the destruction of the Texas fever tick would be beneficial to agriculture of the South.

It is true that the southern states have suffered from the same agricultural depression as other sections of the United States, and we hope that this situation will soon change and that sufficient funds will be available to prosecute the work until all areas are free.

Tick infested states bear their portion of the Federal taxes levied to support the tuberculosis eradication campaign in the form of Federal indemnities and they have a low percentage of tuberculous cattle. Many of the other states outside of the tick infested area have a very high percentage of tuberculous cattle, and when we think of tick eradication and what it means to the animal industry of the nation, we should give full support to any campaign that will bring immediate material assistance. If we do nothing more than prohibit the movement of cattle from infested to clean areas, tick eradication will then have been given the support that is desired and necessary to accomplish the end sought, namely, the complete eradication of the cattle tick.

Swine Disease.

The control of swine disease has always been an important problem. Hog cholera has probably caused the greatest losses, but when regular protective inoculation is practiced it is a comparatively simple procedure to grow and market hogs with profit.

It has been fully demonstrated that it is not practical to attempt to manage garbage feeding establishments unless all of the animals are double treated as a protection against hog cholera.

In the past some of the states have experienced difficulty in regulating the distribution of serum and virus to the laity. This has not always been in the interests of swine disease control, but we believe
that it is generally recognized that protective inoculation against hog cholera should be administered by qualified veterinarians only, and we, as sanitarians, should insist on this provision being carried out to protect the live stock industry, and favor the redrafting of legislation that will prohibit the indiscriminate distribution of serum and virus, especially virus.

**Abortion Disease.**

Abortion disease is generally recognized as causing a greater loss to the animal industry than any other single disease now prevalent in the United States, and until this time the work along these lines has been confined to research, but we now believe that sufficient progress has been made for sanitary officials to consider regulatory measures to restrict its spread by the movement of diseased animals interstate and the disposal of reactors through the medium of private or dispersal sale within the state.

There are many of the breeders of purebred cattle who have their herds tested for abortion disease and have either isolated their reactors and are holding them on separate premises or disposed of them through slaughter, but on the other hand there are others who presumably have had their herds tested for abortion and dispose of the reactors other than by slaughtering methods. While we may be cleaning a few herds, the disease is being disseminated to others where it has not existed previous to the purchase of the infected animal or animals.

Much the same situation existed when tuberculin was first used for the diagnosis of tuberculosis and it has only been within later years that the states have by statutory enactment required the reporting of all tuberculin tests and proper disposal of reactors to the test, thus placing tuberculosis eradication on a sound basis.

Should we not handle reactors to the abortion test in the same manner?

It has been repeatedly suggested that we should inaugurate a state accredited herd plan for the control of abortion disease drafted after the form of the accredited herd plan for the eradication of tuberculosis, which has proven so successful in its operation. We should at least go on record as being opposed to the present method of handling this disease and assume control of the situation, as under present methods great harm is being done to the live stock industry.

Three of the states of the Union now require proper certification of dairy and breeding animals moved interstate, or they are quarantined at destination and held until tested for abortion disease.

**Tuberculosis.**

The indiscriminate distribution of tuberculin to the laity is not conducive to the best results in the eradication of tuberculosis from our live stock and poultry. There should be some efficient check on the sale and reporting of the use of this diagnostic agent, and we believe that the only effective way in which this matter may be handled
is working through the Federal Bureau of Animal Industry in cooperation with the state live stock sanitary officials of the state in which the tuberculin is used.

Regulations need not in any way interfere with the manufacture of this biological product or its sale and use, as I believe that all reputable biological houses and other distributing agencies would assist in complying with any regulations that might be formulated.

To impress you with the necessity for a regulation to control the handling of this product, I beg to refer you to paragraph 2 of the report of the Special Committee on Bovine Tuberculosis Eradication for 1918:

"That the indiscriminate distribution of tuberculin is detrimental to the control and eradication of tuberculosis and we suggest that the Association pass a suitable resolution requesting the Secretary of Agriculture to prohibit by regulation the interstate distribution of tuberculin except to state and Federal live stock sanitary officials, who in turn should restrict the distribution within their respective states to veterinarians regularly or temporarily engaged in live stock sanitary control work."

Tuberculosis eradication and other sanitary control work cannot be effectively and efficiently carried out unless high grade, qualified and well paid state and Federal officials are employed and entrusted to this work. We believe that the salaries should be commensurate with the services rendered and sufficient to compensate the veterinarians so that they may devote full time to Federal and state service.

The object of tuberculosis eradication is to maintain herds free from tuberculosis and in order to do this satisfactorily it is necessary to buy from clean herds or clean areas rather than assume the risk of purchasing from affected herds or areas and depending on tuberculin to eliminate the diseased animals.

We can build up clean herds satisfactorily only by purchasing cattle free from disease.

Statistics gathered from the records of tuberculin testing indicate that the percentage of tuberculosis in our live stock varies greatly in different areas and sections of the United States. As this information is now available I believe that after a careful study of the conditions obtaining in each area, zoning could be practiced advantageously and cattle from an area where a low percentage of tuberculous animals have been removed, could move under special regulations or a more liberal interpretation of the present regulations than from an area having a high percentage of tuberculous cattle. This would offer encouragement to breeders and dairymen whose herds are now free from disease and facilitate the renewal of depleted herds from safe sources. The real value of tuberculin tests of animals in herds or areas under supervision is largely in proportion to the prevalence of tuberculosis in that herd or area. While we are interested in the healthfulness of the individual animal or herd, the fundamental principle of tuberculosis eradication lies in the healthfulness of the herd or herds in the community in which such cattle originate.

The states that import a large number of dairy cattle for replacement need have no fear of not being able to obtain a sufficient number
of properly tested animals, as there are now under supervision thirteen million cattle and a large number of counties are classified as modified accredited areas.

We import into the State of New Jersey from foreign states practically 20,000 dairy cows each year. Where intensive dairying is carried on by commercial dairymen adjacent to the larger cities, these cows are used through the milking period, then fattened and sent to slaughter. It is a great economic loss, but we do not see at the present time any way to avoid it, and as dairy animals are not available at home it is necessary for us to go long distances in order to get the kind of cattle necessary for our dairy use.

In my opinion the only plan that will insure the interstate movement of healthy cattle for dairy and breeding purposes and protect the dairymen and dealers who make purchases for interstate movement is to establish "zones" embracing free, comparatively free and badly infected areas based on initial tests or on the prevailing percentage of infection existing in previously tested areas as determined by tuberculin tests in each township, county, district or area and which might embrace one or more states.

I beg to offer the following suggestions as a basis for classification and as a requirement for interstate movement in order to take care of replacements in accredited herds and to meet the conditions which now exist in many of the eastern states:

1. Cattle for dairy and breeding purposes from fully accredited herds, free areas or modified accredited areas classed as Zone 1 may be moved interstate under the conditions embodied in the accredited herd agreement.

2. Cattle for dairy and breeding purposes from comparatively free areas classed as Zone 2, may include those of paragraph 1 and be moved interstate subject to the conditions thereof.

Other cattle for dairy and breeding purposes from comparatively free areas may be moved interstate if the following requirements are complied with:

(a) The tuberculin tests must not be applied at public stock yards or public sales stables.

(b) The tuberculin test must be applied immediately before shipment by an accredited veterinarian.

(c) The tuberculin test must be made to conform to the United States Bureau of Animal Industry Rules and Regulations and the requirements of the state of destination.

3. Cattle for dairy and breeding purposes from badly infected areas, classed as Zone 3, may be shipped interstate when they originate in herds under state and federal supervision which have passed one clean test unless covered by paragraph 1.

Later on paragraph 3 may be further strengthened and permit on certification only the interstate movement of animals which originate in fully accredited herds.
The extent of proposed zones shall be determined by the cooperating federal and state authorities in conjunction with other cooperating agencies within the proposed zones.

It is understood that all quarantine restrictions are to be rigidly enforced and adequate quarantines established on clean herds, clean areas and modified accredited areas.

All tuberculin tests to have the approval of the sanitary official at point of origin.

We have always maintained the attitude that if the state veterinarian or other state live stock sanitary official assumed the responsibility of approving a tuberculin test chart it should be accepted providing it meets the requirements of the Department of Agriculture or Live Stock Sanitary Board of the State of Destination.

We recognize the assistance given us by representatives of State and local boards of health in enforcing regulations requiring the maintenance of a safe raw milk supply, but I do not believe that we will have achieved all that is desired until it is required by statute that all milk sold in the raw state must be produced by animals that are free from tuberculosis as indicated by the tuberculin test unless the product has been properly pasteurized.

We see no objection to the proper pasteurization of all milk if made to satisfy the requirements of boards of health in order to prevent the spread of infectious agencies of human disease which may be carried through the medium of milk, but from an economic standpoint we believe that all animals should be tuberculin tested whether the milk is sold raw or pasteurized. (Applause.)

PRESIDENT McNEIL: We will now proceed with the remainder of the program. I will ask Dr. Kinsley to take the chair.

(Dr. A. T. Kinsley took the chair.)

CHAIRMAN KINSLEY: Gentlemen, according to the usual custom, we will pause now briefly to extend our sympathies to friends of those who have departed during the past year.

The first in our memorial proceedings will be a vocal number by Dr. J. I. Gibson, Mrs. Sylvia Wentworth of Chicago, accompanist.

(Vocal solo by Dr. J. I. Gibson.)

CHAIRMAN KINSLEY: Dr. N. S. Mayo has prepared a eulogy in behalf of our departed friends and I will read it at this time.

(Dr. Kinsley read the paper.)

Time pauses not in his endless flight, the years pass in quick succession and again, as before, we pause in our deliberations to pay a tribute of respect to those who have labored with us in the years that have gone, but who have laid down the joy, the sorrow and labors of life, for those of us who remain to take up and "carry on" as best we can.
We enter the world, as an ancient bard has said, like a moth that
flutters into the brilliantly lighted banquet hall for a short time and
then wings its way into the night and is known no more.

In all lands and in all ages man has striven to prolong his existence,
and while the allotted years of life have been added to, yet Charon's
boat is always waiting to take us across the misty river into the
Great Beyond.

Today as we pay a deserved tribute to our departed members let us
also draw a lesson from their lifes' work that shall be helpful to us
and to others as we "carry on." We can pay them no higher tribute,
and we know that this would be their desire.

Dr. Samuel Brenton was born in Ontario, Canada, in 1858, and his
whole busy life was spent as a private practitioner in Detroit. He
took an active interest in all phases of veterinary science, as shown
by his membership in our Association. He was an ardent supporter
of every measure for advancing the interests of the veterinarian. Modest
and unassuming, he was a man of strong conviction and sterling worth.
Dr. Brenton died at Detroit, Michigan, February 16th, 1925.

Another of our departed co-workers also came to us from beyond
the borders of our country, but in his adopted land he won by his
charming personality and splendid ability an enviable place in his
chosen work. William H. Dalrymple was born at Stranraer, Scotland,
in 1856, and after graduating from the Royal Veterinary College at
Glasgow, came to the United States and became one of our most honored
and valued citizens. In his long years of service at the University of
Louisiana he was a pioneer and firm champion of measures for the
advancement of live stock sanitary service and for the development of
the live stock industry of the Southland. His name was known in
almost every Southern home, for he was a man of high ideals, great
ability, sterling integrity, and a true gentleman in every sense of
the word. He was beloved not only by students but by all who came
in contact with him. His death at Baton Rouge in July, 1925, was
a great loss to our profession, not only in America, but Europe also.

Stricken suddenly in the midst of an unusually active career, Dr.
S. E. Bennett died at Chicago August 4th. Born at East Liverpool,
Ohio, and receiving his professional training both in this country and
in Germany, practically all of his life had been spent in live stock
sanitary work. He was splendidly trained and an unusually efficient
executive. No one ever had any doubts as to where Dr. Bennett stood
on any question, and under trying conditions he carried on his work
without fear nor favor. His judgment and assistance were sought by
those in charge of the great live stock interests, and they were not
disappointed. A charming, loyal friend with jovial personality, he was
at the same time an energetic, fearless and efficient worker, loved and
honored by all who knew him.

It has been said, "Death loves a shining mark." When the Great
Destroyer took from our midst Dr. B. H. Ransom we lost one of the
world's great scientists, who had devoted his life to the service of
humanity. As Chief of the Zoological Division of the U. S. Bureau of Animal Industry, he probably contributed to our knowledge of animal parasites as much as any living man, and his death is a great loss not only to us but to the world. His life was measured by heart throbs, not by years. Only 46 years of age when he died September 17th at Washington, D. C. He had accomplished more in his short life, as his intimate co-workers have well said, than most men hope to do in three score years and ten. A modest, courteous, patient, painstaking and persistent worker, he is worthy of a place in the nation's hall of fame for his contributions to science that meant so much for the progress and welfare of humanity.

Today we miss the familiar face of Dr. Ben Pierce. For many years he has been a faithful attendant at our meetings. Dr. Pierce had served for years in the United States army on the old frontier and was one of the staunch members of the old guard who labored earnestly and continuously for the betterment of the veterinary profession and for the improvement of the live stock industry. He was a great lover of animals, particularly of horses, and a loyal, devoted and generous friend. He would divide the last dollar with a friend. Dr. Pierce passed away at Springfield, Massachusetts, the 4th of November.

These able leaders in our profession have gone to their reward, but they have left a legacy of high ideals and efficient service as a guide to cheer us up and spur us on to higher and nobler efforts in the service of our country and humanity.

"Build thee more stately mansions, Oh, my soul,
As the long seasons roll,
Leave thy low vaulted past;
Let each new temple nobler than the last,
Shut thee from heaven with a dome more vast,
Till thou at length are free,
Leaving thine outgrown shell on life's unresting sea."

N. S. MAYO.
RESOLUTION.

WHEREAS, God in His wisdom has called Drs. S. Brenton, W. H. Dalrymple, S. E. Bennett, B. H. Ransom and Ben Pierce to their final reward, during the past year; be it

RESOLVED, That we here and now express our sorrow at the loss of their valued council and genial companionship, and that we extend to their bereaved families our sincere sympathy; and be it further

RESOLVED, That these resolutions be spread upon the minutes of this Association, and that a copy be sent to the families of our departed friends.

J. I. GIBSON,
A. T. KINSLEY,
N. S. MAYO.

CHAIRMAN KINSLEY: Your Committee, as has been the usual custom, has prepared resolutions that I will read.

DR. J. W. CONNAWAY: I move that the resolutions be adopted.

(The motion was seconded by Dr. C. G. Lamb and carried.)

CHAIRMAN KINSLEY: The memorial services will be closed by another vocal number by Dr. J. I. Gibson, accompanied by Mrs. Wentworth of Chicago.

(Vocal solo by Dr. J. I. Gibson.)

(President McNeil resumed the chair.)

PRESIDENT McNEIL: We will listen to the report of the Secretary-Treasurer.

SECRETARY DYSON: The report that I should deliver at this time was published in the proceedings of the Twenty-Eighth Annual Meeting.

DR. P. F. BAHNSEN (Atlanta, Ga.): I move that the printed report of the Secretary be accepted as the report of the Secretary.

(The motion was seconded and carried.)

(Secretary Dyson read his report.)

(Applause.)
**REPORT OF SECRETARY-TREASURER.**

**Receipts.**
- Membership dues 292@ $2.00: $584.00
- New members 12@$3.00: 36.00
- Reports sold 104@$1.00 ea.: 104.00
- State memberships including U. S. B. A. I. and Dept. of Agriculture of Canada @ $25.00: 550.00
- Interest on bonds purchased: 29.75
- State memberships—1924: 75.00

Total receipts: $1,378.76

**Disbursements.**
- Printing reports—1,000: $585.60
- Stenographic report of meeting: 105.00
- Stationery, printing: 19.50
- Circular letters: 3.00
- Clerical hire: 9.70
- Postage: 67.27
- Telegrams: 6.81
- Wrapping paper and tape: 1.00
- Notary fees: .50
- Express and freight on supplies: 4.51
- 1925 programs: 21.45

Total cost of meeting: $824.34

**State Memberships.**
- Arkansas
- California
- Connecticut
- Florida
- Georgia
- Indiana
- Iowa
- Kentucky
- Minnesota
- Montana
- Nebraska
- New Jersey
- North Carolina
- North Dakota
- Ohio
- Pennsylvania
- Texas
- Vermont
- Virginia
- New Hampshire

**Investment**—7 $100.00
- Liberty bonds: 719.14
- Cash balance: 273.54

Balance: $1,817.02

**PRESIDENT McNEIL:** You have heard the report. What is your pleasure?

**DR. A. T. KINSLEY:** I move the report be received and placed on file.

(The motion was seconded and carried.)

**PRESIDENT McNEIL:** Dr. Day has an announcement to make.

**DR. DAY:** Remember that tonight at 7:30, at the Saddle and Sirloin Club, the presentation of the portrait of Dr. Bennett will take place.

**DR. KINSLEY:** I move we adjourn.

(The motion was seconded and carried and the meeting adjourned at 12 o'clock.)

Adjournment.
WEDNESDAY AFTERNOON SESSION

December 2, 1925

The meeting was called to order at 1:50 by President McNeil.

PRESIDENT McNEIL: Gentlemen, come to order and we will proceed with the program.

This afternoon we will have the discussion on nutritional diseases. The first paper will be by Dr. H. Steenbock of the Department of Agricultural Chemistry, University of Wisconsin, Madison, Wisconsin, on "Experiments of a Laboratory Worker in the Deficiency Diseases of Live Stock." Dr. Steenbock. (Applause.)

EXPERIENCES OF A LABORATORY WORKER IN THE DEFICIENCY DISEASES OF LIVE STOCK

In attempting to speak on the deficiency diseases of live stock I beg to call your attention to the fact that all diseases of nutrition are diseases having their origin either in an excess or a deficiency of certain constituents, and thus under the caption of deficiency diseases I might very well treat of the insufficient intake of energy, protein or even individual amino acids, or of the effect of withholding fat or carbohydrates. I might also speak of the effect of lack of sodium chloride, lime, iodine or even iron. These inorganic elements especially have occupied a very prominent place in nutrition investigations because of their scarcity in plants grown in certain regions, their variation in plants with climatic conditions and the tremendous need of the animal for them under special condition such as milk production. A cow producing 20,000 pounds of milk a year will during that time put out 142 pounds of minerals though her body contains only 51 pounds. In the past the emphasis has always been put upon protein and energy, and the mineral elements, outside of ordinary salt, have been left to be taken care of incidentally.

I came in contact with this general problem in 1907 when there were started at the University of Wisconsin certain experiments to test out the inadequacy of the then prevailing conceptions of what the ration for an animal must include to be satisfactory. Dr. S. M. Babcock always expressed the belief that he could compound a ration satisfying all the requirements imposed by our modern feeding standards and yet obtain complete failure of nutrition, and so there were started under the direction of Prof. E. B. Hart experiments attempting to nourish young heifers on rations balanced respectively from constituents of the corn plant, the wheat plant and the oat plant.

The result of these experiments was, that while all the heifers grew fairly uniformly, disaster resulted when the wheat and oats fed animals were subjected to the strain of reproduction. Some improvement was obtained by the addition of minerals, especially lime salts—all
lots having been given sodium chloride from the beginning, but fundamentally failure was due to a lack of vitamines.

Quite similar results were obtained with pigs. Pigs confined in pens with cement floors were not successfully reared on a ration of grains and their concentrates. Again some improvement was secured by the addition of lime, but later it was realized that certain vitamine were lacking and without their addition no satisfactory nutritiou was possible. This then brings me to the essence of my talk—the relation of vitamines to the satisfactory nutrition of live stock. To introduce this, I shall have to make use of illustrations obtained on small laboratory animals because clear-cut uncomplicated illustrations with large animals are not available.

At the present time we recognize the existence of five distinct vitamines, viz., A, B, C, D and E. All are indispensable for the maintenance of growth in the animal at one time or another and in one form or another. None has been isolated in pure form but they can be distinguished because in natural foods they do not always occur together, they vary in solubility—A, D and E being soluble in fats, B and C in water—and they all produce different effects in the animal when absent.

Vitamine A prevents certain ophthalmias and infections of the respiratory tract. In its absence certain secreting epithelial tissues are changed into keratinized non-secreting tissues, resulting disastrously for the eyes, the bronchii, the lungs and often the kidneys and pancreas as well.

Vitamine B prevents certain neuro-muscular phenomena characterized by extreme spasticity, convulsions and partial paralysis of the gastro-intestinal tract leading to cessation of food consumption and ultimate starvation.

Vitamine C prevents scurvy. Without it multiple hemorrhages occur subcutaneously, intramuscularly and subperiosteally complicated by fragility of bone and swelling of the joints. Man and monkey as well as the guinea pig need this vitamine. Some animals such as the rat and chicken apparently can synthesize it from certain precursors in the diet.

Vitamine D prevents rickets by making it possible for the animal to assimilate lime more efficiently and to retain it when assimilated.

Vitamine E functions in reproduction, making possible the normal growth of the embryo in utero. When it is absent ovulation, impregnation and implantation occur normally, but sooner or later resorption of the partially developed embryo occurs and young are never born.

In our studies with live stock, vitamine B, C and E deficiencies were not encountered. There is no evidence that live stock require vitamine C in the ration and vitamine B and E are found abundantly in grains. But we indeed observe deficiencies of vitamines A and D.

Vitamine A deficiency resulted because all ordinary grains outside of yellow corn, certain varieties of peas and millets and soy beans do
not contain it; neither is it present to any extent in straws, though it
is contained in hays. It can therefore be appreciated why many of our
pigs died of respiratory infections and why one of our wheat fed
heifers actually went blind.

Vitamine D deficiency resulted because—and this may sound peculiar
to you—of insufficient exposure of the animals or their rations to light
and specifically ultra-violet light. There occur in plant and animal
materials, certain substances which the action of ultra-violet light
have imparted to them properties which enable them to stimulate normal
calcium metabolism. Allow me to illustrate.

When we fed rats a ration composed largely of cereal grains and
3 per cent CaCO₃, after an interval of five weeks their dried bones con-
tained from 22 to 31 per cent ash. But when we first exposed this
ration to ultra-violet light as produced by a quartz mercury vapor lamp
for 30 minutes, we obtained an ash content of bone ranging from 43 to
55 per cent.

To us when we first discovered this reaction this appeared almost
unbelievable. Allow me, for instance, to call your attention to the pro-
gressive nature of this calcium deposition. When rats were first made
rachitic by the feeding of a grain ration well known to produce rickets
and then changed to the same ration which had been irradiated for 30
minutes, after six days calcium deposits just began to make their
appearance. In ten days more calcium had been deposited, and in
nineteen days the bone was almost completely healed.

Sunlight has the same effect though to a less degree because it
contains but little ultra-violet. To demonstrate its effect we cured
clover hay under various conditions, viz.: (a) in the dark, (b) in the
sun, and (c) in the sun, dew and rain, and then fed it to rats as incor-
porated in a rickets producing ration at a 6 per cent level. When cured
in the dark it did not prevent rickets, but subsequent irradiation with
ultra-violet light made it active. Cured in the sun, or in the sun, dew
and rain, it was active without further treatment.

But as I have already stated, sunlight is not as active as it might
be. Our experience has been that exceedingly prolonged exposure to
sunlight, totaling twenty-eight days, will not produce the same effect
as a thirty-minute exposure to the radiations of a quartz mercury vapor
lamp. This indicates that qualitative as well as quantitative differ-
ences are responsible for its decreased activity. Probably certain rays
in sunlight counteract the action of the limited ultra-violet contained
therein so that even prolonged exposure will not produce the same
effect.

As I have already stated, this effect upon the calcium metabolism
of an animal can be brought about by direct irradiation of the animal.
This is not a new discovery with us. It represents merely an agri-
cultural application of what had been demonstrated with infants in
human medicine in 1919. Then it was shown definitely that ultra-violet
light alone will cure rickets.
We showed that the same effect upon deranged calcium metabolism is produced in the adult. For this we used a goat as the experimental animal. On a ration containing plenty of lime but deficient in vitamine D, a goat will lose large quantities of lime above the amount in its ration. But with exposure to the radiations of a quartz mercury vapor lamp these losses are reduced or entirely eliminated.

This effect is brought about by the activation of the inactive vitamin D found extensively in the animal's body. If the animal happens to be producing milk, much of the vitamine D is secreted into her milk. In some cases we have actually found the rickets preventing properties of milk increased four to five times even when the goat was irradiated only thirty minutes a day.

Apparently in chickens we find the greatest need for ultra-violet radiation, which is probably related to the tremendous activity of their calcium metabolism during egg production and their very rapid rate of growth in early life. Not only will a brief period of exposure of ten to thirty minutes a day to a quartz mercury vapor light prevent and cure so-called leg weakness or rickets in chicks, but egg production may be increased three to four times, as we have found in certain experiments. Here again as in the case of the dairy cow the antirachitic property of the product is enormously increased. Not only does the young chick hatched from such an egg have a better chance for existence in early spring, but man is directly benefited because eggs produced under such conditions represent a far better article of food.

Under the present practice of housing our stock in barns there is absolutely no question but that they do not receive enough sunlight and therefore not enough ultra-violet. I want to leave with you the question, if it is not possible that our dairy herds have been bred for quantity production to such an extent that deficient lime assimilation may in part be unavoidable. It is not too far removed to suggest the possibility that it may in part be responsible for the sterility and non-contagious abortion which is becoming more and more prevalent in high producing herds. If so, it is possible that ultra-violet light may be a more beneficial agent than is even now appreciated—and in addition, it is not to be forgotten that it represents a very potent curative agent in tuberculosis.

Though it is to be admitted that most of the diseases to which live stock are ordinarily subject cannot be related to vitamine deficiencies, yet there is no question that at least one, and that one of the most prevalent ones, is of such origin.

PRESIDENT McNEIL: Gentlemen, I am sure you have all appreciated the lantern slide demonstration and the illuminating lecture. I feel that if this completed the program we have gained sufficient information from this address to justify our coming to Chicago.

Now we will listen to the report of Dr. Schalk, chairman of the Committee on Nutritional Diseases. Dr. Schalk is from the Veterinary Division, Experimental Station, Agricultural College, North Dakota. (Applause.)
DR. A. F. SCHALK: Mr. Chairman and Gentlemen: When your committee was fortunate enough to get Dr. Steenbock to come before this Association and deliver the most excellent address that he did, it materially changed the plans of the committee. We really thought there would be no occasion for any more report.

You are quite familiar with the most excellent work that Dr. Steenbock and his cooperators have been doing along this line at the University of Wisconsin. We realized that we had better not attempt to discuss very much along that phase of the problem.

I want to take this opportunity, in behalf of the committee, to express our appreciation to Dr. Steenbock for coming here and giving us this lecture.

(Dr. A. F. Schalk read the report of the Committee on Nutritional Diseases.) (Applause.)

REPORT OF THE COMMITTEE ON NUTRITIONAL DISEASES

By A. F. Schalk

Your Committee on Nutritional Diseases was somewhat reluctant and hesitant in going about its work, with the hope of laying a satisfactory report before this Association. The so-called "Newer Nutrition," whose theories have been born but little more than a decade ago, is yet in its swaddling clothes, but straining to go, endeavoring to grow and develop into an established science, which will command independent recognition, stand upon its own pedestal, and take its place alongside the older established lines of nutrition.

Following in the wake of traditions which customarily accompany all innovations and "things new," the newer nutrition today occupies a unique position in experimentation and maintains a hold upon the threshold of popularity, that perhaps is not approached by any other phase of human knowledge.

Naturally, pioneering in the newer nutrition studies has been fraught with some dangers. However, the speculative and adventurous stage is fairly well passed, and out of it all has come much that is basic and fundamental, much that will serve as a nucleus and foundation for future researches.

While the spotlight of public interest is being focused intently upon the newer nutrition, we believe it behooves us immensely not to overlook the possibilities in connection with the better established or what may be termed the older nutrition.

In the consideration of nutrition in general we are largely concerned with what it means in the way of growth and development in the young and maintenance, production and reproduction in adult animals. Most people recognize readily the role of nutritional factors in health and well being, but few are able to associate them with a condition of ill-health or disease. Consequently, the exact part played by nutrition in its many and varying phases, in animal diseases, is far from being
satisfactorily solved. We do not hesitate in stating that there is no field of animal diseases in which the data pertaining thereto is so ill defined and inclusive as that in which nutrition in one form or another is concerned.

What, then, really constitutes a nutritional disease is perhaps the first and foremost question before us. It only requires a casual glance at the literature to realize that there is a great diversity of opinion upon this point. Therefore, this being a rather newly created committee in the annals of the Association, it was deemed advisable to make a preliminary survey of conditions.

Accordingly, in order to gather the different viewpoints, obtain the prevailing opinions and assemble the data pertaining to nutritional diseases, a brief questionnaire was spread before the sanitary authorities and the research workers in animal diseases through the country, with the hope of obtaining something tangible, that would serve as the nucleus for a report, and possibly suitable material for serious thought and consideration for the future.

Perhaps our policy of limiting the questionnaire to veterinarians only may be justly criticized, and that it should have been extended to chemists, nutrition specialists and workers in animal production. However, as much of this work has been confined to the white rat, guinea pig and rabbit stage of experimentation, which may not apply to our domestic live stock, it was thought best to limit this preliminary survey to the domain of veterinarians and leave the more extensive survey for the future.

Among other things, the questionnaire was primarily designed to ascertain if possible which diseases are recognized and established and which are only probably of nutritional origin. As was surmised, the profession did not take a definite stand on this point and refused to make a clean cut distinction between them. We interpret this as ample evidence of a vein of conservatism on the part of those entrusted with the welfare of animals when considering a science that is in its infancy and whose status is so indefinite and incomplete.

On the whole the response to this questionnaire was quite satisfactory. Among more than ninety parties circularized, nearly seventy replied in form or by personal communication. While some were somewhat hesitant in rendering an opinion, lest it not be absolutely correct and reliable, for the most part, they gave some expression as to what they had seen, experienced and believed. This is exactly what the committee desired. Although an ultra-conservative attitude is a most laudable one to assume in most instances, when searching for new knowledge, we believe it would be rather difficult to arrive at a consensus of opinion on such important problems if all adopted a policy of "silence" and "waiting."
The questionnaire covered all classes of domestic live stock, including horses, cattle, swine, sheep, poultry and house pets. The condensed summary below brings to light the following information:

### Nutritional and Deficiency Diseases in Domesticated Animals.

<table>
<thead>
<tr>
<th>No. of Reports</th>
<th>Name of Disease</th>
<th>Apparent Causes</th>
<th>Prevalence</th>
<th>Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Horses.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Osteomalacia</td>
<td>Lack of proper bone building material.</td>
<td>1 mod.</td>
<td>2 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exclusive wheat straw feeding</td>
<td>1 slt.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Osteoporosis</td>
<td>Insufficient mineral metabolism</td>
<td>1 slt.</td>
<td>1 gen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 mod.</td>
<td>1 loc.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Goitre in Foals</td>
<td>Excessive volcanic deposits in water</td>
<td>2 ext.</td>
<td>4 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Confined to irrigated districts</td>
<td>1 mod.</td>
<td>1 gen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possibly shortage of calcium in soil</td>
<td>2 slt.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Depraved Appetite</td>
<td>Poor grade foodstuffs</td>
<td>1 slt.</td>
<td>1 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Narrow rations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Rickets.</td>
<td>Insufficient minerals</td>
<td>1 mod.</td>
<td>2 gen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of lime in dam's milk</td>
<td>1 slt.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Alkali Disease.</td>
<td>Unknown.</td>
<td>1 ext.</td>
<td>2 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 slt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Azoturia.</td>
<td>Heavy protein feeding</td>
<td>1 mod.</td>
<td>1 gen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cattle.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Osteomalacia.</td>
<td>Calcium phosphate deficiency</td>
<td>1 mod.</td>
<td>4 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possibly shortage of calcium in soil</td>
<td>5 slt.</td>
<td>1 gen.</td>
</tr>
<tr>
<td>8</td>
<td>Goitre and Big Neck in Calves</td>
<td>Unbalanced rations and lack of proper minerals</td>
<td>2 ext.</td>
<td>5 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Iodine deficiency</td>
<td>5 mod.</td>
<td>3 gen.</td>
</tr>
<tr>
<td>4</td>
<td>Abortion and Sterility</td>
<td>Unbalanced rations and lack of proper minerals</td>
<td>1 ext.</td>
<td>2 gen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Narrow limited rations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Rickets.</td>
<td>Lack of sunshine</td>
<td>1 ext.</td>
<td>1 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of calcium</td>
<td>2 slt.</td>
<td>1 gen.</td>
</tr>
<tr>
<td>5</td>
<td>Pica, Bonechewers, Psudo Licking Disease and Salt Sickness</td>
<td>Lack of phosphorous</td>
<td>2 ext.</td>
<td>1 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Calcium phosphate deficiency</td>
<td>1 slt.</td>
<td>2 gen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possibly calcium deficiency</td>
<td>1 mod.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Narrow rations, fed on cottonseed meal and hulls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Alkali Disease.</td>
<td>Unknown.</td>
<td>1 ext.</td>
<td>2 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 slt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Back and Loin Disease.</td>
<td>Phosphorous deficiency</td>
<td>1 mod.</td>
<td>1 loc.</td>
</tr>
<tr>
<td>No. of Reports</td>
<td>Name of Disease</td>
<td>Apparent Causes</td>
<td>Prevalence</td>
<td>Extent</td>
</tr>
<tr>
<td>---------------</td>
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<td>-----------------</td>
<td>------------</td>
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</tr>
<tr>
<td><strong>Cattle—(Continued).</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>&quot;Creeps&quot; or Degenerative Arthritis</td>
<td>Insufficient minerals in nursing cows on grass only</td>
<td>1 mod.</td>
<td>1 slt.</td>
</tr>
<tr>
<td>1</td>
<td>Red Water (?)</td>
<td>Unknown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Sweet Clover Disease (?)</td>
<td>Eating damaged sweet clover, hay and silage</td>
<td>1 mod.</td>
<td>1 loc.</td>
</tr>
<tr>
<td>1</td>
<td>No Name Disease</td>
<td>Excessive feeding of cottonseed meal</td>
<td>1 mod.</td>
<td>1 gen.</td>
</tr>
<tr>
<td>1</td>
<td>Grand Traverse Disease</td>
<td>Mineral deficiency</td>
<td>1 slt.</td>
<td>1 loc.</td>
</tr>
</tbody>
</table>

| **Swine.** | | | | |
| 11 | Hairlessness and Unbalanced rations and excess of Big Throats | Volcanic deposits in water | 6 mod. | 3 gen. |
| | | Iodine deficiency or imperfect iodine metabolism | 2 slt. | |
| 9 | Rickets | Exclusive feeding of wheat | 7 mod. | 3 loc. |
| | | Lack of salt, calcium, etc. | 2 slt. | 5 gen. |
| | | Cold, damp quarters | | |
| | | Lack of sunlight | | |
| 11 | Posterior Paralysis | Lack of vitamine "A" and calcium | 2 ext. | 5 loc. |
| | | Exclusive corn diet | 5 mod. | 6 gen. |
| | | Advanced pregnancy and recent parturition | 4 slt. | |
| | | Hogs fed on peanuts | | |
| 1 | Bone and Joint Disease | Calcium deficiency or ante-rachitic factor | 1 mod. | 1 gen. |
| 1 | Malnutrition | Unknown | 1 mod. | 1 gen. |
| 2 | Alkali Disease | Unknown | 1 ext. | 2 loc. |

| **Sheep.** | | | | |
| 8 | Goitre or Big Neck | Iodine deficiency | 2 ext. | 5 loc. |
| | | 4 mod. | 3 gen. | |
| | | 2 slt. | | |
| 3 | Ante-parturient Paralysis or Pregnancy Disease | Excess of protein immediately following a diet deficient in protein | 2 ext. | 1 loc. |
| | | Lack or exercise at time of parturition | 1 mod. | 2 gen. |
| | | Possibly toxemia or nutritional | | |
| 2 | Rickets | Mineral deficiency of calcium and phosphorus | 1 mod. | 1 gen. |
| 2 | Alkali Disease | Unknown | 1 ext. | 2 loc. |
| 1 | No Name Disease | Die in corn fields, possibly unbalanced proteins | 1 mod. | 1 gen. |
TWENTY-NINTH ANNUAL MEETING

<table>
<thead>
<tr>
<th>No. of Reports</th>
<th>Name of Disease</th>
<th>Apparent Causes</th>
<th>Prevalence</th>
<th>Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poultry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Leg Weakness</td>
<td>Vitamine &quot;D&quot; deficiency</td>
<td>4 ext.</td>
<td>6 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of green material</td>
<td>5 mod.</td>
<td>7 gen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of ultra-violet light</td>
<td>4 slt.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Direct sunlight deficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Nutritional Roup</td>
<td>Lack of green material and exclusive white corn</td>
<td>2 mod.</td>
<td>2 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of vitamine &quot;B&quot;</td>
<td>5 slt.</td>
<td>5 gen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of vitamines &quot;A&quot; and &quot;C&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Nutritional Disease or Stiff Neck</td>
<td>Excessive protein feed and lack of green material</td>
<td>2 mod.</td>
<td>2 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vitamine &quot;A&quot; deficiency</td>
<td></td>
<td>2 gen.</td>
</tr>
<tr>
<td>6</td>
<td>Certain Paralyses</td>
<td>Lack of vitamines &quot;A,&quot; &quot;C&quot; and &quot;D&quot;</td>
<td>2 ext.</td>
<td>5 gen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Polynueritis</td>
<td>2 mod.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of green material and exclusive grain rations</td>
<td>1 slt.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vitamine &quot;B&quot; deficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Goitre</td>
<td>Iodine deficiency</td>
<td>2 ext.</td>
<td>2 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 slt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Rickets</td>
<td>Faulty mineral metabolism</td>
<td>1 mod.</td>
<td>1 gen.</td>
</tr>
<tr>
<td>2</td>
<td>Alkali Disease</td>
<td>Unknown</td>
<td>1 ext.</td>
<td>2 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 slt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Malnutrition</td>
<td>Not exactly known</td>
<td>2 mod.</td>
<td>2 gen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grave nutritional disturbances</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>House Pets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Rickets (Dog)</td>
<td>Lack of calcium</td>
<td>4 slt.</td>
<td>2 loc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of calcium and vitamines</td>
<td>1 mod.</td>
<td>3 gen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of phosphorus and sunlight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Simple Goitre</td>
<td>Iodine deficiency</td>
<td>2 slt.</td>
<td>2 gen.</td>
</tr>
<tr>
<td>(Dog)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Black Tongue</td>
<td>Unknown</td>
<td>2 slt.</td>
<td>2 gen.</td>
</tr>
<tr>
<td>(Dog)</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Of course, it is not to be understood that this survey is anywhere complete and conclusive. However, we believe it is a pretty good indication of the "nutritional disease pulse" of the country. In a compilation of this nature it gives opportunity for one to learn what his fellowmen experience, think and believe and to make comparative studies of same, whether he be practitioner, sanitarian or experimenter.

Let us now attempt a brief analysis of the replies to the questionnaire, with the idea of determining if any dependable "guide posts" or "building stones" can be established.

First, it is quite evident that the hairless pig condition, with its thyroid gland involvement, is a problem only of the northern states, the southern limits of which approximates a line parallel with the northern boundary of the state of Iowa. All replies tending towards an
unanimous opinion that the cause is lack of iodine in the food, water or soil, or failure of the dams to adequately assimilate and metabolize the available iodine.

It can also be deduced that leg weakness in young chicks is quite general in its distribution, and that no particular sections of the United States are entirely free from this disease. While there appears to be a multiplicity of opinions as to the cause of this malady, the efficient preventative and remedial measures pertaining thereto can be quite satisfactorily supplied by furnishing the young chicks with foods containing an adequate quantity of vitamine "D," plenty of green material and exposure to a sufficient amount of direct sunlight.

Another disease that appears to be country-wide in extent is that of rachitis. The questionnaire indicates that it is a problem in all classes of domestic live stock and is quite prevalent and general in distribution.

The so-called "bone and joint disease" reported by some authorities is recognized by many as a form of rachitis. There are possibly other conditions with rachitic characteristics. Therefore, it might be more explicit to refer to them as the "rickets complex" until further studies determine more definitely if they are separate entities or simply different forms of a common disease. The causes disclosed in the questionnaire for these conditions, such as lack of sufficient sunlight, deficiency of calcium and phosphorous, extremely narrow rations such as the wheat plant, and damp, dark living quarters, point strongly towards a common origin, and that they are only different manifestations of one and the same disease.

When we consider these diseases from a sectional standpoint, not all parts of the country seem to be affected. With the possible exception of leg weakness in young poults, and an occasional case of rickets, the entire New England group and some of the Atlantic seaboard states are practically free from these disorders; all agencies reporting that they are not a problem or at least they are not brought to their attention.

Particularly noticeable is the large number and varying kinds of paralyses or semi-paralytic conditions existing in practically all classes of live stock and listed under nutritional and deficiency disorders. Accordingly a wide range of causes are given for same; too numerous to be noted in detail, but in a general way can be grouped under lack of vitamins "A," "B" and "C," insufficient green material, deficiency in calcium, exclusive grain diets, particularly white corn, heavy protein feeds in pregnant ewes, and exclusive peanut feeding to hogs.

Equally interesting and outstanding is the extremely small and narrow limitations of some diseases suspected to be of nutritional origin. Here may be mentioned such conditions as "alkali disease" and "back and loin disease." In so far as can be determined, the so-called alkali disease affects all classes of live stock including poultry, but is reported only from South Dakota, and is evidently confined principally to the country adjacent to the Missouri River. Both authorities reporting from this state believe that the term alkali disease is a mis-
nomer, but are inclined to class it among the nutritional or deficiency diseases. Evidently but little is definitely known about this mysterious disease as no suggestions are offered as to its prevention or remedial measures given for its relief, except keeping live stock off the areas involved.

From the lone state of Texas comes the report of "back and loin disease," and that it is confined to a comparatively limited area along the Gulf seacoast. It will be recalled that about two years ago when Sir Arnold Theiler, Director of Veterinary Education and Research, Union of South Africa, visited America he found many things in common with this disease and the so-called Lamziekte of the South African countries. Another local cattle disease of Texas, commonly known as "creeps," was also recognized by Dr. Theiler as being identical in most respects with the Styfziekte disease of the Union of South Africa. This leaves but little doubt but that they belong in the nutritional or deficiency group of diseases.

Let us next see what can be interpreted from the questionnaire in the way of mineral requirements for farm animals. From a superficial observation of the data presented, one may erroneously conclude that the reports indicate a "haven" for the advocates and propagandists for promiscuous mineral administration. On the contrary the very opposite is true. A more careful scrutiny of all the disease conditions reported, shows that only three minerals are mentioned. They are calcium and phosphorous for more general use and iodine for special administration for hairless pigs and allied conditions in other species of animals.

It is quite gratifying to know that this verdict, arrived at by a large band of competent veterinarians, entrusted with the regulation and investigation of animal diseases, throughout the country is firmly substantiated by the Sub-Committee on Animal Nutrition of the National Research Council. This committee has given a most thorough and instructive discussion of the subject under the title of "Mineral Nutrient Requirements of Farm Animals," issued in Circular Series of the National Research Council No. 60, under date of December, 1924. Your Committee strongly urges that every member of this association secure a copy of same and avail himself of an opportunity to read the most comprehensive and scientific discussion of this subject that has ever been issued.

Relative to the possible involvement of certain geologic formations and agronomic and meteorological conditions being contributing factors, the replies were quite limited and expressed with considerable caution. The western mountainous districts seem to favor mountain snow waters as the chief cause of goitre troubles, which of course would not apply to many lower regions. Practically all are unanimous in their belief that "leg-weakness" in late winter and early spring is mainly attributable to lack of sunshine and green material which are at a low ebb during those seasons. Again, most all experience more paralytic conditions in winter and early spring, but some refuse to attach any
seasonal significance to this problem. Many give considerable credence to the possibility of greatly leaching the soils of their lime and phosphorous form consistent rains, and likewise failure to put into solution these same minerals in protracted droughty seasons, in sufficient quantities to furnish the necessary quota of same to grains and grasses to make them dependable foods for live stock.

Lastly, we come to the question of nutritional and deficiency projects under investigation throughout the country and who are conducting the studies. This part of the questionnaire brings to light the intelligence that approximately seventy-five per cent of these researches are being pursued by chemists, designated as biochemists, nutritional chemists, animal chemists, nutritional specialists and animal and dairy husbandmen without the active participation or consultation of comparative physiologists, pathologists or sanitarians. Only five projects are being carried out by the latter group alone, while about an equal number are primarily projects of the former group with consultation with the latter.

It is acknowledged at the outset that certain nutritional studies can be carried to a satisfactory conclusion by chemists and nutrition specialists. On the other hand some can be covered quite efficiently by comparative pathologists and similarly trained men. However, as health and disease are so intimately connected with nutrition, we believe a very large proportion of such projects calls for either a man highly trained in chemistry, comparative physiology and pathology, or for cooperative work by individual specialists trained in these respective lines. The former is almost out of the question as we do not often meet with such a rare combination of training in one individual. The latter seems to be the more plausible plan. The gross and microscopic pathology of these diseases are indispensable and should not be overlooked.

The more recent investigations of berberi, xerophthalmia, rickets, scurvy and other deficiencies and avitaminoses in human as well as rickets, polyneuritis, bone and joint disease and back and loin disease and many other conditions in experimental and domesticated animals, only bear witness to the trend of events, and the significance of detailed pathological studies in connection with most nutritional investigations.

Therefore, in view of this most important factor that is being neglected or entirely omitted in many present day researches along these lines, your Committee is of the opinion that it would be highly advisable if many more of our qualified comparative pathologists, could and would become identified with all nutritional and deficiency projects that may have a bearing on the health of our domestic live stock.

PRESIDENT McNEIL: We will have a short period of time for discussion of this report and the address by Dr. Steenbock.

DR. I. D. WILSON: I should like to ask Dr. Steenbock whether or not he has noticed any difference in the length of time that it has
been necessary to expose these animals to the ultra-violet rays as regards color, whether or not it is necessary to expose a black animal longer than a white one.

DR. STEENBOCK: We haven’t carried out any experiments on the relation of the color of the animal to the intensity of the light required but that is generally recognized as a very important factor in human medicine. Rickets, as you may probably know, is a very common malady among negroes and that has been very definitely correlated with the absorption of the ultra-violet light by the pigment of the skin preventing it from penetrating to a sufficient depth to activate the compounds found in it. Ultra-violet light is not able to penetrate any material of common occurrence—not even glass—except water and quartz. It is well recognized that animal tissues cannot be penetrated to any greater depth than a fraction of a millimeter. The fact that light acting upon the skin does act in an antirachitic capacity points to the fact that the skin acts as an internal secreting organ. The skin is very rich in compounds which can be activated and these are then subsequently secreted into the blood stream.

DR. C. P. FITCH: I noticed one of the conditions that Dr. Schalk reported as occurring on the questionnaire was rickets in cattle in England and the evidence which was given for the presence of this disease was in my judgment at least insufficient. I would like to ask Dr. Steenbock if he has had any experience with this condition in this group of animals.

DR. STEENBOCK: When I start to answer questions about rickets I immediately get into difficulty, for the simple reason that there are few individuals who agree as to what rickets actually is. Some base their conception of rickets upon clinical observations; others upon the histological features; and others again upon Roentgenographic pictures. Rickets as we look upon it is a condition of affairs resulting from the improper mineralization of the bones in the young growing animal. It undoubtedly also produces changes in other tissues of the body but at present we recognize distinctly the production of a wide metaphysis free from mineral salts. This represents a specific histological picture in the young; but as far as the deposition of mineral salts is concerned, we have a very comparable condition occurring in the adult. The lesions produced in the adult are designated sometimes as osteoporosis and sometimes as osteomalacia, but unfortunately there is no unanimity of opinion with regard to the basis of exact differentiation of these various lesions.

We did not observe rickets in our animals, but I think there is absolutely no question but that under proper conditions rickets can be produced in the cow or calf. It probably has not been observed because it has not been studied sufficiently, and undoubtedly the exposure of the animals to sunlight at one time or another may have interfered with the production of a well defined pathological picture. I don’t believe that there is any question but that rickets can be produced in all of our mammals. Years ago we used to think that we couldn’t
produce rickets in a rat but now we produce it with great regularity
and, in fact, have found that the rat is one of our best animals for the
experimental study of rickets.

PRESIDENT McNEIL: If there is no further discussion, we will
proceed with the program. Diseases of Swine. The first gentleman
on the program under this heading is Dr. L. Van Ess of the University
of Nebraska, Lincoln, Nebraska, who will discuss, "Sanitation and Con-
trol in Swine Diseases." Dr. Van Ess. (Applause.)

SANITATION IN THE CONTROL OF SWINE DISEASES.

Dr. L. Van Ess, Lincoln, Nebraska.

In view of the fact that it is only three years since the speaker had
the privilege of presenting the subject of sanitation in connection with
swine growing to this organization, it does not seem necessary to dwell
again on this subject at great length.

In the previous discussion, attention was called to the great mor-
tality of young pigs in certain sections of the country due to diseases
which were designated as "filth born." It was pointed out that polluted
soil played a very important part in the transmission of those diseases
and that the abandonment of old hog lots and the rotation of pastures,
as already prescribed by our lamented friend Ransom in connection with
certain worm troubles, are prophylactic measures of the greatest im-
portance with reference to the diseases mentioned. The importance of
a clean water supply and sanitary feeding methods was also emphasized.
None of those details requires to be repeated on this occasion.

It may be fitting, however, to again view the importance of sanitary
management of swine in the light of more recently acquired knowledge
and impressions. For so far as actual knowledge is concerned, there
can be no doubt of the great damage done to young pigs by intestinal
diseases associated with paratyphoid or suipestifer infections.

This type of pig diseases along with so-called "bull nose" and
intestinal helminthiases are most readily prevented by means of sanitary
methods which assure a clean uncontaminated soil and an unpolluted
water and food supply.

On many of the nearly 200 Nebraska farms where a more or less
complete system of sanitary management is being carried out the results
were often striking, and in practically all cases the method enabled the
farmer to raise a thrifty, healthy pig crop, while during the years im-
mediately preceding, when the old haphazard methods prevailed, his
death losses were great, and his surviving pigs were commonly runty
and unprofitable. It appears also that even on farms where a recognized
disease problem had not yet presented itself, the pigs raised under sani-
tary control are apt to be more vigorous and more profitable to the
owner than the ones which had grown up under the archaic conditions
of former years.

The damage done by intestinal worms must, of course, be granted.
This can also be effectively prevented by the sanitary practices to which
reference has already been made. The pig ascarid, however, presents another aspect which gives it a certain sanitary importance, paradoxical as the statement may seem. The statement refers particularly to the fact that the ascarid of the pig may be regarded as a valuable gauge to the sanitary fitness of an environment for young pigs.

When pigs or shots are conspicuously wormy, the fact indicates in a most certain manner that something is wrong in a sanitary sense. The indications should be especially valuable to the farmer who may not be in a position to suspect a pig typhoid infection for a long time, and who may have some difficulty to connect this disease and the one he calls "bull-nose" with fecal contaminations of his yards. He, on the other hand, knows worms when he sees them; in fact, they are one of his pet worries and he can more rapidly understand the reason of their being there once the problem is explained to him.

In our observations during the last three years, no evidence was encountered which tended to show that the occurrence of "flu" and hog cholera was prevented by sanitary practices. It may be, however, that in a more indirect manner the hog cholera mortality may be favorably influenced by a more sanitary management of our swine herds. During recent years we have so commonly observed that so-called vaccination breaks frequently occur in herds which show a marked paratyphoid morbidity, and there may be some reason to suspect a connection between those factors and that in a pig affected with any form of pig typhoid; it may be more difficult to establish a solid immunity than in one in a normal state of health. This observation is merely an empirical one, but while awaiting the accumulation of more substantial evidence it may be given weight in a plea for the more general adoption of sanitary practices in the management of swine.

Since the discussion of the subject of sanitation three years ago, we have learned much in regard to the more prolific sources of swine tuberculosis.

The fact that the preponderating number of swine retained on account of tuberculosis obtained their infection through contact with tuberculous poultry flocks, and the further fact that avian tuberculosis is largely soil born makes it obvious that in the control of swine tuberculosis the adoption of sanitary methods of management is destined to play an important part.

Owing to the feeding habits of swine and the alimentary origin of many of their diseases, the pollution of their food and water, and the substances with which the latter comes in contact stands out preeminently as the environmental fault especially to be guarded against. This is the object of what has previously been described as sanitation. At the present time its practice in a large area of the swine growing section has acquired the same importance as anti-hog cholera vaccination. Prompt and intelligent attention to both cannot help but be greatly instrumental in removing a large part of the hog disease incubus which weighs so heavily on many producers.
PRESIDENT McNEIL: Gentlemen, the next number on the program, "Immunization of Young Pigs Against Cholera," will be discussed by Dr. M. Dorset and S. S. Buckley, Bureau of Animal Industry, U. S. D. A., Washington, D. C. Dr. Dorset will present the paper. (Applause.)

THE IMMUNIZATION OF YOUNG PIGS AGAINST HOG CHOLERA.

By M. Dorset and S. S. Buckley.

United States Bureau of Animal Industry, Washington, D. C.

A determination of the ages at which hogs may be successfully immunized against cholera is of the greatest importance to the farmer. However, although this question has been discussed for years, there are records of but few carefully controlled experimental studies of the subject.

Quite a few years ago Dr. Cahill was the first to publish records of an experimental study of this question. He administered the simultaneous inoculation to several thousand sucking pigs and reported that later about 75 per cent of them were found to be susceptible to cholera. On the other hand, Niles and Rietz, using a much smaller number of pigs it is true, reported that after the immunization of 177 sucking pigs, exposed to cholera from 5 to 9 months later, all were found to be completely immune against the disease. Others have touched upon this subject at various times but we mention these two instances of experimental work merely to show what a wide divergence of opinion has been expressed by qualified men.

A little consideration is sufficient to show that the immunization of pigs before weaning has much to recommend it, provided, of course, the immaturity of the sucking pigs is not a bar to the acquirement of a permanent and lasting immunity.

The first and foremost advantage of treating young sucking pigs appears to be the cheapness of the process. There can be little doubt that the amount of serum required for suckling would not be more than half of that which is now used for weaned shotes. There are other advantages, such as the protection of the pigs during the sucking period as well as after weaning; the greater ease of handling the small animals, and also the possibility that the sucklings might not suffer the loss in condition which no doubt takes place almost always after the simultaneous inoculation of shotes and older hogs which are almost universally placed on reduced rations for two or three weeks after treatment. If this loss of condition did not occur in the sucking pigs we might expect that they could be ready for market two or three weeks earlier or that they would be of a greater weight at marketing time. For spring pigs, early marketing is generally very desirable as the market frequently is going down with the heavy runs and anything that will tend to help getting them to market earlier is of value.

These important considerations, taken together with the very conflicting statements found in the literature, convinced us that the question of the advisability of vaccination of sucklings should be settled
one way or another. As a result of Dr. Mohler's active interest in this question, and of a very hearty cooperation between the Animal Husbandry and the Biochemic Divisions of the Bureau of Animal Industry, we have been afforded the opportunity of studying the effect of sucking pig immunization under practical farm conditions, and yet with the most rigid scientific control, for a period covering about five years. We feel that we are especially indebted to Mr. E. Z. Russell, who is in charge of the Swine Husbandry Investigations, of the Division of Animal Husbandry. His advice and criticisms have been of the greatest value, and his willingness to permit the use of his experimental pigs for this immunization work has made it possible to procure the data which we have to present to you today.

The Animal Husbandry Division controls six different farms upon which our experimental work has been done. One of these has been located at Beltsville, Md., near Washington; another at McNeill, Miss.; a third at Jeanerette, La.; a fourth at Newell, S. D.; a fifth at Ardmore, S. D., and a sixth at Huntley, Mont. As stated already, our experience covers a period of five years. For the most part the pigs were from immune sows and included representatives of six different breeds—Berkshires, Durocs, Chester Whites, Poland Chinas, Hampshires and Tamworths, together with some nondescript pigs known as Piney Wood Rooters. The work was begun at the Beltsville, Md., farm in 1921. On the other farms it began in 1923. The age of the pigs at the time of treatment has varied from one day to a little more than nine weeks. Thirty per cent of all the pigs immunized were less than three weeks of age at the time of immunization. The method of immunization has been to inject the serum into the axillary space and the virus into the flank. The dose of serum and virus during the course of the experiments has been varied to some extent, a question which we will discuss later. After immunization no change whatever was made in the feed of the pigs or of the sows. The time elapsing between immunization and exposure to cholera has varied from three to seven and three-fourths months, and the method of exposure in order to determine whether or not the pigs were immune after such a lapse of time has been to inject each of them subcutaneously with 3 cc. of hog cholera virus which was proven to be of good virulence by the injection of non-immune pigs with the same dose. The controls in all cases contracted hog cholera as a result of such injection.

There were three questions which we were particularly interested in deciding, namely:

1. Does the simultaneous inoculation of the sucking pigs result in vaccination breaks; that is, sickness following the treatment and as the direct result of the treatment?

2. Is the growth of the pigs interfered with by the treatment; and

3. Are the pigs rendered immune by the treatment? By this we mean, of course, are they given a lasting immunity?

The first question is easily answered. We have given the simultaneous inoculation to 3,187 sucking pigs. Of these, not a single pig has been lost after inoculation from cholera.
At the Beltsville farm it is the regular practice to weigh all pigs at birth and weekly thereafter until they are weaned. This afforded an opportunity to secure data to answer our second question. The accompanying graph was prepared by arranging the Beltsville pigs, 1,715 in all, in age groups; that is, the first group includes pigs less than one week old when immunized. The second, less than two weeks old; the third, less than three weeks old; the fourth, less than four, and so on. The final group represents pigs nine to ten weeks old. As you may see, there were 169 pigs less than one week old, 273 less than two weeks old, 238 less than three weeks old, 93 less than four weeks old, 110 less than five weeks, and so on. The heavy vertical line in the center of the graph indicates the time of simultaneous inoculation. The rate of growth can be traced prior to inoculation and after inoculation. As you will see, these growth lines are remarkably similar. The group of pigs immunized when nine to ten weeks old is essentially a control group, and indeed the group next to it between eight and nine weeks old may be regarded in the same light. It may be seen that the groups of pigs immunized when less than one or two weeks old have essentially the same growth curves as the groups immunized at eight or nine weeks of age; it should be observed that the group lines when crossing the immunization line show practically no deviation whatever from normal except in the case of the group of pigs immunized between three and four weeks of age. The variation in this group of pigs was caused by the development of a rather severe outbreak of hog flu in the Beltsville herd during one year when the pigs were vaccinated in large part at about three weeks of age. It will be seen, however, that even this group of pigs, although apparently set back at the time indicated, eventually at the end of the tenth week reached a weight equal to or above the average of the other groups. This graph, covering as it does 1,715 pigs, is sufficient to show quite clearly that simultaneous immunization of these pigs in no way interfered with their growth and development.

It seems, then, in view of the entire lack of losses from cholera as a result of inoculation, and in view of the fact that inoculation in nowise interfered with growth, that these experiments suggest no objection to the simultaneous inoculation of sucking pigs on the ground of injury by the vaccination process.

We may then proceed to a discussion of the more important question as to the immunity derived by the sucking pigs as a result of simultaneous inoculation. In view of the number of farms involved and of the fact that the practice at the different farms varied slightly, it would take far too much time to attempt to discuss the results at each of these farms individually. Instead we shall first show a summary of all of the results at all of the farms, for all of the years of experiment and then discuss in more detail the work at the Beltsville farm near Washington.
Table I.
Summary of Results at All Stations.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number Immunized</th>
<th>Age in days at immunization</th>
<th>Number Exposed</th>
<th>Interval immunization to exposure</th>
<th>Losses</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921-1925</td>
<td>1761</td>
<td>1 to 70 days (3 to 8 weeks)</td>
<td>822</td>
<td>4 to 7¾ mos. (9 sows)</td>
<td>119*</td>
<td>14.4%</td>
</tr>
<tr>
<td>Field Stas.</td>
<td>1426</td>
<td>2 to 62 days</td>
<td>823</td>
<td>2¼ to 4½ mos.</td>
<td>92</td>
<td>11.2%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>3187</td>
<td>1645</td>
<td>211</td>
<td>12.8%</td>
<td></td>
</tr>
<tr>
<td>1924 pigs</td>
<td>2181</td>
<td></td>
<td>980</td>
<td></td>
<td>16</td>
<td>1.6%</td>
</tr>
<tr>
<td>eliminated</td>
<td>1006</td>
<td></td>
<td>666</td>
<td>195</td>
<td>29.3%</td>
<td></td>
</tr>
<tr>
<td>exclusively</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As may be seen from Table I, a total of 3,187 pigs have been immunized as sucklings. Of these it was possible to expose later by virus injection 1,645. The interval between immunization and exposure varied from three to seven and three-fourths months. For the most part the length of time was five or six months. Of the 1,645 pigs exposed by injection with hog cholera virus, we have lost from cholera 211, or 12.5 per cent. Of these total losses, 195 occurred among the pigs immunized in 1924. And only 16 among those immunized in other years. The percentage loss from virus injection in 1924 was 29.3 per cent. Whereas, in all of the other years combined it was only 1.6 per cent.

In order that we may better discuss the very striking difference in the degree of immunity among the pigs immunized in 1924, and those immunized in the other four years, your attention is asked to the second table. This presents a summary of five years' work at the Beltsville, Md., farm.
Table II.
Results at Beltsville Farm.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number immunized</th>
<th>Age in days at immunization</th>
<th>Number exposed</th>
<th>Interval immunization to exposure</th>
<th>Losses</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921</td>
<td>66</td>
<td>3 to 64 days</td>
<td>7</td>
<td>4 months</td>
<td>2*</td>
<td>*</td>
</tr>
<tr>
<td>1922</td>
<td>369</td>
<td>4 to 70 days</td>
<td>65</td>
<td>4 to 7 1/2 mos.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1923</td>
<td>519</td>
<td>1 to 62 days</td>
<td>415</td>
<td>4 to 6 mos.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(3 to 8 weeks)</td>
<td>(9 sows)</td>
<td>(12 to 16 mos.)</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1924</td>
<td>527</td>
<td>3 to 41 days</td>
<td>237</td>
<td>4 to 6 1/2 mos.</td>
<td>117</td>
<td>49.4%</td>
</tr>
<tr>
<td>1925</td>
<td>280</td>
<td>3 to 41 days</td>
<td>98</td>
<td>5 to 7 1/2 mos.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>1761</td>
<td>822</td>
<td>119*</td>
<td></td>
<td>14.4%</td>
<td></td>
</tr>
</tbody>
</table>

1924 pigs eliminated 1234

Controls used to check exposure virus.

As may be seen, the work at this farm began in 1921 with the simultaneous inoculation of 66 pigs and has continued yearly on an extensive scale since that time. The age of the pigs, when given the protective inoculation, varied from one to 70 days. Unfortunately, in 1921 the Animal Husbandry Division could spare us but seven pigs to be used for testing immunity after inoculation, and these seven pigs were culls and runts which at the time of the immunity test were in extremely poor condition. In fact, although eight were originally sent to us by wagon from the Beltsville farm for test, one of the number died in the wagon on the way to be tested. Of the seven remaining pigs, two were almost in extremis when they reached our testing pens. Notwithstanding their condition, they were injected with virus, as were the remaining five. The virus was not sufficient to save the two pigs just referred to. They died, and so we have charged them as deaths after testing, although there is no question in our minds but that these pigs did not die as a result of the inoculation of hog cholera virus. Of the pigs immunized in the year 1922, 65 were made available to us for the purpose of testing their immunity, and as you will see, all remained well after being injected with hog cholera virus from four to seven months after having been given the simultaneous inoculation. In 1923, 415 pigs were made available for immunity tests four to six months after inoculation. Of these, none died following the virus injection. Up to this point, then, we had practically a perfect score. In 1924 we exposed, from four to six and one-half months after immunization, 237 pigs, of which 117, or 49.4 per cent, contracted cholera as a result of the virus injection. In 1925, the spring of this year, there were immunized 280 pigs, of which 98 already have been injected with 3 cc. of virus subcutaneously, 5 to
7 months after the date of immunization. All of these pigs have remained well.

It should be remembered that at every period when the immunity of these inoculated pigs was tested by virus injection, the same virus was injected into non-immune pigs as a control on the virulence of the virus. Never less than three, and at times as many as 10 such controls, were used. In every single case the controls have contracted cholera.

It is evident, then, that the immunization of sucking pigs has yielded all that could be desired in the way of a lasting immunity in every one of the five years except 1924. It is great importance to consider closely the results in 1924 as compared with other years. Were the unsatisfactory 1924 results due to the age of the pigs treated or to some other factor?

**TABLE III.**
Comparison of 1924 and 1925 Results, Beltsville Farm.

**1924**

<table>
<thead>
<tr>
<th>Number exposed</th>
<th>Age in days at immunization</th>
<th>Dosage immunization</th>
<th>Interval immunization to exposure</th>
<th>Losses</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>94</td>
<td>6 to 27 days</td>
<td>V - 10 S</td>
<td>4 to 6½ mos.</td>
<td>17</td>
<td>18.1%</td>
</tr>
<tr>
<td>67</td>
<td>30 to 53 days</td>
<td>Varied doses</td>
<td>4% mos.</td>
<td>54</td>
<td>80.6%</td>
</tr>
<tr>
<td>76</td>
<td>54 to 75 days</td>
<td>Varied doses</td>
<td>4% mos.</td>
<td>46</td>
<td>60.5%</td>
</tr>
<tr>
<td><strong>237</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>117</strong></td>
<td><strong>49.4%</strong></td>
</tr>
</tbody>
</table>

**Beltsville Farm**

**1925**

<table>
<thead>
<tr>
<th>Number exposed</th>
<th>Age in days at immunization</th>
<th>Dosage immunization</th>
<th>Interval immunization to exposure</th>
<th>Losses</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>4 to 21 days</td>
<td>Varied doses</td>
<td>5 to 6 mos.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>48</td>
<td>3 to 16 days</td>
<td>Varied doses</td>
<td>6 to 7½ mos.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>30</td>
<td>17 to 31 days</td>
<td>Varied doses</td>
<td>6 to 7½ mos.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>98</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
</tr>
</tbody>
</table>

Table No. III gives, in some detail, the inoculation and exposure history of the pigs tested for immunity in 1924 and 1925 at Beltsville. As may be seen from the table, in 1924 94 pigs from 6 to 27 days of age were given the simultaneous inoculation. These pigs were exposed by injecting hog cholera virus 4 to 6½ months after the pigs had been immunized. Of the total number, 17 were lost, or 18.1 per cent. Of
67 pigs 30 to 53 days old, exposed after 4½ months, 80.6 per cent were lost and of 76 from 7 to 10 weeks of age at the time of immunization, 60.5 per cent were lost as a result of virus injection 4½ months later. In 1925, of 98 pigs immunized and tested, none were lost. As the table shows, these pigs were from 3 to 31 days old when immunized. They were on the average much younger at the time of immunization than the pigs of the 1924 lot, and none of them were as much as 5 weeks of age. There is certainly nothing in these figures to indicate that age was a controlling factor in so far as susceptibility to disease is concerned. If we turn to other years in considering the effect of age, the story is the same, for in 1921, 1922 and 1923 very young pigs as well as considerably older pigs were given the simultaneous inoculation and when later tested by virus injection were all found to be immune, as explained previously.

It should be mentioned at this time that beginning in 1924 we began to change the dosage of serum and virus. Prior to that time we did not use doses of serum less than 20 cc. and in the case of very large pigs at times as much as 30 cc. was employed. At the same time the amount of virus per pig varied from ½ of a cubic centimeter to 2 cubic centimeters. In 1924 we considered it advisable to study the effect of smaller doses of serum. The dose of serum in that year was therefore varied from 10 to 20 cc. Where possible single litters were treated with varying doses, some pigs being given 1 cc. of virus and 10 cc. of serum, others 1 cc. and 20 of serum, and others 4 cc. of virus with 10 cc. of serum, and similar variations. The idea naturally suggested itself that perhaps this change in dosage might in some way have been responsible for the failure of the 1924 pigs to receive lasting immunity. However, it was not possible after a very careful study of the dosage and of the results of immunity tests, in any way to correlate the losses with the dose of either serum or virus. Furthermore, in order to obtain more light on the effect of the dose of serum and virus, we proceeded in 1925 to apply the same system of dosage as was used in 1924, that is, from 1 to 4 cc. of virus was administered with 10 cc. of serum and from 1 to 4 cc. of virus with 20 cc. of serum. In some cases doses of 15 cc. of serum were used. Ninety-eight pigs, some immunized with each of these combinations, have been tested. As was shown by the table, all of these pigs proved to be immune when tested by virus injection. There is, therefore, nothing to indicate that the dosage of serum and virus was responsible for the results in 1924. If the cause of those bad results was not due to the age, was not due to the dosage of serum or virus, which likewise seems out of the question, could the results have been due to the methods of feeding, or to the pigs themselves? As has been stated, these experiments were all carried out on the same farm for 5 years. The method of feeding of the sows and pigs has not been varied to any material extent throughout the experimental period. There is nothing in the feeding history of the sows or the pigs to point to any possible explanation of the 1924 results. Furthermore, the Beltsville Farm pigs themselves were as nearly alike from year to year as it
would be possible to secure. They were all from immune sows and of essentially the same breeds each year. Since the pigs from the immune sows in 1921, 1922, 1923 and 1925 all acquired a firm immunity after simultaneous inoculation, it cannot with reason be suggested that those in 1924 failed to acquire immunity because of the fact that their dams were actively immune. By thus eliminating all of the factors relating to age, dosage, feeding and the pigs themselves, we have left to consider the virus and serum used for immunization. The serum employed in all years was produced at the Bureau's Experimental Farm at Ames, and the virus was obtained from the same source. All of the serum was tested prior to use and found to be fully potent. There seems no way to connect the serum with the 1924 results. The virus was tested each year at or about the time the simultaneous inoculation of the sucking pigs was carried out and in all cases this virus proved to be virulent enough to produce sickness in the inoculated controls, although it appeared that some of the virus test pigs in 1924 did not contract as acute disease as we have been accustomed to observe. Certain possible differences in the quality of the 1924 virus have suggested themselves and are now being investigated but no conclusions are as yet possible. In 1924 the virus was tested at Ames and used for immunization at Beltsville at a somewhat later date. There is, therefore, a possibility that during shipment by mail or subsequently before us this virus was altered in potency. We are without positive proof that the virus was at fault, and yet cannot avoid the impression that the 1924 virus was lacking in some quality not fully understood, but essential to the production of a lasting immunity. Perhaps, when we have learned the true cause and have devised means for preventing breaks in immunity of pigs inoculated during the sucking period, we will have gone a long way toward eliminating any similar occurrences among pigs treated after weaning.

Looking upon these experiments as a whole, they seem to show that sucking pigs from immune sows can be given a lasting immunity; that immaturity is no insuperable bar to the acquirement of such immunity. They show, also, that young pigs at times fail to acquire immunity after simultaneous inoculation. But, as suggested above, we are inclined to attribute such failures to the virus employed for immunization rather than to the immaturity of the pigs.

These experiments confirm our faith in the efficacy of the simultaneous inoculation but to our minds they seem to point clearly to the need for more research with the object of preventing even those relatively rare occurrences, breaks in immunity of immunized pigs.

The problem thus presented is difficult and therefore attractive, as a field for investigation. A solution of it will be of inestimable value to the farming interests of the country. We shall therefore continue our experimental studies, in which we hope the various State research organizations may join.
PRESIDENT McNEIL: The next subject, "Studies of Enteritis in Swine," will be presented by Dr. Charles Murray, Iowa State College, Ames, Iowa. (Applause.)

DR. CHARLES MURRAY: I am sure you will appreciate that it isn't possible to incorporate in a paper that could be given here, without that paper becoming tedious, the results of any extensive investigational work. I have abbreviated my work as much as possible to avoid embarrassing you. I may say that publication of the complete work will soon be forthcoming. I don't know whether I am presenting anything new or not, but I do feel that particularly the work that has been done in the pathology of this disease is well worth while.

(Dr. Charles Murray read his paper.) (Applause.)

STUDIES OF ENTERITIS IN SWINE.

Chas. Murray, H. E. Biester, Paul Purwin, S. H. McNutt,
Department of Veterinary Investigation, Ames, Iowa.

Necrotic enteritis of swine is widespread in Iowa. There is no section of the state but has reported its occurrences. It appears as enzootic rather than as epizootic. In some herds, particularly those made up largely of stocker hogs fed in yards that have been long used for feeding cattle followed by hogs, the disease may show a heavy mortality. These yards usually present a very unsanitary aspect and particularly favor wide spread of the infection. In breeding herds the disease makes its appearance after pigs are removed from the farrowing sheds where exposure may have occurred or following their exposure in hog lots long used without rotation. The disease can hardly be considered a seasonal one, although its occurrence is commonest in spring farrowed litters. We have observed it in the coldest winter weather as well as in each of the other seasons. It is of commonest occurrence in shoats, though we have encountered severe outbreaks in breeding gilts and to a lesser degree in aged breeding stock.

In field cases the disease usually manifests a chronic character, though in recent years we have observed some outbreaks of a decidedly acute nature, deaths occurring within a week's time of appearance of symptoms. The typical field cases show extreme emaciation, sunken abdomen, rough coat and profuse diarrhea. Experimentally induced cases are much more acute, possibly due to the more severe exposure from feeding massive doses of the causative organism.

Very few of the induced cases run into a chronic form, mortality usually occurring early in nearly 100 per cent of the animals infected. Marked regularity of occurrence of the disease from feeding cultures has been our experience and the data accumulated up to the present is from about 75 head of such cases. We have encountered not to exceed 10 per cent escapes of the animals fed and not one of these but has shown severe reaction following its exposure.

Success in transmitting the disease has occurred for us only by feeding. Introduction of the causative agent other than per os results
in stimulating the formation of agglutinins but never in production of the typical disease.

As fit subjects for experimental production of the disease healthy pigs were purchased from farms with a clean history so far as enteritis is concerned. These pigs were held for a considerable time before exposure and several fecal examinations were made to determine absence of blood from the same. The occult blood test* constituted the technique used in this test. The least trace of blood is made apparent by a greenish blue color resulting from admixture of a minute quantity of feces and the test solution. Some pigs from the lot to be used were held over for long feeding periods and served as checks to demonstrate the absence of natural infection.

In determining the etiology of necrotic enteritis, four types of organisms were considered of sufficient significance to merit careful study. These have either been assigned by other workers as the cause of the condition or were observed by us to be of sufficiently regular occurrence in histo-pathological sections to warrant their consideration. They include Trichomonas suis, Balantidium coli, Actinomyces necrophorus, and organisms of the paratyphoid-enteritidis group. Trichomonas suis was found in microscopic examination of feces in some cases but not in others. Balantidium coli also was demonstrated in feces and in some cases in tissues in great numbers, mostly in the upper regions of the caseated membrane, in a few in the deeper layers. In one case they were demonstrated beneath the muscularis mucosa, several above this and several more within the solitary lymph nodes. These, however, were exceptions to the usual findings. Their location and invasive power in the pig do not compare with those of the organism as demonstrated in sections from human intestines from cases of balantidium colitis. In view of the fact that the two protozoa named above did not occur in over 50 per cent of the subjects studied and that enteritis was regularly produced by feeding cultures of a specific bacterium, it is our opinion the protozoan forms can be eliminated as specific factors in this disease. Since a number of times balantidia were observed to contain bacilli within their bodies it would seem that further study of them may profitably be made and that such might possibly show them to play a part in infection as mechanical carriers at least. The Actinomyces necrophorus, which has frequently been referred to as the cause of necrotic enteritis, is in our opinion of secondary significance in the production of lesions following invasion of organs by the primary agent, with production of injury and subsequent exudation and necrosis of the epithelium of the mucosa and underlying tissues favoring the anaerobic conditions necessary for its growth and activity. In experimentally induced cases destroyed during the early stages of the disease, the zone of caseation just having been formed, a nearly pure culture of the primary agent will be found with but few of the necrophorous-like organisms in short chains at the edge of the tissue still retaining life or in the early stages of retrogression. In subjects running a longer course with heavy exudate or caseated membrane furnishing suitable anaerobic

*Benzidene (knife tip full); glacial acetic, 2 mils; hydrogen peroxide, 20 drops.
conditions the necrophorous-like organisms were present in heavy masses in the depths of the mucosa with the primary agent predominating in the upper and middle portions of the exudate or membrane. In general the following picture is typical in the three zones of lesions arbitrarily established.

A. The primary agent occurring exclusively or greatly predominating in the upper parts of caseation necrosis.

B. Necrophorous-like organisms and diminishing numbers of the primary agent in the intermediate part of caseation.

C. Dense masses of necrophorous-like organisms in the base of caseation and the karyorrhetic zone as well as in the upper portion of the leucocytic band. In those places where caseation was not advanced and of shorter duration necrophorous-like organisms not so numerous and in shorter chains.

The organism with which we have so consistently produced the typical disease by feeding falis under Jordan's classification of the paratyphoid-enteritidis group as a B. suipestifer strain. In fermentation reactions it is identical. Serologically it corresponds also with eight strains we have received from the following reliable sources, viz.: Dorset, Washington; Jordan, Chicago; Theobald Smith, Princeton; M. Fischer, Prag and Rosenthal. Detailed study of this organism is to be presented in a forthcoming paper.

Temperatures taken on the artificially induced cases show considerable variation, depending upon the stage of the disease, ranging from subnormal to 107° F. As a rule temperature reactions appear within 24 hours after feeding, rarely reaching as high as 105° F. in that time. A gradual rise of 1 to 1½° each 24 hours generally occurs, reaching a maximum usually about the 72nd to 96th hours. A gradual decline from this usually follows, with occasional cases showing a second rise from the sixth or seventh day with a second curve closely paralleling the first. The urine analysis shows an acid reaction, with indican and sugar usually and albumin always negative. Occult blood and bile are nearly always negative. Blood examination shows no radical hematological deviation, except a slight decrease in percentage of hemoglobin, a slight increase in white cells, and a somewhat constant slight increase in mononuclear leucocytes. In this latter respect there is some similarity to human typhoid which shows an increase in ungranulated mononuclear cells after the third week. As in human typhoid, too, there is sometimes high hemoglobin and red counts during the first few days after infection, possibly due to rapid elimination of body fluids through diarrhea. Necrotic lesions in the mouth or on the lips were absent in all except three case studied. Tonsilar changes, except in one case, showed no relation to the bacterial agents producing the intestinal changes, as demonstrated by cultures and sections made from these glands; in fact, the tonsilar changes showed little variation from those encountered in routine autopsy examinations of cases of varied causes.
The abdominal and pelvic cavities usually contained varying quantities of a clear fluid and the serosa presented a gelatinous appearance. Only in intensive cases where massive doses of the organism were fed and in a few severe field cases was the peritoneal exudate abundant, these also showing petechiae on the gastric and intestinal mucosa.

The intensity of the gastric lesions varied in both field and experimental cases. Changes most commonly noted, though not uniformly all present in a single case, were edema, hyperemia, hemorrhage, leucocytic infiltration, heavy catarrhal muco-purulent or fibrinous exudates, ulcerations and in some cases, necrosis. The gastric changes were seldom as advanced as those found in the intestines.

The general pathological changes in the intestines consist of edema, leucocytic infiltration, heavy mucopurulent or croupous exudate and focal or diffuse necrosis. The intensity of the whole process increases toward the colon, generally subsiding from here to the rectum. Necrosis is seldom found in the duodenum and in the few cases in which it did appear was microscopic and of a karyorrhectic nature. In the jejunum karyorrhexis is more advanced and caseation more frequent. The ileum shows still more advanced lesions, which increase in intensity through the cecum and to the middle of the large colon. From here there is a gradual recession of changes until the diphtheritic membrane entirely disappears or is in the form of pin head sized foci with a hemorrhagic mucous membrane. The first appearance of pathological changes is always in the cecum. The general picture of typical intestinal changes shows three definite zones of reaction. The first is a zone of caseation necrosis, varying in thickness up to 3 m.m. This merges into a second zone of karyorrhexis, varying in intensity in different subjects, frequently extending far into the submucosa and in a number of cases involving the inner circular muscle. Beneath this second zone is a dense zone of leucocytosis, involving the balance of the gut.

In a number of induced and a few field cases it was observed that when pigs were destroyed shortly after the onset of diarrhea the middle portion of the large colon and in some instances the cecum showed discs or plates of somewhat firm intestinal contents adherent to the mucosa, held there by means of a turbid muco-purulent exudate and leaving a shallow depression when forcibly removed. In the underlying crypts were found dense masses of necrophorous-like organisms. The epithelium in these crypts showed advanced changes.

The changes in the small colon fall between two extremes, an indifferent catarrhal colitis and an advanced caseated necrosis, resembling the lesions found in the cecum or large colon. Swelling, caseation and infiltration producing an intestine often compared to a garden hose was sometimes encountered. Most frequently, however, the lesions consisted of hemorrhage or congestion of the mucosa which was studded with foci of caseation necrosis in various sizes, shapes and degrees of intensity.

The changes occurring in the liver are those usually accompanying a general toxic or septic condition.

The alterations in the lymph glands of the stomach, intestines and liver were in general similar, although the severity of the lesions may
vary greatly in different groups of glands in the same case, widest variations occurring in the gastric and hepatic glands. Advanced lesions were found more consistently in the mesenteric glands of the ileum. Grossly the glands were swollen to about twice their normal size and were markedly congested. The cut surface bulged and a turbid blood stained fluid flowed from same. A mottled gray and yellow appearance of this surface suggested foci of necrosis. Microscopic examination revealed marked congestion and advanced inflammatory edema, diffuse and dense focal leucocytosis with numerous patches of karyorrhexis and early caseation.

In a number of cases of natural infection it was found impossible to make use of all animals secured for study. The ones not used were placed in cement floored pens that were washed frequently. Many of the subjects thus handled showed signs of improvement or arrest of the disease or recovery without medication. Cases far advanced continued to retrogress and finally died. Those in which the processes were arrested remained potbellied, stunted and proved entirely unprofitable. Their feces became free from blood and later autopsy revealed absence of caseation or karyorrhexis, the mucosa showing only a roughened surface, regeneration having occurred.

Efforts to stimulate a protective immunity by bacterins and vaccines have afforded some encouragement. Different lots of pigs have been so treated and then placed on badly infected premises together with equal numbers of untreated pigs. There have been losses in both classes of pigs thus subjected to natural exposure but the percentage of such has been much higher in the case of untreated than in treated ones. One lot of seven pigs were injected intravenously with increasing doses of culture up to 5 mils in August. On November 25 they were fed massive doses of the causative organism which produced a severe reaction within 24 hours with temperatures up to 107°F. Only two of seven showed diarrhea and all but these two were back on feed within 48 hours. The two were sick for 72 hours, after which time diarrhea ceased and they were in apparent good health. Not enough work has as yet been done on immunization to warrant a statement one way or the other.

(Applause.)

PRESIDENT McNEIL: Next on the program is a paper on “Iodine as a Disinfectant Against Nemotode Eggs and Larvae,” by Prof. W. L. Chandler, Michigan State College, Lansing, Michigan. (Applause.)

PROF. W. L. CHANDLER: Mr. Chairman, with your permission I should like to make a little correction in the program. It should be Michigan State College, not the University of Michigan. We are rather proud of our station and we don’t like to have it gobbled up or confused by the State University.
IODINE AS A DISINFECTANT AGAINST NEMATODE EGGS AND LARVAE

By Wallace L. Chandler, Ph. D., Department of Bacteriology, Michigan State College, East Lansing, Michigan.

It is an observation common to all parasitologists that nematode eggs and larvae are extremely resistant to the action of chemical disinfectants. Indeed, it is a usual laboratory practice to use a 5 to 10 per cent formalin solution as a medium in which to incubate and preserve living ascarid eggs. I myself have placed fresh female specimens of the caecum worm of poultry in a 10 per cent solution of potassium dichromate for a period of two weeks and observed the complete development of the larval worms within the eggs in the uterus. These same specimens were then washed in water and transferred to Amman's lactophenol (a preparation consisting of one part phenol crystals, one part lactic acid, one part water and two parts glycerin), and at the end of two weeks I observed active movements of the larval worms within the eggs. I have also placed incubated eggs of the gapeworm of poultry in a 1 per cent sulphuric acid solution in a watch glass and allowed this solution to evaporate to a syrupy consistency. Months later, although the egg shells appeared charred, the larval worms within the eggs were still alive. On the other hand, very weak solutions of free—elemental—iodine (an observation made first by myself in 1920) almost immediately kill nematode eggs, larvae and even adults when brought into direct contact with these.

The peculiar resistance which nematode eggs and larvae exhibit toward the action of the common disinfectants has always discouraged the idea that it would ever be practical to employ disinfection as an aid in the attempt to control intestinal nematode parasites. Control measures have, therefore, been worked out along other lines; and, while some of these measures, particularly those involving the thorough mechanically cleansing of the bodies of animals and their quarters, and pasture rotation, have in many instances given fairly satisfactory results, still no one can doubt but that there are many times when it would be decidedly advantageous to be able to effectively destroy all nematode eggs and larvae on the body of an animal and in its quarters. Apparently, however, the only hope of accomplishing this end lies in the utilization of iodine for this purpose.

Iodine is one of the chemical elements belonging to the halogen family. It does not occur in nature as elemental iodine, but exists in combination with other substances. It occurs in recoverable quantities in certain seaweeds, and, as iodate deposits, in Chili salt peter beds. It is recovered in the solid crystalline form, purified by sublimation and given to commerce in the form of heavy, dark, metallic-looking crystals. These crystals are but slowly and sparingly soluble in water. They are, however, appreciably soluble in iodides and in alcohol, which solvents are used most commonly for rendering free
iodine available for surgical and disinfectant purposes and comprise the
greater part of such substances as "tincture of iodine" and "Lugol's solution," with which you are familiar.

While it is a demonstrable fact that weak iodine solutions, such as a 1 per cent aqueous solution of Lugol's solution, will almost immediately kill nematode eggs and larvae when washed specimens of these are placed directly into the solution, it is, however, also a demonstrable fact that organic matter and alkaline material, such as occurs in animals' quarters, when suspended with nematode eggs and larvae in a weak solution of iodine remove, by conversion into iodides and iodates, all of the free iodine from the solution before all of the eggs and larvae are destroyed—iodides and iodates have absolutely no lethal action on nematode eggs and larvae. It is apparent, therefore, that in an attempt to effect the practical disinfection of animals and their quarters with the common iodine solutions, solutions containing an appreciable amount of free iodine would have to be used. To increase the amount of iodine in solution, however, necessitates an increase in the strength of the solvents; and as the solvents are increased in strength they hold the iodine more firmly in solution, thus rendering the solution less potent from the standpoint of available free iodine. Furthermore, appreciable strengths of either Lugol's solution or the tincture cannot be applied to the skin of animals without running the risk of setting up inflammatory processes. These facts, together with a consideration of the expense of preparing effective iodine solutions indicated at the outset that in all probability none of the known iodine solutions could ever be economically used for the disinfection of animals and their quarters.

In spite of the discouraging aspects presented during the early stages of this work, I could not get away from the outstanding fact that such a small amount of free iodine was needed to kill nematode eggs and larvae when these were actually reached by the iodine. Moreover, certain other interesting observations noted during the early stages of this work indicated that an attempt to work out a method of reaching nematode eggs and larvae in the presence of organic matter, or possibly the preparation of a form of iodine which would render free iodine economically available in effective amounts, might be a problem well worth undertaking.

One of the interesting things noted regarding the reaction of nematode eggs and larvae, and certain microorganisms, is the rapidity and ease with which their plasmic material absorbs iodine from an aqueous solution. Placed in a weak aqueous solution worm eggs and larvae actually become stained very dark with iodine and may remove practically all of the iodine from the water. Iodides and alcohol, on the other hand, unless they already hold in solution an appreciable amount of iodine, are capable of extracting freshly absorbed iodine from nematode eggs and larvae. It would, therefore, appear that water is the most favorable medium of contact, or material in which to apply iodine for distinfectant purposes. Iodine is soluble in water only
to the extent of four parts in ten thousand. In the absence of alkaline material and organic matter this strength is many times that necessary to kill worm eggs and larvae; but in the practical application of an aqueous solution of iodine as a disinfectant some method of rapidly replacing in the water the iodine which is quickly destroyed by excessive organic matter present in even mechanically cleansed animals' quarters must be provided. Sublimed iodine crystals do not go into solution in water rapidly—it requires weeks to obtain a saturated solution. Rapidly precipitated iodine crystals, however, go into solution in water more readily, the rate of solubility depending for the most part on the structure of the crystal. I, therefore, early became interested in a study of the comparative solubility and methods of precipitation of various precipitated iodine crystals.

In the rapid precipitation of iodine from its salts or its solutions there at first appears a brick-red precipitate which immediately changes to a dark precipitate which usually very quickly settles out. Studied under the ultra-microscope, the brick-red precipitate appears to be of the nature of an "hydrophobic colloid." The extremely minute particles composing the brick-red precipitate dissolve almost as soon as formed and from the resultant solution larger crystals arise. These larger crystals show a very great variation in size, shape, crystal structure, individual color and degree of solubility depending apparently primarily on the rapidity with which they are formed. In the very rapid precipitation of iodine, as that obtained by the oxidation of hydriodic acid (solutions of such concentration as will yield from 1 to 3 per cent iodine appear best), by the action of hypohalous acids, crystals corresponding to those which I have in a previous paper designated as "hyperactive" iodine crystals are formed. The degree of the solubility of iodine crystals probably depends, in the main, upon at least two factors: the "looseness" of the crystal structure and the exposed surface area of the crystal. Because of the extreme fineness of the particles composing the brick-red precipitate (they easily pass through a Berkefeld filter), these should present a maximum exposed surface area, and should, therefore, be extremely soluble. It occurred to me, therefore, that if one were able to stabilize the brick-red precipitate as soon as it is formed, the resulting suspensoid being composed of minute iodine particles in suspension in water, and not held in solution by powerful solvents, should constitute an ideally available form of iodine. This I succeeded in doing by carrying out a modification of the process for the production of the "hyperactive" iodine crystals under conditions of reduced temperature (0°C. or lower), and in the presence of a protective colloid, such as gum arabic.

I should like at this time to describe very briefly some of the properties of this new form of precipitated iodine: It appears to be of the nature of a colloidal suspensoid in which iodine particles constitute the internal phase and water the external phase. In strengths most suitable for surgical purposes (about 3 per cent iodine) it is comparatively non-irritating, non-toxic, does not blister even tender skin, such
as mucous surfaces, and does not leave a permanent stain. Furthermore, this form of iodine seems to possess very great bactericidal powers, probably because of the absence of solvents which if present would undoubtedly reduce the availability of the iodine. Professor W. L. Mallman of Michigan State College, who is working with this phase of the problem, has found that when one-tenth cc. of a broth culture of bacillus typhosus is introduced into five cc. of a solution of colloidal iodine containing two parts (by weight) of the iodine in one million parts of water, these organisms are killed within fifteen minutes; and that, under similar conditions, solutions containing seventeen parts of the iodine in one million parts of water kill bacillus typhosus within two and one-half minutes. Professor Mallman is carrying out further researches on this interesting subject. I myself have killed the eggs of belascaris marginata within two minutes' time by placing two drops of tap-water containing washed eggs in five cc. of the colloidal iodine solution containing eighteen parts (by weight) in one million parts of tap-water.

It will readily be seen that an iodine preparation possessing the form and properties exhibited by this colloidal suspensoid not only apparently satisfies the requirements of an ideal disinfectant for use in destroying nematode eggs and larvae on the bodies of animals and in their quarters, but affords a most available form of iodine for most of the uses to which iodine is put. It, moreover, opens up unlimited possibilities for the application of iodine in surgery, in medicine and in general hygiene; indeed, a number of experiments are at present under way for the purpose of determining its value in these fields.

In arriving at the probable strength and volume of the colloidal suspensoid suitable for general use as a surface disinfectant against nematode eggs and larvae many vital questions, such as what amount of iodine will be destroyed by the organic matter and alkaline material adhering to mechanically cleaned surfaces, and what amount will be lost through volatilization, have had to be answered. Answers to these and like questions were obtained through a long series of laboratory and field experiments involving the determination of the iodine destroying power of scrapings from the pens of various species of animals; the actual scrubbing of mechanically cleaned swine farrowing pens, poultry houses, sheep barns, silver fox kennels and dog kennels with definite strengths of the suspensoid, and then testing the vermicidal power of the fluid recovered from the floors; the practical application of definite strengths of the suspensoid to the bodies of pregnant animals known to be infested with ascarids, and the surfaces of their mechanically cleaned quarters; and then the periodic examination of young animals, born in iodized quarters, for the presence of ascarid eggs; as well as the post-mortem examination of such animals for the detection of worms. Providing for all recognized possible limitations, and allowing for an excess of iodine, it has been estimated that a strength of the colloidal iodine which will be efficacious as a surface disinfectant against nematode eggs and larvae will be one containing
approximately two-tenths of one per cent iodine. This should be applied at the rate of three gallons per 100 square feet. This means that if one obtained the colloidal suspensoid in strengths containing 4 per cent iodine, this material may be diluted to twenty volumes for practical disinfection. This diluted strength is actually more than one hundred times stronger than that needed to immediately kill nematode eggs and larvae in the absence of an excess of organic matter or other materials capable of destroying iodine. It will probably be possible, however, to obtain on the market strengths of the suspensoid containing as much as 50 per cent or more of iodine, since the colloidal suspensoid can apparently be concentrated, or diluted, to almost any desired strength.

Because of the rapidity with which free iodine is converted into inactive compounds by organic matter there are conditions where it will not, of course, be practical to employ iodine as a disinfectant against nematode eggs and larvae. It will, for instance, obviously not be possible to disinfect hog lots with iodine; nor more than just the surface of the soil in poultry yards, fox pens and the like. It will, however, be wholly practical to employ iodine as a disinfectant on all reasonably clean surfaces such as the bodies of animals, swine farrowing pens, poultry houses, sheep and cattle barns, horse barns, fox and dog kennels, and the like. In fact, its worth in these connections has in a number of instances already been demonstrated; and sufficient data has been obtained to indicate that it should prove of especial worth as a supplement to the procedure carried out under the "McLean County System of Swine Sanitation."

In closing, I should like to specially emphasize the following points:
1. While the amount of iodine needed to kill nematode eggs and larvae is very small, the iodine must be free, that is, uncombined or elemental, iodine. Iodine containing compounds such as the metal salts of iodine, various organic salts of iodine and the so-called iodine containing soaps, are wholly worthless as disinfectants. 2. In order to kill nematode eggs and larvae with iodine they must be actually reached with the iodine while it is in the free state. It will do no, or at best but little, good to simply spray dilutions of the colloidal suspensoid on the surface to be disinfected. The surface to be disinfected must be scrubbed with the material to insure bringing the eggs and larvae in contact with the free iodine before it volatilizes, or is converted into inactive compounds by the organic matter and alkaline material present. 3. It is possible to determine, at any stage of the process of washing a surface with colloidal iodine, whether effective free iodine is still present: Simply throw a little of a dilute solution of boiled starch on the surface being treated; if a blue color is thereby obtained, free iodine is still present in effective amounts. 4. If a surface to be disinfected, such as the floors of animals' quarters, is first given a practical cleansing—either scraped fairly clean or washed with clear water—a dilution of the colloidal iodine containing two-tenths of one per cent iodine, and applied at the rate of about three gallons per 100 square feet of surface,
should prove effective under all conditions. However, I am convinced that should it be found necessary or desirable to use stronger suspensions than that recommended, the final cost of the colloidal suspensorid for disinfectant purposes will be sufficiently low as to make it economically possible to use three or four times this strength for any purpose.

5. The amount and nature of the iodine compounds left in animals' quarters following disinfection cannot possibly be injurious to the animals. On the contrary, they will serve as a source of supply of the small amounts of iodine so vital to the well-being of an animal, and yet so deficient in the food and water in many localities. Moreover, these residual compounds, being primarily organic, ought to render the iodine more available for the prevention of goitre than the metal iodides commonly fed animals.

PRESIDENT McNEIL: We will listen to the report of the chairman of the Committee on Diseases of Swine. Dr. C. H. Stange, Chairman, Dean, Division of Veterinary Medicine, Iowa State College, Ames, Iowa. (Applause.)

REPORT OF COMMITTEE.

Diseases of Swine, U. S. L. S. S. A.

December 2, 1925.

The papers which have been presented to you have discussed phases of four of the most important problems in the conservation of our swine industry. Your committee believes it is preferable to present the subject of swine diseases to you in that manner rather than as one long report.

It is very gratifying to note that the most recent statistics from the Department of Agriculture show that losses of swine from disease were lower in the year ending April, 1925, than they have ever been before in the history of the country. The only thing that can conceivably cause a return to the large losses experienced in 1912-13-14, would be the occurrence of a year of hog cholera epizootic. It is felt, however, that this can be prevented if proper sanitary measures and intelligent use of serum are employed. It seems that in connection with hog cholera, one of the most important things requiring to be settled definitely is the question of the advisability of immunizing sucklings.

The question of the so-called breaks following the use of anti-hog cholera serum and virus is still a pressing problem. This being a research question, we believe that the various State and Governmental authorities should give careful study to the causes of the so-called "breaks" in immunity; that these "breaks" have occurred there can be no question and the important thing now is to determine positively and definitely the causes for them.

While garbage feeding does not present a major problem in the corn belt, it is nevertheless important in many other sections of the
country. Information concerning the dangers of garbage feeding is available and we suggest that garbage feeding plants should have some supervision by animal health authorities. Sanitary officials should be given sufficient authority to prevent outbreaks of hog cholera arising from this source.

The committee hearily commends the careful research work of Van Ess and Martin on avian tubercle infection in swine. This question should be pursued until it is definitely solved and a satisfactory method developed for ultimate eradication if that be necessary. Federal and State control agencies and research laboratories should be able to cooperate on this work to the great advantage of the live stock industry.

Mange in hogs is responsible for increased losses each year. We believe that it would be in the interest of economy and strongly urge that control measures be adopted along the lines used in the case of mange in other classes of live stock before the disease becomes a greater menace. At the present time some packing plants are reporting as high as forty per cent of the swine coming to their slaughter as being affected.

In connection with the question of sanitation, the following information gathered last year may be of interest. Sixty-five veterinarians selected on the basis of their professional standing and ability were asked a number of questions relating to this problem. Seventy-five per cent were of the opinion that farmers are using better sanitation than previous to the use of anti-hog cholera serum. All indicated, however, that lack of sanitation is still responsible for much difficulty in swine production, and that improved sanitation would bring about better results in the treatment and control of swine diseases by the profession.

The majority of these men thought that the demonstration method was advisable and nine-tenths of the cases it was found that personal supervision was necessary in order to get owners to actually apply proper methods.

The efforts now being made to secure general adoption of the McLean County system is commendable. The plan, however, has one handicap in that it entails labor and expense which prevents the average swine raiser from adopting it without a large amount of persuasive effort on the part of the person recommending it.

Practicing veterinarians should be encouraged to take a more leading part in campaigns of this kind as in the end the live stock industry will look to the veterinary profession for guidance and assistance in matters pertaining to the conservation of our live stock industry.

EDW. A. CAHILL.
A. EICHHORN.
H. J. SHORE.
C. H. HAYS.
C. H. STANGE, Chair.
PRESIDENT McNEIL: Gentlemen, these papers are open for discussion. Make your discussion short and snappy. We would like to get in two or three more reports this afternoon before we adjourn.

DR. E. A. CAHILL: Mr. Chairman, the entire program has been so interesting that it is very difficult to speak on any one particular paper. The paper presented by Dr. Dorset held particular interest for me. I want to say first of all that I think his is by far the most interesting on the subject that has ever been presented, not even excepting my own, and I was impressed with an article which I recently read, I think by Twort, the great English authority on filtrable virus, in which he said research work and medicine in general would be in a very much healthier condition if the people working on certain problems would, after evolving a fact, attempt to disprove their own theory and uncover all the things which tended to disprove rather than the things which tended to prove it.

I am very much interested in the other side of this question which Dr. Dorset has presented. For a while I thought perhaps there was some similarity between the year 1924 and the year 1914 in which my work was done. I am absolutely at a loss, and have been for several years, to understand the difference in my results and those which could be compared with Dr. Dorset's. Practically all of my work was done with animals on garbage feed. So far as I know, the only work that had been done on animals that were on such feed was by Peterson, whose work was published, after his death, by the University of California. I don't know whether or not this is a factor which accounts for the discrepancy in the result. There must be some factor. It hasn't been my privilege for the past two years to be able to get to this problem for additional work.

I am very well satisfied that the report of Dr. Dorset's results will be a great impetus to the vaccination of baby pigs. Personally I am rather glad that is going to happen. I think that is the way to solve the problem. Use the treatment on young pigs and determine the results that are obtained under field conditions.

There are two practical aspects of this that I present, not to start a controversy in any way but merely in the light of observation. While I haven't been able to do any direct experimental work on this subject for some seven or eight years, I have had an opportunity to have certain of my associates keep records. They have compiled records on several hundred investigations of so-called breaks, some with the serum in which I am particularly interested and some with others. There are, of course, a great many discordant findings in such reports, but there is one that is occurring regularly and if the figures were compiled would be very interesting.

The average veterinarian vaccinating the average spring or fall crop of pigs finds animals of all ages and weights, from two weeks on up to forty or fifty pounds. Naturally, the tendency is to vaccinate those pigs, as Dr. Dorset has said, at the earliest possible age, and
even though the veterinarian may not have wanted to vaccinate those animals, he urges sufficiently in most instances to have him do so.

Now there is a rather remarkable parallel in the data which is available to us that in these breaks where the animals are not retreated and on which the form of investigation shows the weights of the animals at the time of vaccination as nearly as can be determined, the largest percentage of the herd that are sick are the lightest animals in the herd or the lightest animals that were vaccinated at the time. That would prove or indicate that those animals failed to receive immunity. It is a striking coincident and one which has been observed by many practitioners; in fact, one which has caused practitioners to stop vaccinating these young pigs.

I offer that only for the thought that it may carry.

My second thought is also an observation. In 1924 it was my privilege to spend a portion of the year in South America. I found two or three of the largest hog breeders in those southern countries pretty well broken up over the question of raising hogs. They had been given every assurance by North America that if they used serum and virus they wouldn't have any trouble, and for a while they didn't have any trouble. I found the prevailing custom was to vaccinate pigs at any age, but largely as young as possible. The majority of the animals were vaccinated when something like three, four, or five weeks old. The advice was given (you can appreciate that, knowing my attitude on the matter) that they should discontinue vaccinating baby pigs and establish a line something like forty or fifty pounds, unless cholera broke out. That was a year ago last June. They vaccinated two crops of pigs. I have had letters from four or five of the largest breeders in South America telling me they have never raised such a large crop of pigs, that they have never gone that long before without serious breaks, and their swine are doing better, with practically no cholera. Perhaps that has no bearing on the question, but they are just two practical thoughts that I think are important.

Now I sincerely hope that as Dr. Dorset's work continues he will prove conclusively that we can vaccinate baby pigs. I very readily grant that that would be the ideal situation and I hope it can be brought about, and I hope that Dr. Dorset, in his thoroughly controlled experiments which he has shown here, will eventually show us if it can be done, and also show us why there are isolated cases, as in 1924 at Belleville, why the animals failed to become immune.

MR. I. K. ATHERTON: I believe that the paper by Dr. Van Es has been overlooked, and also the report of the Hog Cholera Committee. I don't know how the rest of these gentlemen have taken this proposition. I have got the idea that if baby pig vaccination can be accomplished fully, it is the solution of the hog cholera problem. We look at the hog cholera problem from a dollar and cents standpoint. In Maryland last year we had hog cholera on three-fifths of one per cent of the farms where hogs are raised. Our losses were approximately $60,000. Probably $15,000 more was spent for serum. To have inoculated those
baby pigs I believe any veterinarian was justified in charging forty cents a head. The animal husbandmen have argued, or estimated that we have at least 500,000 baby pigs in Maryland each year, and that is going to cost $200,000, against the sixty-five as we are running it today.

This year our outbreaks have kept below the Volstead per cent, less than one-half of one per cent, and that is on farms where the double treatment has not been used. We have checked some work this year that, on account of my good friends in the serum game, I don’t like to present here.

I am preparing an article and I want a little object lesson in it; I might have got it from Billy Mitchell had I interviewed him before I came down here, but the idea is this: We have had permits issued for the double treatment on seventy-five farms in Maryland this year. We have investigated fifty-nine of those cases, and had seventeen per cent breaks, against one-half of one per cent on the farms where the treatment was not used, and at a cost of $60,000 against $200,000 to have immunized all of those baby pigs.

I would just like to have seen one candle on the birthday cake of these baby pigs before they were given the virus; it doesn’t occur to me that six or seven months is a real test.

It isn’t at all uncommon to have your hogs break after they have been double treated for one or two years. I was talking to a gentleman last night regarding the matter of conferring immunity on swine. He is a double treatment man, pure and simple; he backs it up as a solution of the hog cholera problem, but he said, “Doctor, at the end of two years I tell them if they are going to keep those hogs over to give them another shot.”

Now, gentlemen, you were invited to help carry out these experiments regarding the immunization of baby pigs. You will all agree with me that the disease of hog cholera does not start spontaneously. You will also agree with me that usually it dies out on a farm very soon after the outbreak has died down.

The experiments of Dr. Dorset and others have shown that putrefaction kills the infection in a comparatively short time. In Maryland we have been carrying out some very interesting investigations regarding the sources of infection in new outbreaks of hog cholera. If we can solve that and control those sources of infection, haven’t we solved the hog cholera problem?

I invite you, I urge you to co-operate with us in carrying out those investigations.

PRESIDENT McNEIL: Is there any further discussion?

DR. JOHN REARDON: In discussing the paper presented by Dr. Dorset, I would be inclined to agree with what I assume to be his idea as to the results of this experiment in one way as indicating a question of whether or not the virus used in the 1924 experiment was capable of immunizing the swine had they been given it at any age. The thought whether the virus was sufficiently virulent to do that which we expect of it, to immunize swine, is one which I think gives us all a great deal
of concern. I wonder if there is any bearing on the time that intervenes between the drawing of the virus used in the particular experiment and the time it was used for the experiment. I wonder if there was anything in the rechecking of the work at Ames that would indicate to the manufacturer of that virus in the autopsy on those particular pigs, or the symptoms exhibited by those pigs from the time they were inoculated until the time that the blood was drawn, why this virus acted differently than other viruses. In other words, is there any way for the manufacturer, when he takes a known strain of virus and inoculates a guide him? What is there to indicate to him that this virus might not not that virus is going to be virulent enough to immune swine?

It seems to me as though that is a big problem for the manufacturer to find out. For instance, he produces serial No. 100 and he finds that in the history of the herds which are immunized with serial 100, he has, in different parts of the country, trouble occurring in thirty or sixty days, and a question arises as to whether or not the immunity of those animals has been secure, and then produces from that same virus 101, 102, 103, 104, and so on up to 130, and has no trouble with the virus of those serials; then he produces 131 and has trouble with that serial and doesn't have trouble with a later serial. What is there to guide him? What is there to indicate to him that this virus might not be as virulent as it should? Is there any way for science or money or honest endeavor to determine those factors?

Then I wonder if there have been any experiments to determine the effect of variations in temperature of virus, the carrying of virus up to a high temperature and then the reduction of that virus to a temperature approximating forty or fifty degrees and then raising it again, as, for instance, say an operator receives the virus from the manufacturer and puts it into the ice box at a temperature of, we will say, forty-five degrees, and the average sized ice box varies as to temperature as the ice supply varies from forty-five to fifty-five or sixty-five degrees. That goes forward for quite some time, and then the virus is brought out to the field, exposed to a higher temperature, and then is put back into the ice box. I am wondering what the possible effect of using less than one-half of one per cent of phenol in virus would be. Is it possible that that virus would stand more variation of temperature if there were less than one-half of one per cent phenol in the virus? I wonder if it is possible for less than one-half of one per cent phenol to accomplish the purpose for which we put it in there.

DR. J. W. CONNAWAY: Knowing Dr. Dorset as I do, I know that his work was not done to prove any theory, but to get at the absolute facts and to present those facts as they occurred in his experiments. He has shown here in some of the experiments that he got what he believed to be a permanent immunity in hogs and in another year he got results that were not at all confirmatory of those other results, and as he is scientifically honest, as well as otherwise honest, he made an honest interpretation of it and pointed his finger at what was the probable cause and that was in the impotency of the virus. The man who made that serum and that virus is one of the best men in the whole country
in the manufacture of those products—Dr. Niles. We can expect the same kind of results to happen, time and time again, with serum and virus which is not prepared with that scientific skill and knowledge which Dr. Niles possesses. In other words, you will find that you will have those same results with the commercial serums that are sent over the country, that in some cases you will have in those older hogs a permanent immunity and in other cases, as pointed out by Dr. Atherton, you will have breaks.

The practical point I would make here with those of you who are engaged in practical work is this: Don’t misinterpret those breaks as being something else than hog cholera and inoculate them with hemorrhagic septicemia vaccine or other vaccines, but just make a good, big guess that you may have hog cholera there and give them a re-vaccination and save the man’s hogs.

DR. M. DORSET: Mr. Chairman, just a word to close this discussion. I am very grateful to Dr. Conoway for stating that I was not trying to prove a theory. I don’t think Dr. Cahill intended to give you that impression, and yet I had in mind myself to state before the meeting was over that what we are trying to learn is the truth. We would be very glad, of course, if we could find that the suckling pig could be actively and permanently and regularly immunized, because that would mean a reduction of cost to the farmers. We would like to do it, but, of course, as far as our results are concerned, we are looking merely for what the fact is, we couldn’t afford to attempt to advise farmers to do a thing of that sort if it wouldn’t work. Common sense is sufficient to show that that would be most unwise, as well as an immoral thing.

There were one or two questions asked, Mr. Chairman, that I might attempt to answer. One was as to the reduction of the phenol in the virus, which I think would be extremely unwise and very dangerous. We have seen some very, very unfortunate results and heavy losses resulting from virus which did not contain one-half of one per cent phenol. Less than that is not sufficient to preserve, especially dehydrated blood. As you know, bacteria will even grow in this dehydrated blood with half a per cent of phenol in it.

There was also a question asked regarding how a manufacturer is to know when his virus is a good immunizing virus. That is just what we want to find out. It is a most important thing to the manufacturer to know, and I wish very much that it were possible for me to suggest how to do it. We don’t know how to do it, and when we do learn how to do that thing, then I think we will stop all discussion of hog cholera breaks, which are probably the most puzzling and difficult things that I have ever come in contact with during my period of service in animal disease research.

DR. E. A. CAHILL: May I have one word? I very greatly regret that I evidently expressed a thought that wasn’t clear. What was intended as an opinion of my attitude was evidently taken as a reflection on Dr. Dorset. My quotation from Twort was meant to say I was not
persistently trying to discover things that were favorable to the improving of some experimental work which I did but that I gladly acknowledge the superior work which tended to disprove my work and prove the other side. I meant it as a tribute to Dr. Dorset rather than a reflection.

PRESIDENT McNEIL: If you will bear with us, we will call for a short report of a very important committee, the Committee on Foot-and-Mouth Disease, of which Dr. A. W. Miller, Chief of the Quarantine Division of the Bureau of Animal Industry, is Chairman.

UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF ANIMAL INDUSTRY.

Washington, D. C.

Instructions to Prevent the Spread of Foot-and-Mouth Disease.

By Dr. A. W. Miller.

The following instructions are issued to assist in preventing the infection of foot-and-mouth disease from being spread from infected premises to healthy animals on other premises. Your hearty co-operation is essential if we are to be successful in eradicating this outbreak of the disease which threatens our livestock industry:

All livestock, including poultry, on infected farms must be closely confined and not allowed to cross the highway.

Do not allow your dog to run at large.

Do not take your horses and wagon or automobile on the public highways until after you have been instructed by Federal or State employee how it may be done.

Do not allow any milk, hay, other feed, straw, or manure to be removed from your farm.

Do not permit any members of your family, or your hired help, to visit other farms until you have been notified that it is safe to do so.

Do not permit visitors, agents, hunters, stray livestock, or dogs to come on your farm.

Co-operate fully with the Federal and State authorities in the appraisement and disposal of your cattle, sheep and hogs, and in the disinfection of your premises.

Adhere closely to all quarantine requirements.

We must all work together to accomplish success and any failure in carrying out these measures is very likely to cost you and your neighbors heavy losses through the extension of the disease from infected animals and premises.

(Signature State official in charge.)

Members of Foot-and-Mouth Disease Committee.

1925.

Mr. E. S. Bayard, Editor, The National Stockman & Farmer, Pittsburgh, Penna.
TWENTY-NINTH ANNUAL MEETING

Dr. S. E. Bennett (deceased).
Mr. J. E. Boog-Scott, care Livestock Sanitary Commission, Fort Worth, Texas.
Dr. George H. Hart, Div. of Veterinary Science, College of Agriculture, University of California, Berkeley, California.
Dr. George Hilton, Veterinary Director General, Ottawa, Canada.
Dr. L. H. Howard, Director, Division of Animal Industry, State House, Boston, Mass.
Dr. J. P. Iverson, Chief, Div. of Animal Industry, 1015 L Street, Sacramento, California.
Dr. B. J. Killham, Chief Veterinarian, Bureau of Animal Industry, Lansing, Michigan.
Dr. Edward Records, Director, State Veterinary Control Service, Reno, Nevada.
Dr. R. C. Reed, College of Agriculture, University of Maryland, College Park, Maryland.
Dr. R. W. Smith, State Veterinarian, Concord, New Hampshire.
Dr. W. R. Smith, Director, Bureau of Animal Industry, State Capitol Building, Boise, Idaho.

DR. A. W. MILLER, Chairman.


A noteworthy event of the year now drawing to a close was the sending of a commission to Europe by the United States Department of Agriculture to make research studies of foot-and-mouth disease. The scientists selected for this important mission were Dr. Peter Olitsky, of the Rockefeller Institute for Medical Research, Dr. Jacob Traum, Associate Professor of Veterinary Science, College of Agriculture, University of California, and Dr. Harry Schoening, Associate Veterinarian of the Federal Bureau of Animal Industry.

The commission, after visiting a number of countries and conferred with leaders in animal disease work, established a laboratory at Strasbough, France, in which to conduct its investigations. Members of the commission report that after observing conditions in countries where quarantine and treatment methods are employed they are more convinced than ever that the slaughter method is the only practicable one for this country. It was found by them that the authorities of various countries which were visited concurred in this view. They also advised that Frosch and Dahmen have been unable to substantiate their claim that they had discovered the causative agent of foot-and-mouth disease.

The disease has been especially prevalent this year in most of the countries of continental Europe. Denmark has been experiencing the worst outbreak in its history. From January 1 to June 30, 1925, infection was found in 34,015 stables. The extent of the disease in several other countries is shown in the following table:
Czechoslovakia, March 16 to Sept. 15, 1925........ 2,911 premises
Netherlands, January 1 to Oct. 1, 1925............. 24,485
Hungary, April 13 to Oct. 1, 1925.................. 3,518
Belgium, Jan. 1 to June 1, 1925..................... 1,505
Poland, May 1 to Sept. 30, 1925.................... 36,580
France, Oct. 11 to Oct. 20, 1925.................... 4,603
Germany, June 30 to July 15, 1925.................. 1,439

In our report a year ago we referred to a small outbreak that had just occurred in the vicinity of Malmo, Sweden. Hitherto outbreaks in that country have been quickly eradicated by the slaughter method. In this instance, however, several valuable herds in the two counties of Scania which became infected were not destroyed. The result was that the disease was soon out of control and quickly spread to such an extent that the slaughter method was temporarily abandoned in those counties. That the Swedish authorities recognize the impossibility of controlling the disease by quarantine and treatment is evident from the following statement which is quoted from an article that appeared in the September 4, 1925, issue of the Sydsvenska Dagbladet:

"Further the Board considers it hopeless in the long run to prevent the disease from spreading to other parts of the country as long as the stamping out method is not applied in Scania, but substituted with expensive isolation and disinfection measures. It must not be forgotten, points out the Board, that several of the animals that have gone through the acute stadium of the disease may be bearers of the contagion for months thereafter and that therefore when the disease breaks out again there might be several sources of infection in the country. By the application of the stamping out method we free ourselves from these chronic bearers of the microbes and lessen also the possibility for human beings to act as bearers of the infection."

Switzerland, a country that employs the most stringent quarantine and treatment measures, has failed to hold the disease in check, outbreaks during the present year having been much more numerous than during the preceding year.

In England the authorities seemed to be getting the upper hand of the disease, there having been only 33 outbreaks during the first 42 weeks of this year as compared with 1,515 outbreaks for the whole of the calendar year 1924. In October, however, the disease broke out with renewed virulence and during the last two weeks of October and the first three weeks of November numerous and widely separated outbreaks occurred in that country. As most of you are aware, the stamping out method is employed in Great Britain.

There was a recurrence of the disease last May in the Island of Jamaica. As soon as it was known that an outbreak had occurred on that island, our Federal Department of Agriculture issued an order prohibiting the importation of hides, skins, other animal by-products, hay, straw, and forage. That order is still in effect.
At the present time, Norway, Ireland, the Channel Islands, Australia, New Zealand, Japan, Guam, the Union of South Africa, Canada, Mexico, and the islands of the West Indies, with the exception of Jamaica, are considered to be free from foot-and-mouth disease. It is also probable that the Central American countries, Colombia, and possibly two or three other countries of South Africa, as well as a number of islands in the South Pacific, are not infected.

The foot-and-mouth disease situation in this country is far more satisfactory than it was at the time of our last meeting. Only one outbreak in domestic animals has occurred in California this year. This was a recurrence of the disease on April 5 on previously infected premises. The original outbreak on these premises occurred on April 23, 1924. Thus it will be seen that a period of nearly a year elapsed between the original infection and the recurrence. The infection in this case, it seems, was traceable to hay which was allowed to remain in the mow of the barn at the time of the original outbreak on the premises.

The campaign to eradicate foot-and-mouth disease in deer in California apparently is drawing to a close. No infection has been found in such animals since June 10. Approximately 22,000 deer have been destroyed in this campaign. Early in September about 1,000 head of test cattle were placed on the range in the Stanislaus National Forest on which infected deer had been found. These cattle were distributed over those ranges in lots of such size that they could be easily handled. Each lot was under the personal supervision of a veterinary inspector experienced in foot-and-mouth disease eradication work. None of these animals have developed any symptoms of the disease.

There was a recurrence of the disease in Texas this year, the affection being officially diagnosed on July 30, 1925, in a herd of Zebu cattle in the same pasture in which the infection made its initial appearance in September, 1924. No infection has been found since October 14, and recent reports from those in charge of eradication work indicate that they are hopeful that the disease has been eradicated. The number of animals involved in the outbreak and their appraised value are shown in the following table:

<table>
<thead>
<tr>
<th>Herds</th>
<th>Infected</th>
<th>Exposed</th>
<th>Cattle</th>
<th>Swine</th>
<th>Sheep</th>
<th>Goats</th>
<th>Animals</th>
<th>Appraised Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harris</td>
<td>124</td>
<td>643</td>
<td>11,958</td>
<td>568</td>
<td>801</td>
<td>283</td>
<td>13,610</td>
<td>$262,350.60</td>
</tr>
<tr>
<td>Galveston</td>
<td>121</td>
<td>174</td>
<td>8,695</td>
<td>83</td>
<td>587</td>
<td>12</td>
<td>9,277</td>
<td>228,822.75</td>
</tr>
<tr>
<td>Brazoria</td>
<td>0</td>
<td>20</td>
<td>395</td>
<td>27</td>
<td>4</td>
<td>0</td>
<td>426</td>
<td>12,247.50</td>
</tr>
<tr>
<td>Total</td>
<td>245</td>
<td>817</td>
<td>20,948</td>
<td>678</td>
<td>1,392</td>
<td>295</td>
<td>23,313</td>
<td>$503,420.85</td>
</tr>
</tbody>
</table>

As many of you know, certain misguided individuals went into district courts in Texas and secured injunctions restraining the State and Federal officers from conducting eradication work in accordance with approved methods. In one instance a district judge issued a restraining order to prevent the slaughter of several herds of cattle which were
considered to have been exposed, but which the owners alleged were not infected with the disease and had not been exposed to it. One of these herds broke a few hours after the injunction was granted and another one on the second day thereafter. There could scarcely be a more convincing example of the folly of interference with eradication work by those having only a superficial knowledge of the subject.

It is evident that the true and serious character of foot-and-mouth disease is not generally understood by many in the United States. Columns of the local press in Texas were open to those who, though in error, believed that at some time in previous years they had seen and treated this disease in their herds in this country. There were also many open letters in the press from former citizens of European countries who contended for methods of non-slaughter as practiced in their native lands. Unfortunately, they failed to state that this system has invariably led to the permanent establishment of the infection in those countries beyond all hope of eradication and at a staggering cost for quarantine and depreciation in the value of affected live stock. The unfortunate interference experienced in the Texas outbreak emphasizes the fact that illy-informed, though well-meaning, persons are not safe guides in these matters. They are not the ones to depend upon for guidance when we are faced with a national menace of this kind. In fact, it is the function of trained men only to cope with such a serious live stock plague as foot-and-mouth disease. Your committee, accordingly, feels that so far as possible the laity who, though unqualified, presume to have especial knowledge of such technical matters should be discouraged in their untenable attitude.

The committee on uniform regulations is submitting a draft of proposed regulations to cover movements of livestock, dairy products, and materials within the quarantined area and from such area to the free area of a state. You will recall the fact that in 1917 the Federal Bureau of Animal Industry prepared a comprehensive plan of procedure to be followed in combating outbreaks of foot-and-mouth disease which might occur in the future. This plan, a copy of which should be on file in offices of all state livestock sanitary officials, was submitted to and approved by the states. If misplaced in any instance that Bureau will supply a copy on request. As a suggestion to all officials concerned, this committee is submitting as a part of its report quarantine posters and a letter of instructions which may possibly be used to advantage in handling an outbreak. (See Exhibits A and B.)
Exhibit “A.”

WARNING

These Premises QUARANTINED for FOOT and MOUTH DISEASE

By Order of

Violators will be Prosecuted

Livestock Sanitary Board of United States Government (State)

Exhibit “B.”

PROTECTIVE QUARANTINE

WARNING

KEEP OUT

These premises are under protective quarantine to prevent an infectious disease.

U. S. GOVERNMENT LIVESTOCK SANITARY BOARD OF (STATE)
In no line of work is preparedness more important than in foot-and-mouth disease eradication. Not only should a trained personnel be immediately available when this disease makes its appearance, but livestock sanitary officials who may be called upon to combat outbreaks should have ample legal authority to enforce necessary quarantine measures and adequate funds with which to conduct the work. This is one phase of the subject that we feel cannot be too strongly stressed and we, therefore, are submitting for your serious consideration the following expression of our views on this subject.

Owing to the constant danger of foot-and-mouth disease being introduced from foreign countries, it is of prime importance that every state in the Union be thoroughly prepared to cope promptly with an outbreak of the disease.

To insure such preparedness, there should be in each state a single, strong, centralized organization of thoroughly competent and fair-minded livestock sanitarians free from political, commercial or other improper influence. The proper functioning of such an organization should be made certain through laws providing for adequate quarantine control over livestock, commodities, and persons, and for the appraisal and destruction of infected and exposed livestock. Such laws should be most carefully drawn to insure both their adequacy and constitutionality. The legal department of each state should be familiar with the provisions of its livestock sanitary laws and be prepared at any time to demonstrate their constitutionality in any court where they may be called into question.

As the prompt and fair settlement of all claims for livestock and property destroyed is an important factor in preventing public opposition to the work of eradication, adequate financial provisions should be made to meet the unusual expenditures incident to an outbreak of this disease.

To supplement and make more effective preparedness plans adopted by the various states, we recommend that the Federal Bureau of Animal Industry continue to maintain an experienced foot-and-mouth disease personnel prepared to take the field on a moment's notice and conduct eradication work in accordance with a definite plan. This force should be so organized that it will be in a position to take full charge of an outbreak within a state if requested to do so by the competent officials of the state.

Although the men listed for this activity naturally would continue to perform their regular duties, there should be, if possible, several in various parts of the country giving especial attention to a study of foot-and-mouth disease control and eradication under various conditions. An important function of these men would be to make a survey of the area to which they are assigned, with a view to obtaining knowledge of the various geographical, state administrative, commercial, and social
conditions which would have a bearing upon a possible outbreak of the disease. As a result of this survey, the development of adequate co-operating state organizations would be encouraged.

A. W. MILLER, Chairman,
E. S. BAYARD,
S. E. BENNETT (deceased),
J. E. BOOG-SCOTT,
G. H. HART,
GEORGE HILTON,
L. H. HOWARD,
J. P. IVERSON,
B. J. KILLHAM,
EDWARD RECORDS,
R. C. REED,
R. W. SMITH,
W. R. SMITH,
Committee.

PRESIDENT McNEIL: Dr. Udall is here and he has to return home tomorrow, so I will call for his report now. Dr. D. H. Udall will report on "Diseases of Live Stock."

DR. D. H. UDALL: Mr. President and Gentlemen: In the preparation of this report your committee was in some doubt as to the propriety of certain parts, inasmuch as it is not clear that the information is of the kind that should properly come before an association concerned chiefly with regulatory matters. However, they have attempted to collect a very brief survey of some of the more important diseases that were not covered in special reports, such as those on tuberculosis, abortion, and so forth, and in doing this we have resorted to the customary method of distributing a brief questionnaire.

(Dr. Udall read his paper.)
REPORT OF THE COMMITTEE ON DISEASES OF LIVE STOCK

Dr. D. H. Udall, Chairman.

Your committee has endeavored to gather information on diseases not considered in other special reports to this Association. This information is at best incomplete, and for the most part reveals only the occurrence of such affections. It has been obtained through a questionnaire sent to a few live stock centers. Many useful and interesting replies have been returned; they refer largely to the following diseases:

Anthrax.

From New England, two new areas are reported in Vermont. They are thought to be extensions from old infected areas in New Hampshire. Connecticut has a permanently infected, quarantined and vaccinated area. Massachusetts vaccinates on a few previously infected farms. Michigan, rare. Minnesota, has appeared on about 75 farms, gradually spreading, not severe since 1919. North Dakota, two outbreaks in the last year. Montana, negligible. California, localized in several sections. Wyoming, none. Colorado, one district in the state. Kansas, none. Nebraska, four cases in the northwestern part contiguous to the South Dakota anthrax territory. Missouri, rare. Kentucky, none in the past few years. Alabama, none this year.

Blackleg.

Reported from all states that sent replies. Infrequent in Michigan and Alabama.

Hemorrhagic Septicemia.

Vermont: Reported occasionally by practitioners, but usually it proved to be lead or forage poisoning. Massachusetts: The stockyard type does not occur, but the acute fatal septicemic form is occasional. Connecticut: Increasing; vaccination is necessary in certain localities to prevent outbreaks. Pennsylvania: Extensive, more important than blackleg or anthrax. Michigan: Uncertainty in regard to the nature of this disease; whatever it may be, it is on the increase. It is frequently reported by practitioners, and is chiefly a stockyards affection. Minnesota: It is either dying out or never existed. We continue to have outbreaks as the result of the shipment of thin feeder cattle from the public stockyards, particularly in the fall and winter. North Dakota: 246 cases, 187 deaths. Montana: Rare. Washington: Widespread and on the increase. California: Reported; no positive information that it is responsible for any serious loss. Colorado: A few outbreaks in feeder calves; no outbreaks in sheep. Wyoming: More prevalent during the past few years; vaccination seems to control. Kansas: Common. Nebraska: Mostly in feed-lot animals brought through stockyards; it has caused some heavy losses this year in sheep. Kentucky:
Diagnosis and vaccination common; seldom confirmed. Missouri: Diagnosis and vaccination common; the amount is unknown; vaccination is not a control factor. Maryland: Occurs only as a stockyards disease.

Diseases of the Genital Tract Not Due to B. Abortus (Bang).

Vermont: Sterility is quite prevalent in pure-bred herds in which contagious abortion has crept in from time to time. Maryland: No data. Connecticut: Increasing due to more infectious abortion. Michigan: Considerable observed, probably on the increase. Minnesota: Constitutes 15 per cent of genital disease; exchange of animals is not an important factor in the spread of diseases of this group. Montana: The exchange of animals with diseased genital organs is a decided factor in the spread of such disease. Abortion occurs occasionally in sheep due to a vibrio in stagnant water. Wyoming: Exchange of animals is not the cause of disease to any extent. Alabama: Exchange of animals is probably responsible for some abortion. Missouri: Many cases of sterility are found in non-infected animals. This group needs more investigation; it is possible that transmissible forms exist. There is need of better education of practitioners in the individual handling of cases. The danger from exchange of animals is an open question.

Botulism.

Maryland: Considerable in cattle, horses, and poultry; serum treatment is effective when given in the first stage in enormous doses.

Forage Poisoning.

North Dakota: 254 cases, 137 deaths.

Johne's Disease.


Parasites.

bama: In cattle the most important parasite is stomach-worms. Nodular
disease occurs in sheep and cattle. California: This is a serious prob-
lem in the pastures of Northwestern California in sheep, calves, young
cattle and goats at pasture. The chloroform treatment is a failure.

**Sweet Clover.**

Michigan: Encountered a number of times. Minnesota: Increasing;
often confused with blackleg and hemorrhagic septicemia. Montana:
Reported occasionally; always due to old and mouldy clover. North
least three outbreaks have been reported in cattle; one was very fatal.
Missouri and Kentucky: Not known to occur. Maryland: Occurs.

**Plant Poisoning.**

Vermont: Forage. Michigan: Poisonous plants are abundant; fail
to get authentic reports; so-called forage is common. Minnesota: Little
or no significance. Montana: Loco, larkspur, lupine, cicuta. Wyoming:
Larkspur, death camus, wild parsnips to a slight extent; some form of
forage poisoning in horses. Nebraska: In northwestern part of the state
is some form of disease among horses that is on the increase, evidently
due to some form of poison; under investigation. Colorado: Heavy
losses formerly resulted from poisoning with milkweed; now rare. Ken-
tucky: Chiefly larkspur in the spring. Missouri: Little; sprouting
cocklebur in hogs and budding buckeye in cows. California: Plant
poisons are serious in some places.

**Mastitis.**

Michigan: Widespread, and the most baffling problem of veteri-
narians. B. abortus and malta faver germ in the udder bid fair to
become a serious public health problem. Minnesota: Common and
sheep. Montana: Occurs in sheep. Alabama: Quite common. Ken-
tucky: Common and of great economic importance. Missouri: Not
the cause of a spreading ailment.

**Sanitation.**

Michigan: Insanitation is common. Minnesota: An important
factor. Montana: Gradually improving, and the losses are less. Washing-
ton: Improved; purchasers are more careful. Connecticut: Im-
Improving. Massachusetts: Much improvement in parasitic conditions.

**Fouls.**

Minnesota: Common in cattle.

**Lip and Leg Ulceration.**

Montana: The venereal form occurs; it is a serious disease but of
no great importance.
Dermatitis.

Montana: Pollen dermatitis of white spots occurs; certain that it is a pollen anaphylaxis.

Lungers.

Montana: This is a progressive edematous pneumonia of old sheep; it is similar to "Jagziekte."

Coccidiosis.

Colorado: Two outbreaks in lambs have been studied this fall; either increasing or improved recognition. North Dakota: 263 cases, 120 deaths.

Unknown Disease.

California: Hemorrhagic enteritis in mountains.

Posterior Paralysis.

Colorado: Occurs throughout eastern part of the state.

Diseases of the Digestive Tract.


PRESIDENT McNEIL: The meeting will stand adjourned until tomorrow morning at nine o'clock.
THURSDAY MORNING SESSION.
December 3, 1925.

The meeting was called to order at nine forty-five by President McNeil.

PRESIDENT McNEIL: We will change the program a little, as Prof. Smith must judge cattle at the stock show tomorrow and he has asked to be heard this morning. He will present his report on Legislation.

MR. H. R. SMITH: Mr. Chairman and Gentlemen: As the President has announced, this report of the Legislative Committee is being put in at this time because of my inability to be here tomorrow on account of the cattle judging at the show, and we are also having to wait a few minutes for Mr. Meyer, who is first on the program this morning.

The activities of the Legislative Committee have been, to a large extent, confined to tuberculosis and, as most of you know, this Committee has been following along lines that have been followed for several years past in arranging for an annual hearing before the Appropriations Committee in Washington. I might say that at the last hearing we had a very good delegation present, consisting of representatives of the various states, quite a number of states. We were given about two hours of time to prepare our arguments in behalf of an increased Federal appropriation. The committee granted an increase, although not as large as we should liked to have had.

It is a matter of importance, I think, for all of us to have this in mind so that at the next hearing, which will be held just before Christmas or just after the holidays, we may have a good delegation there.

Congress convenes Monday, and these hearings will be held early in the session. I have a letter from the chairman of the Appropriations Committee stating that the hearing will be arranged early in the session of Congress.

I want to say that the time, I think, is right for a material increase in the Federal appropriation. The states have gone way beyond the Federal appropriation. When the first appropriation was made in 1918, the proposition made in the first bill introduced was that the Federal Government would pay a certain amount of indemnity if the state would pay at least as much. Now the states have gone way ahead of the Federal appropriation. I have taken the pains to communicate with all of the states to determine the amount of appropriation that is available this fiscal year. The total state operating expense is $1,773,022, the state indemnity fund, $9,754,719.45. That gives a total of $11,527,741.45, operating under indemnity funds provided by the state legislatures.

We have county indemnities totaling $13,500 for this fiscal year, and county funds appropriated for operating expense, $1,615,638, making a total county fund of $1,629,138.
That gives a total of state and county funds amounting to $13,056,879 for tuberculosis eradication.

When these reports were compiled, we were informed that the New York legislature would appropriate $2,000,000 at the beginning of the next session in January. I have learned since coming here that that is a million and a half. It gives a total state fund (and we must regard the county money as state money) of approximately $12,000,000 available this year for tuberculosis eradication.

Up until this time we have been going on a ratio of about two to one, two dollars of state money to one of Federal, and it would seem to me of the greatest importance to maintain that ratio that the Federal Government should have a fund at least half as large as the total state fund.

At the time of the Eastern States Tuberculosis last June, I presented this matter to those people and it seemed to meet with quite general approval that we should ask for a fund of $6,000,000. Just between ourselves, we don't usually get all we ask for, but it is only by asking for plenty that we get what we want, and, therefore, I am personally favorable to requesting a Federal appropriation of $6,000,000. I feel it is an expense entirely justified.

The facts are these: This work is no longer in an experimental stage. All we need now is adequate funds to carry on this work to a successful conclusion, and there is no reason for dilly-dally; the quicker it is done the better, and the cheaper it will be in the long run. When you are fighting tuberculosis, you are fighting with a fire, and unless you fight aggressively, it is going to cost a great deal more in the end.

I think we can present a very strong case in favor of a very liberal increase in the federal appropriation. There are a large number of states that need a larger federal appropriation. I don't know of any state that needs it more than Illinois. You have noticed by the papers the fight that is on right now in the city of Chicago for pure milk. An appropriation went through the Senate for $3,000,000 and Governor Small refused to to O. K. more than $2,000,000 because he said the state couldn't stand the expense. Now comes the Chicago order requiring that milk come from tested herds and the requests are very numerous for the testing in a badly infected district; that means that the $2,000,000 fund in Illinois will not be anywhere near sufficient, so we are hoping to get a liberal increase not only for Illinois but for other states, like Ohio, and many other states that are very much in need of larger appropriations to carry on this work.

I want to say that Mr. Madden, who is chairman of the Appropriations Committee, is more favorable to this appropriation than he ever has been before. I think we can count on Congressman Madden for his support.

I don't think it is out of place for me to say that our greatest trouble will be the President of the United States. He has got the Yankee idea of thrift, and it is going to be the hardest job to convince
President Coolidge that this great increase is needed. Governor Small called on him recently. I haven't seen the Governor since, but I understand he didn't get a great deal of satisfaction.

I do believe if we can get a representative delegation from all parts of the country to go to Washington when the next hearing is held to present this to the Appropriations Committee in Congress and then to call on President Coolidge and the Secretary of Agriculture, we can make a case that will be given some recognition.

All I want to do in this report is to say to you people that I do hope when the time comes, a large number of states will have at Washington at least one representative, and I would like to have that representative in as many cases as possible represent the agricultural interests, a good, progressive farmer, if you can select someone, so that you will receive a letter as soon as we hear from Congressman Madden as to the exact date of this hearing. All I can say now is it will be held either just before the holidays or very soon after the holidays, and I hope that we can count on a fairly good delegation at Washington at that time so that we can make a good, strong case for a very liberal increase in the federal appropriation.

I don't know that I have anything further at this time to present. I was particularly anxious to have you know the facts regarding this appropriation so that you may be prepared to have someone there representing your state when the proper time comes.

I think that is all, Mr. Chairman. (Applause.)

PRESIDENT McNEIL: We will now be honored by an address by Hon. A. J. Glover, Editor, Hoard's Dairyman, Fort Atkinson, Wisconsin, or "Tuberculosis Eradication and Its Relation to the Dairy Industry." Mr. Glover. (Applause.)

MR. A. J. GLOVER: Mr. Chairman and Gentlemen: The subject which has been assigned to me is rather old. It is one that has been discussed for the past twenty five or more years, and I rather think you must have a good deal of confidence in me if you think I can bring something new, something that will exhilarate, something that will stimulate to make us do our work better and to see the importance of our job in a larger way. It reminds me of the little boy who had wonderful confidence in his father and who for the first time was going with his dad down town. They met a negress, and he said, "Pap, what made her face so black?"

"Oh, that is the way God made her, my son."

He was silent for a few minutes, then he looked up in his father's face and said, "Pap, is she like that all over?"

"Yes, my son."

Again silence, and he finally looked up into his father's face and said, affectionately, "Gee, pap, you know everything, don't you?" (Laughter.)
Now I have no surprises for you, and in that respect I am like the old farmer who had been wearing his clothes for a great many years; they were pretty shabby, and his good wife was taking him to task because he didn't buy some new ones. He said, "Mary, you know times are hard; farm products are selling at very low prices."

One day he went to town and he thought he would surprise his good wife, so he went to a store and bought him a new suit of clothes and a shirt and shoes and hat; he had them all wrapped in a package and he put them in the back end of his wagon. Just before he reached home, he drew out by the side of a little creek, hidden from the road, and started to disrobe. He dropped his coat and vest into the stream and they floated away, and his trousers and shirt followed. Then he went to the back end of the wagon for his package, and somebody had lifted it. He got up on the seat, picked up the lines, and said, "Get up, Jim; get up, Tom; we'll surprise the old girl yet." (Laughter.)

I haven't any surprises for you men, and I didn't expect when I was put on this program that I would offer any. In the beginning I want to supplement what Mr. Smith has said. We have an American Dairy Federation. It is an organization which represents all the branches of the dairy industry. We were in session yesterday. The subject of T. B. eradication came up. We passed a resolution asking for a million dollars more than was appropriated last year, but fortunately I have kept a string on that resolution, because when I drew it up I was just a little in ignorance as to the amount that the federal government is appropriating at the present time and we wanted to ask for at least a million dollars more.

The present situation is just this: The chief of the Budget Bureau has recommended a material decrease in our appropriation next year, and we thought yesterday when we passed this resolution asking for a million dollars more than last year that we were going as far as we ought to, but I rather think that Mr. Smith has put it in a better way by asking for one-half of the appropriation that will be given by the several states. Since that resolution is still here and I was given the privilege by unanimous vote of putting in whatever we thought ought to go in, I rather think we will add it and put it in in that way.

Further, I want to say to you in the way of help that we have appointed a committee to go to Washington to help get this increased appropriation; I happen to be chairman of that committee; Governor Lowden is another member, and Mr. Willis of Pennsylvania is the third member. Now if any of you men have anything to communicate that will help this committee in its work, I wish you would send it to me at Fort Atkinson, Wisconsin.

It is over thirty years ago when I began to pay attention to the tuberculin test and to study tuberculosis, and from that time to this I have given close attention to this work and its importance to the dairy interests. It isn't necessary for me this morning to go into the details before this body and point out the advantages of having clean herds upon our farms. It is becoming more and more important to the welfare
of the dairy industry that the people drinking our milk, buying our butter, should have confidence in the product because there is a change taking place in this nation today that is bringing about a different kind of diet for the people. We have increased the consumption of dairy products very materially in the last five years. People are realizing that milk is an essential food and they are demanding more and more that it come from clean herds and be produced under good, sanitary conditions.

It is important to the dairy farmers of this country that they have clean herds. In the first place it causes the consumer to drink or eat more of their product and to pay better prices for it. Just recently (I don’t know just how many months ago) a little fictitious story went out around Kansas City to the effect that a great majority of the cattle supplying that city with milk had tuberculosis and immediately there was a decrease in consumption of ten per cent. That would be a serious matter to the dairy industry of this country if it would decrease its consumption ten per cent.

I just wonder for a moment if it would be out of place for me to just give you the picture of the magnitude of this dairy industry. Do you know that in 1924 we produced 114,000,000,000 pounds of milk from 26,000,000 cows? That is a lot of milk. None of us can conceive of it. It is a good deal like the little boy whose teacher asked, “How much is a million dollars?” and he said, “I don’t know, but dad says it’s a hell of a lot of money.”

Now if we put that 114,000,000,000 pounds of milk in ten gallon cans and put those cans side by side, how many times do you think they would span the earth? I want to say they would go around pretty nearly fifteen times. That is the dairy industry, and when a little story goes out to the effect that the milk supply is coming from unclean herds and it takes away ten per cent, you have taken away a string of cans that go more than once around the world. If my geography is right it is nearly 25,000,000 miles around the world. Now, that is the meaning of it. It seems incredible that we have so large an industry, but we have figured that again and again. I doubted the figures when they were brought to me and I said to the man, “Go back and figure them again.” He did, and he said, “They are right.”

I could bring out the importance of owning a clean herd. That is growing more and more. The cattle from clean herds with good records today are selling at good prices. My side-partner, who has a herd on the accredited list, sold three animals recently at $250 apiece. Why? Because they came from a clean herd. There are a great many pure-bred herd owners who aren’t able to sell their cattle at half that price. In the first place they haven’t been tested to find out whether they have tuberculosis and to find out what they can do at the pail. There is a tremendous meaning right there in regard to the importance of eradicating bovine tuberculosis from our herds.

In the feeding of our cattle on the farm, our hogs, calves and chickens, there is no part that is quite equal to skimmed milk. Skimmed
milk today at the present prices of hogs is worth 50 cents a hundred; for calves, it is worth more; for chickens, it is worth more. Now, as we all know, there is no better way of disseminating tuberculosis than the feeding of skimmed milk that is coming from animals suffering from tuberculosis, and our losses in our hogs in this country, as Mr. Smith has well pointed out many times, shows the necessity of stopping the spread of tuberculosis by the feeding of skimmed milk. Our poultry is becoming a tremendously important industry, more and more so, and the people on the dairy farms are seeing the wisdom of using skimmed milk for it in the light of our newer information; skimmed milk is not only good to supplement the feeds of the farm for egg production, supplying protein, but when fed in the right way is actually protecting the flock against certain diseases.

One of the reasons I was so anxious to have Dr. Steenbock appear on this program was because of the advanced information that we are getting relative to the effect of certain kinds of feeds upon the health or upon the diseases of our farm animals. When we survey the farm to see what advantages the tuberculin test is bringing to the farmer, we find the advantages lie in having a clean herd, as he can sell his product for more money, he can sell his surplus cattle for more money, and the product that he feeds in the form of skimmed milk and whey is safer and will bring him a larger return when put into animals like hogs and chickens when the herd is free from disease.

How much better it is that the dairymen should face this question now. We have a trifle over three per cent of tuberculosis among our herds. That is very small indeed. It is about one-third of an animal per herd in this country. Now when they talk about the tremendous losses that are coming by slaughtering these cattle, in the aggregate it is a large loss, but what are the losses sustained when we keep the disease in the herd? The men say, "We don't lose animals." A great many men are not telling the truth about that.

Twenty-five years ago I was with the Illinois University. My work was in the northern part of Illinois. I had some good friends there and some of them who had two and three farms admitted to me that they were losing cattle, and they have been losing cattle over since in that part of the country. But here is what takes place (you men know it, and I almost hate to repeat it): When a cow begins to show a rundown condition, she goes to the butcher and goes into Bologna, and it is difficult to figure out the losses per hundred pounds; some have estimated a dollar and a half, that a cow would sell for a dollar and a half more a hundred if they knew she was free from tuberculosis. Then there is a loss in the total weight of the animal, because when she begins to waste away, she doesn't weigh so much and no one can compute the losses there, which would amount to infinitely more than one-third of an animal per herd that we are taking out as reactors.

Wisconsin has always faced this tuberculosis eradication question squarely, and it was due to W. D. Hoard, the founder of Hoard's
Dairyman, and the people who have come on and taken up the work up to the present time and handled it so intelligently and well.

I was talking with Commissioner Jones yesterday, trying to find out if there was some little, new phase that I might present to you men; here is a thing that surprised me and it may be of interest to you: In the area testing work we are finding less tuberculosis than had been anticipated. In one county where they figured on a three per cent, less than one per cent reacted. Now what was at the bottom of that? Since the advent of the tuberculin test, Wisconsin has been doing what may be determined promiscuous testing. A great many people (and I have been one of them) have thought that that wasn’t the way to handle this work. I do now believe that the area test is the best way to proceed, as we are doing at the present time, but when you think that testing here and there and the taking out of reacting animals has caused men to pay attention to where they purchased animals, the care they give their animals and how they clean up after herds, I am confident and I feel sure that the getting of less tuberculosis in counties in Wisconsin than is anticipated by this promiscuous testing is due to the fact that the farmers have been alert and have been thinking about it even though they haven’t tested.

That is one outstanding advantage for a state to face this issue squarely.

Another picture I could give would be the northern part of this state. You had yesterday, I understand, and I was sorry I couldn’t be here to hear it, a very good lecture upon T. B. and what Chicago is doing to increase its demand for milk to come from clean herds. I think that the Bowman Dairy Company should be complimented, for they are paying now twenty-five cents a hundred more for milk from herds under state and federal supervision than for milk from herds that are not, and I believe that that factor alone will turn the tide in this state. It is already turned, notwithstanding the fact that they are passing resolutions out in some of the counties against Hoard’s Dairyman because we have stood squarely for the eradication of bovine tuberculosis. I have talked in places in Northern Illinois, not once but dozens of times, when I have had men get up in the audience and say, “Glover, you ought to go to jail,” and others would say, “No, that is too good, you ought to be hung.” Maybe they were right, but I didn’t just relish that kind of talk.

The struggle is going on in the northern part of Illinois today and it is a death struggle. This job is pretty nearly done if we can keep ourselves collected and going straight and not lose our heads and do the work efficiently and well. I am anxious today on the follow-up, the clean-up, and we must everlastingly keep that in mind, because if we slip back to where we were in any place, we are going to have a tough time to get those people again to come in and clean up their herds.

The northern part of Illinois has had mighty poor leaders in many instances. I will say, too, there are a fine lot of men in the northern part of Illinois, and some of the men who are good have been misled.
There have been men who have been elected to high political offices because they have opposed the tuberculin test, but we have had fearless souls working in various sections of the country. A man by the name of Gaffke, county agent of McHenry County, worked fearlessly for years to get the farmers to see the importance of cleaning up their herds, and they are testing there now. The herds are running from fifty to seventy-five per cent tuberculin. Well, such herds we know might as well be considered all tuberculin, but there is another side to that story. These crooked men came into the state in the early days and shipped across the line when there was no law to stop them and poured all of Wisconsin's reacting animals into that part of the state, and all the time saying there wasn't anything to this tuberculin test. There is the answer—herds running from fifty to seventy-five per cent, and even more, tuberculin, while in Wisconsin, where they faced the situation, where they have taken out here and there in the counties those that have reacted, and sold them. We are running less than we had anticipated.

It needs no further discussion on my part to point out to you the wisdom of tuberculin testing of cattle, the value to the farmer and to the entire industry. These cattle dealers have sold those cattle to renters of the farms and they have held the chattel mortgages on them until the farmer doesn't see how he can tuberculin test his cattle and pay the mortgage. I am sympathetic with those men. They have been misled, they have been given wrong advice. I can't approve of the course they have taken, but yet knowing them as I do, I am sympathizing with those men, and the time is coming very soon that they will have no market for their milk unless they do clean up their herds.

There is another encouraging thing in Northern Illinois. Last Monday, a group of farmers, coming from this section that has so much tuberculosis and where this last stand is being made, met here in Chicago for the purpose of organizing a milk producers association that would offer no milk except that coming from the state and federal supervised herds, and with the twenty-five cents extra that the Bowman Dairy Company has offered for milk coming from clean cattle, I believe that it is only a matter of a short time when all the milk of this great city, and not only this city but all the cities in the United States, will be from clean herds. This means a greater income to the farmer, and it ought to. One of the drawbacks has been that the farmer didn't get any more for his milk from a clean herd. I want to tell you he is human, and when the market doesn't recognize quality, improved service, it holds back this movement, but with the offering of this extra amount for milk from clean herds, and with an organization that will undoubtedly be perfected to sell nothing else but that, it is only a matter of time, if we are sensible in our procedure not to force things, when all the milk for our city supply will come from clean herds, and it will return the farmers more because the people will consume more dairy products when they have the confidence that they are produced by healthy animals.
I am pleased to say that I appreciate this opportunity of discussing this subject with you. I have just been hitting the high places. I want to repeat that if any one of you at any time has any information that will help the committee of the American Dairy Federation who is to help get an increased appropriation for the prosecution of this work, I wish you would send it to me.

I thank you. (Applause.)

PRESIDENT McNEIL: Gentlemen, Mr. Oscar Meyer, President of the Institute of American Meat Packers, will address us on "Tuberculosis Eradication and its Relation to the Packing Industry." Mr. Meyer. (Applause.)

MR. OSCAR MEYER: Gentlemen, it is difficult to imagine a more beneficent work than that which is represented by the people in this room. The eradication of the great scourges that have harassed humanity since the beginning of time is a work of the greatest importance, and it is, therefore, an honor, a peculiar honor for me to be in the midst of a group of militant legionnaires who are conducting a job of this kind, and, as the records show, are putting it over.

Now you asked me whether tuberculosis eradication is of any moment to the packing industry. I can say that perhaps no group of business men have held the bag more faithfully up to the present time than the packing industry, as far as this scourge is concerned, and I would like to outline that with a group of facts with which you are perhaps familiar.

The packer has paid, since time out of mind, for animals at the time of purchase as if they were sound. He has had no recourse upon the seller if those animals were subsequently not found sound, and it is, therefore, easy to imagine the untold losses which this industry has absorbed by virtue of the presence of disease.

Since the inauguration of the Federal Inspection Act in 1906, almost twenty years ago, the inspection for disease in slaughtered animals has been of great rigidity, and justly so, but this has thrown all the more burden on the packing industry. That burden has run all the way from twenty to forty million dollars a year. The pounds involved, of course, would vary with the price scale existent in any year, but it has been a terrific loss primarily to the packer, and, of course, has been then indirectly passed on to the consumer and to the producer, as these losses must eventually be.

However, let me stress the point that as individual packers, there has been great danger involved in the packing business from the standpoint of disease. I will take our own case, for example; the previous speaker interested me very much because our packing interests are primarily in Wisconsin, in Madison, to be exact. Four or five years ago the tuberculous situation with reference to hogs was so bad and we were put to such a disadvantage on account of the extreme losses that we were suffering through condemnation, we were virtually out of business, that is, there was no profit possible at our point at Madison. Fortunately, that condition has been very much remedied, as the
previous speaker stated, and our retentions and condemnations today in Wisconsin, due to an extensive cleaning up process, have been materially reduced. That much for the individual packer. It can make him feel very uncomfortable; it can put him out of business, in fact, it has put some packers out of business. As an industry, of course, it makes for a dangerous instability because it is a variable in our costs which we can not control, and the packing business, God knows, is filled with enough variables as it is without the interjection of this one.

Let me bring this point out: The industry can not guarantee at all that it can pass the losses from disease to the consumer or can make the producer pay for these losses. That thing has been a pure gamble in the past. The packing business operates on the basis of what it can get for its product. It is not an industry economically constituted, like most industries, which builds up a product and then arrives at a finished cost at which that product can be sold. We operate on the economic law of getting what we can. We have a perishable product in fixed supply. It must move into channels of trade and it moves at the prices at which the public will take it. On the buying side there is similar competition for raw material, and very intense competition. In fact, the competition is so intense that I would say that the packer is always paying just a little bit more for his hogs than what economic soundness would demand. Consequently, it is not at all said from the standpoint of our industry that these losses are going to be passed on to the consumer or the producer; they are absorbed to a large extent within the industry, and, of course, have contributed on account of their variable character to making the packing industry more trying than it would inherently be.

Therefore, I will say again that the packers of the United States are intensely interested in the nation-wide campaign to eradicate tuberculosis, and we have every confidence that it will eventually result in the virtual elimination of this scourge.

Tuberculosis has taken, and still is taking a heavy toll from the profits of the packer and the producer alike. That has always been a considerable factor contributing to the higher cost of meat to the consumer. The condemnations resulting from tuberculosis in cattle and hogs causes an annual waste estimated at $50,000,000 at the present time, and converted into meat, it is an average of about sixteen cents per pound; that would mean an annual waste, gentlemen, of 300,000,000 pounds of meat. It is, consequently, to the interest of every citizen to have this disease stamped out at the earliest possible moment. Just as in the dairy industry, as the previous speaker remarked, the elimination of T. B. will make for more and better dairy products, so in the packing industry its conquest will make for more meat and cheaper meat.

We are immensely pleased with the success that has already been attained in this campaign of eradication. Government records show that during 1916, 2.6% of all the cattle slaughtered under federal inspection in the United States were retained for tuberculosis. Statistics for the past fiscal year show that this has been cut to one and a half
per cent. In view of the fact that the retentions in cattle had been steadily increasing for years past, we feel that this is a very credible showing. So little was accomplished in fighting this menace previous to its inauguration as a nation-wide campaign in 1917 that the value of the central organization at Washington is at once apparent. All will agree that the administration of this work by the United States Bureau of Animal Industry has been highly creditable. Tuberculosis reduction is a national problem in that it is necessary to extend the cleaning-up process to every nook and corner, thereby eliminating the possibility of reinfection, which is always possible with a contagious disease like tuberculosis.

I wish also to express my appreciation of the good work being done by the state live stock sanitary authorities in the United States, the intelligent way in which they are handling local problems and the spirit of cooperation shown in the relation of their activities with those of the federal government. Again, in Wisconsin where my acquaintance lies, this state eradication work is certainly deserving of the highest praise, not only from the standpoint of its effectiveness but from the remarkable standpoint of the cheapness with which that work is administered. We contribute to a little fund which is maintained by the packers of Wisconsin, and the work is under the sole control and administration of one traveling veterinarian. The work that Dr. Nylund (?) is accomplishing during a year, single-handed, is a thing which has oftentimes commanded my unstinted admiration, and I believe that that type of work is going on in other states. However, I am intimately and personally familiar with the work in Wisconsin and I will say that there are perhaps few one-man jobs that are so important in their final results as the work which is being done right up in that state.

It seems to me that the so-called area testing work is the outstanding thing that portends eventual success, and in this respect I notice that the other speakers seemed to be agreeing with me. I have watched with interest the reports issued by the United States Bureau of Animal Industry and note with pleasure that there are now considerably more than one hundred modified accredited counties in the United States, and that over five hundred more counties are in the process of accreditation. We believe that this thorough cleaning up of entire areas is the only proper procedure to follow, and the representatives of the packing industry are glad to cooperate by paying a premium of ten cents per hundred on hogs from these clean districts.

Most packers are willing to do this because they feel that the hogs from clean areas will be worth more than the average run of hogs of the same quality that come to market centers. Packers do feel, however, that if they continue, and they certainly intend to continue, to pay this premium, the retentions, particularly in swine, should be still further and more rapidly reduced.

While the elimination of tuberculous cattle from counties has not completely removed the cause of the tuberculosis in swine, it has reduced condemnations materially, as indicated by statistics furnished me by Mr. H. R. Smith, Live Stock Commissioner for the National Live
Stock Exchange, who has charge of the educational and promotional work of this great enterprise. It is impossible for the packers to dress separately all the hogs on which a premium is paid, because the expense involved in separating out lots of hogs during the killing process is entirely too expensive as a regular procedure.

The data, however, have been secured by dressing separately 116,-931 hogs on which the premium was paid, with the following results: Sixteen thousand and twenty-one, or 13.7% were retained, and 161 carcasses, or fourteen one-hundredths of one per cent, were sterilized and condemned for tuberculosis. As nearly as can be determined, these data, compared with the government statistics on hogs from non-accredited counties received at various market centers, indicate that the number of carcasses condemned had been reduced 75%, while the number retained had been reduced only 25%. A retained carcass is one in which the head and viscera are generally lost, while the carcass itself goes through for food; there is a considerable loss due to the rendering of the head, putting it into lard instead of into meat, those parts of the head that are meat, muscle tissue, and, of course, there is a large loss in connection with the loss of the viscera.

As you know, it has recently been found that at least three-fourths of the retentions caused by tuberculosis in swine are of avian origin. This introduces the interesting problem of eradicating tuberculosis from chickens as well as cattle. We sincerely hope that the eradication of tuberculosis from flocks of poultry can be pushed forward as rapidly as possible for the reason that the accumulative loss on heads and viscera is very heavy and for the reason that this loss on heads and viscera has almost positively been established as being due to avian tuberculosis. The avian bacillus is not so virulent, but it does launch in the glands of the head and the intestines, causing a condemnation of these parts. So that the message we want to emphasize particularly is that this group has a problem before it, a new problem in the eradication and the control of avian tuberculosis in the United States. No doubt the killing tests on hogs from accredited areas will show a marked improvement during the immediate future as more counties become accredited in adjoining territory which will reduce the leaks at boundary lines. We should like to urge that before counties are officially accredited there should be reason to believe that the work of eradication has been done very thoroughly and the loss in swine from these counties reduced to a minimum. In other words, the results should be sufficient to justify the payment of the premium. If not, there is certain to be some dissatisfaction, particularly on the part of those packers who are less familiar with the difficulties encountered in this work.

We have, up to the present time, been speaking of reducing economic losses as a result of this campaign. In this connection, however, and finally, I wish to say that the packers of this country are just as interested and just as much pleased in the success of this campaign from a humanitarian standpoint. We realize that a large proportion
of the deaths and suffering from the ravages of human tuberculosis results from infection during childhood through the use of unpasteurized milk from infected animals. The part which you men are taking in relieving human suffering in this way should encourage every worker to put forth his greatest efforts, and no doubt that explains also the great enthusiasm and aggressiveness which has been shown in this work.

We wish you every success, gentlemen; we are bound to you indissolubly. You may at all times expect full cooperation from the men in the packing industry. (Applause.)

PRESIDENT McNEIL: Gentlemen, the next speaker on the program, Dr. J. E. Crewe, of Rochester, Minnesota, will address us on "Use of Milk in the Treatment of Human Disease." Dr. Crewe.

DR. J. E. CREWE,
Rochester, Minnesota, December, 1925.

While milk is widely used and recommended as an article of diet, it is seldom used by regular physicians exclusively as an agent in the treatment of disease. For fifteen years the writer has employed the so-called milk treatment in various diseases and during the past ten years has had a small sanitarium devoted principally to this treatment. The results obtained in various types of illness have been so uniformly excellent that one's conception of disease and its alleviation is necessarily modified. The method itself is so simple that it does not greatly interest medical men and the main stimulus comes from the patients themselves. The fact that many diseases are treated and successful results claimed, leads almost to disrespect. However, this fact, while it is regretted, is not necessarily discouraging. The reasons are basic, and in accordance with established facts.

In a paper' read at the Mayo Clinic Staff Meeting in 1916, the writer made the following statement: "Speaking broadly, we may say that most diseases are due to poisoning from pathologic bacteria, from faulty elimination of the toxins generated in the body tissues, or from defective blood or defective circulation, resulting in mal-nutrition of certain tissues or parts of the body. Obviously, then, to cure disease we should seek to improve elimination, to make better blood and more blood, to feed the tissues, to destroy the invading bacteria, to quickly remove bacterial and other toxic products, and to build up the body resistance." The method used, tends to accomplish these things. Blood conditions rapidly improve and the general condition and resistance is built up and recovery follows.

In several instances Osler speaks of milk as being nothing more than white blood. The cow's udder is filled with blood which is converted into milk during the milking process. Milk resembles blood closely and is a useful agent for improving and making new and better blood. Blood is the agent in the body that feeds the tissues, each cell, and also

"Large Quantities of Milk in Disease."—Journal-Lancet, 1916.
acts as scavanger to carry off and eliminate waste and toxic products. In other words, blood is the chief agent in metabolism. Milk is recognized in medical literature almost exclusively as a useful food and is admitted to be a complete food. Practically its only recognized use as the sole curative agent is in the treatment of nephritis by the Karrel method, which advises the use of six and one-half ounces of milk four times a day, or twenty-six ounces.

The method advocated employs milk in much larger quantities. The patients are put at rest in bed and are given at half-hour intervals from five to ten quarts of milk a day. Very rich, raw Guernsey milk is used for the most part, but Holstein and various modifications are sometimes used. Also the patients are given orange juice in the morning, and at night a dish of prunes or lettuce or sauerkraut. A more detailed account of the method will be appended, also references to several special papers by the writer. Three quarts of milk are more than equal to the amount of food required by a person of average weight, at rest, in a day, therefore the number of quarts above this amount can be used for other purposes than mere maintenance. Most patients are started on three or four quarts of milk a day and this is usually increased a pint a day until six or eight quarts are being taken. The Weir Mitchell idea is followed and the patients are kept at rest in bed. Elimination is promoted by increased diuresis due to the large quantity of milk taken, and diaphoresis is stimulated by hot baths and hot packs and heat in other forms. A daily enema is given, but cathartics are rarely used or needed. It is quite likely that practically the same things could be accomplished with a proper selection of other foods, but milk can be given in larger quantities and is a balanced food and is aided by the addition of the orange juice, etc. The treatment is used in many chronic conditions, but chiefly in tuberculosis, diseases of the nervous system, cardio-vascular and renal conditions, hypertension, and in the patients who are underweight, run down, etc. Perhaps the most striking results are had in the treatment of pulmonary tuberculosis, and other forms also. The method has been more extensively treated in two other papers. Briefly, the method is much the same as that used in other diseases, but several points should be stressed. All cases are kept absolutely at rest in bed for a period depending upon the extensiveness of the lesion. Rest is not given in rest periods as is usually done, but is continuous twenty-four hours a day. After the initial period of complete rest, the patient is gradually allowed to be up, and later graduated exercises are begun, following the method of Marcus Paterson of Brampton Hospital, England. Recently a quotation from Marcus Paterson from the London Lancet was seen. "He suggests that the term night sweats is a misnomer and should be changed to slumber sweats, as the sweating may occur at any time when the patient sleeps. He states that in the early stages of pulmonary tuberculosis and in the absence of any other infection, the sweats are often

1An Intensive Treatment of Tuberculosis.—Journal-Lancet, July, 1915. Treatment of Tuberculosis is as Used at Oronoco Sanitarium.
the only indication of the presence of an active tuberculosis. They do not occur a few weeks before death because the patient's resistance has been overcome. Various drugs have been recommended for slumber sweats, but these are unnecessary, as the sweats can be prevented without drugs, simply by having the patient sleep on a grass mat over the mattress or by sleeping without a mattress on canvas. The sweats are due to the presence of large amounts of bacterial products (toxins) in the blood; the sweats may appear in any bacterial disease and consequently they are not diagnostic of pulmonary tuberculosis, as is generally believed."

Practically the same thing was said in the papers mentioned above. The treatment used since 1914 recognizes this fact and these patients are given hot baths and sweats daily or on alternate days. These patients are refreshed by the sweating and will not willingly do without the sweats. They do not have the so-called night sweats. Gains of from four to seven pounds a week are the rule. The sputum becomes more liquid at first, disappearing later, and the cough is soft and easy. Hemorrhage is rare. Improvement in every way is rapid and is notable even in advanced cases.

Another class of cases in which striking results are seen are diseases of the heart and kidneys and high blood pressure. The treatment of this class of patients is given in a paper presented to the Minnesota State Medical Society in 1923. This cannot be gone into in detail at this time, but most striking results are had.

In cases in which there is marked edema, the results obtained are surprisingly marked. This is especially striking because so-called dropsy has never been treated with large quantities of fluid. With all medication withdrawn, one case lost twenty-six pounds in six days, hugh edema disappearing from the abdomen and legs, with great relief to the patient. No cathartics or diuretics were given. This property of milk in edema has been noted in both cardiac and renal cases.

Patients with cardiac disease respond splendidly without medication. In patients who have been taking digitalis and other stimulants, the drugs are withdrawn. As in tuberculosis, rest in bed is very important in the treatment of cardiac disease, but milk as given is undoubtedly a very important factor. Caution, of course, is observed in giving sweats, but this form of elimination is used.

High blood pressure patients responded splendidly and the results in most instances are quite lasting. The results in this class of cases have been especially satisfactory.

Weir Mitchell was very enthusiastic over the good effects in many nervous conditions obtained by his rest cure. Milk, in itself, seems to have a sedative effect, and with the rest in bed most satisfactory results are had. Equally good effects are had in other conditions, but they will not be enumerated.

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1Minnesota State Medical Journal.
The treatment has been used successfully in obesity without under
alimentation. One patient reduced from 325 pounds to 284 in two weeks,
on four quarts of milk a day, while her blood pressure was reduced
from 220 to 170. It was necessary to give some patients much smaller
amounts in order to reduce. It may be said, however, that tissue change
is marked in some conditions where it can be observed, as in tuberculous
glands and ulcers, goiters and varicose veins. Some extremely inter-
esting results have been obtained in a few cases of diabetics, but as
some special work by this method is now in progress by the writer and
some other observers it is not desirable to make a report now.

Fifteen years of seeing patients rapidly and satisfactorily getting
well from various diseases by this simple method has inspired the
writer with the realization that disease and methods of curing it is a
much simpler matter than our present complicated practice of medicine
would lead one to believe. With the wonderful advance made in medical
science in recent years there should be much less disease, and people
should attain greater age. We are told that the span of life is rapidly
increasing but statistics obtained from the Bureau of Census do not bear
this out to any extent. It is true that the average length of life has
somewhat increased, owing chiefly to better care of infants and a
greatly lessened infant mortality which brings up the average, but
after the age of 30 the life expectation increases but little and in the
advanced ages the life expectancy was greater twenty years ago than
now.

An immense amount of excellent work is being done and vast
amounts of money are being spent in the science of medicine, but
disease still takes its toll and we can scarcely help but wonder what
blocks the way of medical progress and defeats in a measure those who
are so earnestly seeking to eliminate disease and suffering.

It is strange that so little thought is given to the lives of certain
primitive people who are said to live with but little disease. That this is
so, is attested by numerous writers. Major McCarristan, who spent
nine years in the Himalayan Mountains in Northern India, stated the
tribes there were long-lived and retained their youthful appearance till
late in life, and that he saw very little disease of any kind, no stomach
or intestinal disease and no cancer. He attributed their fine condition
to their simple food, consisting of fruits and vegetables and milk prod-
ucts. Outdoor life was probably also a factor. But the Esquimeaux
spend much of their lives in close, overheated igloos, and also had little
disease before white men brought tuberculosis to them. Their diet was
mostly meat and fish. Stefansson has written interestingly about these
matters. He also tells of how he and several companions traveled over
the frozen Arctic seas for nine months, living entirely on fish and
seals, polar bears and caribou. During these months they underwent
the severest hardships, most of the food was eaten raw. One of
them was ill until on the return journey they found at Herschel Island
a store of food left by a previous explorer. This food had been placed
in a little stone hut and was well preserved, and consisted of salted
meats and preserved fruits and vegetables, flour, etc. The men were eager to eat civilized food again and ate heartily of this food for several days, against Stefansson's advice. Soon they began to suffer from sore mouths, loose teeth and diarrhoea, symptoms of scurvy. The food had been in storage six years. Stefansson immediately placed them on a diet consisting mostly of raw caribou tongue and in a few days they recovered.

Charles Darwin spent five years in South America in 1831-1836, studying the people and fauna of that country. He stated that the Fuegians along the Straits of Magellan were of splendid physique, averaging six feet in height. They were able to endure severe exposure with scanty clothing. Their food consisted almost entirely of shell fish and a kind of fungus that grew there. Magellan also has written of the giants he encountered as he entered the Straits that bear his name. The people in Western Argentine, he observed, lived almost exclusively on meat, averaging about five pounds a day, while across the Andes the people do not raise stock but live almost entirely on vegetables.

In 1887 when Henry M. Stanley went to rescue Erwin Pasha in Central Africa, Erwin Pasha had been sent by the British Government to establish an empire in Central Africa. The tribes in the north became engaged in a religious warfare and controlled the Nile, which was the only highway into Central Africa at that time. It was feared that Erwin Pasha and his men would be either starved or massacred by the tribesmen, and Stanley was sent to rescue them. He was obliged to enter on the west coast and travel up the Congo under the equator. He had five or six hundred bearers carrying ammunition and supplies. The negro bearers were fed upon what the country supplied. They lived mostly on manioc roots, from which our tapioca is made, and bananas. They were in good health and spirits so long as they had an abundance of this sort of food, although carrying burdens of from forty to eighty pounds through swamp and jungle in a tropical region. They suffered only when little or no food could be obtained.

Livingston wrote that he was able to subsist upon what the country provided, but that he got along much better when he was able to have cows or goats with the caravan so that he could have milk.

The foregoing seemingly foreign matter has been given to show that many different primitive people managed to get along on various types of food, but that it was natural food, mostly raw. Numerous other examples could be shown, but these brief citations are given to show that peoples who live on the simplest foods have little diseases. It would seem to indicate that an excess of vitamines is an important element in maintaining health.

When sick people are limited to a diet containing an excess of vitamines and all the elements necessary to growth and maintenance they recover rapidly without the use of drugs and without bringing to bear all the complicated weapons of modern medicine. In other words, there should be but little disease. It was not in the original scheme of nature. Nature has been able to adapt herself to many things, but tin
cans, automobiles and steam heated houses and various other modern practices are too much and as a result we have loss of resistance to practically everything. We cannot breathe horse dust or pollen and we have all the allergies. Science is cunning in providing the remedies for these things. We have Insulin but we should not have diabetes, and so on. From a recent book on dietetics' the following is quoted: “If an aboriginal textbook on medicine could be found, it would probably be noted that there was no chapter on chronic constipation.” It might be added that there would be a number of other chapters missing.

There is an interesting chemical analogy between the mother earth and the bodies of the higher forms of animal life and no doubt the lower forms also. There is a similarity between the chemistry of the body and the soil. The same chemical and mineral substances necessary for fertility in the soil are also necessary for health and fertility in man and animals.

Of these substances the most important ones are the metals: calcium, magnesium, potassium, sodium, iron and manganese, and of the non-metallic are oxygen, hydrogen, nitrogen, phosphorus, chlorine, iodine and sulphur.

Virgin upland soils for the most part are slightly alkaline in reaction and the first crops are usually luxuriant and little subject to disease. As repeated crops are taken off, they take with them considerable amounts of the bases, principally potash, lime, phosphorous and soda, and the chemical reaction changes and we have an acid soil or acidosis, and in consequence, spindling crops that are more subject to disease and parasites.

A deprivation of these substances in the body, results in the same thing, spindly growth, non-resistance to disease and parasites, rickets, scurvy, tuberculosis, cancer, diabetis, nephritis, anemias, ophthalmic diseases and neurosis. In most of the diseases mentioned there is a decrease in the alkaline reserve of the blood. Cancer is known to thrive best in acid tissues and decreased alkalinity of the blood is no doubt favorable to the development of cancer. It is quite likely that a decreased alkalinity favors the development of these diseases rather than that the decreased alkalinity is due to the disease. The soils are starved and we have acid soils and weakened growth and disease. In our modern preparation of foods these same substances, calcium, potash phosphorous, soda, iron, iodine, etc., are removed, and we have diminished alkalinity and a lessened resistance to the disease mentioned above. And how are we deprived of these substances? By throwing away the more soluble chemical substances in the waters in which our vegetables and meats are cooked and by the milling of grains, whereby the parts richest in lime, potash, phosphorous, soda, magnesia, etc., are contained, and by further destroying the important vitamines by cooking and aging in cans or by storage. The vitamines are necessary as the spark to set off the fuel ammunition and make it available to the body. We not only take out the important elements but by freezing,

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cooking and preserving and storing, we destroy or impair the vitamins and we are obliged to eat too much food in order to survive.

Pestilence and disease have always followed starvation. Most chronic diseases are diseases of mal-nutrition. Rickets can be classified as near rickets, dental rickets and plain rickets and so with scurvy and pellagra and beriberi andophthalmia. The half starved Hindus are subject to ophthalmia and cataract. The people of the South who live largely on degerminated corn have pellagra, while their neighbors across the Mexican border, who grind their own corn as they need it, and who live on polished rice are subject to beriberi and the people whose diet is deficient in the Vitamine A are undersized as the Japanese.

In summarizing, the following statements are based on observations covering fifteen years and are made with sincerity and thorough belief.

1. That certain primitive people live with little disease and that this is due to simple methods of living, and principally because they live on simple foods that have not been tampered with by modern civilized methods.
2. While no Utopian idea is entertained it would seem that improvement could be attained in civilized communities by a closer scrutiny of the methods of the simpler races.
3. That modern methods weaken the resistance to many annoying and dangerous diseases.
4. That there is already great improvement in the knowledge of the importance of proper food but that the knowledge is not sufficiently impressed upon the people.
5. That the glitter of recent brilliant medical discoveries tends to obscure some of the simple basic things.
6. That the very striking results obtained by rest and baths and an intensive milk diet prove that simple untampered food, much of it raw, is extremely important in preventing disease and in restoring health.

PRESIDENT McNEIL: The next paper on the program is entitled "Keeping Certified Milk Safe," and will be presented by Dr. R. R. Ferguson, Secretary of the Certified Milk Producers Association of America.

DR. R. R. FERGUSON: Mr. Chairman, Members of the United States Live Stock Sanitary Association: It is indeed a pleasure for me to be before you today and reacquaint you with certified milk if you have forgotten what it is. The previous speaker, in speaking about the nice work that it is doing up in Rochester, spoke of himself as purveying a patent medicine, but I want to assure him that the only thing his milk lacks is a certificate of a medical milk commission calling it certified milk, and then he would be with the rest of us. In other words, the stamp, "Certified milk," means something in this country, and I hope that in appearing before you, you will not think that there is nothing in certified milk for your association, and I be-
lieve before I have finished with my paper that you will see the great importance that certified milk is and has been for these many years to the dairy industry.

I have been called up in the last twenty-four hours, not only locally but by long distance, asking where the Chicago Medical Society stood as a society on the tuberculin test. In other words, will the Medical Society, will the Medical Milk Commission of Chicago, will the Association of American Medical Milk Commissions, of which I am also chairman, and the Certified Milk Producers Association back up Chicago's desire for clean milk. It was almost an insult to ask me such a question, because we have stood for the tuberculin test in all of our cattle for years and years, and how could we think of any such thing other than standing behind our Commissioner of Health at a time like this in order that we can have clean milk for the people of Chicago. (Applause.)

KEEPING CERTIFIED MILK SAFE

By Dr. Ferguson.

Introduction.

Thirty-two years ago, down in New Jersey, there was born an infant of fairly normal size, fairly nourished but with a future none too promising so far as environment was concerned. But according to modern thought, heredity is about 10 times more important than environment, and since this child was the offspring of a union of two of the oldest, if not the greatest professions the world has ever known (medicine and farming, Coit and Francisco) it became at once apparent that this child (Certified Milk) was destined to do more towards raising the standards of the entire dairy industry to the high plane which they now occupy than any other single agency. The two professions believe that this destiny is being fulfilled.

However, I am not unmindful of the wonderful service which was rendered by the veterinary profession, who not only assisted this child into the world but who have been an ever constant, watchful and faithful friend all down through these eventful 32 years. Without the veterinary profession our child would have perished long years ago.

But let us pass over the early eventful years of infancy of childhood and the period of adolescence and early manhood, during which years our child grew in stature and pleased not only the Lord, but the various health officers throughout the country, since it gave the latter an ideal which they could look up to with considerable pride for they could claim at least some small part in its fatherhood. That was the health officer of ten or twelve years ago.

Our child has now attained its 21st birthday—that was 11 years ago—and represents a capital investment well up into the millions of dollars with a capacity of about 1 1/2% of the total amount of milk delivered in communities in which Certified Milk is sold. During the last 11 years and especially during the last 4 years Certified Milk has taken on a new life; new farms and new medical milk commissions have been
and are still being formed. We have thousands of requests coming into headquarters for our methods and standards for the production of Certified Milk not only from this country but from Canada, South America, Japan, Hawaii, England, France, Germany, and Czecho-Slovakia. At the present time our capacity is about 2% as against 1½% of 11 years ago which shows a slow but healthful growth.

Gentlemen, nothing but an ideal could withstand the onslaughts which have been made on Certified Milk during the last ten years, and, why has Certified Milk been able to withstand all these attacks successfully? Only by climbing higher on the ladder of idealism, and, my only purpose in coming before you today is to point out a few of the rungs by which we are ever climbing higher.

No. 1. A survey of the entire country shows distinctly that 80 or 90% of the Certified Milk sold is on doctor's prescriptions or verbal orders. The family doctor still considers Certified Milk a clinical milk—his ideal of a perfect well balanced food.

It goes without saying that a Certified Farm in any part of the country is the envy of all the surrounding farms; it is the ideal that every farmer hopes to attain some day. We have hundreds of letters on file at National Headquarters to prove this assertion.

No. 2. In order to keep Certified Milk safe it must be protected at its source and this is done locally by the medical milk commission and nationally by the National Association who are also the protectors of the copyright "Certified Milk."

No. 3. Much friction has been noticed between the adherents of the pasteurized and certified product to the detriment of both. In order to correct this condition, at the joint conference of the A. A. M. M. C. and the C. M. P. Association in Atlantic City in May of 1926 and at the convention of the International Milk Dealers Association in Indianapolis in September, 1925, the following resolution was passed unanimously by both associations.

WHEREAS, there has always been and should be a comity of relationship between the A. A. M. M. C. and the C. M. P. Ass'n. of America and the International Milk Dealers Ass'n. and

WHEREAS, the A. A. M. M. C. and the C. M. P. Ass'n. of America have always recognized the necessity for pasteurization of the country's enormous market milk supply, and

WHEREAS, the progressive milk dealer has always recognized the necessity for the certification of such of the country's milk supply as is sold as raw milk, and

WHEREAS, it is to the interest of the dairy industry as a whole that each of these groups should work in complete harmony with the other—

THEREFORE, Be It Resolved, that our Associations in their 1925 annual conventions assembled, urge upon their members the recognition of each of these industries so essentially fills in the food supply of the country, and that we view with displeasure any practice which tends to exploit either product at the expense of the other.
We believe this resolution throws a further safeguard about Certified Milk.

No. 4. A great deal of time and money has been and is being spent by Medical Milk Commissions and producers of Certified Milk to better safeguard our product. During the next month or so, Prof. J. Howard Brown of Johns Hopkins in collaboration with Prof. Frost at the Madison Agricultural College will report very definitely on their two months' work on Streptococcus Hemolyticus and will clear up many supposedly dangerous conditions. This will be of particular interest to the veterinarians but I am not at liberty to disclose their findings at present. This work was carried out at the expense of the Chicago Medical Society Milk Commission.

Jones of the Rockefeller Foundation is doing considerable research work on Certified Milk at Princeton, New Jersey. Prof. Cavanaugh of Yale is doing considerable work on the feeding problem, while many of our farms are spending money direct on research work. The Wasserman, stool, urinary and throat examinations of employees, surface water, ventilation and fly eradication, are some of the many subjects we are working on at the present time.

No. 5. Legislation—During the past two or three years some of the Health Officers have complained that our Medical Milk Commissions are not properly safeguarding the product under their supervision. We believe this was true a year or so ago. We are therefore taking the proper steps to have our methods and standards made a part of every State Sanitary Code as well as every City Health Ordinance. This we have already done in several states, to-wit, New Jersey, Massachusetts, New York and Maryland—but we desire it in every state so that when the Medical Commission becomes derelict in their duty to the public and to the farmer the Health Officer can step in and straighten things out. In other words we need the help of the Health Officer and not his antagonism and we believe the following article incorporated into every State Sanitary Code will do much to place Certified Milk on the highest rung of the ladder; but only so long as the Health Officer protects his own child and does not use his authority to strangle his only legitimate offspring.

This Is the Article Referred To.

"50a. Regulating the Sale of Certified Milk.—No person shall sell or exchange, or offer or expose for sale or exchange, as or for Certified Milk, any milk which does not conform to, and, is not produced in accordance with the regulations prescribed by a Milk Commission appointed by a County Medical Society, chartered by the Medical Society of the State of ———, and unless such Commission shall certify that such milk was produced under conditions prescribed by it, and adopted as standard by the American Association of Medical Milk Commissions; neither shall any person sell or exchange or offer or expose for sale or exchange, as and for Certified Milk, any milk which is not free from antiseptics, added preservatives, pathogenic bacteria or bacteria in
excessive numbers. All milk sold as Certified Milk shall be conspicuously marked on the outer cap with the name of the commission certifying it."

There is nothing which our two associations will not do to place Certified Milk one step higher and I am looking for information today relative to the federal accreditation. It has been said very lightly that in proportion to their numbers more common herds are accredited than are certified.

Recently I have made a survey of the entire Certified Milk industry relative to the federal accreditation and I believe these figures will disprove any such statement. Among others the following questions were asked and answered:

Is your herd accredited or in the process of accreditation?
Forty-three per cent answered in affirmative.

Is your herd accredited, in the process of accreditation or under federal and state supervision?
Sixty-three per cent answered in affirmative.

Have you had any reactors when buying from an accredited herd?
"Yes" in 6% of the cases.
"No" in 94% of the cases.

Are you satisfied with your federal accreditation?
Yes, 100%.

In order to bring out some further discussion may I read a few excerpts from some of the questionnaire letters?

"I am satisfied with the federal plan but think it is unnecessary to quarantine animals 60 days which have already been tested and found free. This makes it almost impossible for a commercial dairy to comply with the regulations."

"Our reason for not approving the accredited plan is that we prefer to have a veterinarian of our own selection do this work rather than run the risk of having some one do it in whom we have not the greatest confidence."

"We do feel that government and state should follow up the work more carefully after the herd is accredited."

"We buy all cows possible from accredited herds, but there are not enough of the kind of cows we want to fill our demand. Even if we were accredited we would not dare advertise this fact as on any subsequent test there would always be the possibility of losing the accreditation. One of the weaknesses of the accredited herd plan, is that a cow can be bought by another farmer or dealer and be jockeyed around through several stables and can be resold for interstate shipment on the original test chart of the accredited..."
herd. Even though the cow is tested at the time of shipment there is a good chance of infection being picked up at the dealer's barn to show up in test 6 or 12 months later."

"We are not accredited because we have not been able until very recently to raise enough calves to make our replacements. We have had to increase our herd from time to time by outside purchase. This factor alone would practically make it impossible to become accredited because even with the quarantine and the 60 day retest the purchase of outside animals is a very severe handicap for a 100% clean herd. There are not enough accredited herds to supply our demand."

Now for the brighter side:

"We are more than pleased with the accreditation plan and hope that it will prove to be all that is claimed for it."

"Yes, we are accredited—would not have a cow that is not accredited."

"We are entirely satisfied, in fact we cannot too strongly express our appreciation of the assistance and courtesy and constant interest shown in our problem."

"We are more than satisfied. It has been our experience that if the owner is as anxious to rid himself of tuberculosis as the government is to help him, the thing will come to pass; but I can see where the system might fail, because it depends so much on the honest cooperation of the owners."

"Yes, we are entirely satisfied, I believe the corps of men doing our work is as competent as could be gotten together. We believe the heads of the departments are competent and honest men, always prompt to correct any mistake brought to their attention."

"We are satisfied with the support and co-operation which we receive from the officers."

"We have been accredited for the past 6 years, our next T. B. test being next week. We have been buying cows from accredited herds only and have never had a reactor after the retest. We pay all costs; we believe this is a hardship on the ordinary farmer. We believe there is enough money collected to help pay those farmers who are ready to go into federal accreditation at least for the veterinary costs and loss of cattle."

"I believe that tuberculosis is controlled by this plan as efficiently as it is humanly possible to do. No specific method of control or no group of individuals is responsible for the limitations of the tuberculin test."

"We are not accredited, we have had no reactors in our herd for years but we have at the suggestion of our Medical Milk Commission, under whom we certify, made application for accreditation although we are still skeptical."
In closing, from the great mass of evidence we have collected by this questionnaire it hardly seems possible that the accredited herd plan will ever reach the enormous proportions which it was originally hoped it would—or if it does, 50 years will still see us working on the up-grade. At the present time the restrictions are such that the work must necessarily be slow due mainly to two causes: the lack of money primarily, and to the lack of men secondarily; and this has its background in President Coolidge's administration of economy and home-rule.

To illustrate my final point may I read the letter from a chief state veterinarian to a certified producer:

"Owing to the great demand for the area work, it was found absolutely necessary to discontinue the testing of scattered herds if even a small portion of the service asked was to be rendered. The ruling has been made applicable to the entire state.

"There does not appear to be any possibility of your having your cattle tested, except through the employment of a local, approved veterinarian, unless the county, through its Board of Supervisors, at some future date provides funds for the work.

"At the present time there are some twenty-three counties on the waiting list. Some of these counties made appropriations over two years ago and are asking for service at the earliest possible date.

"Thus, in view of the somewhat restricted funds available for the work, it was found necessary to confine all the efforts to those counties officially co-operating in the campaign."

DR. FERGUSON: Gentlemen, I hope you will take this questionnaire in the sense that I have brought it before you and not in any sense of correction of the wonderful work which the men at the head of that department are doing. We bring you greetings from the two associations, the Certified Milk Producers and the American Association of Medical Milk Commissions, and also the Chicago Medical Society of Chicago, of which I am president.

I thank you. (Applause.)

PRESIDENT McNEIL: The next paper on the program, "Tuberculosis from the Standpoint of Meat Inspection," will be presented by Dr. E. C. Joss, Bureau of Animal Industry, Washington, D. C.
TUBERCULOSIS FROM THE STANDPOINT OF MEAT INSPECTION


The fight which is being waged in the United States against tuberculosis of cattle and hogs is inseparably linked with meat inspection. The tuberculin test establishes the presence of the disease, but does not indicate with any degree of certainty the character and extent of the infection in the reacting individual. Under the method almost universally followed in this country of submitting reactors or known tuberculous animals for slaughter, the tuberculosis eradication campaign merges intimately with meat inspection in an effort to salvage as much of the value of the animal as possible and to ascertain and record for comparison and study the location, character and degree of the infection in each properly identified animal.

It was through studies made in the conduct of post-mortem meat inspection, in large measure, in the countries most advanced in hygiene and sanitary control that the extent and ravages of tuberculosis of cattle and hogs were first definitely determined and brought into prominent notice and the economic importance of limiting and controlling the disease recognized. With the Federal Meat Inspection Service applying ante-mortem and post-mortem veterinary inspection to approximately two-thirds of all live stock slaughtered in the United States after the passage of the meat inspection law of 1906, the enormous losses due to tuberculosis amongst cattle and hogs on the farms and ranches throughout the country were rather clearly established. Records were kept of the occurrence of diseases which were diagnosed in animals in packing plants and summaries of these findings were published. It was largely by these means that public attention was early directed to the presence of animal tuberculosis in varying degree in different parts of the country, it being even established that the infection had spread to the wide-ranging, half-wild herds of cattle on the far western ranges.

Twenty years or more ago the forces of the U. S. Bureau of Animal Industry began to furnish material aid in helping to trace the origin of animals found upon ante-mortem or post-mortem examination or elsewhere to be affected with communicable disease by reporting such cases, when the necessary information was obtainable, to the proper sanitary authorities of the states in which the shipments originated. Continuing down through the years the Federal Meat Inspection Service has endeavored to extend the fullest assistance to all agencies engaged actively in combating animal scourges. In addition to its service of inestimable value to the consumers of meat and products through the elimination of diseased and otherwise unfit meat from the food supply of the nation, the Meat Inspection Service continues to furnish valuable information regarding the prevalence of communicable animal diseases in different sections of the country.
Losses of Meat Due to Tuberculosis.

During the five-year period ended June 30, 1926, there were retained for tuberculosis under meat inspection administered by the Federal Meat Inspection Service more than 34,000,000 carcasses of cattle and hogs. Of this number there were condemned and destroyed as unfit for food a little more than 240,000 entire carcasses of cattle and 336,000 separate parts, and of hogs more than 410,000 carcasses and nearly 4,000,000 parts. Thus during the five-year period the total condemnations of both species for tuberculosis alone under Federal meat inspection were more than 650,000 carcasses and 4,260,000 parts.

These tremendous losses due to tuberculosis alone occurred in animals which the producers and owners believed were mainly fit in every way for transformation into wholesome human food. Many thousands of the animals condemned on post-mortem came direct from the farms, feed lots and ranges to the meat-packing houses well conditioned for meat purposes, only to be found on examination at the time of slaughter to be affected with tuberculosis to a degree that necessitated the condemnation of the carcasses or parts of the carcasses. Of the 34,000,000 or more carcasses retained for tuberculosis in Federally inspected establishments for the years 1921 to 1925, inclusive, some parts or all of the carcasses and viscera in which the disease was found were condemned for food purposes and were rendered into fertilizer and denatured grease. These losses are borne in the end mainly, if not wholly, by the live stock producer. In addition to the losses sustained by the producer, the direct loss of the millions of pounds of food to the nation due to the disease is of no small account.

Already meat packers are paying a premium for animals from free areas. With the condemnations for tuberculosis alone under the Federal Meat Inspection Service approximating the total condemnations of cattle and hogs for all other diseases and conditions, it should be clearly apparent that the meat packers will be able to pay substantial premium prices for market animals known to be free from tuberculosis as the work of eradication is extended and completed.

The Principles of Meat Inspection.

Very few animals are absolutely free from disease in a technical sense. It is estimated that less than 5 per cent of the animals slaughtered for meat throughout the world are entirely free from disease in some form. One of the important aims of meat inspection as applied in this country is to detect and destroy diseased meat. Comprehensive regulations and instructions have been issued by the Secretary of Agriculture and Chief of the Bureau of Animal Industry governing the inspection of animals and meats falling within the scope of Federal laws and these are available for distribution. The part of the regulations relating to ante-mortem and post-mortem inspections is based upon opinions held by eminent veterinary and medical scientists, hygienists and sanitarians that it is not necessary for food animals to be entirely free from all disease in order for the meat to be entirely sound and fit
in every sense for human food. It is true that this judgment of experts is attacked by some unknowing and prejudiced persons who hold that no part of any carcass in which disease in any degree is found should be passed for human consumption. The passing for food of unaffected parts of a carcass in which slight or localized lesions of tuberculosis are found rests upon a uniformly safe basis when the principles of American meat inspection are intelligently applied by veterinary experts. The consumer should feel fully protected in the consumption of inspected meat, particularly when it is understood that the American regulations governing the disposition of carcasses in which disease is found are conceded to be more strict than are the requirements of foreign countries where meat is less plentiful and more expensive.

The Federal meat inspection regulations set forth four specific declarations of principles for guidance in passing judgment on carcasses affected with tuberculosis. These declarations are:

"Principle A. No meat should be used for food if it contains tubercle bacilli, or if there is a reasonable possibility that it may contain tubercle bacilli, or if it is impregnated with toxic substance of tuberculosis or associated septic infections.

"Principle B. Meat should not be destroyed if the lesions are localized and not numerous, if there is no evidence of distribution of tubercle bacilli through the blood or by other means to the muscles or to parts that may be eaten with the muscles, and if the animal is well nourished and in good condition, since in this case there is no proof, or even reason to suspect, that the flesh is unwholesome.

"Principle C. Evidences of generalized tuberculosis are to be sought in such distribution and number of tuberculous lesions as can be explained only upon the supposition of the entrance of tubercle bacilli in considerable number into the systemic circulation. Significant of such generalization is the presence of numerous uniformly distributed tubercles throughout both lungs, also tubercles in the spleen, kidneys, bones, joints and sexual glands, and in the lymph glands connected with these organs and parts, or in the splenic, renal, prescapular, popliteal, and inguinal glands, when several of these organs and parts are coincidentally affected.

"Principle D. Localized tuberculosis is tuberculosis limited to a single or several parts or organs of the body without evidence of recent invasion of numerous bacilli into the systemic circulation."

Disposition of Carcasses.

While it is impracticable and unscientific to formulate specific rules for the disposition of every carcass and part showing lesions of tuberculosis, the following may serve as a general guide to veterinarians not expertly associated with or experienced in meat inspection:

1. The entire carcass should be condemned if any of the following conditions occur:
(a) When the animal is suffering from fever at the time of slaughter.
(b) When there is a tuberculous cachexia, as shown by anemia and emaciation.
(c) When the lesions are generalized or extensive.
(d) When the lesions are multiple, acute and actively progressive.
(e) When there is evidence of recent invasion of tubercle bacilli into the systemic circulation.

2. Carcasses showing lesions which are slight, localized and calcified or encapsulated (except as noted in the preceding paragraph), after the removal of the affected parts or organs, may be passed for food.

3. Carcasses showing lesions less severe than those described for carcasses to be condemned and more severe than those described for carcasses to be passed for food, may be passed for cooking if the distribution of the lesions is such that all parts containing tuberculous lesions can be removed.

It will be observed that there is a rather broad range in the classification "passed for cooking." The carcasses and parts falling within this classification are those in which no known infection with tubercle bacilli exists so far as a macroscopical inspection can determine, but to render the meat safe for consumption beyond an element of doubt it is required to be cooked under official supervision before being finally passed for food and so marked. In most post-mortems in the field and in many packing houses, in the absence of facilities for treating the products, carcasses and parts falling within the classification for cooking are not utilized for food purposes but are properly disposed of as required for condemned product.

Negative Post-Mortem Findings.

Owners at times have not understood why reactor animals taken from their herds do not reveal tuberculous lesions when expertly examined at the time of slaughter. Likewise, veterinarians applying the tests but somewhat inexperienced, perhaps, in post-mortem inspections have not been pleased when slaughtering reports are returned to them showing some so-called "no-lesion" cases in animals tested and pronounced reactors by them. In justice to the veterinarian who tested the animals and pronounced them reactors, and also to help establish that close cooperation so necessary between owners of reactor cattle submitted for slaughter and the tuberculosis eradication forces, it is of deep concern to the Federal Meat Inspection Service to verify whenever possible the tuberculin test through post-mortem examinations by exposing lesions of the disease when present and making permanent records of the findings in each individual case. However, notwithstanding the excellent facilities provided in official establishments for the conduct of efficient inspections and the additional help usually supplied by inspectors in charge when reactors are being slaughtered, the records of the Bureau still show an appreciable
number of no-visible-lesion cases amongst reactors slaughtered under Federal meat inspection. It is not unlikely that the absence of positive findings in a proportion of the post-mortem examinations of tuberculous reactors at meat packing plants will continue. Allowance must be made for negative post-mortem findings in that proportion of reactors in which the infection has not progressed to the point of producing visible lesions. A fine dissection and extended research in retained carcasses would, of course, reduce the proportion of no-visible-lesion cases now included in the reports of post-mortem inspections. However, meat inspection procedures should remain on a practicable basis. Laboratory methods or undue mutilation of carcasses in the search for minute or hidden lesions of tuberculosis in the ordinary conduct of meat inspection, it should be granted, cannot be regarded as warranted or desirable.

The Federal Meat Inspection Service, in its performance of an important service in public hygiene and sanitation, extends its assurance of continued assistance and cooperation to the various forces engaged in the eradication of animal tuberculosis and the control of other diseases disastrous to live stock.

SECRETARY DYSON: I am quite sure that every one present has greatly enjoyed the program this morning, and I am also quite sure that the program this afternoon will be equally interesting and that you will want a copy of the proceedings. Now the cost of publication is three dollars per page. We are just emerging from a financial depression that somewhat threatens the welfare of this Association. In order to overcome that, we have reduced the initiation fee to two dollars. That entitles you to a copy of the proceedings and a membership in this Association. Your application for membership will be taken at the first door to the left as you leave this room. We don't want to come to the necessity of passing the hat in order to keep this Association in a prosperous condition. I am glad to say that we have had a few applications for membership; there have been twenty-five or thirty received up to this time, and I hope that we will have at least that many more.

I want to add a new member to the honor list of states, namely, New Hampshire.

PRESIDENT McNEIL: Now, gentlemen, I think we should, in a general way, discuss these papers, as briefly as we can, because some of the speakers may not be here this afternoon, and if there is any explanation to make or any statements corrected, I think they should take place while the essayists are here. Evidently you are well satisfied with the statements that have been made, and as you seem to be in somewhat of a hurry, I presume the chair will entertain a motion to adjourn.

(The meeting adjourned at twelve o'clock.)

Adjournment.
The meeting was called to order at 1:40 by President McNeil.

PRESIDENT McNEIL: Gentlemen, the first address on the program this afternoon is by Hon. M. G. Thornburg, Secretary of Agriculture, Des Moines, Iowa, on "Tuberculosis Eradication in Iowa." Mr. Thornburg. (Applause.)

MR. M. G. THORNBURG: Mr. President and Gentlemen: What little I will have to say this afternoon in regard to the tuberculosis eradication work in Iowa will deal entirely with the history of the work and from an administrative standpoint. Not being veterinarians, we leave those professional questions entirely to the chief of the Animal Industry Division of the Department, to the inspector in charge of the B. of A. I. work in Iowa, and to our veterinary college.

TUBERCULOSIS ERADICATION IN IOWA
Hon. M. G. Thornburg

The history of tuberculosis eradication in Iowa dates back to July 1, 1919. Before this, of course, there had been more or less testing by owners of cattle who believed that a tubercular animal was unprofitable from the standpoint of production and who tested their herds at various intervals to eliminate danger of spreading the disease to other animals.

In 1917, the U. S. Bureau of Animal Industry assigned three tuberculosis inspectors to Iowa to conduct an educational campaign on the dangers of bovine tuberculosis, and to establish tuberculosis free accredited herds.

The requests for this work became so numerous that in 1919 the 38th General Assembly of the State of Iowa were asked by the cattle breeders of the state to appropriate $100,000.00 to be used in cooperation with the U. S. Bureau of Animal Industry for the eradication of tuberculosis and the control of other contagious and infectious diseases, which they did. The bill embodying the $100,000.00 appropriation became effective July 1, 1919.

A campaign was inaugurated and a force of six tuberculosis inspectors were put to work, three by the state and three by the Federal Government. On June 30, 1920, the results of this campaign showed 49 herds fully accredited, 177 herds passed one clean test and 1550 herds under supervision. Due to the increased demand for this work the money appropriated by the 38th General Assembly was insufficient to meet the demands. The 39th General Assembly increased the appropriation $150,000.00, making a total of $250,000.00 to be used annually. With this increased amount, it was possible to increase the amount of work.
to the extent that on January 1, 1923, 1,302 herds, representing 35,149 cattle had been fully accredited; 3,882 herds, representing 77,107 cattle had passed one clean test and 1,619 herds, representing 40,248 cattle showed infection.

The State officials at this time were confronted with a demand not only coming from the owners of cattle that their cattle be tuberculin tested, but from health officials of cities and towns in the state asking that the dairy cows supplying milk products used for human consumption in their respective communities, be tuberculin tested.

Due to these laudable requests, the 40th General Assembly was again confronted with the question of increasing the state appropriation, as the number of herds on the waiting list to be tested numbered 3,537.

The educational groundwork had been laid during the four years of tuberculosis eradication, under the accredited herd plan, but the appropriated funds were proving inadequate for the demand.

The question of continuing the work advisability of an increased appropriation confronted the 40th General Assembly.

The results of the accredited herd work showed that the percentage of reactors in the different counties varied to such an extent that a general state appropriation was conceded to be an unfair distribution of taxes, for the reason that the taxpayers in a county having a small percent of infection would be compelled to pay indemnity for counties where the infection was greater.

In order to make an equitable distribution of funds and to take care of the increased demand for testing, the county area and accredited area plans were incorporated in the tuberculosis law—which in substance is: When any number of resident owners of breeding cattle constituting a number equal to fifty-one per cent of the number of owners of breeding cattle in said county, as shown by the assessor's roll, petition the Board of Supervisors for the establishment of a county area eradication plan, such a petition including agreement on the part of the respective signers for the testing of their respective herds, the Board shall cause a notice to be published for two consecutive weeks in two official county papers of the date of the hearing on said petition. If, after such hearing, or if no objections are filed to such petition on or before such date, the petition shall be found sufficient, the Board shall make application to the Secretary of Agriculture for the enrollment of the county under the county area eradication plan. The accredited area plan is established whenever seventy-five per cent of the owners of breeding cattle in a county operating under the county area plan, shall have signed agreements with the Department of Agriculture. The Department shall cause a notice to be published for two consecutive weeks in two official county papers of the date and place of hearing on said agreements, which hearing shall be held before the Secretary of Agriculture in said county not less than five or more than ten days after the last publication, said date and place of hearing to be set by the Secretary of Agriculture.
If the petition is found sufficient, the Secretary of Agriculture shall make an entry of record establishing the county as an accredited area and shall notify the Board of Supervisors of such county accordingly. Thereafter every owner of breeding cattle within the county shall cause his cattle to be tested for tuberculosis.

In each county enrolled under either of the plans provided, the Board of Supervisors shall each year when it makes the levy for taxes, levy a tax sufficient to provide a fund to pay indemnity and other expense, but such levy shall not exceed three mills in any year upon the taxable value of all the property in the county.

Under these two plans of tuberculosis eradication more effective work has resulted, which can best be illustrated by the fact that during the past nine months, 1,003,117 cattle have been tested in comparison with 1,089,783 tested from the beginning of the accredited herd work in 1917.

In 1923 when this law became effective, twenty-six counties adopted the county area plan and were enrolled. In 1924, 19 counties were enrolled. In 1925, 7 counties were enrolled making a total of 52. Twelve counties have been declared by the United States Department of Agriculture, Bureau of Animal Industry, as "Modified Accredited Areas."

The county tuberculin testing is in charge of an accredited veterinarian appointed by the Secretary of Agriculture, who is known as the inspector in charge. Local accredited veterinarians are also appointed by the Secretary of Agriculture upon the inspector's recommendation to assist with the work on a per diem basis.

In some counties a committee, consisting of a representative of the board of supervisors, farm organizations and breed associations, together with the inspector in charge of the county, has proved of valuable service. In other counties, such a committee has been found to be unnecessary.

In the forty-five counties enrolled under the county area plan since the work started in 1923, approximately three hundred veterinarians have assisted in the work. This method of procedure has worked out very satisfactorily.

Under these two plans of eradication more effective work has been possible and I feel that more real progress has been made in the extermination of bovine tuberculosis than in any similar period in the history of the work in our state.

I believe that if this work is continued in a vigorous way under our present policies of administration over a short period of years the result cannot be other than satisfactory and tuberculosis will be eliminated from our cattle.

In conclusion, will say, that in addition to the twelve counties in Iowa classified as "Modified Accredited Areas," we have five thousand seven hundred ninety-two accredited herds, and fifty-seven thousand five hundred seventeen herds that have passed a free test.
PRESIDENT McNEIL: Gentlemen, the next on the program is "Legal and Other Phases Involved in Area Work," by Dr. C. E. Cotton, Secretary and Executive Officer, Livestock Sanitary Board, St. Paul, Minn. (Applause.)

DR. C. E. COTTON: Mr. President and Gentlemen: When the chairman of the Tuberculosis Committee asked me to read a paper on the legal phases, I hesitated. I told him I wasn't a lawyer, but if he would give me the privilege of inserting the words "and other phases" in the title, I would undertake to do so.

This has become rather an old story to me and I hope I will not be intruding on your time and I hope that you will be sufficiently interested to appreciate what we have tried to do in Minnesota, and our victories in so far as we have gone from the legal standpoint.

We undertook to start the area work, having gotten the good will of the farmers by the accredited herd plan in our individual work, but it was necessary to have some legislation before it could be put over. We, therefore, enacted what we thought was the proper area law. This paper applies to the experiences in Minnesota. I realize that I could have gone further and communicated with the authorities of the various states and perhaps covered a larger sphere from a legal standpoint but didn't have the time, and this practically applies to our experience in Minnesota on the area work and our status before the courts in the work.
LEGAL AND OTHER PHASES INVOLVED IN AREA WORK

Charles E. Cotton, Secretary and Executive Officer, Minnesota State Live Stock Sanitary Board

The successful control and elimination of tuberculosis requires the support and cooperation of the owners of live stock. This support cannot be obtained and maintained unless the work and efforts of the control organizations are performed efficiently, conscientiously, economically and thoroughly.

Legislation for the control of tuberculosis under the area plan would have been impossible ten years ago, as the general public and live stock owners were not educated to the extent of having faith that the disease could be controlled and eliminated from the herds.

As the result of earlier legislation and appropriation by the states and Federal Government, it was demonstrated by the accredited and individual herd test plan, by which all tests were made on voluntary requests of the owners, that the control and elimination of the disease by successive tuberculin tests, the slaughter or isolation in quarantine of reacting cattle, and the cleaning and disinfection of premises was practical and satisfactory. The confidence of the public and herd owners was thus established and the demand for the extension of the work resulted in legislation and much larger appropriations for the control under the area plan by a number of states.

Under the area plan many more cattle can be tested and with much less expense. The control organizations are striving to meet the demands to extend the testing under this plan. This work must be so performed that the confidence of the cattle owners and the public will be continued and lasting results be assured.

In order to inaugurate the control of the disease under the area plan it was necessary to have legislation making it compulsory for all cattle in the area to be tested. The Minnesota Legislature in 1923 enacted a law providing for this plan of control, and appropriated $100,000 annually for the biennium for indemnity for cattle tested under the area plan.

The law authorized the Board of County Commissioners, upon petition of a majority of persons owning cattle in the county, to appropriate a sum of money not exceeding 25 cents per head for each tuberculin test that may be administered, until the percentage of tuberculous cattle within the county is reduced to meet the requirements of a "modified accredited area." The money so appropriated can also be used for the purpose of aiding in the testing of cattle in the county and of carrying out sanitary and quarantine regulations. The law provides for the State Live Stock Sanitary Board to enter into a cooperative agreement with the county commissioners of a county to cause the testing of all cattle in the county, provided funds are available for the payment of indemnity. The agreement shall specify such quarantine rules and regulations as the State Live Stock Sanitary Board may deem advisable relative to the
control of tuberculosis among cattle in such county. For the purpose of receiving Federal aid, the Federal Bureau of Animal Industry may be a party to the cooperative agreement. The cooperative agreement shall be registered with the State Live Stock Sanitary Board, and tuberculin tests shall be administered to the cattle in any county in order of registration of such agreements. After a county has been certified as a modified accredited area, subsequent tests of cattle and retests of infected herds shall be made at the discretion of the State Live Stock Sanitary Board and without expense to the county. Definite quarantine rules and regulations shall be adopted and enforced by the State Live Stock Sanitary Board within the area covered by the cooperative agreement.

The law requires owners of cattle to submit the same for tests and to slaughter reacting cattle within thirty days. Indemnity cannot be paid unless the stables and premises are cleaned, disinfected and placed in a sanitary condition within thirty days from date of removal of reacting or condemned animals.

As a result of legal proceedings since July 1, 1923, when the control under the law providing for area work in Minnesota was started, we have learned that perhaps it was a mistake that the law did not include a penalty for violation of its provisions. This was considered at the time of its enactment.

It was decided not to include a provision for a penalty as it would require an action in the District Courts, but to rely on the state law which requires the Sanitary Board to make such rules and regulations as it may deem expedient to protect the health of domestic animals of the state, and which also provides that violation of such rules and regulations constitutes a misdemeanor. These complaints can be tried in justice courts, thus making it possible to obtain results in a shorter time, which may be necessary in the successful testing of all the cattle in an area. The Sanitary Board adopted rules and regulations preventing importations of cattle into areas as required by the modified tuberculosis free area plan, and also providing for a strict quarantine of all cattle when the owner refuses to permit the testing and preventing removal from the premises of milk, milk products, manure and any article or thing that may convey infection.

Immediately after the law was enacted, more counties registered agreements than the amount of appropriation for indemnity under the area plan would justify the Board in undertaking to test in a two-year period.

The policy was adopted of testing all the cattle in a county by placing an organization of veterinarians in sufficient numbers to complete the test in a period of fifteen days. All infected herds are retested after ninety to one hundred twenty days, again retesting herds that disclose reactors within ninety to one hundred twenty days, and making a second complete test one year after first test, provided one per cent or more reactors were disclosed on the first test; and providing the second complete test disclosed less than one per cent a retest of the infected herds ninety to one hundred twenty days thereafter.
The extension of the work was limited to five counties during the first two years. The Legislature at the last session appropriated $250,000 annually for indemnity under the area plan for the biennium beginning July 1st, 1925, thus permitting the extension of the work to other counties.

The results of the work to date show that if the first test of all the cattle disclose a percentage of infection of five per cent or less, the method of testing under this plan will reduce the percentage of infection in the county to less than one-half of one per cent within a period of sixteen months. The expense to the individual herd owners, to the county, state and Federal Government is materially lessened as the tests and retests are made as frequently as possible and consistent with our present knowledge of the disease and the tuberculin test.

The tests are applied by employing the accredited veterinarians located in the county and adjoining counties, and if a larger force is necessary, from any part of the state. They are paid $10 per day and expenses while in the county. The regular state and Federal force is not used in the area work except as supervisors.

No. 1.

Interpolation No. 1: I might say that we also employ a local farmer. We ask the central committee that is organized prior to the putting on of the work to select outstanding farmers in each community. We pay him five dollars a day for his Ford car and to assist the veterinarian in making his test, and two dollars a day to board the veterinarian. In that way we keep the veterinarian in the field and on the job.

The intradermic test is used in making the complete test of all the cattle in the area; if one or more reactors are disclosed on the 72d hour, a second reading is made at the 120th hour after injection. Experience shows that by this method a number of reactors are disclosed that would be left in the herd if the later reading was not made. All retests are made by a combination of the ophthalmic and intradermic tests.

Minnesota now has four accredited counties, in three of which all herds have passed at least one complete negative test. The first complete test, two retests of infected herds and the second complete test have been made in the fifth county.

Since July 1st, 1925, the second complete test of the cattle in the fourth county, the second retest of infected herds and the second complete test of all the cattle in the fifth county on the list, the first complete test of cattle in the next five counties and the retest of infected herds in two counties, has been completed. This represents a total of 817,943 cattle tested under the area plan during this period.

The control of tuberculosis under the area plan in Minnesota has received the support of the live stock owners, the press, the public and the practicing veterinarians in every territory in which the plan has been adopted and applied, with the exception of a single territory. The opposition occurred in Meeker, the first county in which the tests were made under the area plan of control. This county is comparatively
small in area, but is an intensive dairy district. It contains 2,474 herds consisting of 47,960 cattle. The first complete test disclosed 3.58 per cent reacting cattle.

After the second retest of the infected herds was completed, as a result of the activities of the American Medical Liberty League, through the efforts of a chiropractor located in the county, an organized small number of farmers employed attorneys and succeeded in obtaining a temporary injunction issued by a judge of the District Court, restraining the State Live Stock Sanitary Board and the Board of County Commissioners from proceeding to carry out the terms and conditions of the agreement for testing the cattle or attempting to institute any criminal proceedings under said law or quarantine rules and regulations. The defendants procured a change of venue to another county in order that the trial could be heard by another judge.

No. 2.

Interpolation No. 2: I might state that the attorneys for the farmers wrote the injunction and took it over to the judge who was controlled by this option and he put the injunction on. We realized if we took it before that judge, we were lost. We had a change of venue, and the only way we succeeded in getting the change of venue was that it seemed there was some law that if the majority of the defendants are residents of a county or judicial district they can get a change of venue on demand; they made so many of us defendants that we had one majority who lived outside of that district and we succeeded in getting the change to the Ramsey County courts. (Applause.)

The plaintiffs complained that the law providing for the compulsory testing of their cattle was an unnecessary interference with their business; that the same did not serve any public use and denied to plaintiffs equal protection of the law, and deprived them of their property rights without due process of law; that the law provides for the use of public funds for a private and illegal purpose; that it provides for the raising of funds by taxation for a private purpose, all in violation of the Constitution of the United States and of the State of Minnesota, providing that all laws of a general nature shall be of uniform operation, prohibiting class legislation and prohibiting the delegation of legislative powers; that the criminal actions instituted and threatened to be instituted by the State Board are without warrant of law and deny plaintiffs equal protection under the laws.

The time will not permit including any of the evidence of the case in this paper. It is a matter of record consisting of over two hundred printed pages. We will be pleased to furnish such record to anyone who may be involved in similar cases.

The decision of Judge John B. Sanborn of the District Court of Ramsey County, who has since been elevated to a judgeship in the United States District Court, ordered that the temporary restraining order be discharged and that the motion of the plaintiffs for temporary injunction be denied.
The judge, expressing his conclusions in a memorandum attached to his decision, states: "The fact that the operation of this law is of pecuniary benefit to private individuals or corporations does not in any way affect its validity. Nearly every law confers some pecuniary benefit upon some individual or class of individuals, and it is only where no public purpose is served that the law becomes invalid. It would be impossible in this day and age to sustain a contention that the eradication of tuberculosis, even though done piecemeal and upon conditions, does not serve a public purpose. The reasons for this legislation are obvious. The legislature desired to inaugurate a systematic eradication of tuberculosis from the herds of cattle in this state. It determined that the work should be done by counties and the expense paid, in part at least, out of county funds. The question as to whether funds were available and should be appropriated was left to the discretion of the County Boards. The County Boards were not to make provision for the tests unless the majority of the cattle owners in the county should petition therefor. It was considered inadvisable to give the County Boards absolute authority to require the testing of the cattle in the county if the owners were opposed to it.

"The position which the plaintiffs take is, that because the Legislature imposed as a condition that a petition of a majority of the cattle owners should be filed before an appropriation could be made by the County Board, that that placed the initiation of the proceedings in the hands of a class and made it class legislation. The Legislature might have required each county to have its cattle tested. It could have given the County Board of each county power to make the appropriations and have the work done without the petition or approval of anyone. It could have provided that the County Board should make the appropriation provided it was authorized by a majority of the electors of the county, either by vote or petition. In other words, the Legislature could have ordered a state-wide compulsory test and placed the burden of making it upon the county, or it could have granted permission to the county to make it, or it could have granted permission conditional upon the will of a majority of the electors of the county. Does the fact that the law imposes as a condition that a majority of the cattle owners petition for the test make the law class legislation? These cattle owners have a real interest in the testing of their cattle. They have no power to bring about the testing of them under the Act in question. All they can do is to petition the County Board and the County Board can then have the test made or not as it sees fit. The Legislature could compel the cattle owners to submit to such a test, regardless of how a majority felt. But on the other hand, why should the law be declared invalid because they are given a voice in the matter? Where an evil exists, the Legislature is not required to use the most effective weapon. It is enough that the weapon chosen is aimed at the evil.

"The fact of the matter is that it would be impossible to lay down a rule in this case under which this law could be held unconstitutional without affecting a great mass of existing legislation which is based
upon the same general legislative theory. I am satisfied that the Act violates no constitutional amendment."

On request, attorneys for the plaintiff made an additional memorandum sustaining the criminal prosecution for violation of quarantine rules and regulations of the State Live Stock Sanitary Board.

The case was appealed to the State Supreme Court, which on February 27th, 1926, affirmed the decision of Judge Sanborn of the District Court. The decision was sweeping and general. I will quote only one paragraph of the decision, which is in answer to the contention, on the part of the plaintiffs, that the law infringes on the provision of the Constitution and imposes a taxation for a private purpose. The paragraph reads: "That tuberculosis is a dangerous contagious or infectious disease which attacks both human beings and domestic animals; that it is prevalent throughout the state among both human beings and domestic animals; and that it is communicated to human beings, especially to children, by milk and other food products from infected animals, stands undisputed. The object of the statute is to promote and preserve the public health by providing a means for the control and suppression of this disease among cattle. That it is not for a public purpose is beyond question."

The plaintiffs, desiring to submit the question of the validity of the law to the Supreme Court of the United States, were compelled to institute another action for the reason that the decision of the State Supreme Court denying the temporary injunction was final and could not be appealed. The case was heard in District Court of Ramsey County. A decision was rendered July 26th, of 1925, "that defendants are entitled to judgment of dismissal of the entire proceedings upon the merits, together with the costs and disbursements therein." This case has also been appealed to the State Supreme Court where without doubt its former decision will be sustained, when the plaintiffs will appeal to the United States Supreme Court.

The work of control and suppression of tuberculosis in cattle now has the confidence of the cattle owners, the public and legislative bodies, and the laws providing for the work have been sustained by the courts. The cattle owners are demanding that the work be extended. A great and serious responsibility is now placed on the shoulders of the organization controlling diseases of live stock and the veterinary profession. We are on trial. Shall we demonstrate that we are equal to the occasion and deserve the confidence and trust? We must assume the responsibility and use every method and means known to science to eliminate the disease.

In our enthusiasm and zeal to meet the demands for the extension of the work we should comply strictly with the rules and regulations recommended by the United States Live Stock Sanitary Association and adopted by the Federal Bureau of Animal Industry and the Live Stock Sanitary Authorities of all the states. If we neglect to establish and enforce the necessary quarantine regulations in the areas and thereby permit the infection to gain entrance, if we fail to subject to the test
every bovine animal over two weeks old in the area or place it under absolute isolation and strict quarantine, if we do not insist that the tests be applied under the necessary aseptic precautions and the animals restrained in order that the operator may make the proper injections and the proper interpretations of the test, and if we do not require the proper cleaning and disinfection after the removal and slaughter of the reacting and condemned cattle, we will be unable to eliminate the disease and in the course of a few years the work will not show permanent results or returns commensurate with the expenditure of the large appropriations. We will then lose the confidence of the owners, the public and legislative bodies.

As all phases of the legal question of control of an animal disease communicable to man are included in this case, it should be of value to every control organization in the country. A copy of the decision of the District and Supreme Court is therefore appended in order that they may be published in the proceedings of the association.

STATE OF MINNESOTA, DISTRICT COURT,
County of Ramsey, Second Judicial District.

Wm. F. Schulte et al., Plaintiffs,
vs.
C. P. Fitch et al., Defendants.

The consolidated cases above entitled came on to be heard before the court at special term on the 18th day of October, 1924, upon the order issued by Hon. Harold Baker, judge of the District Court in and for the Twelfth Judicial District, on September 16, 1924, requiring the defendants to show cause why a temporary injunction should not be issued and also upon the order issued by Hon. Hugo O. Hanft, one of the judges of this court, requiring the plaintiffs to show cause why the application of the Minnesota Co-operative Creameries Association, Inc., to intervene in said cases should not be granted. Manahan, Sullivan & Hoogesteger appeared for the plaintiffs; Clifford L. Hilton, Attorney General, and Victor E. Anderson, Assistant Attorney General, appeared for the defendants; and Mitchell, Doherty, Rumble, Bunn and Butler appeared for the Minnesota Co-operative Creameries Association, Inc.

After hearing the arguments of counsel and being duly advised it is
Ordered that the order to show cause and temporary restraining order issued by Hon. Harold Baker, judge of the District Court in and for the Twelfth Judicial District, on September 16, 1924, be discharged and that the motions of the plaintiffs for temporary injunctions be and the same are hereby denied.

It is further ordered that the application of the Minnesota Co-operative Creameries Association, Inc., for leave to intervene be and the same is denied.

Dated October 29, 1924.

JOHN B. SANBORN,
District Judge.
Memorandum.

Chapter 269 Laws of 1923 must be sustained unless it clearly transgresses some constitutional limitation.

“All laws enacted by the Legislature are presumed to be valid, and it is the duty of the courts to declare them valid unless they transgress some limitation upon the power of the Legislature imposed by the State or Federal Constitution.”


The principal objections made to this Act are:

1. That it appropriates public funds for private purposes.
2. It is special and class legislation, grants to one class of citizens privileges and immunities not granted to others and fails to operate uniformly.

The fact that the operation of this law is of pecuniary benefit to private individuals or corporations does not in any way affect its validity. Nearly every law confers some peculiar benefit upon some individual or class of individuals, and it is only where no public purpose is served that the law becomes invalid. It would be impossible in this day and age to sustain a contention that the eradication of tuberculosis, even though done piecemeal and upon conditions, does not serve a public purpose.

The Act is not special or class legislation. The question of classification for the purpose of legislation is left largely to the Legislature.

“There has been a marked change in recent years in the attitude of the courts upon the question of proper classification for the purpose of legislation. The prevalent tendency is to leave the matter largely to the discretion of the Legislature.”

Seamer v. Great Northern Ry., 142 Minn. 276.

Dunnell’s Minnesota Digest 1921, p. 194.

In Heath & Milligan Mfg. Co. v. Worst, 207 U. S. 354, cited in State v. Standard Oil Co., 111 Minn. 85, the court says:

“We have declared many times, and illustrated the declaration, that classification must have relation to the purpose of the Legislature. But logical appropriateness of the inclusion or exclusion of objects or persons is not required. A classification may not be merely arbitrary, but necessarily there must be great freedom of discretion, even though it result in ill advised, unequal and oppressive legislation.”

Quoting from Mathieson v. Minneapolis St. Ry. Co., 126 Minn. 286; 148 N. W. 71:

“It is also the province of the Legislature to draw the line marking the boundary between one class and another and between several classes and the general public. When such classes have been determined by the Legislature, the legislative judgment is binding upon the courts, unless they can point out that the classification is purely fanciful and arbitrary and that no substantial or logical basis exists therefor.”

The reasons for this legislation are obvious.
The Legislature desired to inaugurate a systematic eradication of tuberculosis from the herds of cattle in this state. It determined that the work should be done by counties and the expense paid, in part at least, out of county funds. The question as to whether funds were available and should be appropriated was left to the discretion of the County Boards. The County Boards were not to make provision for the tests unless the majority of the cattle owners in the county should petition therefor.

It was considered inadvisable to give the County Boards absolute authority to require the testing of the cattle in the county if the owners were opposed to it. This was no doubt upon the theory that a compulsory testing of cattle against the will of a majority of the cattle owners in any county might be so unpopular as to defeat its own purpose and would serve to discourage rather than promote the public purpose for which the law was passed.

The position which the plaintiffs take is, that because the Legislature imposed as a condition that a petition of a majority of the cattle owners should be filed before an appropriation could be made by the County Board, that that placed the initiation of the proceedings in the hands of a class and made it class legislation.

The Legislature might have required each county to have its cattle tested. It could have given the County Board of each county power to make the appropriation and have the work done without the petition or approval of any one. It could have provided that the County Board should make the appropriation provided it was authorized by a majority of the electors of the county, either by vote or by petition. In other words, the Legislature could have ordered a state-wide compulsory test and placed the burden for making it upon the county, or it could have granted permission to the county to make it, or it could have granted permission conditional upon the will of a majority of the electors of the county.

Does the fact that the law imposes as a condition that a majority of the cattle owners petition for the test make the law class legislation? These cattle owners have a very real interest in the testing of their cattle. They have no power to bring about the testing of them under the Act in question. All they can do is to petition the County Board and the County Board can then have the test made or not as it sees fit. The Legislature could compel the cattle owners to submit to such a test, regardless of how a majority felt. But, on the other hand, why should the law be declared invalid because they are given a voice in the matter? Where an evil exists, the Legislature is not required to use the most effective weapon. It is enough that the weapon chosen is aimed at the evil.

The State here offers to the counties the use of the Live Stock Sanitary Board for the making of these tests upon compliance with certain conditions. Permission is granted to all alike. County Boards are not required to appropriate funds, and the cattle owners can only petition and not compel. While there is some language in Lodoen v. City of Warren, 146 Minn. 181, which seems to sustain the plaintiff's position,
that case is readily distinguishable. There it was left to each city to
determine whether a general law granting charter powers should apply.
Manifestly, the law could operate with no uniformity and constituted
a delegation of legislative power. Here there is merely a grant of
power, and the only thing the county determines is whether it will take
advantage of the grant.

In effect, the Legislature declares that the appropriation of funds
by a county for the testing of cattle is a proper public purpose. That
if the appropriation is made, the State Sanitary Board shall assist the
county in making the test, but that the test shall not be made if the
majority of the cattle owners do not petition for it. Regardless of what
action the county takes, the law is still operative and still applies to it
and remains to be taken advantage of at any time.

There is nothing offensive in using the county as a unit. It has
been repeatedly done in this state for almost every purpose. The most
noteworthy example is perhaps in connection with the liquor laws. In
State v. Stoffels, 89 Minn. 204, the court said:

"It is not an open question in this State that the Legislature
may constitutionally provide for the establishment of prohibition
districts by local option or by direct legislation, although the
license for the sale of intoxicating liquor was the general rule of
the State and prohibition in certain districts the exception."

The fact of the matter is that it would be almost impossible to lay
down a rule in this case under which this law could be held unconstitu-
tional without affecting a great mass of existing legislation which is
based upon the same general legislative theory. I am satisfied that
the Act violates no constitutional limitation.

With reference to the application of the Minnesota Co-operative
Creameries Association, Inc., for right to intervene, I think that it does
not appear that it has such an interest as would entitle it to have its
application granted. It is clear, however, that it has a sufficient in-
terest so that it ought to be permitted to participate in any future argu-
ment.

A speedy decision in this case is more important than an exhaustive
memorandum, and I have therefore taken the liberty of expressing
briefly the conclusions I have come to from the arguments presented and
the authorities cited.

JOHN B. SANBORN.

(Additional memorandum attached to Order of October 29, 1924.)

The question as to whether a criminal prosecution can be had for
the violation of the rule of the State Live Stock Sanitary Board, dated
November 7, 1923, "under the authority of Section 4691 General Statutes
1913, and as required by Chapter 269, Laws of 1923," referred to in the
complaint, was argued and considered in connection with the denial
of the motions of the plaintiffs in these cases.
Notice of Appeal.

To Messrs. Clifford L. Hilton and Victor E. Anderson, Attorneys for the Defendants; Mitchell, Doherty, Rumble, Bunn & Butler, Attorneys for the Intervener; N. J. Robinson, Esq., Clerk of the above named court:

Take notice that the plaintiffs above named appeal to the Supreme Court of the State of Minnesota from that part of the order of the above named court made herein on October 29th, 1924, discharging the order to show cause and temporary restraining order issued by the Hon. Harold Baker, judge of the District Court in and for the Twelfth Judicial District, on September 16th, 1924, and denying the motions of the plaintiffs for temporary injunctions.

Dated November 10th, 1924.

MANAHAN, SULLIVAN & HOOGESTEGER,
Attorneys for Plaintiffs,
636 Hamm Building, St. Paul, Minnesota.

MINNESOTA STATE SUPREME COURT DECISION.

No. 458 Ramsey Co. Taylor, C.
William F. Schulte et al., Appellants,
24578 —vs.—
C. P. Fitch et al., Respondents.

Syllabus.

1. Statutes are presumed to be valid and will be declared invalid only when they clearly transgress some inhibition of the Constitution.

2. Chapter 269, laws of 1923, adopting the "area plan" for suppressing tuberculosis among cattle, does not violate the constitutional provision forbidding taxation for private purposes; nor the provision requiring taxation to be uniform on the same class of subjects; nor the provision forbidding the state to engage in internal improvements; nor the provision forbidding special legislation; nor the provisions securing equal protection of the laws.

3. Statutes to promote and protect the public health by suppressing tuberculosis among domestic animals are for a public purpose.

4. Laws for promoting and protecting the public health are liberally construed to accomplish the intended purpose.

5. By this statute the State adopted the "area plan" for controlling and suppressing tuberculosis among cattle, designated counties as such areas, and made them one of its agencies for carrying the plan into effect.

6. The statute deals with a matter of State concern. It does not regulate the affairs of counties as such, and does not offend the provision that laws regulating such affairs "shall be uniform in their operation throughout the state."

7. It is general in form and in operation, and does not violate the equality rules.
8. The legislature was within its discretion in providing that the "Area plan" should be put into operation in a county only when the board of county commissioners, on petition of a majority of the cattle owners, made the required appropriation to aid in defraying the necessary expense.

9. The statute is supplemental to prior laws, and as the quarantine regulations adopted are authorized by prior laws, violations of them are within the penal provisions of such laws.

Affirmed.

Opinion.

Chapter 269, laws of 1923, provides, in Section 1:

"The boards of county commissioners of the several counties of this state are hereby authorized upon petition of a majority of the persons owning cattle in the county * * * to appropriate * * * a sum of money not exceeding twenty-five cents per head of cattle for each tuberculin test that may be administered, until the percentage of tuberculous cattle within the county is reduced to meet the requirements of a 'modified accredited area' as defined and approved by the United States Department of Agriculture, and the State Live Stock Sanitary Board of Minnesota, for the purpose of aiding in the testing of cattle in the county for tuberculosis and of carrying out sanitary and quarantine regulations."

Other sections of the act provide that the State Live Stock Sanitary Board shall enter into an agreement with any county board, making such appropriation, to test all cattle in the county for tuberculosis, provided funds are available for the payment of indemnities as provided by law, and provided also that qualified veterinarians are available to make the tests; that for the purpose of receiving federal aid the Federal Bureau of Animal Industry may be a party to such agreement; that the owners of cattle within such county shall submit them for tests and physical examinations and shall cause all infected animals to be slaughtered; and that the State Live Stock Sanitary Board shall make and enforce all necessary quarantine rules and regulations within the area covered by the agreement.

In May, 1923, the Board of County Commissioners of Meeker County, under and pursuant to this statute, entered into an agreement with the State Live Stock Sanitary Board, and the Federal Bureau of Animal Industry by which the State Board, with the assistance of the Federal Bureau, was to test all cattle in the county for tuberculosis, to cause all infected cattle to be slaughtered and put into effect and enforce the rules and regulations necessary to establish the county as a "modified accredited tuberculosis-free area," as defined by the Federal Department of Agriculture.

The Live Stock Sanitary Board proceeded to make the tests as provided in the regulations. The first test disclosed 553 infected herds. The board proceeded to carry out the provisions for eradicating the disease, and a later test showed that the number of infected herds had been reduced from 553 to 60. To accomplish the purpose more effectively the board adopted additional quarantine regulations. Edward Branson and five other cattle owners, engaged in the dairy business in the county, then brought an action to enjoin the County Commissioners,
the Live Stock Sanitary Board, and the Board of Health from carrying out or enforcing the provisions of the agreement on the ground that the statute is unconstitutional, and that the agreement entered into and the regulations adopted by the board are unauthorized and void. William F. Schutte, and seven other taxpayers of the county, brought a similar action on the same grounds. By consent the two actions were consolidated. The plaintiffs applied for a temporary injunction restraining the defendants from carrying out the provisions of the agreement or enforcing the quarantine regulations during the pendency of the action. The application was denied and the plaintiffs appealed.

The two assignments of error challenged the constitutionality of Chapter 269, Laws of 1923, and the authority of the State Live Stock Sanitary Board to institute criminal prosecutions against cattle owners who refuse to permit their cattle to be tested.

In support of their contention that the statute infringes the provisions of the Constitution, plaintiffs assert that it imposes taxation for a private purpose; that it makes the State a party to a work of internal improvement; that it provides for a tax not uniform on the same class of subjects; that it denies equal protection of the laws, and that it is special or class legislation.

That tuberculosis is a dangerous contagious or infectious disease which attacks both human beings and domestic animals; that it is prevalent throughout the state among both human beings and domestic animals; and that it is communicated to human beings, especially to children, by milk and other food products from infected animals, stands undisputed. The object of the statute is to promote and preserve the public health by providing a means for the control and suppression of this disease among cattle. That it is for a public purpose is beyond question.

"That the preservation of the public health is one of the duties devolving upon the State, as a sovereign power, cannot be successfully controverted. In fact, among all of the objects sought to be secured by governmental laws, none is more important than the preservation of the public health; and an imperative obligation rests upon the State, through its proper instrumentalities or agencies, to take all necessary steps to promote this object. This duty finds ample support in the police power which is inherent in the State and which the latter cannot surrender. It is as much for the interest of the State that the public health should be preserved as that life should be made secure." 12 R. C. L. 126.

"It is a well recognized principle that the protection of the public health is one of the first duties of government. Therefore, whatever rationally tends to promote and preserve the public health is an appropriate subject of legislation." 29 C. J. 242.

As the statute is clearly a measure for the protection of the public against disease, it is not within the constitutional inhibition against taxation for private purposes, nor within the inhibition against the State engaging in works of internal improvement. The dairy products certified as coming from a "modified accredited area," as defined in the federal regulations, bring higher prices in the markets than such products from other areas, a fact shown by the record, does not establish
that the act is for a private purpose, as claimed by plaintiffs, but that
the public recognizes that such areas are comparatively free from
infection and that food products therefrom may be consumed with little
or no danger of contracting the disease.

Plaintiffs apparently base their contention that the act provides
for a tax not uniform on the same class of subjects on the fact that the
amount to be appropriated by a county for the purpose of making the
tests is to be determined by the total number of cattle in the county
instead of by the number infected. They urge that a county having
a large number of cattle with only a few infected is required to raise a
greater sum than a county having a smaller number but with a large
number infected. We see little force in this contention, for all cattle
in the county must be tested and the number infected is not known at
the time the appropriation is made.

The contention that the act is special or class legislation and there-
fore violates the equality rules, raises the important question in the
laws for controlling and suppressing disease, and for promoting
the public health are always given a broad and liberal construction that
they may accomplish the purpose intended in enacting them. Schmidt
v. County of Stearns, 34 Minn. 112; State ex rel. v. Zimmerman, 86
Minn. 353; Town of Iosco v. Board of County Commissioners, 93 Minn.
134; 29 C. J. 243.

The State may make municipalities, counties or other territorial
subdivisions its agencies in performing its governmental functions. To
accomplish its purpose, it may employ any agency it pleases. State v.
Robinson, 101 Minn. 277; Associated Schools v. School Dist. No. 83, 122
Minn. 254; State ex rel. v. George, 123 Minn. 59; Berman v. State Agri-
culture Society, 93 Minn. 125; State v. Boehm, 92 Minn. 374; Kramer v.
County of Rentville, 144 Minn. 195; State Board of Health v. Greenville,
86 Ohio St. 1, 98 N. E. 1019, Ann. Cas. 1913 D 52.

By this statute the State made the counties as well as the Live
Stock Sanitary Board a part of the governmental machinery for pro-
tecting and preserving the public health. The powers to be exercised
and the duties to be performed by a county under it are to be exercised
and performed merely as a governmental agency. Davock v. Moore, 105
Mich. 120, 65 N. W. 424, 38 L. R. A. 883; Blue v. Beach, 155 Ind. 121, 56
N. E. 89, 80 A. S. R. 195; Henderson County Board of Health v. Ward,
107 Ky. 477; Forges v. Escambia County Board of Health, 28 Fla. 26,
13 L. R. A. 549.

The power to enact laws is vested in the Legislature and is without
limit except as restricted by the Constitution. A statute enacted by the
Legislature is presumed to be valid, and can be declared invalid only
when the court can point out some constitutional provision which it
transgresses. Plaintiffs contend that this statute violates the provisions
of Sections 33 and 34 of Article 4 of the Constitution, which declares
that:

"the Legislature shall pass no local or special law regulating the
affairs of * * * any county, city, village, township, ward or
school district";
and that

"All such laws shall be uniform in their operation throughout the State."

In support of this contention they cite *State ex rel. v. Copeland*, 66 Minn. 315, and *Lodoen v. City of Warren*, 146 Minn. 181, in which it was held that a statute regulating the affairs of cities, but which became operative in only those cities which elected to adopt it, violated the requirement that such laws "shall be uniform in their operation throughout the State."

The provisions there construed apply only to laws "regulating the affairs" of the municipalities specified. They do not apply to the statute here in question. The statute does not regulate or affect any matters pertaining to counties as such. It does not apply to or affect any of the corporate, municipal or local powers or duties exercised or performed by counties in managing and conducting the county business. The distinction between laws in respect to the local and municipal affairs of municipalities and laws in respect to matters of State concern, in which the State sees fit to act through the agency of such municipalities, has been frequently pointed out. *State ex rel. v. Sullivan*, 67 Minn. 379; *State ex rel. v. Dreger*, 97 Minn. 221; *Dahlsten v. Anderson*, 99 Minn. 340; *State ex rel. v. Fleming*, 112 Minn. 136; *State v. Village of Cloquet*, 52 Minn. 9.

To encourage action to control and eradicate tuberculosis among domestic animals, the federal department had approved what is termed the "area plan"; and offers aid in carrying out this plan; and will certify as a "modified accredited tuberculosis-free area" any given area in which the disease has been brought under control and suppressed in accordance with its requirements. To co-operate with the federal department, the State adopted this plan as one of its measures to conserve and protect the public health. As a matter of convenience, it designated counties as the "areas" to which the plan should apply. It could, with equal propriety, have established such areas regardless of county lines or other municipal boundaries. It was not dealing with the affairs of counties, but with a matter of state concern to which the restriction upon the legislation relating to county affairs does not apply.

The act is general, both in form and in operation. Any county in the state can obtain the benefit of it in the same manner and on the same conditions as any other county. It does not violate the equality rules.

Objection is made because the act is permissive, not mandatory, and does not go into operation in any county until the county board, on petition of a majority of the cattle owners of that area, make an appropriation to aid in defraying the expense of making the tests. A law may permit as well as command. Here the State offers substantial financial aid and the services of the State Live Stock Sanitary Board with its corps of veterinarians in suppressing the disease in any county which will make the required appropriation. It could have made compliance with the act compulsory. Instead it permits each county to determine for itself, through its board of county commissioners, whether the "area plan" for eradicating the disease shall be put into effect and
be enforced within such county. The Legislature deemed it wise to invite and secure voluntary local co-operation before applying that plan to a given area, and we cannot say that it exceeded the prerogative of the law-making power in doing so. The claim that the procedure adopted offends the Constitution is sufficiently answered, we think, in prior decisions. State ex rel. v. City of Nashwauk, 151 Minn. 534; William v. Evans, 139 Minn. 32; State v. Sullivan, 67 Minn. 379; State v. Brothers, 144 Minn. 337; State ex rel. v. Rogers, 97 Minn. 322; Elwell v. Comstock, 99 Minn. 261; State v. Fairmont Creamery Co., 85 Minn. 437; State ex rel. v. Brown, 97 Minn. 402.

That the petition initiating the proceedings in a county is to be made by cattle owners instead of by legal voters is not a delegation of legislative power to cattle owners. Although the Board of County Commissioners, the legislative body of the county, is not authorized to act until the required petition has been presented, the final decision rests with that board. It is within the province of the Legislature to require compliance with such conditions as it deems proper before the powers which it confers may be exercised. It has frequently required a petition by other than legal voters. The petition for a county road must be made by freeholders, G. S. 1913, 2520; and that for a drainage project by landowners, G. S. 1913, 5525. See State ex rel. v. Nashwauk, 151 Minn. 534; Banse v. Town of Clark, 69 Minn. 58; Bowman v. Virginia State Entomologist, 11 A. L. R. 1121; Woodward v. Fruitvale Sanitary Dist., 99 Cal. 554.

Section 6 of the statute provides:

"Definite quarantine rules and regulations shall be adopted and enforced by the State Live Stock Sanitary Board within the area covered by the co-operative agreement."

But this statute contains no express provision declaring a violation of such rules and regulations to be a criminal offense. Because of this omission, plaintiffs claim that they cannot be prosecuted criminally for refusing to comply with such rules and regulations. They allege that defendants have instituted criminal proceedings against plaintiff Branson and threaten to institute such proceedings against others of the plaintiffs and ask that defendants be enjoined from instituting or prosecuting such proceedings.

Even if we were to concede that violating the quarantine rules and regulations is not a penal offense, it is at least doubtful whether the facts stated would justify a court of equity in enjoining a criminal prosecution. Cobb v. French, 111 Minn. 429; Milton Dairy Co. v. Great Northern Ry. Co., 124 Minn. 239; Sherod v. Aitchison, 71 Ore. 446, Ann. Cas. 1916 C 1151, and annotation at page 1153.

In enacting this statute the Legislature necessarily had in mind the laws relating to such matters then existing, and clearly intended this as an addition or supplement thereto. Such prior laws are found in Sections 4690 to 4722, inclusive, of the General Statutes of 1913 and the several amendments thereto. They create a State Live Stock Sanitary Board and define its powers and duties, provide measures for controlling, eradicating and preventing contagious and infectious dis-
eases among domestic animals, direct the adoption and enforcement of appropriate rules and regulations to prevent the introduction or spread of such diseases, and provide for the slaughter of infected animals, after notice to the owner and for payment of an indemnity to the owner of the animals so slaughtered. They also declare that every person violating any of the provisions of such laws, or any rule or regulations adopted by the Live Stock Sanitary Board thereunder, shall be guilty of a misdemeanor. Plaintiffs insist that by the terms of these penal provisions, the only quarantine regulations to which they apply are those adopted under and pursuant to the law in which they were enacted, and that the regulations here in question are not authorized by that law. The act of 1923 clearly intends that the prior laws shall apply to proceedings thereunder, for it provides in Section 2 that the Sanitary Board shall cause the cattle of a county adopting the plan to be tested, "provided funds are available for payment of indemnities, as required by law."

The only provision for paying indemnities for cattle slaughtered and for providing funds therefor is found in the prior laws. Whether the act of 1923 goes far enough to make the penal provisions of the prior laws apply to proceedings under it we need not determine, for the rules and regulations adopted by the Live Stock Sanitary Board, found in the record, are clearly within the power conferred upon that Board by the prior laws and consequently are within the penal provisions of those laws. The order of the learned trial court is affirmed.

PRESIDENT McNEIL: The next paper will be by Dr. Edward Records, Director, State Veterinary Control Service, Reno, Nevada, on "Some Changes in the Requirements for Modified Tuberculosis-Free Areas." (Applause.)

DR. EDWARD RECORDS: Mr. Chairman and Gentlemen: On the printed program there is a slight error in the title of the paper we propose to present here today. It is only one word, but possibly it had better be rectified in your minds before we start. The word "proposed" has been left out. The title should be "Some Proposed Changes in the Requirements for Modified Tuberculosis-Free Areas." That is rather important because what we have to say here can obviously only be suggestions.

In a way, I suppose we should apologize for presenting exactly the paper we have here today for the reason that it consists to a considerable extent of repetition of material that has already been presented to the Association. Dr. Butler last year, especially, presented a paper which contained a great many of the things we are going to say here today, and he probably said them a great deal better. We don't feel inclined to apologize, though, for keeping the subject before the Association until some satisfactory solution is worked out, because it is one of vital importance to a third or more of the area of the United States.
SOME PROPOSED CHANGES IN THE REQUIREMENTS FOR
MODIFIED TUBERCULOSIS-FREE AREAS.

By Dr. Edward Records, Director, State Veterinary Control
Service, Reno, Nevada.

Everyone who has watched or taken part in the campaign for the
eradication of tuberculosis in the United States has been gratified at
the great progress made in a comparatively short time. As in the case
of all such projects, the plan of operation has been modified and built
up as the work progressed.

The accredited herd plan may be said to have been the starting
point of the organized effort to control and eventually eradicate tubercu-
losis from this country. This plan and the rules governing the same,
subject to its own minor weaknesses and defects, appears to have been
about equally applicable to individual herds in all parts of the United
States.

Later as the work progressed an effort, which has been in part
successful, was made to apply a similar program to herds within a
given area—usually a single county. This resulted in the adoption of
what has been designated the modified accredited area plan, working
under the provisions of which about 110 counties have now been classed
as modified tuberculosis-free areas. It sometime since became apparent,
however, that the modified accredited area plan as now in effect was
really applicable only where all lands were fenced, with the cattle at all
times under control and not subject to seasonal migrations over long
distances to obtain feed. These shortcomings of the present plan were
most severely felt in the western range and semi-range states.

The need for some changes in the modified accredited area plan
which would make it applicable to western conditions resulted during
1924 in the preparation by the Western States Live Stock Sanitary Asso-
ciation of certain proposed modifications which were presented for the
consideration of your Committee on Tuberculosis and considered by it
at last year's meeting. Definite action was deferred by the committee
until this year and it is the object of this paper to lay the proposed
changes before the Association as a whole so that you may be prepared
to act advisedly on any recommendations the Committee on Tuberculosis
may make.

It should be clearly understood that it is not proposed to discard or
set aside the present rules governing the creation of modified tubercu-
losis-free areas. The object in view is to provide an alternate plan of
procedure in certain cases which will make the plan applicable to all
parts of the United States under reasonable and just conditions. As a
matter of fact there is now no state in the Union where the present
plan would not apply and have to be used in the more thickly settled
counties; on the other hand there are vast areas in the western and
southwestern states where it is quite inapplicable.
The proposed modifications presented to the Committee on Tuberculosis last year were embodied for the sake of clearness in a redraft of the entire modified accredited area plan with the idea that the committee should work same over in their own discretion.

As only two sections of the new regulations presented to the committee embodied any material change from those now in effect we will confine our present discussion to them. Section 4, which was a new section, read as follows:

"4. Any area consisting of one or more counties wherein seventy-five (75) per cent or over of the cattle are strictly range cattle of a recognized beef type shall be classed as modified accredited tuberculosis-free area by the co-operating Federal and State departments, if as the result of any complete test of all the dairy, pure-bred and other non-range cattle therein the total number of reactors does not exceed one-half (0.5) of one per cent, and slaughter records on range cattle from the area show no evidence of the presence of tuberculosis in excess of one-quarter (.25) of one per cent; and it is further provided that individual quarantine shall be established on the remaining infected herds and such infected herds shall not be re-tested in less than sixty days from date of original test and all subsequent tests on such herds shall be made in accordance with the uniform accredited herd plan."

This proposed new section merely provides an alternate method for creating a modified tuberculosis-free area where 75% or more of the cattle therein are range cattle by exempting such cattle from a tuberculin test if slaughter records do not show the presence of tuberculosis. Such a procedure we believe perfectly rational and safe on the basis of now generally accepted facts.

The statement has been made that tuberculosis occurs in range cattle but a careful analysis of the situation will show that the percentage among cattle so classed under a proper definition of this term is negligible. It also appears to be a well established fact that whatever small percentage of tuberculosis may be present in range herds will rapidly eliminate itself if constant fresh introductions of the disease through infected bulls, etc., is prevented, which would be the case if the proposed plan were placed in operation.

It should also be noted in this connection that Regulation No. 7 of the United States Bureau of Animal Industry designed to prevent the spread of tuberculosis in cattle permits of the unrestricted interstate movement of steers and strictly range cattle. It would seem to us that if such cattle are considered by the Federal Government as fit to move into any state in the Union without a tuberculin test or other restrictions, that we could all well concede they were fit to be included in a modified tuberculosis-free area on the same basis.

It has also been said that range cattle can be tested. In the northern range states where the severe winters force the cattle down into the valleys and feed yards this is to an extent true. Such cattle can be tested, but at an expenditure of time, money and hardship on man and beast that cannot be justified in the eyes of any fair-minded man when the negative result measured in reactors is considered. On the more southerly ranges where the cattle run free all the year round anywhere
near a complete gather is a physical impossibility and is not even attempted for commercial purposes as no holding facilities are available.

Dr. Butler of Montana presented a paper at last year's meeting entitled: "The Problems of Tuberculosis Control in Cattle Under Range Conditions," a large portion of which was and is applicable to the question we are discussing. Dr. Butler said in part:

"Bovine tuberculosis eradication has advanced far enough now for the United States Bureau of Animal Industry to have an adequate idea of the prevalence of the disease, and its main centers of infection. Official figures in this work have demonstrated that the problem in range states is to locate centers of infection, and not to locate clean areas, as is the problem in most middle western and eastern states.

"We all agree that the work on hand is to eradicate bovine tuberculosis, and not one simply of tuberculin testing cattle. If this is so, why should we be asked to test cattle that are next to impossible to test and in which tuberculosis does not exist? That tuberculosis does not exist to any appreciable extent (probably not more than exists in accredited herds) in range cattle is amply proven by Federal Meat Inspection post-mortem reports, and by the tests of bulls and other cattle from range herds, by Federal and State authorities."

Many of the western or range states have conducted more or less intensive tuberculosis eradication campaigns over a considerable period of years. Other such states would no doubt do so if a definite goal were in sight. To do what has been accomplished has entailed a large expenditure of money and much work under adverse conditions. Some of the western states have spent on tuberculosis eradication amounts in proportion to their total taxed valuation larger than have any of the eastern or middle west states.

What is the result today in states where this work has been pushed? Tuberculosis has been practically eradicated and further inroads by the disease headed off, it is true. On the other hand, our western live stock owners are debarred under the present discriminatory system from the commercial advantages and moral satisfaction of having their counties and states classed as modified accredited tuberculosis-free areas.

As further evidence that a large portion of our western country is worthy of being classed as modified tuberculosis-free area with very little more systematic work, we would like to call your attention to the War Map of Tuberculosis of Live Stock issued by the Bureau of Animal Industry as a poster under date of July 1, 1924. This is an official publication based on detailed knowledge of the facts and it is safe to assume no county in the United States was given the benefit of the doubt, any error being on the side of conservatism.

A survey of this map as it relates to the western states shows that in the vast areas embraced in the states of Idaho, Nevada, Montana, Utah, Arizona, Colorado, New Mexico and Texas, there were only thirty-three counties rated as having over one per cent of tuberculosis. Three of these states mentioned had no counties rated at over one per cent and three had only one each. The three Pacific Coast states, Washington, Oregon and California, are not included in this group as they are not
predominantly range states taken as a whole, but in what may be
properly classed as range counties in these three states the condition is
identical. Practically none of these range counties are rated at over one
per cent of tuberculosis.

As a matter of fact many of the counties rated on this map at not
over one per cent were undoubtedly far below that figure as except for
the modified accredited areas no lower rate was specified on the map.
It would seem, therefore, that even a year and a half ago we had a vast
empire within the United States practically free of tuberculosis and
easily made quite so by a properly co-ordinated effort, awaiting only
definite official recognition.

Section 5 of the draft as presented last year to the Committee on
Tuberculosis was offered as a substitute for the present regulations
governing the entry of cattle into a modified tuberculosis-free area or
one in process of creation. It read as follows:

"Section 5. The minimum requirements for the shipment,
transporting or driving of cattle into a modified accredited tuber-
culosism-free area shall be those of the Federal regulations relative
to tuberculosis governing the interstate movement of cattle."

This section merely provides that the regulations of the United
States Bureau of Animal Industry governing the interstate movement
of cattle shall be acceptable at least as the minimum requirement for
cattle entering a modified tuberculosis-free area or one in process of
creation.

As these requirements as set forth in the Bureau of Animal In-
dustry regulations have been in effect for several years without material
change we must assume that those best able to judge feel them adequate
to prevent the introduction and dissemination of tuberculosis. If further
experience proves otherwise the Bureau regulations will obviously be
changed and strengthened accordingly so we see no valid objection to
their being accepted in the connection suggested.

The fact that such regulations are established as a minimum re-
quirement need not, of course, bar any state or county from adopting
supplementary regulations to meet local conditions which may exist.
The adoption of such regulations would make it possible, however, to
adequately and honestly police modified tuberculosis-free areas and areas
in process of being so created in a range country, a procedure which is
not possible under the present regulations.

In conclusion, we can only again urge that you give favorable con-
sideration to some safe and conservative plan to make the recognition
of tuberculosis eradication truly national in its scope and not continue
to exclude approximately a third of the area of the United States from
the benefits of such official recognition.

PRESIDENT McNEILL: The next paper will be presented by Dr.
E. L. Stubbs, of the Pennsylvania Bureau of Animal Industry, Harris-
burg, Pa., on "The Tuberculin Test for Poultry." (Applause.)
TUBERCULOSIS WORK IN POULTRY.


(Presented at the 29th Annual Meeting of the United States Live Stock Sanitary Association, Chicago, Illinois, December 2, 3, 4, 1925.)

Those who first studied tuberculosis found that it was not only a disease of mammals but that birds were also affected. It has been found in practically all kinds of birds and has been observed in all countries where fowls are raised. Tuberculosis is causing untold suffering in the human family. Who is willing to guess at the damage it has done to the dairy industry? Those interested in poultry should take warning and measures should be instituted to prevent such a condition in our flocks. Reports from various parts of the United States indicate that many flocks in certain sections are already suffering severe losses from tuberculosis. In Pennsylvania we have found a section in which many flocks are badly infected with this disease.

In 1922 the Pennsylvania Bureau of Animal Industry first undertook work with the tuberculin test in poultry. This work was begun for the purpose of becoming acquainted with the tuberculin test as well as to study its practical value in controlling or eradicating this disease. Four flocks were selected and the first test was made in July, 1922. The first test comprised 467 birds and 192 or 38 per cent reacted. All reactors were killed as well as 51 culls which were negative to the test. These negative birds were poor individuals, several being emaciated and believed to be advanced cases of tuberculosis which failed to react. About half of these 51 negative birds showed lesions on autopsy. The results of the tests on these four flocks led us to believe that positive reactions were more significant than negative reactions, because some cases were evidently being left in the flocks. In this work a fifty per cent solution of crude tuberculin avian was used intradermally, as recommended by Drs. Van Es and Schalk of the North Dakota Station (1).

It was then decided to give powdered tuberculin a trial, since this product was giving good results when used intradermally in bovine tuberculin testing. A comparative test was started on seven flocks comprising 1312 birds. Approximately one-third were given 50 per cent crude tuberculin avian, one-third 10 per cent powdered tuberculin avian and one-third 5 per cent powdered tuberculin avian. From this test 534 reactors were obtained. These were killed as well as 91 birds which were negative to the test. The results of this test, including autopsies of reactors were summarized by the author in an article appearing in the A. V. M. A. Journal, May, 1925 (2), and led us to believe that powdered tuberculin was superior to crude tuberculin in producing a higher percentage of positive birds showing lesions as well as a lower

(1) Bulletin No. 108. N. Dak. Experiment Station, Van Es and Schalk.
percentage of negative birds showing lesions. From then on all tests have been made with powdered tuberculin.

Work has been done in 13 flocks since July, 1922, as shown by the accompanying chart, and is still being continued in some of them. In all 9453 individual tuberculin tests have been made and 1131 reactors obtained. Tests have been conducted twice yearly except in 1923 when only one test was made. These were common bred farm flocks, kept under ordinary or poor farm conditions without modern housing and without special care of the flock. This work was entered into, voluntarily, by the owners and no indemnity was paid for reactors, although all reactors were slaughtered under our supervision. Several flocks were dropped for various reasons. One flock, No. 13, had no reactors and was not tested again. One flock, No. 6, had 82 per cent infection with only 30 fowls left which were sold. One owner, No. 10, moved out the community after the first test was made. Two owners, Nos. 4 and 5, quit farming and the flocks were dispersed.

The left wattle was used for the injections, the right wattle being left as a control. The injections were made as closely as possible to the surface of the skin, as emphasized by Drs. Van Es and Schalk. A small needle was used, half inch, 25 gauge, and no attempt was made to measure the dosage, sufficient tuberculin being injected to obtain a slight swelling. In recording reactions the slightest thickening of the wattle in comparison with the control wattle was considered a reaction and marked plus 1. Gradations were made to plus 4, which indicated swelling of the entire wattle. In all tests each bird was leg-banded and the results recorded individually. Considerable difficulty was experienced in getting every bird on the premises included in the test. Usually there were a few stragglers and if the birds were not confined during the entire test we would have a few not injected and a few not read. All reactors were killed. The owners were furnished with disinfectant and instructed to thoroughly clean the houses and spray them following each test.

In the initial test of 13 flocks, including 2540 individuals, 797 or 31 per cent reacted. Included in this test was one flock (No. 13) of 213 birds, all of which were negative and one flock (No. 6) of 168, of which 138 or 82 per cent reacted. The other flocks ranged in percentage of infection between these two extremes with an average of 31 per cent. In a second test of ten of these same flocks, including 2300 birds, 7½ per cent reacted. On a third test of seven of these flocks, including 1125 birds, 6.31 per cent reacted, and on a fourth test of seven flocks, 4.8 per cent reacted. At this time two of the small flocks, Nos. 1 and 2, were negative. The following test, however, showed one reactor in one flock, No. 2, but has since been negative on two tests. On the fifth test of six of these flocks, 1324 birds were tested and 1.8 per cent reacted. At this time one flock, No. 1, had been negative on two successive tests and was dropped. On a sixth test of four of the flocks, including 811 birds, 1.35 per cent reacted. At this time two more flocks, Nos. 2 and 3, were entirely negative and remained so through the next test.
Flock No. 1 on the initial test in July, 1922, showed 60.9 per cent infection. It was again tested in November, 1922, November, 1923, and in June, 1924, was clean. It was again clean in September, 1924, and since then no work has been done in this flock.

Flock No. 2 on the initial test, July, 1922, showed 17.9 per cent infection. It was again tested in November, 1922, November, 1923, and in June, 1924, was clean. The next test, in September, 1924, showed 1 reactor and since then the flock has been negative in March and October, 1925.

Flock No. 3 on the initial test in July, 1922, showed 31.7 per cent infection. It was again tested in November, 1922, November, 1923, June, 1924, September, 1924, and was clean on the last two tests, March and October, 1925.

Flock No. 7 on the initial test in August, 1922, showed 23.6 per cent infection. It has been tested six times in three years and still shows 3.28 per cent infection. This is one flock in which we have always had some difficulty in getting all the birds confined at the time injected. At one test one of the reactors got away and the owner promised to catch it and destroy it but it was left in until the next test, when it reacted again and was taken out.

Flock No. 8 showed on the initial test in August, 1922, 48 per cent infection. On a second test in October, 1923, 5.9 per cent infection, and since then has been dragging along with one to three reactors.

Flock No. 12 has also been discouraging and on the fifth test still has 3.27 per cent infection. This also is a place where we have always had difficulty with stragglers and where we have not had very good cooperation of the owner.

Thus in a period from July, 1922, until October, 1925, three flocks, Nos. 1, 2 and 3, which averaged 38½ per cent infection, on the initial test, have now passed two successive negative tests, one flock, No. 1, requiring five tests and two flocks, Nos. 2 and 3, seven tests.

Three other flocks, Nos. 7, 8 and 12, which averaged 22.38 per cent infection on the initial test, one of which has been tested five times and two six times, had at the last test an average of 2.48 per cent flock infection.

DISCUSSION—From the work so far done it seems that avian tuberculosis may become a serious disease affecting poultry, not only causing great losses by deaths, but also producing enormous economic losses. The nature of the disease makes it one which commands all the resources of the poultryman and the veterinarian in combat. Its eradication from the farm flock requires careful, persistent and conscientious efforts. Its diagnosis is difficult by physical examination unless in parts externally situated or in advanced stages of the disease. Insidious in nature, it becomes firmly established in a flock before its presence is suspected. Serious inroads are made which cannot be halted except by tireless and continued efforts.

By the intradermal test a diagnosis of tuberculosis can readily be established in the living bird and the extent of the infection throughout
a flock can be determined. By the repeated use of the test, with the
removal of reactors, careful cleaning and thorough disinfection of
premises, tuberculosis can be eliminated from some badly infected flocks.
Exercise of the utmost care by the veterinarian is necessary to get the
best results with the tuberculin test in avian tuberculosis, this being
particularly true in making the intradermal injection. Quite a few badly
diseased birds will not react to the tuberculin test and must be taken
out by physical examination. Correct breeding, proper feeding, care-
ful management and practice of preventive measures against other
fowl diseases are important factors in a consideration of avian tubercu-
losis. Premises should be kept clean and disinfection used to destroy
infection.

Plan for Handling Avian Tuberculosis on a Flock Basis.
1. Determine the extent of the infection by history, tuberculin test and
   autopsy.
2. Removal and slaughter of diseased fowls, under official supervision.
   In extensively infected flocks the exposed fowls should also be
   slaughtered.
3. Clean thoroughly and disinfect premises under official supervision.
4. Flocks from which diseased fowls have been removed but where the
   entire flock has not been slaughtered, should be given a physical
   examination and all fowls in good condition tuberculin tested and
   should be retested in 60 to 90 days.
5. In the event of reactors being disclosed to the 60 to 90 day retest
   the flock should be again tested in 6 months.
6. After a negative test and all fowls are in good physical condition
   the flock should be tuberculin tested annually.
7. All diseased fowls should be killed under official supervision.
8. Droppings should be disposed of so as to not come in contact with
   poultry.
9. Cleanliness should be maintained and frequent disinfection used.
10. Fowls other than baby chicks should be tuberculin tested before
    being added.
11. Uncooked table scraps and similar refuse should be discontinued as
    feed.
12. Consistent effort should be made to exterminate carriers such as
    rats, mice and pigeons.
13. In the prevention and eradication of avian tuberculosis attention
    should be given the tuberculosis problem in all kinds of associated
    live stock, especially swine tuberculosis.
14. Owners will be expected to practice careful breeding, correct feed-
    ing, proper flock management, principles of sanitation and to use
    preventive measures toward other fowl diseases.
15. The following certificate is issued to owners who will agree to follow
    the above plan and whose fowls have passed two annual negative
tuberculin tests.
AGREEMENT

of Owner with the Bureau of Animal Industry, Pennsylvania Department of Agriculture.

I hereby agree to the terms of the above plan for the prevention, repression and eradication of avian tuberculosis. I further agree to observe and fulfill the foregoing requirements and failure on my part shall be sufficient cause for cancellation of this agreement.

My flock consists of .................................................................

Number Breed
Date ............................................. Owner.............................................
Witness ............................................. Address.............................................

Certificate of Inspection and Test for Avian Tuberculosis.

No. ............................ Issued..........................

This is to certify that the entire flock of..................................................
Owner

................................................., consisting of ..............fowls,
Address

has undergone inspection; has passed the required number of tuberculin tests; and that the owner has complied with the requirements prescribed by the Pennsylvania Bureau of Animal Industry for the prevention, repression and eradication of avian tuberculosis.

This certificate is good for one (1) year from date unless revoked.

............................................. State Veterinarian.

Tuberculosis Work in Poultry.

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<td>707</td>
<td>1743</td>
<td>31.4</td>
<td>2300</td>
<td>173</td>
<td>2127</td>
</tr>
</tbody>
</table>

Total Tests, 9453.
Total Reactors, 1131.
Total Percent Reactors, 11.96.
TWENTY-NINTH ANNUAL MEETING

PRESIDENT McNEIL: The next paper to be discussed is "Avian Tuberculosis," a paper prepared by Drs. Robert Graham and E. A. Tunnicliff, of the University of Illinois, Urbana, Illinois. The paper is to be delivered by Dr. Graham.

THE RELATION OF AVIAN TO PORCINE TUBERCULOSIS.

Robert Graham, I. B. Boughton* and E. A. Tunnicliff, Laboratory of Animal Pathology and Hygiene, University of Illinois.

The progress of tuberculosis eradication in cattle in recent years through the application of the tuberculin test, slaughter of reactors and disinfection of premises, under federal and state supervision, more than any other factor, has been responsible for a growing appreciation among the live stock owners throughout the United States of the practical advantages of tuberculosis-free herds. With the decrease of the disease in cattle the problem of maintaining herds free from infection has received more consideration, and at the same time, the control of tuberculosis in other farm animals has become a matter of more concern. In this connection the results of investigations regarding the relation of avian and porcine tuberculosis have broadened our understanding of the disease in farm animals, and slightly enlarged the general plan or problem of animal tuberculosis control. The relation of the disease in poultry to swine has also emphasized the important need of accumulating more knowledge regarding the epizooLOGY of animal tuberculosis in order that the work of eradication in all animals may be expedited with the least possible expenditure of funds and a minimum of delay. As the work progresses it is reasonable to assume that problems quite unsuspected at this time may be presented for study, and it may be advisable to re-examine some aspects of the older and accepted beliefs with reference to the mammalian and avian types of the disease. In fact the relation of the disease in one species to another under farm conditions becomes a more practical subject for consideration as the problem of control advances. The slightly infective, as well as the sensitizing power of tuberculous virus in an unnatural host, is one of the familiar problems with certain unfamiliar aspects which should, if possible, be carefully studied in animals under varying conditions in order that the usual as well as the unusual phenomena may be made known.

It is the purpose of this paper to report the results of orienting tests started in 1922, which throw some light on the susceptibility of swine to avian tuberculosis under field conditions. A summary of both laboratory and field evidence leads to the belief that avian tuberculosis may be, and probably has been for at least a decade, an important factor in the occurrence of tuberculosis in swine in Illinois. It now appears that the control of swine tuberculosis is closely related to, if not directly dependent upon, measures for the suppression of the disease in fowls as well as cattle.

*Resigned April 15, 1925.
The Importance of Avian Tuberculosis Underestimated.

For nearly a quarter of a century it has been known that pigs were susceptible to avian tuberculosis though the practical significance of the avian infection to swine in the United States, at least in the Middle West, was not generally accepted until Van Es and Martin (1) reported their findings in tuberculous lymph glands of swine in 1924. Previous to this time authoritative opinion estimated that the larger part of swine tuberculosis and probably as high as 90 per cent of the infection in these animals was due to association with infected cattle or to feeding unpasteurized milk or milk products from creameries. This teaching regarding the bovine type of tuberculosis in swine appeared logical and for many years the control of the disease in these animals was thought to be dependent upon the progress of eliminating the bovine infection.

As a result avian tuberculosis, though prevalent in many localities in Illinois, received little attention in the general program of eradicating tuberculosis in cattle and swine until the federal-state plan for the suppression of tuberculosis in cattle was modified to a county area basis. This plan as first adopted in Illinois in 1920 provided an opportunity for federal and state inspectors to observe the prevalence of tuberculosis in fowls as well as the intimate contact between infected flocks and other farm animals. The increasing prevalence of avian tuberculosis, as encountered in the field, probably stimulated inquiry regarding the danger of this disease to other animals and in some instances where irregularities in the eradication of the disease in both cattle and swine were encountered it became apparent that fowl tuberculosis was suspected as a possible factor in perpetuating tuberculosis in other animals on the farm.

The infective character of avian tuberculosis to swine and calves following certain types of exposure did not lack proof and in the reported experimental studies the possible danger of the avian virus spreading to swine, under farm conditions, could not be entirely unheeded. Weber and Bofinger (2), Titze (3), Mohler and Washburn (4), DeJong (5), Bang (6), Griffith (7), Christiansen (8), Day (9) and others presented evidence at different times to prove that swine may be spontaneously or experimentally susceptible to the injection of Mycobacterium tuberculosis (avian), or to the cadavers of infected chickens and mice. At the termination of certain preliminary experiments at the Illinois Experiment Station in 1922, wherein pigs proved susceptible to

avian tuberculosis as the result of exposure to infected chickens, Giltner (10) simultaneously reported the isolation of an acid-fast organism from a case of spontaneous lymph gland tuberculosis in a hog which proved indistinguishable from Mycobacterium tuberculosis (avian). His report probably more than any other, together with the increasing prevalence of the disease in fowls in Illinois, called attention to the importance of investigations regarding the possible danger of allowing tuberculous chickens access to the swine feed lots of the Middle West.

The initial experiments were planned to obtain information regarding the danger of tuberculous fowls associating with healthy non-tuberculin reacting pigs and calves. The exposure provided in some experiments was analogous to natural exposure under farm conditions. The results of these preliminary exposure tests and later the findings in lymph glands of market hogs from Illinois farms, slaughtered at the Chicago and East St. Louis packing houses, contributed evidence which serves to emphasize the importance of avian tuberculosis in swine and the approaching need of a systematic and practical plan for eradicating this type of tuberculosis in the Middle Western States.

Swine Susceptible to Avian Tuberculosis.

In the orienting tests the feces of tuberculous chickens were allowed to contaminate the feed of pigs for varying lengths of time. Healthy, non-tuberculin reacting pigs were fed grain on wooden, dirt and concrete floors, where the feces of tuberculous chickens were allowed to accumulate each day. The protocols of two such exposure tests of this character as given in Tables 1 and 3 are self-explanatory, while the results of the findings at autopsy in these two groups of pigs as given in Tables 2 and 4 are typical of such tests. In addition to the exposure provided in tests of this character, a tuberculous fowl carcass was occasionally eaten by the pigs. Though protocols, wherein pigs were exposed to infected feeding floors, were originally designed to prevent pigs from eating any chicken carcasses, the additional exposure incurred by some pigs in this manner was not regarded as sufficiently damaging to warrant discarding the evidence obtained. In addition the results of feeding and injecting cultures of Mycobacterium tuberculosis (avian), as well as investigations not outlined in this paper, involving the use of approximately 100 pigs in more than 30 separate tests, gave rather consistent evidence of the susceptible character of swine to avian tuberculosis. The preliminary observations, including the feeding and injection of Mycobacterium tuberculosis (avian) in pigs, are summarized as follows:

Summary of Preliminary Exposure Tests.

1. Pigs are susceptible to avian tuberculosis through direct or indirect exposure. The development of avian tuberculosis in swine following exposure is sufficiently constant to eliminate the importance of a mutable or uncertain character of the avian virus.

TABLE 1
Results of Exposing Pigs to Avian Tuberculosis.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>P.N.</td>
<td>C.</td>
<td>Intra.</td>
</tr>
<tr>
<td>-------</td>
<td>---------------------</td>
<td>--------</td>
</tr>
<tr>
<td>28</td>
<td>B &amp; W</td>
<td>Neg.</td>
</tr>
</tbody>
</table>

*Mycobacterium tuberculosis (avium) (1803) isolated from chickens submitted by Dr. J. H. Kritchel, Alexis, Illinois.

Diagram of Lot I.
TABLE 2
Results of Tuberculin Tests and Autopsy of Pigs Exposed to Avian Tuberculosis.
April 27, 1922—December 15, 1922.

<table>
<thead>
<tr>
<th>Pig No.</th>
<th>Lot</th>
<th>T. T. 11/28—12/1/22</th>
<th>Retest (4) 1/30/23 Intramucosic 2/2/23</th>
<th>POST MORTEM—February 2, 1923</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Intr. (1)</td>
<td>Opth. (2)</td>
<td>Intram. (3)</td>
</tr>
<tr>
<td>28 B &amp; W</td>
<td></td>
<td>WM</td>
<td>N</td>
<td>M</td>
</tr>
<tr>
<td>31 B &amp; W</td>
<td></td>
<td>N</td>
<td>N</td>
<td>M</td>
</tr>
<tr>
<td>92 Red</td>
<td></td>
<td>S</td>
<td>N</td>
<td>M</td>
</tr>
<tr>
<td>10 W</td>
<td></td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>24 Red</td>
<td></td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>32 Red</td>
<td></td>
<td>S</td>
<td>N</td>
<td>M</td>
</tr>
<tr>
<td>22 Red</td>
<td></td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>63 Red</td>
<td></td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>1-2 Red</td>
<td></td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>3 Red</td>
<td></td>
<td>S</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>4-2 B &amp; W</td>
<td></td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>2 B &amp; W</td>
<td></td>
<td>N</td>
<td>N</td>
<td>S</td>
</tr>
</tbody>
</table>

**TUBERCULIN TEST**

(1)—U. S. D. A. Tuberculin.
(2)—U. S. D. A. Tuberculin.
(3)—Avian Tuberculin U of I.
(4)—U. S. D. A. Tuberculin.
N—Negative Reaction.
M—Marked Reaction.
WM—Well Marked Reaction.
S—Slight Reaction.

4 or 40% of exposed pigs in Lot I showed tuberculosis in more than one group of lymph glands.

10 or 83.33% of exposed pigs in Lot I showed lesions of tuberculosis in the mesenteric lymph glands. All lesions were small and benign in character.

X—Slight lesions.

XX—Marked lesions though not progressive.

XXX—Well marked lesions involving several glands, but not the progressive bovine type of lesions.

Dr. W. A. Hahn, Bureau of Animal Industry, Chicago, Illinois, applied the tuberculin test and assisted in the autopsy of above animals.
# TABLE 3
Results of Exposing Pigs to Avian Tuberculosis.

<table>
<thead>
<tr>
<th>Lot II</th>
<th>Tuberculin Test Aug. 1-4, 1922</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Fig. No.</td>
<td>Sex</td>
<td>Wt.</td>
</tr>
<tr>
<td>19</td>
<td>Female</td>
<td>30-60</td>
</tr>
<tr>
<td>20</td>
<td>Male</td>
<td>a</td>
</tr>
<tr>
<td>21</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>22</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>23</td>
<td>Female</td>
<td>a</td>
</tr>
<tr>
<td>24</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>25</td>
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<td>26</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>27</td>
<td>a</td>
<td>a</td>
</tr>
</tbody>
</table>

**TIME OF EXPOSURE:** August 4, 1922—December 15, 1922—133 days.

**METHOD OF EXPOSURE**

Pigs 19, 20, 21, 22, 23, 24, 25, 26 and 27 were placed in Lot II adjoining frame house A, 6x6 feet square, without windows, where ten to thirty tuberculous chickens were confined (see diagram of Lot II). The chickens represented two spontaneously infected farm flocks, as well as chickens artificially infected by injecting subcutaneously Mycobacterium tuberculosis (avium)*. Twice each day from August 4, 1922, to December 15, 1922, the pigs were exposed by feeding grain on the wooden floor in the house, where the feces of the tuberculous chickens were allowed to accumulate. At the time the pigs were fed, the chickens were removed to Pen B. Exposure by feeding was discontinued December 15, 1922, though the animals were held for observation until February 2, 1923. The results of the tuberculin tests of the exposed pigs on November 28, 1922, and January 30, 1923, are given, together with gross findings at autopsy, in Table IV, page 10.

*Died October 2, 1922—Septicemia.

**TUBERCULIN TEST**


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*Mycobacterium tuberculosis (avium) (1803) isolated from chickens submitted by Dr. J. H. Krichel, Alexis, Illinois.
TABLE 4

Results of Tuberculin Tests and Autopsy of Pigs Exposed to Avian Tuberculosis.
August 4, 1922—December 15, 1922.

<table>
<thead>
<tr>
<th>Pig No.</th>
<th>Sex</th>
<th>Wt. Lbs.</th>
<th>T. T. 11/28—12/1/22</th>
<th>Retest (1) 1/30/23 Intramusosal 2/2/23</th>
<th>POST MORTEM—February 2, 1923</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intr. (1)</td>
<td>Opth. (1)</td>
<td>Intram. (2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WM</td>
<td>WM</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>M</td>
<td>N</td>
<td>XX</td>
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<td>S</td>
<td>N</td>
<td>XX</td>
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<td></td>
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<td>WM Photo</td>
<td>M</td>
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</tr>
</tbody>
</table>

TUBERCULIN TEST

(1)—U. S. D. A. Tuberculin.
(2)—Avian Tuberculine U of I.
N—Negative Reaction.
M—Marked Reaction.
WM—Well Marked Reaction.
S—Slight Reaction.

2 or 25% of exposed pigs in Lot II showed lesions of tuberculosis in more than one set of lymph glands.
100% of the exposed pigs in Lot II showed gross lesions of tuberculosis in mesenteric lymph glands. All lesions were small and benign in character.
X—Slight lesions.
XX—Marked lesions though not extensive.

Dr. W. A. Hahn, Bureau of Animal Industry, Chicago, Illinois, kindly assisted in the application of the tuberculin test and autopsy of animals.
(a) A single feeding of Mycobacterium tuberculosis (avian) may induce lymph gland tuberculosis in pigs.
(b) A single feeding of the tuberculous organs of chickens may produce lesions of lymph gland tuberculosis in pigs.
(c) A single intravenous injection of Mycobacterium tuberculosis (avian) may produce lesions of tuberculosis in the liver and lungs of young pigs.
(d) The daily feeding of grain contaminated with feces of tuberculous fowls for a period of 60 or more days may produce localized lymph gland tuberculosis in pigs.
(e) Healthy non-tuberculin reacting pigs placed in houses in which tuberculous chickens were previously confined may contract tuberculosis. Contaminated quarters appear to be much less infective to swine than association with tuberculous fowls, as judged at autopsy by the number and size of tubercles in the lymph glands.

2. English sparrows and pigeons in the vicinity of tuberculous chickens may show hepatic or splenic lesions of tuberculosis at autopsy. Several naturally infected sparrows and a few infected pigeons coming to our attention were unable to fly, though apparently healthy flying pigeons that were shot a distance of over a mile from known infected premises, showed gross lesions of tuberculosis at autopsy.
(a) An emulsion of the tubercles from the spleen and liver of pigeons proved virulent upon inoculation into susceptible animals.
(b) Naturally infected tuberculous sparrow cadavers proved infective to chickens and pigs, via the mouth, suggesting that wild birds do not necessarily alter the virulence of the avian virus and that through their feeding habits they might carry avian tuberculosis from farm to farm.
(c) No evidence of a rapidly spreading tuberculous infection among sparrow or pigeon flocks was obtained to suggest that the disease is communicated from sparrow to sparrow or pigeon to pigeon to perpetuate the disease in flying birds.

3. Wild rats (Mus norvegicus) proved slightly susceptible to avian tuberculosis but no evidence was obtained to suggest that the disease occurs spontaneously among wild rats on or adjacent to infected premises.

4. Autopsy of pigs experimentally infected with avian tuberculosis, via the mouth, showed the lesions encountered to be local and benign in character and confined to the lymph glands. The mesenteric glands were the most common site of infection. Experimentally infected pigs that showed lesions of tuberculosis in more than one set of lymph glands probably consumed excessive amounts of the virus. Mature hogs proved more resistant than shotes, while sucking pigs appeared most susceptible.
(a) The tubercles in swine lymph glands (avian infection) were small in size, from a pin point to a pea, caseous or caseo-calcareous in character and often dry and well encapsulated. Some of the avian lesions in the lymph glands of pigs were only slightly visible through the gland capsule.
(b) Microscopic examination of smears from lesions in the lymph glands of artificially infected pigs revealed varying numbers of acid-fast organisms. The virus in the experimentally induced lymph gland lesions of avian tuberculosis in swine sometimes proved non-pathogenic following injection into healthy non-tuberculin reacting chickens, even though microscopic examination of the inoculum showed the presence of acid-fast organisms resembling Mycobacterium tuberculosis.

5. Healthy non-tuberculin reacting chickens injected intravenously with tuberculous lymph glands of pigs (avian type) may give a reaction to avian tuberculin in 60 to 90 days, yet fail to show gross lesions or positive microscopic findings.

(a) The Yersin or septicemic type of tuberculosis may occasionally develop in pigs experimentally infected with avian virus. This type of the disease may likewise be observed in experimentally infected chickens. The Yersin type of avian tuberculosis is not a constant or specific character of the virus in chickens or pigs which can be consistently reproduced by reinjecting the Yersin infected tissue into susceptible animals.

6. Pigs infected with avian tuberculosis may communicate the disease to healthy non-tuberculin reacting pigs by continuous direct association. The rate of transmission from pig to pig through association appears to be slower than from infected chickens to pigs following comparable contact.

(a) Seventeen or 22 per cent of 77 rectal scrapings obtained over a period of three months from 10 reacting pigs infected through association with tuberculous fowls, and which later, at autopsy, showed mesenteric lesions of tuberculosis, produced lesions of generalized tuberculosis following injection into healthy non-tuberculin reacting chickens.

7. The intramucosic tuberculin test of experimentally exposed pigs (avian tuberculin), as applied and interpreted, detected a larger number of infected pigs than the intradermic or ophthalmic tuberculin tests as confirmed at autopsy.

Avian Tuberculosis in Naturally Infected Swine.

The positive experimental evidence obtained in transmitting avian tuberculosis to pigs in orienting tests suggested the examination of tuberculous lymph glands from naturally infected swine. The first specimens of tuberculous lymph glands in young pigs received from farms in Ford and Rock Island counties, Illinois, upon examination proved to be the bovine type. Though these pigs suffered from an acute and probably fatal illness in addition to tuberculosis, the lesions of the latter disease observed at autopsy paralleled in extent the lesions encountered in experimentally induced cases of avian tuberculosis in swine at the laboratory. In December, 1922, specimens of tuberculous lymph glands (11) from spontaneously infected swine were received at

11. Specimens of tuberculous swine lymph glands were received through the courtesy of Dr. J. J. Lintner, Inspector in Charge of Tuberculosis Eradication, Chicago, Illinois. The origin of the hogs comprising the first few shipments was not obtained.
Illinois Experiment Station from a Chicago abattoir. An emulsion of the glands inoculated subcutaneously into two non-tuberculin reacting chickens produced generalized miliary lesions of tuberculosis in the liver and spleen of one fowl. Microscopic examination of the lesions in the liver revealed acid-fast cells resembling Mycobacterium tuberculosis. The other chicken and two guinea pigs that received the same inoculum failed to show lesions of tuberculosis at autopsy. The identity of the virus and its avian classification was later confirmed through transmitting the disease from fowl to fowl and by examining other specimens received from the Chicago market during 1923-1925.

Avian Tuberculosis in Market Hogs.

A study of additional tuberculous swine glands from the Chicago and East St. Louis markets was accomplished through the co-operation of the Sanitary Committee of the Chicago Live Stock Exchange and was undertaken largely as the result of increased retentions in swine for tuberculosis. According to the reports of the Federal Meat Inspection Division, retentions at the Chicago market, as compiled by Smith and Davidson, increased from 3.77 per cent to 17.70 per cent from 1908 to 1921 inclusive (see Table 5, page 152), or a percentage increase of lymph gland tuberculosis of swine of 369.59 in 14 years. The condemnations of swine carcasses for tuberculosis did not materially change during this period. To prove or disprove the possible relation of increased retentions in swine for tuberculosis to the avian type of the disease at these markets, infected glands from different carload lots at the Chicago and St. Louis market were sent the Experiment Station for study.

Van Es and Martin of Nebraska (12) recently published the results of examining 250 tuberculous lymph gland consignments from swine, of which 88.51 per cent showed convincing evidence of the avian type of the disease. Their results first called attention to the practical aspects of avian tuberculosis in the eradication of the disease in swine. Later Hastings, Beach and Knilans of the Wisconsin Station (13) reported 34 per cent avian type in ten consignments of tuberculous lymph glands of swine. At the Illinois Experiment Station a total of 163 tuberculous swine glands have been received. The examination of one group including 85 and part of the second group including 33 specimens have been completed. The routine examination consisted of first removing the tuberculous tissue from the gland and after macerating in sterile saline the suspension was treated with antiformin before chickens and guinea pigs were injected. Microscopic examination of the inocula of the first group including 85 specimens invariably confirmed the character of the lesions received for examination. The types of Mycobacterium tuberculosis in these specimens were determined by the extent and character of the gross lesions induced in guinea pigs and

12. Van Es and Martin—1925. Nebraska Experiment Station Research Bulletin No. 50.
chickens 60 to 90 days following injection. Chickens were injected intravenously and guinea pigs subcutaneously. The inoculated animals were confined in separate cages until death occurred or until destroyed for autopsy 60 to 90 days later.

**TABLE 5**

Swine Retained for Tuberculosis at Chicago Market, 1908-1921.

<table>
<thead>
<tr>
<th>Slaughtered</th>
<th>Retained</th>
<th>4</th>
<th>8</th>
<th>12</th>
<th>16</th>
<th>20 per cent</th>
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<tr>
<td>6,110,746</td>
<td>230,478</td>
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<td></td>
<td></td>
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<td>3.77 per cent</td>
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<td>6,172,124</td>
<td>258,224</td>
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<td></td>
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<td>4.18 per cent</td>
</tr>
<tr>
<td>4,831,848</td>
<td>256,577</td>
<td></td>
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<td>5.31 per cent</td>
</tr>
<tr>
<td>5,394,544</td>
<td>408,709</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.58 per cent</td>
</tr>
<tr>
<td>6,227,730</td>
<td>534,829</td>
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<td>8.59 per cent</td>
</tr>
<tr>
<td>5,843,182</td>
<td>566,779</td>
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<td></td>
<td></td>
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<td>9.70 per cent</td>
</tr>
<tr>
<td>5,917,396</td>
<td>665,443</td>
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<td></td>
<td></td>
<td></td>
<td>11.24 per cent</td>
</tr>
<tr>
<td>6,548,442</td>
<td>816,020</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12.46 per cent</td>
</tr>
<tr>
<td>7,343,746</td>
<td>1,161,339</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15.81 per cent</td>
</tr>
<tr>
<td>7,550,530</td>
<td>1,229,297</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16.28 per cent</td>
</tr>
<tr>
<td>6,692,697</td>
<td>1,016,171</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15.15 per cent</td>
</tr>
<tr>
<td>8,359,898</td>
<td>1,104,631</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13.21 per cent</td>
</tr>
<tr>
<td>6,772,692</td>
<td>1,018,632</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15.04 per cent</td>
</tr>
<tr>
<td>6,311,332</td>
<td>1,117,307</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17.70 per cent</td>
</tr>
</tbody>
</table>
FIGURE 1.

Origin of Hogs From Which Tuberculous Lymph Glands Were Examined for Avian Tuberculosis.

GROUP I.

Total Tuberculous Lymph Glands Negative 23 or 27%.
Avian Type 51 or 82.2%.
Mammalian Type 4 or 6.2%.
Avian & Mammalian Types (Mixed) 7 or 11.2%.

Total of 6041 hogs in the 85 carloads.
Retained 1038 or 17.18%.
Condemned 12 or .19%.
Sterilized 37 or .61%.

Number in Circle O denotes number of specimens from separate carloads positive to avian tuberculosis.
Tuberculous Swine Glands, Group 1.

Though the survey of swine tuberculosis in Illinois has not been extended to all localities where avian tuberculosis exists, the attached geographic map (See Fig. 1, page 153) shows the 27 counties where the tuberculous swine were fed from which the glands in group 1 were obtained. The limited number of specimens fail to accurately suggest the extent of the disease, yet it may be safely inferred that avian tuberculosis in swine might at least be suspected in localities known to harbor infected poultry. In 85 separate specimens of tuberculous swine glands, obtained from 85 carloads of market hogs, there were a total of 6041 hogs. One thousand thirty-eight or 17.18 per cent were retained, 37 or .61 per cent were sterilized and 12 or .19 per cent were condemned (See Table 6, below). The results of typing these specimens are summarized in Table 7, page 155. Twenty-three of the 85 tuberculous lymph glands or 27 per cent failed to yield definite results. Of the 62 that could be definitely classified 51 or 82.2 per cent were avian type, 7 or 11.2 per cent were probably avian and mammalian mixed, though this deduction is made upon a single inoculation and no attempt was made to further pass the virus, while 4 or 6.4 per cent of the specimens proved indistinguishable from the mammalian type.

Group 2, as yet incomplete, includes specimens of tuberculous glands representing a total of 2807 hogs in 33 carloads. The retentions, sterilizations and condemnations were comparable to group 1, yet positive and convincing evidence of the avian type of the disease was found in only 38.8 per cent. Fifteen out of the 33 samples of tuberculous lymph glands examined in this lot failed to produce gross lesions in either chickens or guinea pigs, while microscopic examination of the liver and spleen of these inoculated animals, at time of autopsy, gave negative results. (See Tables 8 and 8-A, pages 155 and 156.)

**TABLE 6**

Disposition of Tuberculous Hogs Examined from Chicago and East St. Louis Markets.

<table>
<thead>
<tr>
<th>Hogs Slaughtered</th>
<th>1000</th>
<th>2000</th>
<th>3000</th>
<th>4000</th>
<th>5000</th>
<th>6000</th>
</tr>
</thead>
<tbody>
<tr>
<td>85 carloads</td>
<td>6041</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Retained</td>
<td>1038</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Sterilized</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Condemned</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[17.18 \% \text{ per cent}\]

\[.61 \% \text{ per cent}\]

\[.19 \% \text{ per cent}\]
TABLE 7

Results of Typing Tests of Tuberculous Lymph Glands from Swine in Chickens and Guinea Pigs.

**GROUP I.**

<table>
<thead>
<tr>
<th></th>
<th>15</th>
<th>30</th>
<th>45</th>
<th>60</th>
<th>75</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glands Examined</td>
<td>85</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glands Negative</td>
<td>23</td>
<td>27.0 per cent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glands Typed</td>
<td>62</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avian Type</td>
<td>51</td>
<td></td>
<td>82.2 + per cent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. &amp; M. Types</td>
<td>7</td>
<td>11.2 + per cent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mammalian Type</td>
<td>4</td>
<td>6.4 + per cent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 8**

Disposition of Tuberculous Hogs Examined from Chicago and East St. Louis Markets.

**INCOMPLETE GROUP II.**

<table>
<thead>
<tr>
<th>Hogs Slaughtered</th>
<th>500</th>
<th>1000</th>
<th>1500</th>
<th>2000</th>
<th>2500</th>
<th>3000</th>
</tr>
</thead>
<tbody>
<tr>
<td>33 carloads</td>
<td>2807</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Retained</td>
<td>401</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14.25 + per cent</td>
</tr>
<tr>
<td>H. Sterilized</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td>.96 + per cent</td>
<td></td>
</tr>
<tr>
<td>H. Condemned</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td>.32 + per cent</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 8A

Results of Typing Tests of Tuberculous Lymph Glands from Swine in Chickens and Guinea Pigs.

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glands Examined 33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glands Negative 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45.4</td>
<td>+ per cent</td>
</tr>
<tr>
<td>Glands Typed 18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50.0</td>
<td>+ per cent</td>
<td></td>
</tr>
<tr>
<td>Mammalian Type 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38.8</td>
<td>+ per cent</td>
<td></td>
</tr>
<tr>
<td>Avian Type 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11.1</td>
<td>+ per cent</td>
<td></td>
</tr>
<tr>
<td>A &amp; M. Types 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Survey of Farms for Avian Tuberculosis.

The accuracy of the laboratory findings in identifying the virus in tuberculous lymph glands of swine on Illinois farms is being checked by the State Department of Agriculture, Springfield, Illinois. This work, though not complete, definitely confirms the presence of tuberculosis in fowls on some premises where hogs infected with avian tuberculosis have been fed. In other instances the state inspectors from the chief veterinarian's office have not been able to gather evidence that the infected hogs had had direct contact with fowls. While this does not arbitrarily exclude the possibility of direct exposure it appears from experimental data that swine might become infected through the agency of birds, or that the disease might be perpetuated in breeding herds independent of direct exposure to infected fowls.

Control of Avian Tuberculosis.

The control of avian tuberculosis is one of the important problems confronting the livestock sanitarian and farmer. In several localities of Illinois the disease is a destructive plague and a potential danger to swine and public health. Individual efforts of farmers in controlling the disease are commendable yet failure of accomplishment through lack of proper supervision and co-operative effort in the community has been followed by discouragement and the spread of the disease in many cases. A healthy flock in an infected district does not long remain free of the disease. In some localities owners are awaiting suggestions in the form of a properly supervised plan including the best judgment for the control of avian tuberculosis. Such a plan would obviously possess advantages to the community in promoting a definite
project for all flock owners. One of the most common obstacles encountered in the control of avian tuberculosis in Illinois is a source of healthy breeding stock in which prospective purchasers have confidence. Owners of infected flocks are in many cases ready and willing to sacrifice their flocks and carry out the proper clean-up measures providing assurance for the rebuilding of healthy flocks can be given. This accomplishment invites the co-operation of the local accredited veterinarians in behalf of the owners of pure-bred and market poultry.

The control of avian tuberculosis in the Middle West is not a simple matter dependent upon a single procedure such as culling or keeping only pullets. The practice of culling, within certain limits, together with a program of poultry sanitation may perhaps be co-ordinated into a definite and constructive plan. Whatever plan of procedure is finally adopted it seems important first of all to establish flocks which according to conservative standards are free from tuberculosis, and which may have, in some way, the approval of Federal or State officials. Healthy flocks are needed close at hand in the rebuilding of the industry. Notwithstanding objections to accrediting flocks free from tuberculosis it is possible that flocks officially recognized as free from this infection may serve a role in eradicating tuberculosis in poultry as it has in cattle. Representatives of the poultry industry, as well as the owners of pure-bred swine are interested in the most economical procedure in the control of avian tuberculosis, and it is hoped that the private veterinary practitioner who is accredited by both Federal and State officials may with proper supervision be able to render valuable service in this connection.

PRESENT STATUS OF COOPERATIVE TUBERCULOSIS ERADICATION WORK

Within these walls, that have become so familiar to most of us, was brought forth just eight years ago a plan that all of us wished might succeed. That mandate, known as the "Uniform Methods and Rules for the Establishment and Maintenance of Tuberculosis-Free Accredited Herds of Cattle," was conceived after mature study of tuberculosis made by many scientists at home and abroad. To these eminent investigators, who gave their all that man might be better cared for, we, in our meeting, should pay homage. Our work is merely the adaptation of plans and methods contributed by our predecessors, with some embellishments that are our contributions to knowledge.

The uniform plan does not compel an owner to tuberculin test his herd of cattle. You all know the unanimity of thought in favor of keeping the campaign on a voluntary basis, depending for its support on the intelligence of the American live stock owner. The plan has stood the test of time, the leavener of all things, and today is operating successfully in every state comprising this great Union of ours.

The people, as a whole, and the live stock owners in general, have declared most emphatically that tuberculosis shall be suppressed. They have instructed their legislators, state and Federal, to make funds available so that the work may keep pace with the demand, and yet the demand increases and outstrips the organizations built up to carry on the work. The Legislatures of more than forty states met during the past winter and increased their appropriations from about $6,000,000 for the payment of indemnity to almost $12,000,000; and yet there are indications now that in a number of the states the appropriations will be inadequate to carry on the work at the present pace for the biennial for which funds were provided. There is no doubt, however, that as long as the work is carried on in a systematic and thorough manner the people will support it and will find ways and means to keep it going until the disease is entirely under control, if not entirely suppressed.

It is a stupendous thing to contemplate—an industry represented by more than sixty-five millions of cattle and many more millions of swine, free from the greatest disease menace! It is a delight to find oneself associated with such a gigantic enterprise; it is stimulating to watch the results that may be obtained from each person's work connected with the campaign. It is not a task where the work of the many redound to the credit of a few. The great work performed is that of individual effort on the farm by the field veterinarian. His work must be of supreme efficiency in order that the task may be concluded either in an individual herd or in an area representing a township or county. There is, at least to my knowledge, no live stock sanitary work that has ever been performed where so much depends upon the reliability and expertness of the individual veterinarian. The veterinarian performs an inestimable service when he visits the farm for the first time and discusses
the subject with the owner, getting him in the attitude of submitting
his herd to the test; then applying the test in an approved and scientific
manner; exercising rare judgment, as is required in anticipating the
result of the test; in having the resolution and courage to pronounce
animals, sometimes of great value, as tuberculous; branding them in
accordance with the state law, and appraising them in a manner satis-
factory to the owner; arranging for their shipment to market, and
supervising the cleaning and disinfecting of the premises; assisting the
owner in replacing the diseased animals with healthy ones, and in leaving
with that owner the courage to go on; to rebuild his herd, and to
maintain it in perhaps a more sanitary condition than heretofore main-
tained. These are the duties that the field veterinarian is called upon
to perform. Let me tell you that, in so far as the Bureau is concerned,
and I believe that I speak for the states and all others representing the
industry, the services of the field veterinarian are highly appreciated.
It is admitted that the appreciation is not recognized as fully in a mate-
erial way as we should like to have it, but it is hoped that the time is
not far distant when an improvement along that line also will be
forthcoming. Today there are a great many field men in this gathering
whose main purposes are to exchange ideas and to obtain from each
other information that will strengthen us and make our efforts more
complete in this great undertaking.

Most of you will recall that in the inauguration of this work the
fundamental principle of procedure was cooperation. That spirit has
pervaded throughout the eight years the work has been in progress.
It is even stronger today than at any previous time, and it is hoped
that nothing will interfere with that element, so necessary for the success
of the work. The wonderful cooperation furnished by every branch of
the industry is responsible to a large degree for the success with which
the work has met. We fully admit the commission of many errors in
connection with the campaign, and also the omission of things that
could have been introduced earlier, had they been foreseen. Everyone
has been very generous and tolerant in his attitude toward such errors,
and when criticism was made it was always with a view of building up
the work. Such criticism is always beneficial to any organization.

Accredited Herds.

On other occasions I have trespassed too long on your time in at-
tempts to picture a summary of the cooperative campaign with its
many ramifications. On this occasion I shall confine my remarks to
a summary of what has been accomplished up to date. The principal topics
under discussion are recorded on the map which is before you.

As you recall, the original plan for accredited tuberculosis-free herds
of cattle was confined to purebred animals; that is, the herd was re-
quired to have at least one purebred animal in it. After the expiration
of one year the plan was amended so as to include strictly grade herds
as well. No doubt that arrangement was the means of interesting more
live stock owners in the campaign, but the list became so unwieldy that
it was impracticable to maintain a list of owners whose herds were placed in that status. I would like to see every purebred herd of cattle in the United States on the accredited list, and confine the publication of that list to strictly purebred herds, so that breeders might be fully informed at all times of the status of the herd out of which they would probably purchase animals. There are so many owners of grade herds who are indifferent to the accreditation that we are scarcely warranted in going to the expense of providing them with accredited herd certificates, because a high percentage of them fails to carry out the provisions of the plan.

You will observe on the chart, section 1 is devoted to the status of accredited herds. There were on December 1st 81,286 herds in that class. A remarkable increase in the herds has been made during the past four and one-half years, as is so indicated, an increase of 891.2 per cent. The summary that is published monthly shows that some of the states make great effort to accredit all herds that conform to the uniform plan; on the other hand, there are states that are not very much interested in accrediting individual herds, and prefer that the campaign be confined to strictly area work and to the modification of groups of herds in the county that qualify. Of course, that is a matter for the determination of each state, but it does seem that at least the accrediting of individual herds should be continued, more especially the purebred ones. After an area has been modified, there may be buyers in the various parts of the country who are anxious to secure purebred cattle for breeding purposes, and a list of such herds, if available, would aid them in locating the animals; it would also stimulate the industry in that way. Shall we go on accrediting herds in the manner in which it is being done today, or should some change be made? That is a matter for the consideration of the live stock sanitary officials of the various states.

Reinfected Accredited Herds.

While we are discussing accredited herds I feel that it will be of interest to most of you to know of the number of herds that are removed from the list on account of reinfection found on retest. The records show that of 20,000 accredited herds retested within a specified time, 5.2 per cent were removed, due principally to the additions of cattle that were not tuberculin tested in compliance with the uniform plan. Recently there has been considerable agitation regarding the disclosure of about twenty reactors found in a herd formerly accredited, which were dispersed by the owner. The cattle were sold on the basis of being accredited, and not sold subject to 60 or 90 days retest. About 60 days after the sale one owner had his herd tested and it was found that one of the animals purchased at the sale reacted; subsequently a number of owners had the same experience. The Bureau received several requests asking for an investigation of the handling of this herd on the farm where it was accredited. A careful investigation disclosed the following facts: The herd was properly accredited, and in all probability when it was moved from the farm to another state there was no tuberculosis in the herd, but the farm to which it was assigned maintained a herd
which, on several tests, was found to contain reactors. These reactors, in some instances, had access to the barns in which the accredited herd was stabled. There is a very strong impression among those who have investigated the matter that the infection was contracted in that barn, and from animals that were permitted to associate with those cattle, or that had recently occupied stanchions in the barn. We are at least assured that reinfection was introduced into that accredited herd, and that it was not a case of latent tuberculosis reacting after a period of apparent freedom from disease.

There are many cases that have been investigated, and it appears within reason to believe that, if we were in possession of all the history regarding those herds that became reinfected, they would not be so perplexing as they seem to the veterinarian when he encounters reactors in a previously reported accredited herd. It is freely admitted that there are herds that, notwithstanding our best efforts, persist in showing up infection, and those cases undoubtedly are due to old animals in the herd that continue to disseminate infection but fail to react to the tests applied. But these cases are so few in number that they are most conspicuous in each of the states, and while they are discouraging, they certainly cannot influence the favorable results that are accomplished in more than 99 per cent of the balance of the herds in these states, and even in those herds the disease eventually is controlled. Of course, in some of the herds it is not controlled unless the entire herd is destroyed.

**One Tested Free Herds.**

On November 1st, as indicated in section 2 of the chart, there were 1,049,480 herds that had passed one successful tuberculin test; a gain of 2006.8 per cent during the four and one-half year period. This class of herds continues to increase and should be of great encouragement to the live stock owners in their efforts to suppress the disease. With this number of herds, representing an aggregate of 8,949,137 cattle, it does seem that there is no longer any excuse for a prospective buyer to go into a territory where the extent of tuberculosis is problematical to secure animals for dairy or breeding purposes the health status of which is unknown. A number of states have adopted regulations providing that no cattle shall be added to a herd under supervision unless in accordance with the uniform plan. An effort was made to make that plan as liberal as possible, but consistent with the restrictions necessary to maintain tuberculosis-free herds of cattle.

**Total Cattle Under Supervision.**

On May 1, 1921, there were under state and Federal supervision 1,195,797 cattle; at this time there are almost 13,000,000 cattle, as indicated in section 3 of the chart; an approximate increase of 965.7 per cent in the four and one-half year period. With the rapid increase of area work, it is contemplated that the number under supervision will be greatly augmented within the next twelve months.
Area Work.

As oftentimes repeated, the original plan for cooperative work contemplated the area method of conducting the work. It is needless to attempt to point out its manifold advantages over individual herd testing; suffice it to say, as indicated in section 7 of the chart, 642 counties, representing 20.9 per cent of the total counties of the United States, have taken up area work. Of that number, 137 counties have completed the work to the point where it is definitely determined that tuberculosis exists to less than \( \frac{1}{2} \) of 1 per cent of the total cattle population. The balance of the counties, 505 in number, are at the present time actively engaged in the suppression of the disease, with the ambition to reduce the infection to \( \frac{1}{2} \) of 1 per cent, and to ultimately entirely suppress it. It is rather difficult to realize the rapidity with which this phase of the work has won popular favor. There was justification in believing a few years ago that it would be as impossible to enlist the support of 100 per cent of the live stock owners of the country as it would be in other work the merits of which are less apparent than in tuberculosis eradication.

You will observe from the map that the area “boom,” if it might be called such, is not confined to any particular section of the country. The white stars indicate the counties that are in modified area, and the orange colored disks indicate the counties that are not modified but are actively engaged in the work. It will be an easy matter to add either the stars or the disks to the counties that in the future take up area work; furthermore these additions can be made without obliterating the status of the disease when the work was inaugurated.

I want to take up just a moment longer of your time to relate a short story of the operation of the area plan to the township of a county wherein more than 60 per cent of the cattle population was found to be tuberculous. After preliminary arrangements had been made to take up the work in that township, six veterinarians were assigned to the testing, which was accomplished in six days; three days of which were devoted to injecting, and three days to observation. The total number of cattle tested was 3,654, of which 1,998 reacted. Every bovine animal in the township was tested, and aside from a few complaints, the work was accomplished and the good will of the live stock owners retained. The reactors, amounting to 80 carloads, were removed within a period of two weeks, and several disinfecting crews, with power-spray pumps, were assigned to the work of disinfecting the infected premises. I understand that the owners are gradually rebuilding their herds with a better class of cattle. It is believed that within a period of a few years the story in that township will be that the farmers are making more money by milking a fewer number of tuberculosis-free cattle than they made with their formerly large herds, 60 per cent of which were incapacitated more or less by the ravages of tuberculosis. The retesting in that township will be promptly accomplished and no step known to the sanitary will be neglected in the endeavor to completely suppress the disease.
I will leave it to your good judgment whether, in a country having an industry valued at billions of dollars, it is the right course to pursue to attack tuberculosis and stamp it out, as is being done in that township (and from that township the campaign will spread to the other townships of that county, and likewise through all the badly diseased counties of that state), or whether we should sit down supinely and face the issue with the pessimistic idea that the disease has gone beyond control. I believe that it is our duty as veterinarians to look upon the live stock disease control work with the determination that knows no surrender, because there is too much at issue. Ten years ago we would not have had the temerity to tackle such a county, but we have learned by practical operation the feasibility of carrying on the work even under such tremendous handicaps. So may the area work go on until it shall encompass every county and every state, and until victory shall be forthcoming.

Summary—Progress.

Section 8 indicates the progress of the work by years, and gives statistics showing the number of cattle tested under the area plan. Let us hope that we can show next year a corresponding increase in the number of cattle tested, and a greater decrease in the percentage of reactors found. More cattle are being tested annually and there is less infection of tuberculosis being found. The outlook for suppressing the disease, therefore, is most favorable. The decline in the percentage of reactors might indicate that it is influenced largely by the area work being done in the states where infection is rather slight. I think this is offset, however, by the work that is being carried on in the states where the infection is more extensive. The figures show unmistakable progress.

Retentions for Tuberculosis Federal Meat Inspection.

Section 9 of the chart shows the number of cattle and swine slaughtered in 1917 and 1925; the number retained, and the percentage retained, for the respective years. You will observe that 2.4 per cent of the cattle were retained for tuberculosis in 1917; in 1925, 1.5 per cent were retained, a reduction of 0.9 of 1 per cent. A reduction of 0.9 of 1 per cent collected in dollars and cents represents a saving to the industry and goes a long way towards balancing the cost of operation. In the retention of swine for tuberculosis it will be observed that there is a reduction of 0.7 of 1 per cent in 1925, as compared with the previous year.

The efforts that are being made to control and eradicate avian tuberculosis should within a few years reflect in the further reduction of retentions of swine.

State and Federal Indemnity.

Section 12 of the chart has reference to the financial phase of the campaign. The sum of one million dollars was appropriated by Congress for use in the payment of Federal indemnity for tuberculous cattle during the year ended June 30, 1920, and approximately $1,333,500
was available for state indemnity during the same period. The amount available for this purpose during the present year (1925-26) is approximately $13,000,000. Two millions five hundred and seventy-eight thousand of this sum were appropriated by Congress. The remainder is provided by appropriations made by the various state Legislatures, and, in some cases, from county funds. This increase in indemnity funds during the last five years is due to the increasing demand of the livestock owners, and others, who realize the importance of eradicating tuberculosis. The increase over this period has been gradual, and the amount of indemnity funds at present is much greater than ever before. The greater part of funds for paying state indemnity is provided by state Legislatures, but in a few states laws provide for the raising of funds by a tax on all property in a county where tuberculosis work is taken up or by a tax on the cattle. A part of the funds also comes from general county funds in some states. The governing bodies of our states and Federal Government have been liberal in providing compensation for owners unfortunate enough to possess tuberculous cattle, but the time for any reduction in appropriations for this feature of the work has not yet arrived, although judging from the progress which is being made, the time will come when smaller amounts will suffice. Probably a gradual reduction will take place similar to the increase made necessary as the campaign progressed.

Disbursement of Indemnity Funds.

Practically no changes have been made in the Federal Indemnity Law since it became effective in October, 1918. Its provisions have proved very satisfactory and it is considered quite remarkable that such an important Federal statute, contingent on state, county, territorial or municipal action, operates in such a satisfactory manner. The amount per head that can be paid by the Federal Government is limited to $50.00 for purebred cattle and $25.00 for grades, but other restrictions are made in the law and the same depend upon action taken by the cooperating body. No Federal indemnity can be paid alone, and the Secretary of Agriculture is permitted by law to prescribe regulations for payment of claims so as to authorize compensation in any amount not in excess of the maximum named in the law, and in accordance with the other provisions of same.

The methods of paying state indemnity vary, but are more uniform now than when cooperative work began. The tendency of state Legislatures has been to reduce the maximum per head, and to base the payment on a fraction of the difference between the appraisal and the net salvage received by the owner. In the majority of the states the amount received from state and Government is the same. The appraisal is limited in some of the states, while in others there is no limit, but the amount of compensation is restricted by law or regulation. In one of the western states a plan has been adopted and legalized whereby the amount of indemnity is reduced gradually until after the year 1926 when the amount that an owner can receive is not to exceed $5.00 for a grade animal and $20.00 for a purebred. This action was taken to encourage
early testing. Owners of tuberculous cattle receive compensation for same in all but five states, and, as noted in the table, the average at present is about $28.00 per head as compared to $52.67 five years ago. Each state has the necessary requirements to assure thorough eradication work in their regulations providing for indemnity.

An important change in the laws of some states has been made in order to provide that an owner will receive the same amount when Federal funds are exhausted. This is done by the state or county assuming the Federal share, and permits the work to proceed as long as local funds are available.

Cattle Tested for Interstate Shipment.

With reference to section 6 of the chart covering cattle tested for interstate shipment, you perhaps remember that on July 1, 1919, the Bureau of Animal Industry promulgated a regulation governing this work. This was done at the request of the livestock officials of the various states when it became apparent that they could not legally control such shipments. The first year this regulation was in effect 264,974 cattle were tuberculin tested with the result that 4,777 reactors were disclosed, or 1.8 per cent of the cattle tested.

For the year 1925, a marked increase in the amount of this kind of work was noted, 327,559 cattle having been tested, of which number 3,151 reacted, or 1 per cent of the cattle tested. I wish to call your attention to the fact that the records of five years of this class of work indicate a reduction in tuberculosis in cattle tested of from 1.8 per cent to 1 per cent, which is, indeed, very gratifying.

One other thought in connection with this work is that, since this regulation has been in effect, approximately 20,000 tuberculous cattle have been prevented from moving interstate, where, perhaps, they would start new areas of infection.

When a tuberculin test is made by an approved or regularly employed veterinarian, a copy of the test certificate must be sent to the Bureau. If the test is made by an approved veterinarian, the certificate of same must be endorsed by the livestock official of the state in which the test is made. The certificate is then checked to ascertain if the test has been conducted as per instructions. If slight irregularities are found, the veterinarian's attention is called to them, and a record is made of the same. A number of retests have been made on such complaints, and a few gross irregularities have been disclosed which have necessitated the revoking of the veterinarian's privilege to test cattle for interstate shipment. On the whole, however, the work has been very satisfactory. Veterinarians entrusted with the work of testing cattle for interstate movement should exercise caution in doing this work, as great losses may occur if tuberculous cattle are certified as being free from this disease.

Avian Tuberculosis.

Section 11 of the chart refers to avian tuberculosis. When the Uniform Methods and Rules were adopted in 1917, but little thought
was given to tuberculosis in poultry because it was not known to exist to any great extent in many sections of the United States. It has been known for a long time that the avian tubercle bacilli would infect swine; however, it has only been within recent years that it has become apparent that this source of infection must be eliminated in order to eradicate tuberculosis in swine, which is one of the projects included in the original tuberculosis eradication program.

Avian tuberculosis exists to an alarming extent in the Corn Belt of the United States, and it is causing great losses annually in poultry and swine. In poultry it very often spreads so rapidly that it soon makes a farm flock unprofitable because of numerous deaths and loss in egg production. This disease usually only affects the hog very slightly, in such parts as the glands of the head and mesentery. Such infected parts are not suitable for food and the financial losses in swine are largely caused by the condemnation of these parts.

The Bureau has made a map showing the sections of the United States infected with avian tuberculosis. The information from which the map was made was furnished by the field forces, and while it may not be as accurate as our bovine map, it serves as the basis on which to secure more data on this subject. This map indicates that the states east of the Alleghany Mountains and south of the Mason-Dixon line have very little tuberculosis in their poultry flocks. When it is recalled that poultry raising is practiced on a very large scale in such states as New Jersey, it is difficult to understand how their flocks have been maintained practically free.

A great deal of thought has been given to the formulating of a practical plan for eradicating poultry tuberculosis. The plan should be one that can be carried out by the same inspectors who do the tuberculin testing of the cattle. It does not seem practicable to tuberculin test every farm flock, as the time required in many instances, would make such a practice prohibitive. A plan that is being practiced in a number of states is as follows:

When a veterinarian visits a farm to apply the tuberculin test to the cattle, he is directed to make an inspection of the poultry. If suspicious birds are found, permission is asked of the owner to slaughter them and to hold a post-mortem. If tuberculosis is demonstrated, the owner is advised to slaughter all clinical cases and to vacate the premises of all poultry. The usual sanitary measures are recommended, and after a lapse of a few months, the farm may be restocked with day-old chicks, or with mature birds, if they are free from disease.

Operating on this plan, the veterinarians engaged in tuberculosis eradication work since February, 1926, have inspected 116,715 flocks, of which number 5.8 per cent was found to be infected with tuberculosis. These flocks contained 8,108,859 fowls, and the estimated infection has been placed at 0.07 per cent.

No-Visible-Lesion Reactors.

Your attention is especially called to section 14 of the chart. The subject of the absence of macroscopical lesions in reacting cattle has
furnished material for animated discussions from the time tuberculin was first used as a diagnostic agent up to the present day, and, undoubtedly, we shall continue to make a study of it.

The present-day methods of testing are no more prone to increase the no-lesion cases than were the methods in vogue during the period when two or more days were consumed in testing herds by the subcutaneous method. You will observe that of the 75,887 reactors slaughtered from July to October, inclusive, all showed macroscopical lesions except 6.4 per cent. The number of no-lesion cases found among the 19,000 reactors slaughtered during October amounted to 5.1 per cent. This percentage compares very favorably with the records of testing throughout the period during which tuberculin has been employed. Several years ago we had occasion to look up the testing done in one of the leading dairy states of the country. These records showed that the no-lesion cases from 1911 to 1918 varied from 4 to 6 per cent. That was during the period when the subcutaneous method was the only test employed.

The Bureau has for many years been making a study of the no-lesion cases among reactors, which revealed many reasons why difficulties would be encountered in the classification of reactors and subsequent autopsy findings. None but the most careful technique in applying tuberculin will bring forth conditions that will not interfere with the proper interpretation of observations. By this I do not mean to infer that the technique of the field man is not of a high standard, but we all realize that, until by careful practice the operator has become efficient, there is some faulty work done that may bring about swellings at the point of injection that are perplexing. To what extent the animal tissues are sensitized to tuberculin by organisms other than tubercle bacilli is a matter to be determined by complete investigational work, but reviewing the present-day conditions that exist in areas where tuberculosis infection is limited, I can not understand why it should be greater in one locality than in another, unless there are organisms indigenous to certain soils and capable of sensitizing the tissues of cattle. To illustrate what I have in mind, there were tuberculin tested in a group of the Southern states, where infection is slight, 325,313 head of cattle, of which 1811 or 0.5 per cent reacted. If there had been any considerable sensitization caused by bacteria other than tubercle bacilli, it would seem that more cattle would have been classified as reactors.

Personnel.

By referring to section 5 of the chart it will be observed that there is a total of 963 veterinarians devoting their entire time to tuberculosis eradication work; 514 of them are employed by either county, state or Federal governments; 449 are accredited veterinarians, most of whom work on a per diem basis. Approximately 1,000 of the total veterinary personnel of the United States are rendering a great service to the nation, as well as reflecting credit on this choice of profession. Every indication points to a gradual increase in the number of veterinarians required to take care of this line of work. With the increase in num-
bers of the towns and cities that by ordinances or otherwise are requiring the annual tuberculin testing of dairy cattle, it is an easy matter to realize that, as this custom becomes permanently established, there must be organizations in the various states and counties, and adequate forces to take care of this line of work. While the work must always be conducted under proper supervision, requiring organizations to direct it, I see no reason why the testing cannot be done by the general practitioner. It would also seem feasible to have the veterinary personnel in each state so organized and distributed that the tuberculin testing of all dairy herds may be accomplished annually.

PRESIDENT McNEIL: We find it necessary to change our program a little. We intended to ask Dr. Huddleson to present his paper on abortion, but as he is not present, we will ask the chairman of the Committee on Abortion Disease to present his report at this time, and if Dr. Huddleson arrives later, we will ask him to present his paper.

DR. VAN ESS: May I ask if there will be an opportunity to discuss some of those tuberculosis reports?

PRESIDENT McNEIL: We will try to arrange for time after this report.

REPORT OF THE COMMITTEE ON BOVINE INFECTIOUS ABORTION, UNITED STATES LIVE STOCK SANITARY ASSOCIATION

1925.

Each year since 1917 your committee on abortion has presented its report. As stated in the original motion made and passed by this Association at its twentieth annual meeting, it is the function of this committee "to draw up a compilation of all established facts concerning abortion disease and they shall recommend measures, which have been found most effective in combating the disease under certain conditions." (The italics are ours.) A study of the reports presented for the past eight years shows that the first mandate has been carried out. The recommendations as to the control of the disease have been very meager. Your committee in 1918 made a definite recommendation that "bovine infectious abortion is a dangerous communicable disease of cattle, due to a specific germ, B. abortus (Bang) and that hereafter it shall be considered as such and as coming within the meaning of the laws or regulations of the states having general or special laws, or regulations covering the handling of contagious diseases of live stock, and that in other states, laws or regulations should be forthwith adopted to bring the disease under official cognizance." After a prolonged and heated discussion the Association voted to refer this report back to the committee for further consideration. Each committee since has made certain recommendations, largely, however, relating to the educational policy in respect to the disease, and little has been presented as to control.

The past seven years have been productive of many additional facts in respect to our knowledge of bovine infectious abortion. Additional
germs have been described which cause abortion as mucors and *Vibrio fetus*, but none have been shown to be widespread and common causative factors. Experiments in the field of nutrition have demonstrated that deficient rations in certain species of animals may cause difficult conception and in some cases actually produce abortion. Researches have not shown that nutritional disturbances are important factors in the production of abortion among cattle. Investigators have shown that the disease due to *Bact. abortus* (Bang) is widespread and causes enormous economic losses. The problem before this Association is not how shall veterinary practitioners treat cases of sterility or diseases of young calves, and as a regulatory body we are not primarily concerned with these conditions, brought about in cattle by the pyogenic group of bacteria. What we are so vitally interested in is *Bact. abortus* (Bang) and the animals which have this organism in their bodies. It is the belief of your committee after a careful study of the papers on abortion presented before this Association for the past eight years, and the following discussions, that the importance of the Bang organism as a disease producer has not been sufficiently taken into account by the sanitary officers of many of our states. Your committee this year wishes to emphasize once more the importance of *Bact. abortus* (Bang) as the cause of one of the most serious diseases affecting the cattle industry of the United States. Those live stock sanitary officials who persist in ignoring this organism as a cause of disease and fail to institute measures tending toward the control of animals infected with and eliminating this organism from their bodies are not doing their full duty. This attitude will react unfavorably on the cattle breeding industry of the whole country in future years.

Immediately we hear “Why don’t you formulate a plan for the control of this infection and present it to us for consideration?” Please do not be too hasty in your judgment. Let us see if such a procedure is feasible.

Bovine tuberculosis has been present in this country for many years. After the discovery of tuberculin and its effectiveness as a diagnostic agent in the early nineties, various states took up the problem of the control of this disease. Conditions in the different commonwealths varied greatly and no two states worked under exactly the same plan. Some states made a great deal more progress than others. It was not until 1917, more than twenty years later, that the accredited herd plan for the control of bovine tuberculosis was adopted by this organization. Since this later date many changes have been injected into the original scheme, and other plans, notably the “area plan,” have been initiated. All the states have fallen into line and are now proceeding with the control of bovine tuberculosis in a nearly uniform manner. This however, has been brought about after 30 years of individual effort on the part of each state and further has been made possible only after a tremendous educational campaign by all interested parties. Education of the people to the importance of control measures is the basis of success in combating any contagious disease. Education must precede regulation.
England has pursued the policy of letting bovine tuberculosis largely look after itself. What has been the result? According to statements published in the British Isles, it is estimated that approximately fifty per cent of the cattle of that area will react to the tuberculin test. Just lately an order has gone into effect which will aid in the suppression of the disease in that country. The principal part of this act relates to the disposal of “wasters” or physical cases of tuberculosis and to cases of tuberculosis of the udder. No general application of the tuberculin test is provided. In other words the plan in operation in this country for the control of bovine tuberculosis is not deemed suitable for conditions in Great Britain. We cite these facts in regard to tuberculosis to illustrate our stand that (1) it is not yet feasible to put into effect a general plan to control bovine infectious abortion and (2) to illustrate what happens when a country or state makes little effort to control an infectious disease. It is time that every state here or elsewhere represented, should consider the ravages of bovine infectious abortion and institute some control measures, taking into account the known facts concerning the disease and such measures should be applicable to the conditions of the cattle industry in the respective commonwealth. Your committee stands ready and willing to offer advice and to aid in any way possible, any live stock sanitary official who desires help in formulating measures for the control of the malady. It should be kept in mind that when the committee on abortion was established, that they were charged with “recommending measures which have been found most effective in combating the disease under certain conditions.”

Some states have already made a start. Georgia, South Carolina and most recently Arkansas, have regulations requiring a health certificate for all animals imported into their domains. Pennsylvania has a plan for the control of bovine infectious abortion. A few other states have some form of regulation. In most of these latter cases the regulations are overlooked or not enforced. The great majority of states do not have any plan for the control of this disease.

The time has come we believe when a concentrated effort should be made in all the states of this Union to reduce the losses resulting from bovine infectious abortion. It is absolutely not feasible to attempt at the present time to adopt a uniform plan for the control of this infection. We believe that sometime in the future it will be possible to formulate and place in effect a uniform method for the control of this disease, but at the present time each state should work out its own system, which is most adaptable to its particular conditions. The point we wish to emphasize most is, that now we should take some official cognizance of bovine infectious abortion, and further that this should be done by educational or control measures, which are really active and not merely so many meaningless words or phrases, which are as dead as the paper upon which they are written.

This year throughout this country, there will be spent in excess of $12,000,000 for the control of bovine tuberculosis. This money is being furnished by the taxpayers and because they really believe the work
is worth while, and is yielding results which more than compensate for the enormous cost. The suppression of foot and mouth disease has likewise cost many millions of dollars, yet the money has been wisely spent and its value returned many fold to the animal industry of the United States. It costs money and sometimes large sums to properly control an infectious disease.

One of the reasons for the liberal support given to the eradication of bovine tuberculosis is its definite relation to human health. Any disease transmissible from animals to man receives a great deal of attention. For many years it was believed that bovine infectious abortion had no relation to the health of man. Recently researches have shown that bovine infectious abortion may have connection with human welfare. Alice C. Evans of the Public Health Laboratory was the first to show that Bact. abortus (Bang) was very closely related if not identical with Mic. melitensis, the cause of Malta fever. Malta or undulant fever is primarily a disease of goats which is transmissible to man, and a number of cases have been described in this country, especially by Lake of the Public Health Service. You will probably remember Dr. W. A. Stephenson, late State Veterinarian of Utah who died in 1923 of Malta fever contracted from goats. The work of Evans on the close relationship of the germ causing abortion of cattle, and that of Malta fever, has been amply confirmed by Meyer and his associates in this country; by Burnet in Algiers; Khaled in Egypt; Orpen and Bevan in Rhodesia; Dargein and Plazy in France; and Rebagliati and Vaccaro in Italy. The carefully studied case reported by Keefer of Johns Hopkins Hospital, shows conclusively that an organism which cannot be differentiated from that which causes abortion in cattle, may produce disease of man. Thirty-five cases of human disease produced by the abortus variety of the melitensis organism, have been reported from South Africa. In an unpublished report, Carpenter of Cornell describes a case of disease in man caused by an organism which cannot be distinguished from Brucella melitensis. Carpenter produced abortion in a pregnant cow, with the culture obtained from the human subject. He also obtained the abortion germ by bacteriological examination including animal inoculation from nearly every sample of milk from the dairy supplying it to this individual. Evans reports a case of human disease due to the abortus type in Virginia. This individual was in the habit of drinking raw cow's milk, but the source of the infection was not definitely established. There have been sent to Evans at the Public Health Laboratory at Washington, for identification, strains of the abortus type, isolated from human cases of Malta fever, from South Dakota, Connecticut, California, and Utah. The histories of these cases exclude infection from goats. It is quite apparent that there is some relation between bovine infectious abortion and human health. As was pointed out in an editorial in the Journal of the American Medical Association, "The fact appears to be established that the agent of contagious abortion may infect man."

The efficient control of an infectious disease depends to a large extent upon a reliable method of diagnosis. This is particularly true
in respect to diseases in which the "carrier" problem takes an im-
portant place. The diagnostic use of tuberculin is the keystone in the
arch of tuberculosis control. M'Fadyean and Stockman in England and
Holth and Wall in Denmark in 1908 and '09 were the first to point out the
value of the agglutination and complement fixation tests in the diag-
nosis of bovine infectious abortion. Since this date many investigators
have published reports of their studies of the application of these tests.
During the past year, members of your committee have been studying
the sera reactions for bovine infectious abortion. We have demonstrated
several very important technical features in connection with both tests.
The degree of concentration of the test fluid in the agglutination
method is very important. The individual equation in reading the test
as always must be considered. We have determined that under routine
conditions the agglutination test is superior to the complement fixa-
tion, because it is less complicated and is not affected by so many
factors. Under certain conditions as a check test on doubtful or sus-
picious animals and in the incubative stages of the disease, the comple-
ment fixation test is particularly valuable.

We desire to emphasize that the sera reactions for bovine infectious
abortion are reliable. True they do have certain weaknesses but that
can be said about any biological test. The greater extent to which they
are being used by practitioners as pointed out by your committee last
year, is an indication of their worth, and also the breeders appreciate
their value and are requesting that their herds be tested.

We desire in conclusion to recommend two things: (1) That this
Association take official cognizance of bovine infectious abortion, as
an infectious disease of animals, and (2) That the live stock sanitary
authorities of each state study the situation in respect to this disease
in their particular commonwealths, and initiate such control measures as
they consider advisable and further that such authorities be prepared
to report to this Association next year the progress which has been
made.

E. M. PICKENS,
M. F. BARNES,
J. M. BUCK,
WARD GILTNER.
C. P. FITCH, Chairman.

DR. FITCH: Mr. Chairman, I move you that the report be accepted
and that the recommendations be referred to the Resolutions Committee.
(The motion was seconded and carried.)

PRESIDENT McNEIL: We will now have discussion on these
papers.

DR. J. G. FERNEYHOUGH: I doubt if we realize what Dr. Cotton
has been through. I happen to know something about it. Since 1923 he
has been in a legal battle, you might say, by himself, and I think we
should all appreciate what it means to all the other states. I have had
a little experience myself. Cotton has fought a battle, and it seems that
he is about ready to win. He was so modest when he got up here today
that I could hardly realize it was Cotton. The way he usually is reminds me very much of a story. On one occasion there was an old gentleman who had been very wicked. The minister knew him very well, and knew the whole family. This fellow had been very wicked and profane, almost as bad as Cotton. When he came to die, this old man had asked that this minister preach at his funeral. His wife objected very much to having this minister because the minister knew the old man was wicked, but anyway he came. This old woman was so nervous she could hardly come in. She knew him also. This minister got up there and he said the most lovable things you ever heard of about this fellow. He just pictured him as being one of the greatest, best men you ever heard of. It got the old lady so excited that she said to her son, "Son, look into the coffin; that can't be your father; they've got the wrong corpse." But that was Cotton who spoke to us today, absolutely, and I just want to say that he is fighting a battle that ought to attract the attention of all of us; he is fighting a good cause and a winning cause, and I want to congratulate him on his fight. (Applause.)

DR. VAN ES: Mr. Chairman, I would like to ask Dr. Kiernan, was the percentage of infected fowls ascertained in those 8,000,000?

DR. KIERNAN: Apparently.

DR. VAN ES: Do you think that those figures might be subject to a tremendous factor of error?

DR. KIERNAN: Yes.

DR. VAN ES: I think that statement of avian tuberculosis may be a little bit out of place and misleading, don't you think?

DR. KIERNAN: Of course, those figures are taken from a report sent in by the inspectors in the field, and, as I say, you can't determine reliably whether the chickens are infected unless you make a post-mortem examination, but this was the best judgment of the inspectors who visited those farms and made the inspection of the flocks. There may be flocks that were visited where the disease was present that was not determined at that time.

DR. VAN ES: I have no doubt that the inspectors have done their best, but I would not like to see that item of avian tuberculosis among all those other absolutely accurate figures come before the eyes of the general public too much, because I am afraid that it would be misleading.

DR. KIERNAN: I agree with you thoroughly. That is only an approximation.

DR. VAN ES: It is all right for this Association to see those figures, but there are a lot of people outside who are also intensely interested in that very subject who may be misled by those figures.

DR. KIERNAN: I might say in that connection, we figured it up and there are something like twenty-one states where the reports showed that the total flocks inspected were less than 1 per cent tuberculous.

DR. C. G. LAMB: I would like to be set right on one regulation of the U. S. Department of Agriculture, namely, the branding of beef
TWENTY-NINTH ANNUAL MEETING

The cattle of the entire eastern part of the state, the entire southern part of the state and a large portion of the western part of the state do not pass through public stock yards. Consequently they are not required to be branded when going for feeding purposes.

Our state at a certain season of the year is quite fertile with feeder buyers. They go through all sections of the state, buying cattle. In a certain community, for instance, in Iowa, there may be cattle which have passed through public stock yards and are branded according to the regulations; there may also be cattle from the same portion of the state and exactly the same class of cattle which do not pass through the public stock yards and are not branded.

It occurs to me that the regulatory authorities in the states to which these cattle may go might be subjected to some very embarrassing questions as to why John Smith’s cattle were branded and other cattle from the same locality were not.

I call this to the attention of the regulatory authorities in these feeding states where these conditions are very apt to exist. Of course, the objection comes largely from the added expense, and the expense is not necessarily the bare expense of applying the brand but the extra handling of the cattle means loss to these people; very frequently in the stock yards the branding chute and the branding crew are busy at that particular moment and these cattle are required to stay over another day, and oftentimes the buyer in taking these cattle to a remote part of his state misses his connection and is held over for a day or two at the connection point.

All of these things come up to me. They are not perhaps criticized, but comment is made upon this. I would be pleased to hear particularly from Nebraska and Iowa as to whether or not upon arrival at the feeding yards these cattle are strictly placed in quarantine and in segregation and released as the regulations say, only upon permit, and whether the degree of protection afforded these states is commensurate with the expense, loss and annoyance of branding.

DR. MALCOM (Iowa): In regard to the question of the branding of female cattle in so far as Iowa is concerned, that is one of our state regulations, that all female cattle for feeding or grazing purposes must either pass the tuberculin test or be branded. We have an agreement that we furnish to all markets; the party who buys these cattle fills out the agreement. On this agreement it states that they must be kept under quarantine until they are under tuberculin test or returned back to market for slaughtering purposes. On receipt of that agreement, we immediately quarantine the cattle as feeders and grazers. Accompanying that quarantine is an affidavit that when these cattle are shipped to slaughter, the owner fills out this affidavit and returns it...
to our office. The cattle are then released from quarantine. If he should want to turn these cattle loose from quarantine, all he has got to do is have the tuberculin test applied by the present veterinarian and have a copy of the test sent to our office, and we will release the quarantine.

We don't have any trouble. Many of our buyers are familiar with our local regulations. They can go out to your state, apply for these agreements, purchase the cattle in your state, brand the cattle in accordance with our regulations, and attach a copy to the waybill and a copy is sent in to our office.

I am glad to say that we are getting the very best of cooperation. In a case where a man comes through without a permit of this kind, it must be accompanied by a health certificate. When that health certificate reaches my office, I know they are not branded, they are not in accordance with the rules and regulations, and we immediately set that shipment under quarantine until they are branded or tested.

DR. HAYS (Omaha, Neb.): We have a different story. I would rather talk in private to Dr. Lamb. We are in a situation where we have our own regulations. We are not so exacting on that range stuff that comes out of the other state, coming directly into our state as range cattle. It would hardly be consistent to require of those range cattle something that we cannot require of our own range cattle. If they maintain their identity as range cattle (I speak of Omaha in this regard), we allow them to go out unbranded. We have never had any great difficulty in our experience with these cattle maintaining their identity in the various places in which they went, even though they didn't have the brand.

We have another group of cattle and those are the ones taken out to the premises of a man to escape the requirement of the tuberculin test. The man will swear to anything, sign any kind of a statement, or do anything. In such an instance it has helped us in having those branded, because it invariably causes them to be tested before they go out.

We face an ultimatum at the present time within our state that branding cannot continue because there are too many cattle going into the feed lots that are not required to be branded, and I can see no means by which we can cause the branding to be done and done consistently between the origin of the cattle and our feed lot. We are different from Iowa and we are different from some of the other states.

We have any amount of cattle coming into our state, coming from our western ranges, traveling on feed and transit billing that will come in and escape any policing service that you might put in unless you have a policing service at practically every shipping point. Until we can overcome that we are in a rather difficult position.

DR. MALCOM (Iowa): There is one other explanation that I forgot to mention. We require the branding of cattle coming from our own local market just the same as if they were coming from a market outside. We have the same tab on them coming out of our local market.
The idea is to prevent a shipment coming from a central market to our market in Sioux City or any other market for slaughtering purposes and then getting them out into our state for feeding purposes. Therefore, we require the same thing on our local market that we do on the markets outside.

We have a pretty good tab on branding.

DR. SPENCER: I think the important point of Dr. Lamb's question has not been answered. As I understood Dr. Lamb's question, he wanted to know the value of this branding along with what was being done. We have at the Omaha market (and that same thing applies to the Kansas City and St. Joe markets and many of the other markets) a large number of semi-range cattle coming in there under the strict interpretation of the Federal regulations cannot be classed as range cattle, but they are cattle from a territory that is practically free from tuberculosis.

That map up there indicates that there is a very little part of Colorado that has more infection than the accredited county has. It seems to me it is not necessary to require the additional expense saddled onto the livestock industry that is being done by the branding of these cattle coming from that kind of a territory.

Some of us have been before the Tuberculosis Committee and they have under consideration some plans that I think contemplate taking care of this problem, and we in the middle western section of the state (speaking for the people at the Omaha market) are very desirous of having this matter corrected because it is an unnecessary expense, so far as we see the proposition, and is not accomplishing the purpose for which it was intended.

Now, if it becomes necessary to put any restrictions on these feeding cattle going into accredited counties or into modified areas, it is far better to require the tuberculin test of these cattle. It can be done as cheaply as the branding of the cattle is being done, and it would accomplish an end. I feel that there should be some modification of this regulation governing the branding of feeder cattle.

PRESIDENT McNEIL: Is there any further discussion?
(The meeting adjourned at 5:55 o'clock.)
Adjournment.
FRIDAY MORNING SESSION
December 4, 1925.

The meeting was called to order at 9:30 by President McNeil.

PRESIDENT McNEIL: The first thing on the program will be a report on Uniform Regulations, Interstate Shipments of Live Stock. Dr. Miller will present this report.

DR. A. W. MILLER: In presenting this report, I am, as it were, pinch-hitting. Dr. Hauck, the chairman of the committee, was called home on account of the death of his brother.

Before taking up the report, I wish to make a brief statement. As many of you know, the commissioners and secretaries of agriculture of the several states have been holding a meeting in this city this week. A committee of that organization was appointed to confer with this committee. The members of that committee were Thornburg of Iowa, Hecke of California, Jones of Wisconsin, Stennard of Illinois, Duryee of New Jersey, Whitehurst of Oklahoma, and Willets of Pennsylvania.

In many states the department of agriculture is the office that has the direction of the live stock sanitary control work. Commissioner Thornburg, who acted as spokesman for this committee, is a member of this Association and one of the Vice-Presidents. He proffered us the support of his organization in bringing about greater uniformity in regulations, but stated that some of his associates were apprehensive that the Association might recommend a plan to which they could not subscribe.

I am not going into the details of this matter, but it seems that it is that old bugaboo of states' rights. I am sure we voiced your views in saying that this Association is fully cognizant of the rights that have been reserved to the states and that those rights will be upheld by us. We feel the discussion we have had on this subject has been fruitful and trust that similar conferences may be a part of the regular program in future years.

I will now take up the report of the Committee on Uniform Regulations. This has been a lively topic of discussion for many years. You will probably remember that last year the Committee on Foot and Mouth Disease presented a draft of uniform regulations to govern movements when an outbreak of foot-and-mouth disease might occur, which was adopted.

(Dr. Miller read the report of the committee.) (Applause.)
REPORT OF THE COMMITTEE ON UNIFORM REGULATIONS

Importance of Our Live Stock Industry.

According to the latest official estimates, there were on the farms of the United States on January 1, 1926:

- Cattle: 64,928,000 valued at $2,248,831,000
- Sheep: 39,134,000 valued at $372,909,000
- Swine: 54,234,000 valued at $669,402,000
- Horses and mules: 23,000,000 valued at $1,543,370,000

Totals: 181,296,000 valued at $4,834,512,000

These estimates, enormous as they are, form but a part of the importance of the live stock industry. Of first consideration is the matter of food for the ever-increasing population. The fertility returned to the soil from live stock herds is an item hard to estimate but known to be of immense value. Clothing, shoes and other articles manufactured from wool, hides, bones, hair, etc., add immensely to the value of the live stock industry, to say nothing of the many biological products essential to animal and human health having their origin in the organs and tissues of animals.

An industry of such magnitude and of so much importance, forming, as it does, one of the chief assets of the country, should have the greatest possible degree of protection against the introduction of foreign plagues, in the control and eradication of existing disease and in all ways possible to prevent injury and loss to the industry.

The ultimate object of laws, rules and regulations governing the movement of live stock is to avoid losses to owners primarily and to the general public secondarily. It is beyond question that uniformity in these laws, rules and regulations as they apply to the traffic in live stock, both interstate and intrastate, is desirable in order to simplify their application and that no section of the country may be restricted more than another.

Enemies of Our Live Stock Industry.

Within the borders of the United States the live stock industry is menaced by such contagious and infectious diseases as tuberculosis, Southern tick fever, scabies, hog cholera, infectious abortion, anthrax, hemorrhagic septicemia, blackleg, dourine, glanders, influenza, the hosts of external and internal parasites and the sporadic diseases. Diseases, along with exposure, wounds, neglect, etc., take a toll estimated at $200,000,000 from the industry each year.

The industry is threatened by such foreign plagues as foot-and-mouth disease, surra, rinderpest, Malta fever and swine erysipelas, and the poultry flocks are threatened with European fowl pest and spirochetosis.

Protection Received By Our Live Stock Industry.

Appropriations by Congress for the control and eradication of animal diseases vary from year to year. For the current fiscal year the funds
appropriated for that work amount to $5,467,194. This sum covers cooperative activities with the states for the eradication of animal plagues, the research and experimental work of the Department of Agriculture, the enforcement of Federal interstate laws and regulations and guarding against invasions of animal diseases from foreign countries.

The Federal Government has authority under existing law to restrict or prohibit importations of live stock, animal products, hay, straw, feed, etc., from foreign countries that are considered dangerous, but there is a natural limit to its ability to prevent the organisms of foreign animal diseases from entering our country so long as we continue to engage in commerce with foreign countries. The Government has been very successful with the limited funds provided in keeping the United States so free from foreign animal plague.

The various states contribute to the protection of the live stock industry through appropriations, the enactment of laws, and the promulgation of regulations and their enforcement. Appropriations are more liberal in some states than in others and there is a wide variation in the laws and regulations pertaining to the welfare of live stock. It is to be desired that state officials authorized by law to formulate rules and regulations for the protection of the live stock industry should, in the light of knowledge, training and experience, make and enforce such rules and regulations as may assure safety against the spread of disease but which will create no unnecessary hardships. Regulations should be as concise, plain and specific as possible so that laymen can understand them.

Uniform Regulations.

The Committee on Uniform Regulations is the former Committee on Inter and Intrastate Shipment of Swine, renamed, enlarged and given additional scope and duties.

It is needless to reiterate what has been said so often and published in the reports of this Association in regard to the desirability and the importance of more uniformity of regulations affecting the movement of live stock.

Foot-and-Mouth Disease.—It is especially important that regulations affecting the movement of live stock, farm products and merchandise during outbreaks of such contagious diseases as foot-and-mouth disease and European fowl pest be as uniform as local conditions will permit.

You have but to read the letter of Mr. G. W. Luce of the Southern Pacific Railroad, published in the last report of the Committee on Inter and Intrastate Shipment of Swine, or to recall the address delivered by Mr. H. F. Hovey of Texas, before this Association at its last meeting, to comprehend the chaotic condition that prevailed in interstate commerce following the outbreaks of foot-and-mouth disease in California and Texas in 1924 as a result of the lack of uniformity in state regulations, and to appreciate the difficulties encountered by shippers and transportation companies in their earnest endeavors to comply with the widely different and frequently changing requirements.
Nearly all of the forty-eight states quarantined against California and Texas, regardless of the distances from infection. Included among the prohibitions of some states, whether published in their regulations or not, were one or more of the following: Products of the soil, day-old chicks, eggs, dried fruit, beans and grain, although from the previous year's crop grown and stored in free area, sugar, vehicles, honey bees, new agricultural machinery, although direct from the factory, canned milk and meats, and railroad ties and tombstones were ordered disinfected. Men, women and children traveling in automobiles were stopped at some state lines and required to disrobe and wait while their clothing was being ineffectually fumigated.

This is not intended as a facetious reference to the action of states in issuing regulations which they believed necessary for their protection, but to show the lack of uniformity of action by state regulatory authorities when confronted suddenly with an emergency and when acting under pressure of excited public sentiment.

The responses to the inquiries of your committee show that the feeling is generally prevalent that the Federal regulations should be used, as far as possible, as a basis for state regulations and quarantines, especially in handling outbreaks of such highly contagious diseases as foot-and-mouth disease. Among the reasons advanced are that Federal regulations are drawn by experienced officials and are intended to cover the ground for the protection of the nation's interests as a whole.

It is therefore urged by your committee that the various states accept the regulations as issued by the U. S. Department of Agriculture as a basis for their interstate regulations in handling outbreaks of foot-and-mouth disease. The deviations to meet local conditions should be as limited as possible. In its report at the meeting last year, the Special Committee on Foot-and-Mouth Disease expressed its views in submitting a draft of tentative regulations for the guidance of state officials. The report of that committee was adopted by the Association and still stands approved.

Intrastate regulations issued during outbreaks of foot-and-mouth disease also differ considerably. Although intrastate regulations affect the interests only of the States establishing them, it is to the interest of all concerned that they also be as uniform as local conditions will warrant. The following outline of intrastate regulations is submitted for the consideration of the Association and state authorities, especially in states where the disease has never appeared, who in event of an outbreak in the future, may find it necessary hastily to prepare regulations. These regulations are intended for use in the beginning of an outbreak, and as soon as the outbreak is under control, may be modified to meet the change in conditions.

Proposed Intrastate Foot-and-Mouth Disease Regulations.

WHEREAS, the fact has been determined that an infectious and communicable disease known as foot-and-mouth disease now exists among live stock in certain sections of this state, and particularly in the county of............................
NOW, THEREFORE, in order to protect the live stock interests of the state, under the authority of an act approved............................., the counties of..........................................................are hereby quarantined and the following regulations are hereby prescribed:

REGULATION 1. The territory hereby quarantined is divided into two (2) areas to be known as the closed area and the modified area. The closed area shall include all infected and exposed territory and the modified area shall include certain prescribed territory contiguous to the closed area. The areas are as follows:

CLOSED AREA. (Specify area.)
MODIFIED AREA. (Specify area.)

REGULATION 2. During the existence of this quarantine the shipment, transportation, movement, trailing, or driving of cattle, sheep, other ruminants, and swine from or to any point in the closed or modified area, and the shipment, transportation and movement of hides, skins, hair and other by-products of such animals, and hay or straw from any point in the closed or modified area is prohibited except as hereinafter provided.

REGULATION 3. No dressed carcasses of calves, sheep, other ruminants and swine shall be shipped, transported or moved from any point in the closed area unless the hides or skins and hoofs have been removed from such carcasses and the said carcasses are accompanied by a permit issued by a duly authorized State or Federal inspector certifying that the said carcasses have received ante-mortem and post-mortem inspection and are free from the disease.

REGULATION 4. No hides, skins, hair, wool, horns, hoofs, bones or other by-products of cattle, sheep, other ruminants and swine, and second-hand bags, manure or litter shall be shipped, transported or moved, except as herein otherwise provided, within or from the closed area, unless the said product or material has been disinfected and is so certified prior to shipment, under the supervision of a duly authorized State or Federal inspector in such manner and according to such methods as may be prescribed by the State live stock sanitary authorities.

REGULATION 5. Except as otherwise herein provided, no hay, straw or similar fodder, feedstuffs, grain, rice, cotton, or other similar materials or garbage shall be shipped or transported from the closed area except under permit issued by a duly authorized State or Federal inspector.

REGULATION 6. No biological products manufactured in the closed area from cattle, sheep, other ruminants and swine and intended for use in the treatment of domestic animals shall be shipped, transported or moved from the closed area.

REGULATION 7. No trees, shrubs, vines, cuttings, grasses, scions, buds, roots, bulbs, flowers, or greenhouse plants, fruits, vegetables and seeds from premises infected with foot-and-mouth disease shall be shipped, transported or moved from the closed area; and no such products from non-infected premises shall be shipped, transported or moved from the closed area except upon permit issued by a duly authorized State or Federal inspector.
REGULATION 8. The shipment, transportation or movement within or from the closed area of milk, cream, cheese, and other dairy products is prohibited unless such products are, or have been prepared from, milk or cream which has been pasteurized or sterilized, are shipped in sterilized cans or clean containers, and are certified to by a duly authorized State or Federal inspector.

REGULATION 9. No dogs, cats, birds, or other pet stock, or wild animals shall be shipped, transported or moved within or from the closed area except upon a permit issued by a duly authorized State or Federal inspector. No dogs or other pet stock shall be allowed to run at large within the closed area.

REGULATION 10. The shipment, transportation or movement of live fowls and poultry of all kinds from or within the closed area is prohibited except upon permit issued by a duly authorized State or Federal inspector.

REGULATION 11. The shipment, transportation, or movement of horses and mules from the closed area is prohibited except upon permit issued by a duly authorized State or Federal inspector.

REGULATION 12. The movement of cattle, sheep, other ruminants or swine upon or across any public highway within the closed area is prohibited.

REGULATION 13. No person, other than Federal or State authorities, nor animals, implements or conveyances of any kind shall be allowed to leave infected premises, except upon written permit issued by a duly authorized State or Federal inspector showing that the said persons, animals, implements or conveyances have been properly disinfected.

REGULATION 14. Cattle, sheep, other ruminants and swine may, after inspection and certification by a duly authorized State or Federal inspector at the point of origin, be shipped, transported or moved, for immediate slaughter only, from the modified area to any other point within the State.

REGULATION 15. Hides, skins, hair, wool, and other animal by-products, and hay, straw, forage or similar materials admitted into the United States in compliance with the import regulations of the U. S. Department of Agriculture may continue in transit, without disinfection, from a port of entry in the closed or modified area to destination, provided the owner or consignor shall first file an affidavit with the transportation company at the port of entry certifying that the said products have been admitted as aforesaid.

REGULATION 16. The shipment, transportation, or movement of cattle, sheep, other ruminants, and swine from any point outside the closed and modified areas to slaughtering centers within the closed area for immediate slaughter, or to any point within the modified area for any purpose, is permitted.

REGULATION 17. Hides, skins, hair and wool of cattle, sheep and other ruminants, taken from such animals prior to.................

..............................................................

(name date, for example, 30 days prior to outbreak of the disease)
and which have since that date been stored away from cattle, sheep, other ruminants and swine, may be shipped or transported without disinfection from the modified area, provided that the owner or consignor shall first file an affidavit with the transportation company at the point of shipment certifying that the said products were taken from the animals prior to the date mentioned and have been stored as aforesaid.

REGULATION 18. Hay and straw harvested prior to.............

........................................................................
(name date, for example, 30 days prior to outbreak of the disease)
and which have since that date been stored away from live stock in such manner as to prevent the possibility of contact with cattle, sheep, other ruminants, and swine, their excretions and by-products, or contamination by such animals and by-products, may be shipped, without disinfection, within or from the closed or modified area: Provided that, at the date of shipment no case of foot-and-mouth disease exists within a radius of 5 miles of the place or places where the said hay or straw was harvested and stored; and provided further, that the shipment is accompanied by a permit issued by a duly authorized State or Federal inspector.

REGULATION 19. Hay and straw harvested since.............

........................................................................
(name date, for example, 30 days prior to outbreak of the disease)
and used for packing purposes, and which has been disinfected in a manner satisfactory to the State, may be shipped within or from the closed or modified area if accompanied by a permit issued by a duly authorized State or Federal inspector showing that the said hay or straw has been disinfected as aforesaid.

REGULATION 20. No railroad car which has, since.............

carried cattle, sheep, other ruminants or swine originating in the area herein quarantined, except those cars which have been cleaned and disinfected since last used, shall be used for the transportation of cattle, sheep, other ruminants or swine within this State until the said cars have been disinfected in the manner and according to the methods prescribed by the State Live Stock Sanitary Board.

Note: The live stock and other products not referred to in the regulations for the modified area but specified for the closed area, will be allowed to move without restriction from the modified area.

European Fowl Pest.—There was ample time for reflection between February and December, 1924, but notwithstanding the memories of the annoying experiences resulting from the impulsive and widely varying quarantines against California and Texas, there was another similar display in December, 1924, when European fowl pest made its appearance in the state of New York. Eastern states, where the disease first appeared, embargoed against Western states 1500 miles distant from infection, and Western states even as far west as the Pacific Coast embargoed against far distant Eastern states. The disease originated in
the East and was confined for some time mostly to New York, Pennsylvania, New Jersey, and Connecticut, but was carried later to a few flocks in Indiana, Michigan, West Virginia, Missouri, and Illinois. This was a new disease in the United States and the regulations issued by the states for its control in some instances showed impulsive action and the usual regrettable lack of uniformity.

Some states prohibited the movement, importation or transportation into or through them of any live poultry or birds of any kind from any other states.

Some states required that all shipments be accompanied by a permit from the Federal Bureau of Animal Industry, which practically excluded poultry, for it could not be expected that the Federal Bureau of Animal Industry would be able to inspect and certify all shipments.

Some states admitted poultry on permit from the state authorities at destination.

Some states required certificates issued by a state inspector at the point of origin.

Some states accepted shipments on the affidavit of the consignor. Other states issued permits to the consignors in certain states while they required inspection and certificates from the Federal Bureau of Animal Industry for shipments from other states, and some states adopted the Federal Regulations as they were issued.

It is not surprising that with this dissimilarity in regulations there was great confusion and unnecessary losses to the poultry industry, transportation companies and others during the five months that the outbreak was being eradicated. Only those who were in closest contact with the situation know the heavy losses suffered by the poultry industry as a result of varying, and in some instances unnecessary, state regulations.

Your committee recommends that in future outbreaks of European fowl pest or other unusual contagious disease the Federal regulations, with as little modification as possible to meet local conditions, be accepted by the states as a basis for their regulations. There should be some understanding through telegraph, telephone, or otherwise, between the U. S. Department of Agriculture and the states as to the scope and character of regulations in such emergencies before any are issued.

The Interstate Movement of Live Stock and Poultry Under Normal Conditions.

Under normal conditions in this country we must contend with various diseases of live stock. The character and prevalence of certain diseases in some states are of much importance while they do not exist in others, or are of minor importance. We must combat some diseases continuously while others appear only periodically in certain states or parts of states. There are frequent changes of regulatory officials and there are differences of opinion in regard to policies and practices. Under such conditions we cannot expect to obtain absolute uniformity in state requirements affecting the movement of live stock throughout the country, but progress is being made, and we believe it is largely due to the influences that emanate from this Association.
State authority and police power for the promulgation of reasonable requirements for the protection of the live stock industry against disease are now practically unquestioned. There is an earnest desire on the part of state live stock sanitary authorities for more uniformity in quarantine and interstate shipping regulations and live stock organizations, live stock exchanges, transportation companies and shippers are urging that something be done in the interests of harmony and economy further to improve present conditions.

Much has been said on this subject; much more could be said. The situation is well known and without further comment your committee submits for the consideration of the Association and state authorities a tentative draft of "Regulations to be Considered as a Basis for the Establishment of Uniform Requirements for the Interstate Shipment of Live Stock." This draft of tentative regulations is in the exact form in which it was presented to the Western States Live Stock Sanitary Association at its meeting on July 20, 1926, by Dr. W. F. Crewe, State Veterinarian of North Dakota. The draft of regulations reads as follows:

Regulations to Be Considered as a Basis for the Establishment of Uniform Requirements for the Interstate Shipment of Live Stock Into the States Comprising the Western States Live Stock Sanitary Association.

Horses, Mares, Mules and Asses.

All horses, mares, mules, and asses moved into the state of must be accompanied by health certificates, certifying that the animals have been examined within thirty days previous to date of shipment and found free from all contagious and infectious diseases, provision to be added by states where laws require that stallions and jacks must have certificates of freedom of transmissible unsoundness.

Cattle.

All cattle entering the State of must be accompanied by certificate of health indicating they are free from any symptoms of any communicable disease.

All cattle that can be used for breeding or dairying purposes, including bull or female calves of any age, must be tuberculin tested within a period of thirty days of date of shipment and be accompanied by proper tuberculin test chart health certificate, provided, that cattle originating from a Federal and State accredited tuberculosis-free herd will be admitted within a year of date of last test, accompanied by proper test record health certificate.

Cattle from modified accredited tuberculosis-free areas may be moved in accordance with Federal regulations.

(Exceptions may be made in the instance of cattle for feeding purposes or immediate slaughter in accordance with conditions in State they enter.)
All the conditions prescribed by the Bureau of Animal Industry, U. S. Department of Agriculture, regulations pertaining to the interstate movement of cattle, not contained herein, must also be complied with.

(It is to be noted that time limit on T.B. tests vary a great deal in these 13 states. Some states require that pure-bred cattle, unless from accredited herds, are admitted subject to a retest after 60 days have elapsed.)

**Sheep.**

All sheep moved into the State of ................. must be accompanied by a certificate of health, specifically stating that they are free from scabies and have not been exposed thereto within 60 days prior to being moved and that they are free from any indications of any contagious or infectious disease.

(Several states require the dipping of all sheep before entering the state.)

**Swine.**

All swine moved into the State of .................... unless destined to point for immediate slaughter where proper inspection is maintained, must be accompanied by a certificate of health indicating that no infectious swine disease has existed in the locality where shipment originated within a period of 60 days, provided, that swine may be admitted when certified to by approved veterinarian as having been immunized with anti-hog cholera serum within 15 days of shipment or by the simultaneous method not less than 21 days of shipment. Further provided, that pure-bred swine shipped in crates by express, accompanied by statement of owner, as indicated above, endorsed by an approved veterinarian, may be admitted.

All Federal regulations pertaining to the interstate movement of swine not contained herein must also be complied with.

(Some states require that all swine moved for exhibition at fairs must be immunized.)

**Dogs.**

All dogs moved into the State of .................... must be accompanied by a health certificate indicating that rabies has not existed for the past nine months within a radius of 50 miles of point of origin, and also statement of owner or agent that the dog or dogs have been free from any symptoms of this disease since birth or exposed thereto.

**Health Certificates.**

All inspections and tests must be made and certificates issued by veterinarian approved by the U. S. Bureau of Animal Industry to make inspections of live stock for interstate shipment.

All tests must be made in compliance with the rules of the U. S. Bureau of Animal Industry.

All tuberculin, mallein, or serums must be made or be approved by the U. S. Bureau of Animal Industry.
Penalty.
Whatever state law prescribes.

Special Regulations.

In the instance of epidemic or outbreaks of disease that may occur periodically amongst animals and poultry, where it becomes necessary for the U. S. Bureau of Animal Industry and the states to establish special regulations, I believe that the various states should establish regulations to conform as closely as possible with the Federal regulations.

Contagious Abortion.

While some three states have established regulations requiring that all breeding cattle entering said state must be accompanied by a certificate showing that the blood of such animals has been properly tested and found negative to said tests, I do not believe such regulations can be satisfactorily enforced at this time with any degree of success.

While these regulations might be largely adaptable in other sections of the country, they were drawn to suit especially the conditions in the Western States.

The Western States have the right idea in having such an organization as the Western States Live Stock Sanitary Association and it is regrettable that there are not three more such organizations, one in the Central States, another in the Eastern States, and a fourth in the Southern States.

The Western States Live Stock Sanitary Association holds meetings from time to time and the President is expected to call special meetings in cases of emergency, such as an outbreak of foot-and-mouth disease, to discuss matters of mutual interest, including regulations. The purposes and benefits of such regional organizations are apparent. In view of the fact that we have such an organization covering only the Far Western States, it is the recommendation of your committee that steps be taken by this Association to appoint large committees, preferably a representative from each state in a group, in each of the other regions specified to meet at their convenience for the purpose of discussing regulations and other matters of interest. Prompt meetings of these committees when outbreaks of foot-and-mouth disease or fowl pest occur would be helpful in preventing undue excitement and lead to more uniformity of action in premulgating regulations. The committees could keep in touch with each other and with the U. S. Department of Agriculture.

At present the statutes of a number of states specify the conditions under which live stock may be admitted and can be changed only by an act of the legislatures. No doubt it would be a better plan to have all restrictions on the interstate movement of live stock established by regulation or proclamation so that they may be rescinded or modified promptly as occasion requires. It is recommended by your committee that efforts be made accordingly.
We are all interested in a common cause and our efforts should be directed along similar lines even at the sacrifice of some opinions of minor importance.

PRESIDENT McNEIL: What is your pleasure with this report?
DR. MILLER: I move the adoption of the report.
(The motion was seconded and carried.)

PRESIDENT McNEIL: We have the unfinished program, or the part that we attempted to complete yesterday, on contagious abortion. I think that we will revert to the program as originally prepared and take up the program as indicated.

The next gentleman on the program is Dr. W. R. Hinshaw, with a paper on "Studies of the Transmission of Bacillary White Diarrhea in Incubators," prepared by Drs. W. R. Hinshaw, W. C. Upp and J. M. Moore, Department of Bacteriology, K. S. A. C., Manhattan, Kansas.

STUDIES IN TRANSMISSION OF BACILLARY WHITE DIARRHEA IN INCUBATORS

By W. R. Hinshaw, C. W. Upp and J. M. Moore, Kansas Agricultural Experiment Station.

Bacillary white diarrhea in chicks has been increasing in economic importance since 1900, when it was first reported by Rettger, until now it is one of the most important infectious diseases of poultry. It is of especial importance from a livestock sanitary viewpoint because of its nature of transmission through the egg. At the present time a large percentage of the chicks raised are hatched by commercial hatcherymen and purchased by the poultryman as day-old chicks. The commercial hatching business has expanded so that chicks are shipped from coast to coast. Thus the importance of determining if there is a chance of infection of chicks before they leave the incubators is great.

It was because of the large number of inquiries about the possibilities of such transmission that we started to study the problem. The phases of which we have made preliminary studies are: (1) The bacteriology of incubators, and (2) artificial dissemination of S. pullorum infection in incubators. In this paper we wish to give you a brief summary of our experiments and results with the hope of stimulating further investigation.

Bacteriology of Incubators.

We made a qualitative and quantitative study of the bacteriology of three forced-air-draft type and one sectional type incubators. The results of these studies will be published in another paper. We found that after each hatch there was a direct relationship between the time of incubation and the number of organisms in a machine of the forced air-draft type. After thorough cleaning and disinfecting the incubator, we obtained very few organisms. However, as soon as the chicks began to hatch, the number of organisms greatly increased until the chicks
were removed. This was not true of the sectional type of machine, where the number remained approximately the same throughout the period of incubation.

The organisms found to cause this increase at hatching time were of two fecal types. Therefore, if it is possible to get an increase in fecal types of bacteria, it would seem logical to assume that S. pullora, which causes bacillary white diarrhea, might also be spread by the chick down. In our early experiments with a machine which was hatching infected chicks, we were unable to isolate S. pullora. Later, in an artificially infected machine, we isolated this organism on three occasions, by exposing agar plates for one minute in various parts of the incubator.

Artificial Dissemination of Bacillary White Diarrhea in the Incubator.

Our first problem was to determine if infected chick down, chancing to light on the beak of a chick, will cause bacillary white diarrhea if taken into the mouth or nostrils. We were able to do this, so turned our attention to artificial infection of normal chicks hatching in incubators when infected chick down was known to be present.

As a source of such infected material, sterile chick down was saturated with 24 hour cultures of S. pullora, and then air dried. This dried infected down was placed in a compartment of a forced-air-draft incubator just as the chicks were starting to hatch. Seventy-five controls were removed before the down was placed in the incubator and the remainder of the chicks, which were just hatching, left in the incubator for 38 hours. A total of 117 chicks hatched and were placed in a cleaned and disinfected room which had never been used for brooding of chicks. None of the controls died from bacillary white diarrhea while 33, or 28.2 per cent, of the exposed chicks died from this disease.

In three other experiments, chicks were infected by saturating their bodies with S. pullora culture as soon as the eggs were pipped or immediately after hatching. These infected chicks were used to supply a source of infected down and normal chicks exposed to these in each compartment of the incubator. The summary of the results of these experiments follow:

<table>
<thead>
<tr>
<th>Data</th>
<th>Total No. in 3 lots.</th>
<th>Total died.</th>
<th>Total died from B. W. D.</th>
<th>Total died from other causes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicks hatching in infected compartment of incubator.</td>
<td>151</td>
<td>102 or 67.55%</td>
<td>90 or 59.6%</td>
<td>12 or 7.9%</td>
</tr>
<tr>
<td>Chicks hatching in non-infected compartment but exposed to infected compartment of incubator.</td>
<td>140</td>
<td>43 or 30.71%</td>
<td>38 or 27.14%</td>
<td>5 or 3.6%</td>
</tr>
<tr>
<td>Controls.</td>
<td>25</td>
<td>7 or 28%</td>
<td>none</td>
<td>7 or 28%</td>
</tr>
</tbody>
</table>
In the three experiments 316 chicks were under observation; 151 of these were either artificially infected or exposed to the artificially infected ones in the same compartment of the incubator; 140 were exposed to the artificially infected chicks but in the opposite end of the incubator. The 25 controls were not exposed, and were hatched in a cleaned and disinfected incubator. Higher per cent mortality was observed in chicks exposed in the infected compartment of the machine than in the chicks exposed in the non-infected compartment. This was also true in the experiment where exposure to infected down was the source of disease. Therefore, it seems that there is greater chance of incubator dissemination where normal chicks are in close quarters with the infected ones.

The results given in this paper suggest a source of bacillary white diarrhea dissemination not reported previously. However, since small numbers are involved, the experiments should be repeated, using larger numbers of chicks and better controls and naturally infected chicks should be used. In our preliminary experiments, it was impossible for us to get more than one incubator to work with, and the only eggs which were available were some which were being hatched for determination of hatchability. All of these were from birds which were negative to the agglutination test for bacillary white diarrhea, and records of hatchability and livability were available on 3505 eggs incubated from this flock during a period of six months previous to the time these studies were started. The livability of the 2438 which hatched was over 90 per cent. No outbreaks of bacillary white diarrhea occurred after the flock was tested and reactors removed.

In all the experiments 529 chicks were used and 111 (20.98%) of these were controls. Only one control died with bacillary white diarrhea, and this occurred in the first experiment to determine if chicks could be infected through the nostrils. In this case the infected chicks were separated only by a loose board partition, and infection could easily be carried by the attendant, by mice, or by infected down blown by air. In contrast to this one (0.9 per cent) which died of bacillary white diarrhea in the controls, 170 or 40.68 per cent, of the exposed chicks died with the disease. In all these cases, the diagnosis was confirmed by bacteriological examination.

The question of whether the chick down, pieces of shell, and droppings from naturally infected chicks are a similar source of dissemination yet remains to be settled. There is no doubt that fecal organisms spread throughout the incubators of the forced-air-draft type. And, since it has been proved that the infected droppings are one of the chief sources of infection, it is logical to assume that S. pullora can be transmitted throughout the machine by the air current. To some extent, this may also be true with other types of machines. We hope to report on this phase of the problem later.

One hatcheryman with whom we have been working says that he has seen typical examples of just such infection, but we have no definite data to prove it. One field example has been reported to us through the kindness of George Robertson, assistant Dominion Poultry
Husbandryman, Canadian Experimental Farms, Ottawa, Canada. He reports as follows:

"In one instance we had eggs from a breeder whose flock we afterwards discovered was badly infected with bacillary white diarrhea. I will not give you the results of the whole machine, but simply the results of a line of exhibition Leghorns which we were hatching at the same time.

The two hatches immediately preceding the hatch referred to gave a chick mortality of 2%. The hatch immediately following the hatch referred to gave 100% viability. In the infected hatch the mortality was 85%. In this connection I might point out that the chicks did not come in contact at all. All the chicks were in wire pedigree baskets and were in separate drawers from the eggs from the infected flock. I might say that the flock from which these White Leghorn eggs came was free of pullorum. We got pullorum from the chicks of the infected flock taken from the machine, and also from unhatched eggs from the infected flock which were in the machine."

Although we are not ready to say that bacillary white diarrhea can be spread in incubators naturally infected, we believe that hatcherymen should be careful to prevent such dissemination by using hatching eggs from tested flocks only. The custom hatchery problem is one which needs more attention, and every precaution should be taken to insure the owners of custom hatched chicks that their chicks are not being exposed to infection in the incubator. This can be done (1) by insisting that clients buy eggs from tested flocks only, and (2) by carefully cleaning and disinfecting incubators after each hatch. Custom eggs should not be hatched with eggs intended for hatching commercial chicks, unless it is known that the eggs come from tested flocks.

The conclusions drawn from this work are:
1. That bacillary white diarrhea was disseminated by artificially infected chick down, placed in a forced-air-draft type incubator.
2. That chicks hatching in the opposite compartment from that in which the infected down was spread, did not suffer as high a per cent mortality as chicks hatching in the infected compartment.
3. That similar results were obtained by infecting the down of hatching chicks and exposing healthy chicks to the down which might be carried from the infected chicks to the non-infected.

PRESIDENT McNEIL: Dr. Ferneyhough wants to make a train and he has a resolution he wants to submit.

DR. J. G. FERNEYHOUTH: Mr. President, this is a resolution that the Chairman of the Committee on Resolutions asked me to present to you because he is a host and he doesn't think I am host this morning. It is just a matter, you may say, in the form of a little invitation. Now you must all be a little careful how you turn down invitations.

On one occasion a gentleman arrived in a little town and he went to the hotel there. He couldn't get any quarters to stay in, so he went to the proprietor and said, "I am bound to stay somewhere."
The proprietor said, "Every room in the house is full. We haven't any place for you."

He said, "Old man, I am tired; I must rest."

The proprietor said, "I'll tell you what we'll do. We'll put you in the baby's room."

He commenced to think of the babies at home and how they bothered him. He said, "Is there anywhere else?"

"Yes, you can sleep in the straw stable."

So he went out to the straw stable. The next morning he was cold so he got up early. As he came in, he met a pretty girl coming out of the hotel. He said, "Good morning. I suppose you are the wife of the proprietor. He was so nice to me last night."

She said, "No, I am not the wife of the proprietor. I am the only child and they call me the baby. May I ask who you are?"

He said, "I am the damned fool who slept in the straw stable."

(Laughter.)

Gentlemen, here is a resolution. I do not think it will interfere with any one, and I think perhaps it will be beneficial to us all.

"In the interest of efficient live stock sanitary control, all research work by state agencies affecting directly or indirectly regulatory service should promptly be reported by state research agencies to the regulatory authorities within the state."

I hope you gentlemen will see fit to pass this resolution. It is just merely a help to us to keep in touch with what is going on, and, therefore, I offer this as a resolution, Mr. President, to this Association.

(The resolution was seconded by Dr. Van Es and adopted.)

DR. J. N. CONNAWAY: Some of these old baldheads over here were so much interested in that prelude to that resolution that we didn't get the full purport of that invitation. I wish he would read that again for the benefit of these gentlemen over here.

DR. J. G. FERNEYHOUGH: What do you want, the prelude? I knew that first was going to appeal to Dr. Conoway. I am afraid Dr. Conoway in this respect is something like the fellow to whom his mother said, "You have been most inconsistent; you have done so many things that you should not have done. You ought to go in mourning."

He said, "Mother, I have been thinking about going in mourning very seriously, but I can't decide whether I should go in mourning for what I got or what I missed." (Laughter.)

(Dr. Van Es read the resolution again.)

PRESIDENT McNEIL: The next on the program is the report of the Committee on Diseases of Poultry, by Dr. L. Van Es, Chairman, University of Nebraska, Lincoln, Nebraska.
UNITED STATES LIVE STOCK SANITARY ASSOCIATION.

Report of Committee on Poultry Diseases, 1925.

In the absence of specific instructions as to its task, this committee has deemed it wise to consider the general poultry disease situation and the more urgently needed measures to be taken in preference to dealing with any part of the many technical and scientific problems associated with it. It offers the following for the consideration of this Association:

As a natural consequence of the rapid and extensive development of our national poultry industry, the problem associated with the communicable and other mass diseases of the domesticated birds has assumed such proportions that people engaged in poultry raising, handling and marketing, as well as those having to do with the maintenance of animal health or live stock sanitation are compelled to recognize its magnitude and its potential menace to a most important industry.

According to information imparted by the National Poultry Congress (Chicago, Sept., 1925), the annual output of poultry and poultry products in this country amounts to approximately $1,250,000,000, while the total poultry interests represent a value of double that amount. The poultry products thus amount to $100,000,000 more than those of all the cattle raised and to more than $300,000,000 above the farm value of the wheat crop. It should require no special plea to convince anyone of the fact that an important national industry may be placed in jeopardy by the unrestricted dissemination of the diseases peculiar to domesticated birds.

As already stated, the Committee has not engaged in a special study of any or all the features connected with poultry diseases. Such details can be found in many excellent works, pamphlets and scientific journals and do not require attention at the hands of a committee.

It should, however, be brought to the attention of this association that the most harmful diseases of poultry are annually becoming more prevalent and that their toll is increasing in a steady fashion. How much the losses are cannot be actually ascertained, but it is very conspicuously true that fowl-pox, canker, roup and a particularly fatal bronchitis, possibly related to the latter, have inflicted heavy losses; that in many sections fowl-cholera, fowl-typhoid as well as coccidiosis are exacting a heavy toll from the producers; that in large areas of the country blackhead has well nigh suppressed the raising of turkeys; that bacillary white diarrhea has become a marked incubus on our commercial hatcheries and baby chick enterprises; that tuberculosis among our barnyard fowls has within the last fifteen years, acquired a morbidity rate which must be viewed with serious concern, and that the menace of European fowl plague was but narrowly averted.

No organization of producers, handlers, feeders or shippers assembles without the disease question appearing as a principal item in their deliberations and there seems to be among those various repre-
sentatives of the poultry industry a strong sentiment that steps should be taken to safeguard their extensive interests against the inroads by disease as well as against the more indirect annoyances connected therewith.

It is the opinion of this committee that it has become imperatively necessary that intelligent and well directed efforts be made in order to give our poultry interests the same degree of sanitary protection as that enjoyed by other branches of the live stock industry. It seems fitting that the term "live stock" and "domestic animal" as they appear in laws and regulations be so interpreted as to include all types of poultry.

The production, handling and marketing of poultry should receive the same sanitary supervision as those pertaining to other live stock in order that the business may be carried on without the great hazard of losses by disease and without the molestation by ill-advised or vicious restrictions imposed on account of real or pretended diseases.

A most hopeful evidence of progress in the right direction is to be found in the fact that the poultry interests themselves are now so thoroughly alive to the disease situation that the National Poultry Congress (Chicago, September, 1925), was able to take some initial steps in the matter and formulated a demand for Federal supervision and regulations pertaining to the movement of poultry and to request a specific appropriation of $100,000 per annum in support of this work. The National Poultry Congress in its resolution further requested that the Agricultural Extension Services of the various states emphasize in their educational activities the value of poultry hygiene and sanitation.

In the opinion of this committee, those efforts are worthy of the endorsement and support of the U. S. Live Stock Sanitary Association and that the latter should unite with the National Poultry Congress in the promotion of control measures pertaining to poultry diseases.

This committee believes that for the present this Association should confine itself more to the bringing about and the organization of agencies of control than to the details of measures and methods to be followed. It recognizes that the following agencies may be beneficially employed in bringing about improvement in the poultry health situation:

1. The United States Department of Agriculture, through its Bureau of Animal Industry, to have supervision over poultry movements in interstate traffic; to study the possibility of a supervision over poultry slaughtered in a manner comparable to that followed by its meat inspection service; to challenge the health and to execute quarantine measures pertaining to poultry and poultry products entering the territory of the United States through the channels of international commerce and to initiate measures against any exotic poultry disease which may gain a foothold within its boundaries.

2. State Live Stock Sanitary Boards and Commissioners, Departments of Agriculture and other State Agencies having jurisdiction in matters pertaining to animal diseases, to formulate and execute ways
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and means to cope with poultry diseases within their territories, to promote sound legislation relative to those diseases and to promulgate such regulations as may be needed in their control to supervise the sanitation of establishments and plants in which large numbers of birds are kept or assembled and from which shipments originate, to make statistical inquiry relative to poultry diseases, to publish the results and to establish such agencies as may be required for the routine laboratory diagnosis in the event that official health accreditization of poultry flocks should be deemed advisable.

3. All educational agencies having to do with the dissemination of useful knowledge to farmers and poultry growers to emphasize the prime importance of poultry hygiene to their own immediate interests as well as to the safety of the industry in general and to contribute to the training of poultry raisers in the hygienic management of their flocks, in the exercise of care in the selection of birds for feeding batteries and for long distance shipments.

4. Colleges of Veterinary Medicine to include in their curriculae courses by which matriculants can become acquainted with poultry diseases and the problems they present so that there may become available a larger body of trained advisors to whom flock owners may appeal when in need of technical counsel.

5. Agricultural Experiment Stations and other establishments for research in animal diseases to continue and to inaugurate research projects dealing with the many unsolved problems connected with the diseases of birds and their prevention, to concentrate on studies fundamental to the increase of our knowledge of poultry diseases rather than on routine diagnostic examinations which more properly belong to the function of the sanitary authorities.

This committee recommends that the United States Live Stock Sanitary Association render such aid as lies within its power to bring about and to strengthen any or all of the above named factors in the control and suppression of the diseases of poultry and that it give expression of its sentiments relative to the latter in the following resolution:

Resolution.

WHEREAS, the section of Animal Industry concerned with the production and distribution of poultry and poultry products has developed to the status of an important asset to our national prosperity, and

WHEREAS, there has arisen as a concomitant to the increased poultry population a disease problem of considerable magnitude, which menaces the poultry industry as well as the wealth invested in it, which at all times is prone to seriously interrupt the free movement of poultry and poultry products in the channels of commerce and which is seriously felt by poultry producers in the form of annually increasing losses by death and reduced productivity of the flocks, therefore:
BE IT RESOLVED: 1. That the United States Live Stock Sanitary Association urges and requests of the United States Department of Agriculture and the Live Stock Sanitary Boards and Commissions of all of the states, that diseases of poultry be given the same consideration as those of other forms of live stock and that steps be taken looking forward to their control and suppression.

2. That it urges on the Congress of the United States to appropriate for the purpose of poultry disease control by the U. S. Department of Agriculture the annual sum of not less than $150,000, and on the Legislatures of the various states of the Union to appropriate adequate amounts for the inauguration of similar measures by their own agencies of animal disease control.

3. That veterinary and agricultural educational institutions disseminate in the widest manner possible the knowledge upon which the hygiene of poultry can be based and that they emphasize the imperative need for sanitary flock management on farms.

4. That all research institutions having animal diseases as their special field devote part of their efforts to the solution of problems associated with poultry diseases by the inauguration of experimental projects especially designed to add new knowledge to our present stock of information.

5. That this Association endorse the resolutions and measures recommended by the Standardization Conference held in Manhattan, Kansas (August, 1925), and the National Poultry Congress held in this city (Sept., 1925), for so far as they pertain to the poultry disease problem and that it pledges its support in any effort looking forward to its solution.

6. That those resolutions be communicated to all the agencies and institutions mentioned and be furthermore given the widest possible publicity among people who may be concerned with the prosperity of our poultry producers and distributors.

F. R. BEAUDETTE.
S. ERIKSON.
W. R. HINSHAW.
V. A. MOORE.
E. L. STUBBS.
L. VAN ES.

DR. VAN ES: Gentlemen, I move the adoption of this report and the resolutions that it contains.

(The motion was seconded and carried.)

PRESIDENT McNEIL: The next number on the program is an address by Prof. F. B. Morrison of the University of Wisconsin, on "Nutritional Problems in the Feeding of Young Animals."

PROF. F. B. MORRISON: I am very glad to have this chance to talk to you men of the United States Live Stock Sanitary Association on the subject of nutritional problems in the feeding of young animals. I shall try and make by remarks brief, as I see your pro-
gram is crowded, and, therefore, shall not go into detail concerning many of the things I shall take up.

First of all, I like to look at farm animals as living machines, as machines for converting the products of the field into products that are of some particular use to us, no matter whether it is milk, wool, meat, or work of horses. Looking at animals that way emphasizes that in order to secure efficient production from them, they must secure in their food the right kind of raw material, a thing that all manufacturers appreciate. Even Ford cannot make an automobile unless he has exactly the right kind of raw material, but it is an item that many farmers do not appreciate.

Away back in 1864, Wolff, a German chemist, appreciated this fact fully and got out feeding standards. Today we have adopted into our common life the telephone, telegraph, the automobile, and still more recently the radio, and all these modern inventions. Yet many farmers who have these modern improvements in their homes do not appreciate the necessity of efficient feeding if they expect to secure maximum profits.

What are balanced rations? Reduced to the simplest terms, all that we can mean by balanced rations today is just about this simple fact: That proper amount of protein.

In any set of feeding standards, I do not believe we will be able to express in definite numerical amounts any other factor than the proper proportion of protein to other nutrients. In other words, I do not believe, at least for many, many years, and perhaps never, can we take such factors as mineral matter and vitamins into consideration in any set of feeding standards.

Proper Amount of Protein Needed.

There is a danger on the part of many people at the present time, on account of the great popular interest in some of the new discoveries in nutrition, to ignore the fundamental fact with reference to the need of an adequate supply of protein in rations. Many men get to thinking that vitamins and mineral matter are more important than anything else. That is not so. For efficient production, you must have all the necessary factors. We cannot get away from the fundamental fact, appreciated way back in 1864, that for adequate and economical production we must have the right amount of protein in the rations of livestock.

Of what importance is this fact in feeding young animals? It is of vital importance, simply because young animals making muscle tissue and other protein tissue of the body very rapidly naturally require much more protein than older animals.

This fact is often disregarded, not only by farmers but by experiment station workers. Many trials have been carried on, for instance, in feeding swine, in which they have been fed by experiment station workers a standard proportion of 10 per cent tankage and 90 per cent corn, starting at a young age and keeping on until they reach market
weight. That is all wrong. The men who have carried on experiments of that type have disregarded the fundamental fact that a young animal requires very much larger percentages of protein than the same animal when it is half grown, and still more in comparison with the same animal when approaching maturity.

For example, you probably all know what a nutritive ratio means—simply the proportion of protein to other nutrients. Young pigs at weaning time should have a nutritive ratio, according to our best information, of about one to four or four and a half; that means one pound of digestible crude protein to four or four and a half of other nutrients. Reduced to a percentage basis, that means about 25 per cent of digestible crude protein in the ration. As they get older, they need less and less. For instance, a pig weighing 250 pounds needs only one pound of protein to every 6.7 up to even 7.5 pounds of other nutrients. In other words, he can get along on a nutritive ratio of one to seven and a half, entirely different from a pig right after weaning time. That is a fact of vital importance.

Translate that into terms of common feeds and what does it mean? An old idea is that a pig needs about three pounds of skim milk to every pound of corn he eats when he is not on pasture. That is all right for a certain weight of pig and radically wrong for other ages. At weaning time a pig should get from four to six pounds of skim milk to every pound of corn. When a pig has reached 200 pounds in weight, all he needs is from one pound to one and a half pounds of skim milk to one pound of corn.

If a farmer does not appreciate these facts, he may be underfeeding the young pig and supplying the older pig with much more skimmed milk than he needs. Right here I may state in feeding swine if a farmer has plenty of skim milk or buttermilk for his pigs, there is no necessity whatsoever of purchasing meat meal or tankage to balance the ration because he already has enough very efficient protein.

With reference to corn and tankage, what is the situation? A pig should have 14 to 15 per cent of tankage and the rest of the ration corn just after weaning time; on the other hand, 9 to 10 per cent of tankage is plenty for a 100 to 150-pound pig, a radical difference in the requirements, depending on the age of the animal. I might mention that under pasture conditions it is a little difficult to make hard and fast recommendations, but there, approximately, a pig needs about half as much of the protein-rich supplement as he does under dry lot conditions, providing the pasture is good, efficient pasture, such as legumes or oats and peas or rape.

Under certain conditions, when protein-rich feeds are cheaper than those rich in carbohydrates, it is most economical to feed more protein than recommended in the feeding standards. An animal can stand a certain excess protein without any harm whatsoever. We have entirely given up the theory that men get gout and rheumatism because they eat a reasonable amount of meat. It is the same with an animal.

Under conditions where protein-rich feeds are cheap, such as in the alfalfa districts of the West or the cotton belt, oftentimes it is
most economical to supply a considerable excess of protein simply because it makes a cheap ration, though the animal does not need that excess.

Under conditions in the corn belt, on the other hand, our protein-rich feeds are commonly expensive and, therefore, we should try to feed just enough to balance the ration. A common recommendation for fattening two-year-old steers is to give them two and a half to three pounds of cottonseed meal per thousand pounds live weight daily. In other words, a steer weighing a thousand pounds should have from two and a half to three pounds a day, along with shelled corn, corn silage and what clover hay he will eat. As a matter of fact, steers do not need that much cottonseed meal. You can reduce the amount about 50 per cent, say about one and three-quarters pounds per thousand pounds live weight is enough for a two-year-old steer.

Quality of Protein Is As Important As Amount.

Dismissing this question of amount of protein, next I wish to speak about the importance of quality or kind of protein. Robert Burns said, "A man's a man, for a' that, and a' that." Good poetry but mighty poor common sense, is it not? Proteins differ in quality just like men differ in capabilities.

Experiments that have been carried on at various places, for instance, experiments that have been carried on by Prof. Hart and his associates at our institution, show that very clearly. In these trials, pigs have been fed various rations in cages where all the feces and urine could be carefully collected and then analyzed. On corn, these pigs could turn into pig meat only about 23 per cent of the entire protein in the corn grain. On the other hand, on skimmed milk the efficiency was 66 per cent—a radical difference.

Linseed meal is a highly efficient feed when fed right, yet in these trials when linseed meal was fed as the only kind of protein the pig could store only 17 per cent of it in the form of muscle tissue and other protein tissue. When corn and linseed meal were mixed together, radically different results were secured. The efficiency of the mixture instead of being 23 per cent or 17 per cent was increased to more than 30 per cent.

Still greater improvement resulted when corn was mixed with milk. Remember, corn has an efficiency of 23 per cent and milk over 60 per cent. If you mix milk and corn together in the right proportions, you increase the efficiency of the whole mixture to about the same efficiency as milk alone; in other words, over 60 per cent.

These scientific trials are of tremendous practical importance. We find the same thing holds true in extensive studies we have made of the value of various protein-rich supplements for swine feeding. I will mention some of these practical results later on.

These trials, as well as experiments carried on elsewhere, have shown that the quality of protein is of tremendous importance in feeding swine. A farmer cannot expect to get economical gains if he
feeds inefficient proteins to his pigs; for instance, if he uses as the only supplement to corn or other grain any one of these supplements or all of these mixed together—linseed meal, wheat middlings, corn gluten feed. All these proteins come from plant sources and do not supplement the deficiencies in the proteins of the grains. On the other hand, so far as the protein standpoint alone is concerned, soybeans and peanuts furnish the best balanced proteins of plant sources that we have commonly available.

In poultry feeding, likewise, the quality of protein may make all the difference between success and failure, as practically all of you men know. We cannot expect efficient production from hens unless some source of animal protein is included in the ration or unless special care is taken to balance the protein quality as well as the amount, perhaps by the use of soy bean oil meal or soy beans or some other highly efficient protein of plant source.

Investigations have shown that the efficiency of a ration, so far as protein is concerned, depends on having present in it a sufficient supply of all the essential amino acids. If but one of the necessary amino acids is inadequate in amount, the ration will be inefficient. It will then be radically improved by adding some feed that supplies an abundance of the lacking building stone. Animal proteins such as are furnished by skim milk, tankage, and fish meal are especially good supplements to the cereal grains in feeding swine, due to the fact that they furnish plenty of the very amino acids which are contained in too small amounts in the grains.

With reference to feeding other classes of stock, the situation is different than in feeding swine or poultry. In feeding dairy cows, beef cattle, sheep, and horses, if they are fed a decent sort of a ration—by that I mean legume hay and other good quality roughages—the quality of protein is not of primary importance. If a dairy cow is fed legume hay and corn silage, that roughage combination furnishes protein of good quality, so that if a farmer is using corn as the grain with such roughage, he can use most any of the protein-rich feeds with good results. He can even use gluten feed, which is a corn by-product, and the alfalfa hay protein will supplement the deficiencies of the corn protein in gluten feed. I won't take the time to discuss that further, but simply wish to contrast the importance of quality of protein in feeding swine, especially young pigs, and in feeding poultry with the fact that quality of protein is not of as much importance in these other classes of live stock.

**Importance of Minerals.**

Now let us take up this question which has received so much popular attention recently, the importance of minerals.

We all know that minerals are absolutely essential for life itself. A great deal of propaganda has been indulged in on the question of mineral supplements for live stock. Just what are the facts with reference to the matter.
First of all, all farm animals should get an adequate supply of salt, common salt.

What other mineral constituents are apt to be lacking in the ration? First of all, calcium, or lime may be lacking. Next, phosphorus. This is because young animals need large amounts of calcium and phosphorus to build their skeletons, 90% of the mineral matter of the skeleton being calcium and phosphorus. Dairy cows need large amounts of calcium and phosphorus because they put a great deal into their milk.

Just what is the necessity of farmers under various conditions using mineral supplements to balance rations? It all depends, gentlemen, on the kind of ration they are using. If the ration they are feeding is deficient in any of these mineral constituents, for example, if it is deficient in calcium, then certainly wonderful improvement will result from supplying calcium.

Prof. Hart and his associates at our institution have found that when cattle are maintained on very poor roughage, such as straw or timothy hay from acid marsh soils, there will result nutritional abortion, the production either of dead offspring or very weak offspring, due primarily to a lack of lime in the ration, and also due to a lack of vitamin which is needed for animals to assimilate and use lime. You cannot prevent it by adding a mineral supplement alone, you must also supply the vitamin. It can be very, very readily prevented by simply substituting good legume hay for part of this inferior roughage.

In the case of young animals, what is the evidence with reference to the need of mineral supplements? It all depends on the quality of ration, as I have indicated.

Take the ration of corn and soy beans that has been investigated by the corn belt experiment stations, especially the Indiana station. They have shown very definitely that corn and soy beans are, just as we would expect from chemical analysis, deficient in lime. Therefore, when they add a mineral supplement to the ration of corn and soy beans, the efficiency of the ration is increased very materially. The Alabama experiment station finds the same thing to be true with corn and peanuts, or peanut oil meal—a ration low in lime, and benefited decidedly by supplying lime or calcium.

On the other hand, we have carried on several experiments in Wisconsin to determine whether or not there is an advantage in adding either a calcium supplement or calcium and phosphorus supplements in raising breeding stock, and also for brood sows during the winter. In these trials we have started out with young gilts weighing fifty to sixty pounds. We have begun with young gilts so that we could get full advantage from the use of the mineral supplement. The basal or check ration has been of the type we are recommending our Wisconsin farmers to use where they do not have dairy by-products available. It has been simply a combination of corn, oats, wheat middlings, with five per cent of linseed meal and five per cent of tankage, with good pasture in the summer time and alfalfa hay fed in a rack during the winter time after the gilts have been bred. Water and salt have been furnished all lots.
Right here I want to emphasize that no man should expect profit from raising pigs unless he supplies good pasture throughout the growing season, and I believe he should also supply legume hay for all hogs during the winter time.

Another lot got steamed bone meal of the very best grade; another, ground limestone. The last two years another lot has received a complex mineral mixture supplying not only calcium and phosphorus but also Epsom salts, glauber's salts, copperas, sulphur and potassium iodide. What are the results? In not a single one of these comparisons, taking an average of all the years, has there been an advantage during the growing season, either in rate of gain or economy of gain, through adding any mineral supplement except common salt to this ration, which is already a good one. Also we have been able to see hardly any difference in the returns from the sows at farrowing time, paying due attention to the vigor of the pigs, their body length and the bone development.

What does this mean? Simply this: That ration was already a good ration, containing a fair amount of calcium and a fair amount of phosphorus, so we were not surprised when we did not secure any benefit in particular by adding a mineral supplement which furnished calcium or both calcium and phosphorus. If we had had a deficient ration, we would have gotten a decided benefit. That is a point I want to clinch. In looking into the situation on a local farm and in deciding whether or not to advise that particular farmer to use a mineral supplement, you must consider the situation he is in. If he is on a soil deficient in lime, and is feeding a ration low in lime, entirely different advice should be given than if he is on a lime-rich soil and if he is using rations already rich in lime.

Vitamines Needed in Successful Rations.

I will say a few words with reference to the importance of vitamines in stock feeding. Several books have now been written dealing exclusively with vitamines. On account of the limited time available, it is impossible to go into great detail regarding vitamines. I shall merely emphasize what appears in my mind to be the practical significance of each one of these vitamines in stock feeding.

Vitamine A.

Vitamine A is one of the fat soluble vitamines. Butter fat is rich in this vitamine, and it is therefore of great interest to dairymen. From the standpoint of stock feeding, the points of importance, I believe, are the fact that this vitamine A is contained in liberal amounts in all green leaved plants; also, in well cured dry roughage, such as good legume hay. This means that all stock on pasture do not suffer from a lack of vitamine A. Neither do stock suffer from a lack of vitamine A when they get good green-colored roughage, such as well cured legume hay.
Dr. Steenbock, who talked to you Wednesday, discovered in 1920 that yellow corn is rich in this vitamine and white corn is deficient in it. We immediately started experiments under practical conditions to find out whether this discovery, which was made with rats, would apply to swine feeding. If any of you are interested, I have some copies of this circular, “Yellow or white corn, which?” here.

In a nutshell, the relative value of yellow and white corn all depends upon the condition under which it is fed. If you take young pigs at weaning time and feed them nothing but white corn and skimmed milk, you will quite often kill some before they get to market, simply due to the deficiency of the vitamine. On the other hand, if you put in five per cent of chopped alfalfa hay, reasonably well cured, those pigs will be just as thrifty and happy as though they had received yellow corn. With 100 or 150 pound pigs, you will not see very much difference, though there will be some difference in favor of yellow corn. However, it will not be radical, because at that time the pig has pretty well made most of its growth.

Vitamine B.

The next vitamine is vitamine B, or the water soluble vitamine. This is the vitamine that prevents beriberi, which the Japanese and Chinese suffered from until they learned how to prevent it by changing their diet. Vitamine B is present in liberal amounts in all grains and in all hays, that are reasonably well cured.

Since this is so, I do not see how there can be any common deficiency of vitamine B in the rations of live stock. Neither does the American Medical Association believe there is usually any deficiency of vitamine B in the diets of humans in this country. This is a matter of importance on account of the great amount of propaganda in favor of yeast feeding to live stock and yeast to humans. According to reports of the American Medical Association, the benefits secured from yeast (and there are benefits in the case of some humans) are probably due to the fact that yeast is a very efficient laxative.

In the case of swine feeding, we have been interested in studying this matter, taking pigs right at weaning time. The Michigan and the Missouri experiment stations had previously found in two experiments that they had no benefit from adding yeast to the rations of swine when they started with pigs which were pretty well grown.

During the past two years we have carried on two experiments and are now carrying on the third, taking pigs right from their dams at weaning time. Without going into details in the experiments, I will say that we have not seen a benefit from the use of yeast, either dry yeast or where the feed was soaked and fermented with yeast. Pigs cannot appreciate their "blessings" when receiving the latter ration, because you know, of course, the function of yeast is to change sugar to alcohol. We got a good alcoholic fermentation in the feed but these pigs did not appreciate their advantages. Their gain was more expensive on the yeast feeding, even disregarding all the cost of soaking, just charging the cost of the yeast and donating all the additional time.
Vitamine C.

The next vitamine is vitamine C, or the antiscorbutic vitamine.

When I am talking to farmers I tell them that the word *antiscorbutic* is pretty nearly as hard as *carburetor* or *superheterodyne* and they usually smile and let me talk a little longer to them. We might as well get farmers to appreciate the fact that they should use a professional vocabulary and know clearly what some of these new terms are. To know what such words as antiscorbutic or antirachitic vitamines are may be of much more financial value to them than to know what carburetor or superheterodyne means.

The antiscorbutic vitamine, or vitamine C, is not of importance in live stock feeding, due simply to the fact that man, monkeys and guinea pigs are the only animals which suffer from scurvy. Therefore, I will not take time to discuss scurvy and its prevention. It is important in human feeding to supply an abundance of vitamine C. Many wise mothers supply their babies with orange juice or tomato juice, especially when there is any danger of a lack of this vitamine.

Vitamine D.

Undoubtedly Dr. Steenbock emphasized this vitamine to a considerable extent in his address to you. Vitamine D is the antirachitic vitamine which prevents rickets.

Medical men say that 80% of the children in New York City suffer from rickets. Rickets is a disease of civilization. Savages never suffer from it. They may starve to death, but they never have rickets. Also, animals under natural conditions do not commonly suffer from rickets. However, in zoos you can find many animals suffering from this disease. Cats do not suffer from rickets, while dogs do. A dog is our domesticated animal; a cat condescends to live with us and retains more of her wild instincts; therefore, she does not suffer from rickets, which is a disease of civilization.

Rickets is of tremendous importance in swine feeding. I believe that most of the posterior paralysis in swine, the so-called rheumatism, is nothing but rickets, and I believe one of the best ways of preventing it is the use of legume hay, even for young pigs. Now don't make the mistake of advising too much legume hay. A pig's digestive tract is a good deal like yours and mine, and we would object decidedly if our wives fed us on alfalfa hay for breakfast food.

Five per cent of chopped alfalfa hay added to the ration of a pig in the winter time is sufficient and will prevent many of the troubles which might otherwise result. Don't increase it beyond that. A brood sow should get ten to fifteen per cent of alfalfa hay; she has a more roomy digestive tract.

I shall not take time to go further into vitamine D, because undoubtedly that subject was discussed fully by Dr. Steenbock.
Vitamine E.

The last vitamine, vitamine E or vitamine X, which has been discovered by Dr. Evans of the University of California, may be of great significance in live stock feeding. Apparently an adequate supply of this vitamine is necessary for successful reproduction. However, this vitamine is contained, as far as the data yet show, in most ordinary rations that are fed the large farm animals. Therefore, we do not yet know whether or not we need to pay any especial attention to it in feeding cattle, horses, sheep and swine.

In closing, I will make a few statements with reference to the practical significance of some of these points. We have been interested for the past seven or eight years in carrying on a rather extensive comparison of the value of various protein-rich feeds in swine feeding, starting with young pigs in dry lots or on pasture. As I mentioned before, you cannot secure good results from young hogs if you feed them grain alone, no matter what kind of grain. This is because the protein in grain is all more or less alike, all of it being unbalanced in composition. Neither can efficient results be secured from grain plus such supplements as wheat middlings or linseed meal. We have carried on five experiments where we have compared linseed meal as the only supplement to corn, with tankage as the supplement to corn, all lots of pigs having good pasture. Even when fed to pigs on good pasture, linseed meal, compared with tankage at sixty dollars a ton, was only worth about seventeen dollars and fifty cents. In other words, it was decidedly unprofitable.

At the same time we carried on experiments to see whether or not we could dilute the tankage, because if all the men who do not have dairy by-products available for their swine or poultry started to feed tankage, they would drive the price of tankage so high that it would be no longer profitable. So we wanted to see whether we could not dilute the tankage content of the ration and still secure efficient results.

To our surprise, we did better than we had expected when we substituted linseed meal for half the tankage, then feeding a ration of corn and half tankage and half linseed meal. We secured even better results than on the standard ration recommended by the experiment stations of corn and tankage for pigs on pasture. When fed in this combination, instead of linseed meal, being worth less than tankage, it was worth decidedly more—in fact on the average it was worth seventy or eighty dollars a ton.

We have also worked on what we call our fall pig problem. Many of you men come from the southern states where pigs can be raised just as well in the winter as in the summer, because pasture can be provided over a larger part of the year. In Wisconsin and other northern states, we have a saying, “If you have an enemy, give him a fall pig,” simply because such poor results are often secured with fall pigs.

We have not felt, until the last two or three years, like advising men to raise two litters of pigs a year unless they had plenty of dairy by-products available and also good quarters. For some years we tried
to develop a ration on which we could get just as good results as we could from corn and skimmed milk. I shall not take time to tell you of the failures we have made, but we finally worked out a combination which gives surprising results. We can take pigs at weaning time away from their dams and feed them this ration and get them to gain better than on yellow corn and skimmed milk, a thing I did not believe four or five years ago would be possible.

This ration is a simple combination of corn, linseed meal, tankage and chopped alfalfa. If you leave out any one of those feeds the results will not be anywhere near as good. It is simply a dovetailing together of the various nutritional factors so as to make an adequate ration for young pigs.

I hope as time goes on the experiment stations can work out many efficient rations for the various classes of stock. In other words, that they can get the carbureters of these domestic animals adjusted more efficiently so that the farmers can secure better results.

If there is time, I will be glad to answer any questions, or if not, I will be glad to answer questions after the program is finished.

I thank you.

PRESIDENT McNEIL: We have a few committee reports. We feel at this time that we cannot break in on the program for tick eradication. I think we would split it in two if we would start now; I will try to clean up the things that we have and keep the program, as far as the subjects are concerned, intact.

I will ask Dr. Lamb to make the report that he has on Skin Diseases.

Dr. C. G. Lamb read his paper. (Applause.)

Your Committee on Special Skin Diseases will limit its report almost entirely to the consideration of skin diseases caused by parasites and especially to the disease of cattle and sheep commonly designated as scab.

The Psoroptic or common scab of cattle caused by the Psoroptic Communis Bovis has for many years been quite prevalent in most western range states where its presence is the cause of many grey hairs in the heads of sanitary officials, the cause of many sleepless nights, much hard work of muscle and of brain, much discussion, argument and numerous lawsuits between such official and stock owner.

The cause of the disease is well known to all stock men—the remedy is equally well known and the thorough application of the remedy is an absolute cure for the disease, and in spite of this well understood fact and in spite of the fact that the presence of this disease in a herd or community causes heavy financial loss each year to the herd owner, the fact remains that a considerable percentage of herd owners resist authorities in their efforts to eradicate the disease, even to the extent of invoking the aid of the law to prevent the authorities from ridding their herds of the disease, and as a result of this indifference or actual antagonism the efforts of State and Federal authorities to eradicate it do not show the results that would naturally be expected.
During the year ending June 30, 1924, there were dipped under Government inspection 1,208,927 cattle according to the report of the B. A. I., while in the year ending June 30, 1925, there were dipped 1,121,459, a difference of only 87,468 cattle or slightly more than 7%.

These dippings being in addition to very many thousands of cattle dipped by individual owners without supervision.

It might seem singular to persons not familiar with existing conditions that so simple a disease, and one of which the cause was so well known and the remedy so well understood and so certain, that the disease should be permitted to exist in any locality over a period of years as has been the case in this disease.

To one on the ground the reason is very evident; its continual existence and prevalence is due to any one or more of several causes: The antagonism or indifference of the owner—the imperfect gathering of cattle so that only a portion of the herd is presented for dipping, many infected animals being left on the range to perpetuate the disease. In very many cases the dipped animals are returned to infected corrals, sheds and ranges, and soon become reinfected. In unsupervised dippings the dip is of improper strength, perhaps not heated, the animals simply being rushed through the vat in an apparent effort to break the record of the number of cattle dipped in a given time, with the result that the time, money and effort are wasted and the cattle little, if any, cleaner than before. To the writer this is one of the unexplainable perversities of human nature, while the loss is entirely that of the cattle owner, and the efforts of the sanitary official in the eradication of the disease is to prevent this loss to the owner, his efforts are resisted by the owner in every possible way.

Sarcoptic mange of cattle has not, until recently, been of any serious importance, but it is now becoming a serious menace in many localities, while its cause and remedy is as well known as in the psoroptic variety, its successful treatment is much more difficult owing to the burrowing habits of the mite, making it more difficult to apply the remedy to the parasite.

In all cases of sarcoptic mange which have been brought to the attention of the writer, the disease could be traced directly to pure bred cattle, usually bulls, brought in from the East, and it has been a source of wonderment why it did not cause more inconvenience and loss there when it did so much damage and spread so extensively on western ranges.

The B. A. I. report that during the year ending June 30, 1924, there were dipped under Government supervision 5,065,572 sheep, and during the year ending June 30, 1925, 4,071,375, a decrease of 994,197 or a decrease of almost 20%.

The reasons for the continuance of this disease in sheep are practically the same as those in cattle scab, viz.: Antagonism and indifference of owner or lessee, particularly if such owner or lessee happens to be an Indian or Mexican, for with these people scab is looked upon as a dispensation of Providence and is not to be combated; besides, a
little scab is oftentimes more effectual in protecting certain ranges and water holes than any fence could be—and the practice of returning dipped sheep to old infected corrals and bed grounds, there to soon become reinfected is even more common and dangerous than in the case of cattle.

The fight against scab in cattle and sheep has been waged, on our western ranges, for many years, and while much progress has been made the results do not seem commensurate with the time and effort expended, but the only thing to be done is to continue the fight, and by everlastingly keeping at it the goal of complete eradication of these diseases may be reached.

Dr. French, member of the committee from Wyoming, reports from his State as follows:

"About the 1st of last May ran onto an entirely new disease or trouble to me. Had a call to La Grange, Wyo., 65 miles from Cheyenne. Dr. J. T. Dallas went with me. We found a bunch of about 100 cattle in a large pasture; grass seemed to be good, but soil was sandy and they had a great deal of hot wind. Out of the 100 head some 40 had a trouble described as follows: Every place on the skin where there was white hair, on the udder and nose, the skin was dry and cracked open with a serum exuding out into the hair. They had a moderate amount of fever and were extremely stiff; when made to walk they would step high with hind feet, and at times would kick, first with one foot and then with the other far back behind them; appetite gone and did not care for water.

All cattle affected were cows over three years old. Steers, bulls, heifers and calves running with affected cattle were not bothered. Some 5 or 6 head died, others recovered.

No sign of the trouble on the parts of the body covered with red hair.

Being wild range cattle, it was out of the question to give each affected animal proper treatment.

This may be a common ailment in some places, but is new in the State of Wyoming.

Sarcoptic Mange.

We have had sarcoptic mange in three shipments of bulls which were imported into Wyoming. All, we think, originated from one shipper. At the present time we are cleaning this trouble; we expect to have it all cleared up by December 1st (the time of the meeting in Chicago). We feel we will then be free of this disease.

This particular shipper of pure bred bulls was finally caught at the Denver Stock Show. It is reported that the Government and State authorities finally tied his cattle up to where he had to clean up.

It is my belief that a man who will knowingly sell and ship cattle affected with sarcoptic mange is a more dangerous man to deal with than a man who traffics in T. B. cattle.
Our records from inspection show we have psoroptic mange infection almost stamped out at the present time; we are hot on the trail of it and expect to clean it up.

Last year we had a siege of vesicular stomatitis, which affected the skin on the udder of some of the dairy cows; to date this year it has not made its appearance. This is not necessarily a fatal disease, but causes quite a shrinkage in flesh and diminution in the flow of milk, with some spoiled udders.

This, I think, is about the extent of our troubles where skin lesions appear.

Dr. Pelton of Washington as follows:

"In regard to the skin diseases affecting live stock in this State, sheep scab (scabies) is by far the most important and predominant one. During the past two years there have been outbreaks in the Yakima and Kittitas Valleys, which are the winter feeding quarters for 85% of the sheep in this State. In September and October, 1924, some 40,000 infected or exposed sheep were dipped in these two districts. This spring about 8,000 were dipped, and I understand that within the last month several foreign flocks have been dipped. Most of the sheep dipped last fall were only exposed, having either passed over infected trails or through chutes.

It has been three years since we have had any cattle scab and that never got beyond the stock or packing house yards. It was found in cattle from both Montana and the British Columbia provinces.

From time to time many reports were received of some skin disease affecting cattle, but every one proved to be lice or ringworm.

Fortunately this State is very free from all such conditions and it is very gratifying to be able to make such a report."

The discovery of tubercular lesions in the skin of slaughtered tuberculin reactors presents another important and interesting affection of the skin and explains the why of many so-called "no lesion" cases which existed before the skin received the careful scrutiny which it now does—and I would be glad to receive information from those who have given this matter much study. Does the presence of tubercular lesions in the skin indicate that the disease gained entrance through the skin and localized itself at the point of entrance, or is it possible that the disease gained entrance through the alimentary or respiratory tract, as it is commonly supposed it does, and then localize itself in the skin?

DR. LAMB: Mr. Chairman, I move the adoption of the report.

The motion was seconded and carried.

PRESIDENT McNEIL: The next paper on the program will be the paper by Dr. Huddleson. After we conclude this paper, then we will discuss the papers that have been presented, and then we will have our way cleared for the Tick Committee.

Dr. I. F. Huddleson, of the Agricultural College of East Lansing, Michigan, will read a paper on "Further Studies on the Protection of Animals Against Bact. Abortus Infection by Vaccinal Immunization."
THE VACCINAL IMMUNIZATION OF ANIMALS AGAINST BACT. ABORTUS (BANG) INFECTION.

By Dr. I. F. Huddleson.

It is quite evident to everyone that Bang's discovery of Bact. abortus has been a stimulus for much research to determine the relative value of various biological and chemical agents in the prevention and treatment of the disease named by the Abortion Committee, "Bovine Infectious Abortion." Many investigators in Europe and in this country have made valuable contributions on this phase of the disease. Their data, in many instances, have not supported their conclusions, a fact that has called forth much criticism. That there is yet much darkness as respects the value of such agents is not strange or puzzling when one reviews the history of the development of various therapeutic and prophylactic agents which have proved to be of value in the treatment and prevention of several well known infectious diseases of both man and animals.

Periodically there appear experimental data supporting the efficacy of a given agent which, in the hands of another worker, gives the opposite results. Such findings are not surprising, as the nature of the abortion disease is such that the abortion rate in an infected herd may often be reduced after using any agent one might choose.

Many investigators who have given serious thought to the prevention of this disease have stressed the importance of preventing the premature expulsion of the fetus and it unquestionably is important, but the prevention of infection is also to be desired. Theoretically, an infected animal is considered a potential aborter, and this has caused us to reason that if a state of resistance could be developed in an animal to prevent abortion, she would also resist infection. That this is not true is common knowledge, as many infected animals never abort.

It is, therefore, the purpose of this paper to point out the importance of preventing infection in an animal, as well as the premature expulsion of the fetus, and to present briefly incomplete data which have been obtained towards preventing the same.

For some reason the vast amount of study which has been done to determine the part played by the udder in this disease, has attracted very little attention and, furthermore, its economic importance has been greatly underestimated. Shortly after the epoch making discovery by Smith and Fabyan that Bact. abortus was present in milk from udders of apparently healthy cows became known, Giltner instituted a study of the udder of the bovine and the role which it plays in Bact. abortus infection. In 1913, Cooleadge correlated the presence of agglutinins in milk of apparently normal udders with the presence of Bact. abortus, and later showed that a high cell count milk was also indicative of the presence of the organism. These data, while largely of a presumptive nature, are significant as to the destruction of tissue taking place in the udder.
Little or nothing was known of the nature of the changes Bact. abortus produced in the udder tissue until the histo-pathological studies made by Runnells appeared. He was able to demonstrate that an enormous amount of functioning tissue was continually being destroyed by the action of Bact. abortus. More evidence of the nature of the abortion disease in the udder has been compiled by Sholl and substantiates the findings of Runnells in every degree.

The potential possibilities of Bact. abortus producing destructive changes in the udder tissue as well as premature expulsion of the fetus has caused the writer to question the logic of permitting the use of the virulent living culture as a means of preventing abortion and to term such an agent as dangerous and unwise to use. On the other hand, however, one cannot deny the possibility of developing an active immunity in animals against this disease by using a biological agent of some nature. It is a well known fact that a large majority of cows develop a naturally acquired immunity or resistance to premature expulsion of the fetus after the first abortion from Bact. abortus infection and a considerable percentage of infected animals on which data is lacking never abort. One may observe this condition in many herds where the disease has been present for a number of years.

If, then, the major symptom of the disease is held in check or prevented by an acquired immunity which develops from the natural course of the disease, is it possible to produce an active immunity against infection by artificial means? From our knowledge of this disease it appears to us that this is the state to be desired and toward which much effort should be directed if one ever expects to suppress the disease by immunological agents.

If an agent is developed which causes the resistance of an animal to be raised sufficiently to prevent infection and the premature expulsion of the fetus by Bact. abortus, it must also comply with the following requirements:

It should be incapable of producing a permanent injury to the tissues of an animal.

It should produce an active immunity against an infective dose of the specific organisms through natural channels of infection for at least one year.

It should be possible to use it on pregnant animals as well as non-pregnant ones.

It should not interfere with the breeding efficiency of an animal.

In 1921 a study was begun with the purpose in view of finding an agent which would comply with the above requirements. Prior to this time a study of several strains of Bact. abortus was begun in order to determine their relative pathogenicity. From this study it was learned that there was a wide variation in different strains of Bact. abortus as regards this property. One strain in particular appeared to have lost its virulence as determined by its inability to produce either the acute or chronic type of the disease in guinea pigs. Further tests
carried out on more than one hundred guinea pigs over a period of three years confirmed the preliminary findings. An effort was then made to determine the possibility of producing an active immunity in the guinea pig against infection through natural channels. The pigs were first given a subcutaneous injection of a suspension of the living non-virulent strain of Bact. abortus. After a lapse of thirty days, together with untreated controls, they were exposed to infection by feeding massive doses of virulent strains daily for periods varying from five to ten days. After an interval of six weeks, during which time characteristic macroscopic lesions had time to develop, the pigs were autopsied and all organs examined for characteristic lesions and the presence of the organism. Several series of experiments of this nature have been performed during the past three years on more than one hundred guinea pigs. In each series of experiments there was obtained 100 per cent immunity against infection in the treated pigs and 100 per cent infection in the control pigs. It might be fitting to state here that we have always found the guinea pig highly susceptible to Bact. abortus infection by way of the oral cavity, despite evidence to the contrary as recorded by Hagan and by Schroeder. Torrey in our laboratory has found the duration of active immunity to massive doses of virulent cultures to be six months. However, a high degree of active immunity exists for as long as ten months after vaccination.

The virulent strains of Bact. abortus to which the immunized pigs were exposed were old and newly isolated ones of bovine origin from several sources. In addition to immunizing pigs against bovine strain of Bact. abortus, several series of experiments were performed to determine the possibility of its immunizing pigs against Bact. malitensis. The strain of this organism used was obtained from Miss Alice C. Evans of the Hygienic Laboratory. It was isolated from a case of malta fever near Phoenix, Arizona. Three individuals who have worked with the strain have contracted malta fever. It has all the cultural and serological characteristics of Bact. abortus and from agglutination absorption tests made by Miss Evans falls into the bovine group. This strain will produce abortion in pregnant heifers and in goats. Guinea pigs show very marked macroscopic tissue changes when infected with it.

The degree of protection against infection from this strain was by no means as clear cut as against Bact. abortus of bovine origin. It was found that 80 per cent of the pigs were able to resist infection thirty days after vaccination; 60 per cent after five months, and 25 per cent after eight months.

We are now attempting to carrying the immunization studies against Bact. malitensis further by employing the milk goat in place of the guinea pig.

A study of the effect of this non-virulent culture of Bact. abortus on the bovine was begun in 1921 and from these studies, which are still incomplete, it is hoped that the following questions will be answered:
Is this culture still virulent for the bovine, that is, is it capable of establishing itself and producing changes in those tissues of the body which it normally inhabits, such as the udder and pregnant uterus?

Does it influence an established infection, that is the carrier state?

Is the breeding efficiency of an animal impaired in any degree following its use?

Is there an active immunity developed on the part of the host following its use and if so what is the duration?

How long will it remain viable in the body tissues following injection?

What is the effect on the blood reaction of an animal following its use?

It is obvious to everyone that a satisfactory answer to the principal questions mentioned above will require several years of study and observation and the use of a large number of animals. Yet we believe that a positive or negative answer is essential before an agent of this nature is permitted wide use. During a short time this culture has been investigated a small amount of data has been collected on the several questions enumerated, but it by no means furnishes conclusive answers.

In order to determine its effect on the bovine several severe tests were designed in such a way that the results would show whether it was still pathogenic or non-pathogenic. Pregnant heifers were selected whose histories were known from the date of birth. That is, they had never given a positive blood serum reaction or knowingly been exposed to infection in any manner.

A suspension of the culture was prepared in the same manner as the vaccine and administered to one group subcutaneously and another intravenously. The animals were killed after a period of eight to ten weeks and the organs including the fetus examined for the presence of Bact. abortus. The findings were negative in each case.

Other animals have been injected while pregnant and observed throughout the period of gestation. At the time of parturition the colostrum and fetal membranes were examined for the presence of the organisms. The results were negative in each case.

The possibility of this culture causing the changes in the placentae described by Hallman and thus resulting in a possible premature expulsion of the fetus appears to be very slight as more than five hundred pregnant and six hundred non-pregnant heifers and cows in various periods of gestation have been injected with a suspension of this culture and up to this time all except eight have delivered healthy calves at full time.

The length of time this particular strain of Bact. abortus remains viable in the tissues of the body following inoculation cannot be answered satisfactorily at this time.

As the carrier state is probably the most important and unquestionably is the most difficult problem which confronts investigators of this
disease, the discovery of an agent which will influence this state would be of great service. Some time has been given to a study of this culture with the above purpose in view, but thus far it has been found to have no beneficial effect on the course of the disease. On the other hand, there is some evidence that it acts as a provocative of the disease already present.

In not a single instance has there been noticed the slightest improvement in the breeding efficiency of the animals on which it was used. In some instances the breeding efficiency of the herd as a whole has been lowered due to the fact that there was present previous to inoculation several sterile animals which were retained in the herd in hopes that they might by chance conceive. The majority of the heifers and cows in the herds which have received an injection of this culture previously gave negative reaction to the blood test and should be considered susceptible animals.

As to the stimulation of an active immunity on the part of the body tissues against infection through natural channels, and its probable duration, we are not yet in a position to give a satisfactory answer, for the reason that a sufficient number of well controlled experiments have not yet been conducted. The only measure of immunity which we have on animals in herds outside of the experimental herd is their ability to carry the fetus to full time and produce healthy calves even though they continue to associate daily with infected animals. No effort was made to prevent infection in the treated animals by segregation or isolation. Despite the absence of abortions it would be absurd to say that the treated animals never become infected since no bacteriological examinations were ever made. So one must consider the evidence of active immunity against infection in these cases as being purely presumptive. That is, it is based purely on their failure to abort.

The eight abortions which have been reported in the treated animals may have been due to the Bang bacterium or to one of the various other organisms which have been found associated with premature expulsion of the fetus. In several of the herds in which the treated animals are situated there has been much cervicitis and other conditions affecting the reproductive organs thus lowering the breeding efficiency. Many of the animals in this condition gave a strong reaction to the blood test for Bang abortion and were not given the vaccine treatment.

The blood serum of the inoculated animals gradually becomes strongly positive to the agglutination test and falls again at the end of sixty days providing in the meantime the animals are not exposed to infective material. Whenever this occurs the agglutination reaction will again rise. So long as treated animals are in infected herds and exposed to infective material the degree of the blood reaction will be found to vary.

There are many arguments against the use of an immunizing agent of the nature of the one under discussion. All of these have been taken into consideration and data recorded pertaining to views whenever the
opportunity presented itself. The question of the return of virulence has been given much thought and study. Every means of common knowledge has been tried in this direction, but thus far we have failed to re-establish its disease producing properties. It is believed by some that a culture of low or lost virulence does not have the property of stimulating a high degree of active immunity, but we feel that this belief has been demonstrated to have no foundation from the results obtained in immunizing guinea pigs against this disease.

While this culture may after all prove to be valueless, it is firmly believed that the principle is correct and the logical one to pursue in the immunization of cattle against Bact. abortus infection.

PRESIDENT McNEIL: Now, gentlemen, you will be given a limited time to discuss the paper of Dr. Hinshaw and the report of Dr. Van Es on poultry.

DR. J. G. FERNEYHOUGH: I think those papers have been accepted, if I am not mistaken, Mr. President.

PRESIDENT McNEIL: I thought if anybody wanted to say anything on the papers we would give them an opportunity. If not, we will let the matter stand closed.

Have any of you any questions to ask Prof. Morrison?

QUESTION: I would like to ask him to state the source of the last vitamine.

MR. MORRISON: It is too early yet to state all the sources; that is especially rich in the wheat germ; also presumably in the legume roughages; probably rather widely distributed in common food stuffs, not too highly milled, and so on.

QUESTION: Relative to the age of pigs that get weak hind quarters due to malnutrition, would you say sows are sometimes affected that way as well as the younger pigs?

PROF. MORRISON: I think without any question some of these cases of brood sows going down are due to mineral deficiency or vitamine deficiency. The typical posterior paralysis is different from other conditions we have had once or twice in our experimental animals and also have had reports of it in other cases. The pig seems to lose control more or less of its hind legs; it is not paralyzed, but it is perhaps like a horse with spring-halt, it swings its legs clear out as though trying to swim and walk at the same time. We have tried to find out whether there is any vitamine deficiency there, but we don't know anything about it. It is very rare, but we have had it in certain experimental lots.

I just want to mention one other thing. Some of you may be interested in this bulletin—the recent work that has been done on prevention of leg weakness in poultry.

Leg weakness in poultry affecting young chicks, especially when they can not get out in the sunshine, has been found by work at Wisconsin and also work at Kansas and Maine to be nothing but rickets and can be prevented by adequate ration. This bulletin gives a very suc-
cessful ration worked out by Prof. Hart and Prof. Helpin, containing an added source of vitamins like cod-liver oil that will get the chicks along without sunlight for eight to twelve weeks so that a person can raise early chicks without any cod-liver oil or anything of that kind, provided they can get out in the sunlight at that age.

DR. SCHALK: We all appreciate Mr. Morrison's statement about tankage. The indication is there seems to be a shortage. I would like to ask Mr. Morrison about the garbage tankage springing up throughout the country.

PROF. MORRISON: There has been some work on that, but not very much. Garbage tankage is an entirely different source of material and 60 per cent digestible tankage. Commonly it is much lower in protein. A little work has been done recently. I don't think we can warrant entirely definite statements. In other words, does garbage tankage represent a high quality protein or not? It will all depend on the source, whether there are meat products in there. It is too much of an x, y, z, perhaps, to make definite statements about. It can be used in limited amounts in swine feeding successfully.

DR. J. I. GIBSON: I have been very much interested in Prof. Morrison's paper. I think it is one of the most important subjects dealt with in our meeting. We are coming to a time when not only the acknowledged production of pork, we will say, must be looked into very carefully, but also the quality of the pork produced. I have been pleased to note that the colleges are going to deal with the quality of meat as well as its production. I have been wondering whether or not we have overadvocated the use of peanuts and the soy beans, for if I am correctly informed, they are the first two producers of salt pork, oily pork, which we all admit is inferior pork. I am told that on the St. Louis market the peanut hog looks perfectly good on foot, but before the packer is through handling that hog he finds that he isn't worth within two dollars a hundred as much as the good hog that comes from the corn-feeding territory.

So I am looking in the near future to seeing something on this production of quality as well as the economic production. I was very glad that the professor didn't overurge the use of the peanut or the soy bean. I have been fearful for some time that they are overworking the soy bean in the corn country that produces the best pork that is produced anywhere in the world.

I am very much delighted with Professor Morrison's address this morning; it is along lines that I think we should all be very much interested in. We should all, if possible, be qualified to advise with the farmers as we meet them in our various lines of duty as to not only how to produce good growth, economic growth, but also first-class quality of pork.

PROF. MORRISON: I am very glad to have this last statement, because I felt very deeply on this question of soy beans in the corn belt. In fact, I have been surprised that certain of the colleges have
come out with recommendations in the use of soy beans without warn-

ing the farmers that if they used very much soy beans they are going
to have just the condition that has been emphasized. That fact has
been known in the Southern states for many years.

Undoubtedly it will be found that if the amount of soy beans is
very strictly limited, the effect will not be injurious, but the only
trouble then is to get the farmer to confine his soy beans to that
limited amount. It is a big problem. We don't want the quality of
pork reduced in the corn belt by the use of this protein supplement.

(Dr. Van Ess took the chair.)

CHAIRMAN VAN ES: Is there any discussion on Dr. Huddleson's
paper?

DR. CASE: From a practitioner's standpoint, Dr. Huddleson has
been very kind to me to let me try his vaccine on some of my herds
in my district, and I just want to report a few of the results I have
found so far. In four herds where we fed 118 head of cattle, he tested
the blood and found 46 negative animals in those herds; one herd only
had three negative animals. All herds were infected; we used his
vaccine on the negative animals, whether they were pregnant or not,
with the result thus far that six of those negative animals have aborted.
We know two of those cows have been tested and are still negative, and I
think that the results of abortion have been from some other organism
rather than the Bang.

In the cattle that were positive, I can't say exactly, but a great
number of them have aborted in those herds, where nothing was used
on them.

I feel very hopeful in getting results from the use of this vaccine,
and I think it is going to be a solution of a lot of our trouble from a
practitioner's standpoint.

DR. FITCH: Mr. Chairman, there isn't very much to say in the
discussion of Dr. Huddleson's paper because he so well covered the
subject, but I cannot resist the opportunity of emphasizing some of
the points that he brought out; one, in particular, which I think all
practitioners of veterinary medicine could well bear in mind, namely:
It is a well-known fact that Bacterium abortus (Bang) becomes localized
in the udder and that this localization not infrequently happens from
the use of living cultures upon non-infected animals, and that this
localization that was pointed out by Dr. Huddleson, based upon the
work of Reynolds, actually interferes in the functioning of that udder.
This fact must be taken into consideration when you consider the value
of the use of virulent cultures in the treatment of abortion.

Second, the use of the virulent culture as recommended by Dr.
Huddleson is confined to the non-infected animal and, as he brings out
very clearly, is in no sense a cure but is entirely a prophylactic in
nature.

Third, this agent, if further experiments bear out the claims, will
aid very materially in cutting down the abortion rate in badly infected
herds, but it must be continued and repeated at from six to eight-month intervals, and in this manner it in nowise precludes the advisability under certain conditions of having and maintaining a clean herd.

DR. J. W. CONNAWAY: Mr. Chairman, Dr. Fitch said some of the things that I had in mind. The ultimate solution of this question is eradication rather than immunization. I think everyone will recognize that. I think we will all admit that there may be at the present time a place for active immunization of the individual cows in badly infected herds, but I think in a short time we will all come to the conclusion that the Pennsylvania plan is going to be the best way to handle this question, which is looking to the eradication of the disease rather than the immunization of individual animals in herds. I think we will come to the conclusion which has been expressed by Dr. Barnes on other occasions, that it is not profitable for the dairyman to maintain an infected herd and that he should work as rapidly as possible to get a clean herd. I think the time is not far off that we will have accredited or certified abortion-free herds, just as we have accredited tuberculosis-free herds. That is the end this Association should work for.

I want to say a word, too, in regard to the report of the Abortion Committee. A distinct advance has been made this year in the report. I think they, in their recommendations, have gone far ahead of anything that past committees have reached. I have served on these two committees and was never satisfied with the reports that we made, but I am exceedingly well satisfied with the report of the present committee, of which I am not a member. It is looking to the time when this Association will recommend the application of the interstate traffic of the abortion test and that all animals shipped for breeding purposes from one state to another will go with an affidavit or certificate that they are both free from abortion disease and free from tuberculosis.

The start which has been made by Georgia, South Carolina and Arkansas is a good step, a good precedent for other states to follow just as rapidly as conditions will permit. I believe it was Georgia that started the tuberculin testing years ago, when people were a little bit slow about taking it up. If we can handle the abortion matter in the same way, by individual states, one after the other adopting measures such as these states I have mentioned, we will gradually come to the point where the Federal Government will require it for interstate commerce.

CHAIRMAN VAN ES: Is there any further discussion? If not, we will proceed with the program, taking up the question of Tick Eradication. The first speaker I will call on will be Dr. Carey of Alabama.

DR. C. A. CARY: Mr. Chairman, I move we adjourn until 1 o'clock.

(The motion was seconded and carried and the meeting adjourned at 12 o'clock.)

Adjournment.
FRIDAY AFTERNOON SESSION

December 3, 1925.

The meeting was called to order at 1:20 o'clock by Vice-President Dr. W. B. Lincoln of Nashville, Tenn.

CHAIRMAN LINCOLN: First on the program this afternoon will be Dr. C. A. Carey, State Veterinarian, Auburn, Louisiana, on "Some Reasons Why States Are Not Making Progress in Tick Eradication." (Applause.)

DR. C. A. CARY: Gentlemen, I am fully aware that some of you are not very much interested in this subject at this late day. However, I want to assure you that in many respects this subject is still a national question and not a Southern question alone.

The reasons why I make this statement are these: First, there is going to be a revival of the cattle industry in the South just as cattle prices rise in value. Furthermore, there are probably more people coming to the South right now than at any other time in the last four or five decades. Moreover, the North is going to buy feeders to a certain extent from the South, and they are going to produce them in the South.

Now, many of you have an idea that tick eradication is a thing of the past instead of being a chronic affair that has been running over twenty years or more. Those of you who are not directly in contact with it hardly realize what there is to be done yet. There is much clean-up work to be done and a great deal of original work to be done yet in the South, notwithstanding twenty years or more of work.

Some of you are not as old in the work as I am and will not remember that this organization originated primarily for tick eradication. Sometimes we can't get much in this organization. Usually we are crowded out for everything else. I expect this will be the last time we will ever appear on this program with this Association on tick eradication, because we have formed an organization of our own for this purpose. I give you this warning fairly and squarely and I don't want anybody to take any responsibility but myself. I never yet have failed to tell you what I wanted; I am going to tell it to you now. This is the last time we will apply for a place on the program of this organization. I warned you once before about it. Now understand it fairly and squarely, we don't have to come up here to get this.

Now, just a few words on what I have got to say. If it were not for getting this in print, I wouldn't say it, I would take my paper and print it; but I haven't it written and I am going to give it to you offhand.

There are many reasons why progress has not been greater in tick eradication, but I can just refer to a few. You say, why and how do I know so many reasons? I have been in the work since it started and before it started. I have grown with it and I know what it is in most of the states, therefore I know something about it. I don't know all about it yet.
One of the reasons why this work isn't farther along is due to the old original law of 1884. That was five or six years before the discovery of the real cause of tick fever. That law was written then. There was some reason for it then, but now the day of experimentation in tick eradication, the day of compromising, the day of offering excuses, is over. The time has come when we know enough about it and every state knows enough about it that we can take care of the situation in cooperation with the Federal Government.

What has that law done? It has permitted the movement out of the South, in territories and areas that are not working at all on tick eradication, of cattle for slaughter and sometimes for every other purpose. I will give you an illustration of what I mean. Last year and year before last there were trainloads of cattle that were cleaned in Florida, shipped through my state to Texas and other states. They came from down there where they have never done anything for tick eradication. I am not implicating Florida, not saying anything against Florida particularly, but if Florida sits there and has a territory it is not doing anything in, let it keep its cattle. It is not going to ship any more of them through Alabama.

You say, "Won't that work a hardship on some of these territories?" Yes. You say to me, "How long will it take them to clean up?" I don't know, it depends on how they handle it. I know they can clean up in a year or two years. In my state and in other states we have cleaned whole counties completely in a year. That is not the rule, that is the exception. Why? Because it takes more than a year sometimes to get conditions favorable so that you can clean up a given area in a year. But I am just confident in my own mind that if every infected area in the South were worked faithfully and with all possible means at our disposal and our knowledge, we could clean up every tick in two years at the outside. I am confident about that. Somebody says, "You can't do it on ranges." Gentlemen, we have demonstrated the fact that we can clean up the worst ranges.

Is there any more question about that? If a man gets up and makes that objection, he certainly doesn't know much about it. Let that stand there. Right on top of that, what did that bring about? Dipping stations in quarantined areas for moving cattle out of those regions. We don't want any more of them. Why? They are just excuses for retaining ticks.

If tick eradication was just for the movement of cattle, we wouldn't get a thing done in a large part of the area, so I am dead against dipping stations for getting cattle out of quarantined areas that are not at work.

There are a lot of other things that I am going to leave off because I don't want to take a lot of thunder from Dr. Bux and Dr. Bahnson. I will say just a few more words about some of the reasons why we haven't gotten along better. One of them is the changing of officials, especially state officials in various states. You are aware how that comes about; where a state executive officer who has to take care of
this is appointed every two years by a new Governor, you can readily see that he couldn't learn how to do tick eradication in two years. Systems of that kind have retarded the work. They don't acquire that knowledge by experience or by study in that brief time. Therefore, that system is wrong.

Another factor, general and local politics has mixed up with this because it has been a general subject in the various counties in the various states. Some have fought for it and some have fought against it at certain times in various localities. This has retarded tick eradication very materially in a good many states and counties. I could specify cases, but that is not necessary. It is a fact, nevertheless, that that has occurred.

Then again, there have been some defective laws and some defective execution of laws, both Federal and state laws. Now, maybe some of you say I ought not to criticize the Federal Government, that I ought not to criticize the various states. Gentlemen, we are here to look at facts; we are not here to say this was always right and that was always wrong. Now, someone may say to me, "Wherein has the Federal judges and things like that done wrong in tick eradication?"

Let me give one instance. For instance, if I go down into Florida and kill a man and I shoot back across the state into Alabama and nobody sees me, according to the way they execute the tick law, if they didn't see me cross into Alabama they couldn't get me because they didn't see me cross. Now, wouldn't that be a funny law? Just let me illustrate what they do with ticks: If we find a ticky cow that has come across the line, was driven across or ran across, and if the fellow over there was in Florida and we didn't see him cross the line, the United States judge says we have no case. Why won't it work in both cases? It is absurd, to say the least. Maybe some of these Federal judges will get me, but I am ready to go if they want to get me for that statement. It is so, and every man here who has had any experience with these Federal judges recognizes that thing that has come up time and again. That is one defective enforcement of Federal laws. I could name lots of them in the states, but just let me state to you this: All of this work is done in the states, intrastate work, under state laws. State laws differ in the different states in regard to this work. In some states they have laws that don't work very well. I could name those states, but I am not here to hold up the states on that question. That is their business, but it, nevertheless, has retarded tick eradication because the laws are not so arranged that they can be properly executed nor properly worked on the subject of tick eradication.

I have a pretty good friend in the South who says he doesn't need any law to eradicate ticks. Well, there are some things sometimes that need some laws; there are other cases where you can just get the last thing done by law. Let me illustrate: There are maybe less than 5 per cent of people in any given state who need any criminal law against them, but the 95 per cent have got to put up with it.
Maybe we can get rid of 95 per cent of the ticks without much law, but we have got to have a little law for the other 5 per cent in order to get the final touches and clean-up.

If you go into a county and you find everybody willing and ready to cooperate with the state and Federal Government, you don't need any law. But how many times do you find that? Very rarely. I could name some places where we have found those conditions, but they are so few that they are not noticeable.

My experience has been this: After working twenty years in Alabama, every new county we went into we had practically the same fight over that we had in the other county right next to it. You ask, "Are these facts?" They are facts. I could prove every word I say. Now, you see what kind of a proposition they have got. You say that the people all ought to be educated. Why, many of the people in some counties don't pay any attention to the law or methods of doing this until you get at it. You have got to educate them in every county as you go at it. That is a problem. That work has held back the work of tick eradication.

Just a word about the men. We have had lots of men who never did make tick eradicators. A good many of them we picked out of the counties and the states where the work was done. Some of them never made tick eradicators; we have had some Federal men who never made tick eradicators. I don't say they were defective; they were just not suited to that work. Let me illustrate: Suppose we get a new veterinarian, we will say, from Dr. Cotton's state—Minnesota. He never has been in the South; he doesn't know anything about the practical tick work. How long does it take him to learn it? He can't learn it inside of a year. He may learn something about it, but to get right down to the line and do the work in an effective way he has got to work at it at least a year. You say I am criticizing. Not a bit. I don't want to criticize any man. These are facts we have been up against.

You say to us, "We haven't any problem yet." Yes you have, you have a fighting problem. I can tell you this: If you get a good, fighting tick man out of the South and put him on T. B. work, if he doesn't make good he is an exception. We drilled Dr. Kiernan down in the South. I think I gave him his first instruction over at Richmond, Virginia. That was way back in 1906. At that time we didn't know anything about it.

A good many of the state officials have made mistakes. I have made them. Why? Because I didn't know any better. How did I get out of it? It was born in me. You can't get this thing by just simply reading a book and listening to a lecture in a college. That won't give it to you.

You ask what we want. We want your backing and your stimulation and your help to push this thing over and get rid of it. Why? We are going to have thousands and thousands of you Northern people...
looking to the South to raise cattle? Why? It is a cattle country, and we are going to help feed this country just as sure as the world, and you need not sidetrack it right here by trying to sidetrack our little talks here in the meeting. You are going to have to fight it. I want to warn you again, if you don't give us a better hearing next year on this program we are going to quit you and go where we can get it.

(Applause.)

CHAIRMAN LINCOLN: Next on the program is "Indifference—Tick Eradication," by Dr. J. H. Bux, State Veterinarian, Little Rock, Arkansas.

INDIFFERENCE—CATTLE TICK ERADICATION

By Dr. J. H. Bux.

The indifference in mind in tick eradication is that manifested by the general lack of interest of members of this Association, especially in the live stock sanitary officials of the various tick-free states, in the problem of cattle tick eradication in the remaining tick infested areas of the South. This may be likened to an ungrateful child for its parent. This Association was fathered by cattle tick eradication. It was organized for that specific purpose. It would now seem that the son, represented by the members of the Association, since it has come to full maturity and has become interested in other projects, should at least show the parent respect due it by giving more attention, especially the various state live stock sanitary officials, to the matter of cattle tick eradication.

It appears to the writer that the ordinary Arkansas farmer who has from one to five cattle and who has little or no opportunity of getting away from home to seek information by observation of what others are doing, is convinced almost conclusively of the value of tick eradication by two major occurrences. First, the extensive loss of cattle of Texas fever. Second, the inability to readily dispose of the few surplus animals he produces.

The former operates automatically in the tick infested area without the aid of man; the latter can be stimulated by the promulgation of laws and regulations of, either prohibiting the movement of cattle from inactive infested areas, or preferably stringent requirements which increase the expense and inconvenience of the movements, and has a similar effect.

The value of restricted movement in the stimulation of tick eradication is based on actual observation in Arkansas. Several years ago a questionnaire was addressed to a hundred county officials, judges of the various courts, and stock owners of the tick infested areas of Arkansas, requesting their view of the advisability of prohibiting the movement of animals actually infested with the cattle fever tick. The majority replied that tick infested animals should not be permitted to
move until free of ticks, and some that cattle should not be permitted to move from the inactive, quarantined areas for any purpose and under any conditions. Some added the statement that the completion of the work would be greatly hastened by the inauguration of these measures, and others stating that final tick eradication would never be obtained unless stringent measures were inaugurated.

The writer well recalls the depression in sentiment of cattle tick eradication in Arkansas during the Legislature session in 1921. Not only was there less than half the former amount of finances provided, but every effort was made to repeal the tick eradication laws. These were finally defeated in the Senate after passing the House upon third reading. The officials of the State Veterinarian's office, interested legislators and stockmen would have very greatly appreciated the influence of the state officials of the surrounding states by the intimation that if the laws and finance did not permit proper patrolling of the quarantine lines in the State of Arkansas and provide for safe movement of cattle from quarantined areas, that they would of necessity have to regard the entire state as being infested and exposed and take stringent measures accordingly in prohibiting the movement of cattle from Arkansas into or through their states. Now even those opposing tick eradication at that time would add their unqualified endorsement.

In 1922, practically all the states through which tick infested cattle moved promulgated regulations that the animals must be free of ticks and be dipped at least once under official supervision. Since that time the sentiment for tick eradication in Arkansas has increased very, very materially. It is the opinion of many that the prohibition of the movement of infested animals is the greatest factor responsible.

It is unnecessary to state in this presence of the effectiveness of such action during the recent foot-and-mouth disease in the State of Texas. The same thing can be applied to Arkansas or any other state that does not fully meet its responsibility in carrying forward a program of progressive tick eradication. The officials of the states above the cattle tick quarantine line are reminded that an extensive infestation of cattle fever ticks would inflict losses nearly as great as would an outbreak of foot-and-mouth disease. It should not be inferred that any effort is being made to detract from the importance of promptly eradicating foot-and-mouth disease.

The danger of the tick-free states becoming reinfested with cattle fever ticks is very, very much greater than the danger of infestation of foot-and-mouth disease. It would seem that increased precautions are all the more desirable since Dr. John R. Mohler, the most able Chief of the Federal Bureau of Animal Industry, has found that blood obtained from cattle fever ticks found on animals infested with foot-and-mouth disease contains the virus of the latter.

The requirements regarding the movement into and through the various states of cattle from tick infested areas varies at present. Some states require apparent freedom of ticks and one dipping under official supervision. At least one is requiring two dippings at a central station.
under supervision. Arkansas is requiring that all cattle from the in-
active quarantined areas of Arkansas must be presented free of ticks
at a central station and dipped at least once under supervision of
Federal inspector, but yet Arkansas permits cattle to pass through the
state on one official dipping and apparently free of ticks. This is also
true of at least one or two other states. There is no reason why
Arkansas and Oklahoma should be more stringent with cattle from their
own quarantined areas than from quarantined areas of another state.

It is almost impossible to absolutely free cattle of ticks in an
infested area without at least two dippings; and if this is to be
effectively accomplished facilities must be available for holding animals
in known tick-free pens. The present loophole permitting the shipment
of tick infested cattle, as the writer sees it, is due to, first, exposure
of the cattle after dipping, and second, the difficulty of the state officials
in securing local inspectors sufficiently removed from the influence of
the cattle shippers to enforce the regulations.

Cattle are and will continue to enter interstate commerce from
inactive tick infested areas so long as dipping in the field is recognized
and cattle are permitted to move as apparently free of ticks on one
dipping.

While there is little danger of cattle entering interstate commerce from
counties that have been released from Federal quarantine, but yet
contain a few tick infested herds, yet the writer is firmly of the opinion
from personal observation in Arkansas, in compliance with a regulation
promulgated by Oklahoma, that cattle coming from such counties should
be dipped at least once under official supervision. It greatly stimulated
the work in such counties in our state, seemingly due to the fact that
it was notice on the cattlemen of such counties that some outside forces
were observing them, and that they must complete the task of cattle
tick eradication to enjoy unrestricted market for their surplus stock.

It appears to the writer that the time has come when the regula-
tions governing movement of cattle interstate from tick infested counties
including those in which tick eradication is in progress containing a
few infested or exposed herds, should require that all cattle be inspected
and if found free of ticks dipped at least once under the supervision of
an inspector of the U. S. Bureau of Animal Industry and certified as
eligible for movement as native or tick-free cattle.

It is the opinion of the writer that under the existing conditions
that can be best accomplished by unanimous action of the various state
officials which would relieve the U. S. Bureau of Animal Industry of a
responsibility that it cannot well assume, perhaps, considering its work
in its various branches as a whole. The Bureau, however, is in excellent
position to act as the one force that can apply most effectively and uni-
formly without hindrance the requirements of the various states govern-
ing movement of cattle from infested areas. This would entail very
little, if any, additional expense as the Bureau already has supervision
of infested counties in which tick eradication is in progress, and cattle
from inactive, quarantined areas could be assembled at a designated central dipping station.

An effort to further restrict the movement of tick infested cattle should come from, or at least have the active support of, states that are absolutely tick free, and yet through which there is a movement of cattle from the quarantined areas. As an official from the tick infested area, I feel sure that a conscientious state official of a tick infested state that does not have the legal or financial backing to fully enforce his regulations would appreciate, and were it not for fear of criticism from his own cattlemen from the tick infested areas, would actually court such cooperation.

All states through which cattle are transported from tick infested areas simultaneously passing uniform requirements would result in immediate and wholesale compliance thereof by stockmen, transportation companies and others affected.

Dr. BUX: I would like to add that due to oversight, I didn't include horses and mules. Wherever I have said cattle, I mean horses and mules, too. We find that they are a great factor in the dissemination of ticks.

I want to beg your indulgence just a moment, long enough to relate this incident: Some of you think you are a long way from ticks. The other day one of our land men caught a bull at Little Rock that was as ticky as it possibly could be; it was on its way to the state of Tennessee. You never know when you are going to get reinfestation.

Gentlemen, I thank you for your attention. (Applause)

CHAIRMAN LINCOLN: The next on the program is "Passing the Buck in Live Stock Sanitation," by Dr. P. F. Bahnson, State Veterinarian, Atlanta, Georgia.
"PASSING THE BUCK" IN LIVE STOCK SANITARY CONTROL.

By

Dr. Peter F. Bahnsen, State Veterinarian, Atlanta, Georgia.

Evading responsibility, or, to use a more popular phrase, "passing the buck" seems to be one of the most universally practiced human weaknesses of which we have record.

Every branch of human activity is grievously infected with this abnormal desire to evade responsibility. Neither sex, educational attainment or vocational calling seems to vary materially in the percentage of these afflicted.

It is, therefore, not strange to find a normal percentage of the afflicted in the rank and file of those that are either elected or selected to serve the people and to safeguard public interest.

Politicians and political appointees frequently acquire a skill in artfully side-stepping responsibility that would demand admiration in any worthy and manly endeavor. The public pays millions annually to officials and employees who either fail or evade to perform the services for which they were employed and for which they are being paid.

And yet, probably the cause and the remedy of this exasperating and expensive moral weakness rests with the ultimate victim—the public.

As a nation we proudly proclaim and exalt the principle of: "Equal justice to all, special privileges to none." In practice individuals and groups of special interests are actively engaged in ceaseless efforts to convince or coerce those in authority that special exemptions can and must be made in their case. When an official declines to recognize this clamor of greed and selfishness, he is at once proclaimed a dictator, a czar or an arrogant ass, depending on the temper and the vocabulary of the offended. Incidentally an uncompromising official frequently inherits the undying animosity of offended individuals or special interests. This officially incurred venom may, after a few years, accumulate like an avalanche.

Like ordinary individuals, the public sometimes fails to rally to the support of an efficient public servant in his struggle to give full measure of service and a square deal. Selfish individuals and greedy special interests will only tolerate those in office who are willing to grant them special concessions when their interests are at stake.

So, after all, those who yield to pressure while in public service can generally present an alibi fully as plausible and probably more justified than was the "passing of the buck" by Adam.

If live stock sanitary control is to reach and maintain that degree of efficiency essential to national welfare, prosperity and leadership in the live stock industry three things are essential and must be done.
1st. Live stock sanitation must be under unhampered control of men professionally qualified and endowed with initiative, executive ability and courage.

2nd. Live stock sanitation departments must be, as far as possible, removed from politics.

3rd. There must be more perfect coordination between the various states and between the various states and the U. S. Bureau of Animal Industry.

Let us briefly review these points.

1st. Unquestionably in this day of enlightenment and specialization only those professionally qualified should be charged with the responsibility of safeguarding our immensely important live stock industry. Those placed in charge of live stock sanitation should have experience, proven executive ability, and courage.

For efficient administrative purposes responsibility and authority must go hand in hand. To clothe one individual or board with authority and then saddle another individual with responsibility is unfair and impracticable.

Given authority that is not fettered with needless official red tape and that cannot be brow-beat by bludgeons of political intrigue, the average veterinarian, with adequate experience in live stock sanitary control and endowed with necessary business capacity and grit can safely be trusted with live stock sanitary control in any state.

2nd. The average live stock sanitary board, as they exist today, made up largely of political appointees, is woefully inexperienced, inefficient and in some instances absolutely worthless. There is no sound reason why a state should clothe its Governor with live stock sanitary control authority unless by education and experience he is qualified to fill such position. Nor should the official toga of live stock sanitary control in any state be dished out as a political plum to reward the faithful vote solicitors at the end of a strenuous campaign.

It is well to bear in mind that it is far more difficult for a state or the federal government to secure a real capable live stock sanitarian than it is for a capable live stock sanitarian to secure more lucrative employment.

In states that have Veterinary Examining Boards such boards should be required to pass upon and endorse the qualifications of every applicant for State Veterinarian or Live Stock Sanitary Commissioner. No one failing to receive the endorsement of the board should be eligible to appointment; nor should veterinarians saturated with political ambition or political chicanery be eligible to appointment on the Board of Veterinary Examiners. Appointments should be made for a period of not less than six years.

Nature provides its more perfect creatures with many limbs but only one head; deviations from this rule are monstrosities. So are, in an administrative way, dual-headed live stock sanitary boards.
3rd. Effective cooperation between state and Federal forces in live stock sanitary control is at times exceedingly difficult.

Most states are sticklers for state rights, and that is as it ought to be. But if a state is determined to exercise sovereign authority within her own border, she must also accept full responsibility should her failure to control live stock diseases within her borders lead to drastic quarantine by sister states and by Federal authorities.

In the control of some diseases when, for instance aetiological factors are not known or practical sanitary measures for the control of the disease have not as yet been developed, it is only natural and right that states and the Federal Government should make haste slowly, so as not to burden the public with impractical, unnecessary or expensive experiments which have not as yet proven their economic value and which may have to be abandoned later on.

On the other hand, once a disease or the cause of a disease is thoroughly understood and when practical means for its eradication have been developed, nothing should be permitted to stand in the way of a rigid and if necessary drastic enforcement of regulations that will speedily and permanently eradicate the disease.

That drastic measures are, at times, the most economical in the long run has repeatedly been proven by the eradication of foot-and-mouth disease in the states. The firm and coercive policy adopted is sound and, as far as practical, should be applied in the eradication of every other disease when we can predict a successful finish with reasonable certainty.

When compared with possibilities offered by reason of temperature and seasonal opportunities, the cattle industry in a large part of the South has for years been condemned to mediocrity by the infestation of southern cattle with the cattle fever tick.

For years the cattle fever tick presented an unknown problem as to methods of control. Years were necessary to devise practical ways and means to economically eradicate this pest. Though limited territory on the northern border of the tick belt were freed of tick infestation by means of pasture rotation and disinfection with crude oil emulsions, yet, as a matter of fact, real tick eradication can only be dated back to the time when dipping vats and arsenical solutions were made available in the control of this pest. Even then problems presented themselves under open range conditions that made friends of tick eradication wonder whether a final conclusion of the work was possible. Not until a system of marking cattle at each dipping and then riding the ranges so as to take up and disinfect all cattle that had not been dipped and marked within a specified range was developed did permanent tick eradication under open range conditions become an established success.

The Act of Congress passed in 1884 exempting tick infested cattle from the enforcement of regulations authorized to control infectious and contagious diseases among live stock was, at that time, probably justified. At that time, no doubt, any restrictions on the movement
of tick infested cattle from tick infested areas to non-infested grazing grounds was considered unnecessary by Northern cattlemen and viewed as a drastic hardship by Southern cattlemen. However, from year to year, the restrictions placed on the movement of tick infested cattle from the quarantined area were made more stringent by state laws and by increasingly stringent Federal regulations to safeguard Northern cattle interest from disastrous losses; yet I am sure at no time during these many years of investigation and educational publicity did any appreciable number of cattlemen from the quarantined area feel that any of the quarantine restrictions were justified. Many of them always have and always will contend that the entire cattle tick propaganda is humbug, pure and simple, and is maintained exclusively to furnish easy employment to a few office seekers. Of course, there are others who by sad experience discovered the fact that the cattle fever tick will surely destroy a large percentage of cattle that have not acquired more or less immunity from exposure to tick infestation while they were young; and that uncontrolled tick infestation will, from a purely parasitic point of view, make beef and milk production in the infested area unprofitable.

It is quite natural to encounter a vigorous protest from uninformed cattlemen in the tick infested area against any measures invoked by state or Federal governments to eradicate the cattle fever tick. As sanitarians this attitude of anti-tick eradicators ought not to discourage us in the least. The only question for sanitarians to consider is, "Can the cattle fever tick, and with it tick fever in cattle, be eradicated in a reasonable length of time and without incurring a prohibitory expense?" Both of these questions must be answered in the affirmative.

The cattle fever tick can be eradicated from any county, in any state, in one season. From fourteen to sixteen consecutive dippings, fourteen days apart, and providing every cow in the area is dipped each dip day, will complete tick eradication. This is a never-failing, 100 per cent sure formula. The expense depends largely on the attitude of the cattle owners, the local politicians, and especially on the efficiency of the organization in charge of tick eradication in each county.

The attitude of the owners need not cause a great deal of worry or concern, though a nagging, stubborn individual can make matters very unpleasant for a short while. The attitude of local politicians—whether they own a cow or not—is of much greater importance. If the local politicians—in or out of office—do not offer encouragement to obstreperous cattle owners, local opposition soon fades away. If, on the other hand, local politicians undertake to capitalize anti-tick eradication prejudice, the work assumes much more difficult proportions; but even then, with the right kind of organization enforcing the laws and declining to yield to political pressure, it is only a question of time when the work will be completed.

The greatest calamity is a weak-kneed, inefficient organization in tick eradication, and there is only one remedy for such—that is to
reorganize it. The most essential thing in an effective tick eradication organization are the leaders. Leaders who lack courage, who send substitutes to face and solve unpleasant problems in the field, cannot hope to obtain or retain the respect of subordinates in their organization. Leaders who unflinchingly hurl themselves into the difficult situations as they arise will have no trouble to secure field men who are dependable and who will give a creditable account of themselves at all times. When range riders and inspectors observe the leaders in the work "pass the buck" and duck responsibility, it is only natural that they should follow suit.

A man may be a most scholarly gentleman and a logical debator, but if he has not the spirit of leadership in him he is unfit to lead a tick eradication campaign. Neither honeyed words, clever pleadings or scientific demonstrations will ever eradicate all of the ticks. There are approximately 10 or 15 per cent of people in an average community who obey any law only because competent officials make them respect the law. This is the 10 or 15 per cent that tick eradicators must deal with. Failing to deal with them in an effective way, a goodly percentage of the 85 per cent, who would readily eradicate the ticks, will become disgusted with the work, the law and its enforcement.

This latter condition exists in several of the Southern states at present. Where such conditions exist local authorities find it exceedingly difficult to enforce tick eradication laws without the cooperation and possibly some coercion on part of the Federal Government and the various states now free of cattle fever tick infestation.

Quite possibly some of you gentlemen will disapprove the use of the word "coercion," and I admit it does sound rather harsh, but it is the only word that fills the bill. Nor is there any need for evading the word "coercion" when applied to tick eradication, since we have practiced coercion time and again, with splendid results, during outbreaks of foot-and-mouth disease.

Every state now free of tick infestation should refuse to accept any cattle, horses or mules for any purpose from any state in the tick infested and quarantined area that is not actively engaged in cooperative tick eradication with the Federal Government.

States in which the work of systematic tick eradication is in progress cooperatively between the state and the Federal Government would be in a position to ship cattle, horses or mules from their tick-free and released area, providing the state enforced rigidly intrastate quarantine against the movement of cattle, horses or mules from the tick infested and quarantined area of the state into the free area of the state. Should the state fail to rigidly enforce such intrastate quarantine, then the Federal Government should immediately withdraw its cooperation from the state and place the entire state under quarantine.

This system would be fair to all and work no serious handicap on any state or county. As soon as a state finds that tick eradication is essential in order to do business with their neighbors in other states,
they will immediately provide necessary ways and means for eradicating the cattle fever ticks within their borders. I said they would immediately do so; of course, they would not. The first thing they will do will be to holler “blue murder.” Congressmen, Senators, Governors and other representatives of the people will be appealed to. Much protest, wailing and gnashing of teeth will be indulged in. But as soon as the protestors find that general public interest will not be sacrificed upon the altar of their prejudice and selfish evasions of a duty demanded by public welfare, when the conflagration they expected to incite does not materialize, the anti-tick eradicators go to work and do what they ought to have done years ago—that is, to eradicate the cattle fever tick. When ticks are eradicated the quarantine restrictions are promptly, almost automatically, removed.

A healthy, vigorous protest from states free of tick infestation against movements of live stock from tick infested areas would promptly silence political buncomb fired to misrepresent the real issue. A good citizen has no desire to unnecessarily jeopardize the interest of his neighbor, whether he lives in his or any other state or county. Those who do not respect community interests have no right to expect the community to worry over their selfish, self-inflicted grievances.

Washington officials have time and again pointed to the Act of Congress previously referred to as the one stumbling block against a complete shut-down of the movement of tick infested cattle from the tick infested and quarantined area—and all cattle from open range, tick infested and quarantined areas must be considered as tick infested cattle. I am sure Congress could do nothing that would be of greater service to the country at large and to the South in particular, than to abolish the exemption clause previously referred to.

Completion of tick eradication in the Southern states would open up to the breeders of pure-bred animals one of the most lucrative fields for their surplus stock. To the South it would mean the removal of an embargo that has been both expensive and annoying to Southern shippers. Common sense, sound business and national pride must make all of us look forward to a complete eradication of the cattle fever tick in the states. This cannot be done by legislation alone. In its last analysis, this work is a duty of live stock sanitarians. In office or out of office, weaklings constantly offer alibis and excuses; real men carefully plan the task assigned to and accepted by them and then go to work—if necessary they will fight to win.

CHAIRMAN LINCOLN: This important and interesting section is now open for discussion.

DR. VAN ES: Mr. Chairman, I believe the reason why this organization has been a little bit lax in giving the proper support to the tick eradication campaign in the South has been entirely due to the fact that they all thought things were going on very lovely in the South in tick eradication. When bulletins were issued by the Department of Agriculture, even the fellows living in the North took pride in seeing
the line go down and down. I hear for the first time that things are not going on well in the South in tick eradication. I believe I am free to speak because I am not living in the South. Tick eradication is as much a national interest as tuberculosis eradication and it should have the full support of every state in this Union, because not only from an economic standpoint are we interested in the eradication in tuberculosis, but in making this whole continent fit for live stock to be produced.

I would like to have the three gentlemen who have represented this subject before us now be appointed a committee to, at this meeting or at the next meeting, propose resolutions telling us exactly what they want us to do in that matter. I am sure they will have the whole-hearted support of this organization. I so move.

(The motion was seconded.)

DR. N. F. WILLIAMS (Texas): Texas is vitally interested in this problem of tick eradication. Unfortunately for me, the veterinarian department of Texas is not concerned in the eradication of it. That is under the direct supervision of the chairman of the Live Stock Sanitary Commission, who is a practical cattle man. The operation is carried on by lay inspectors.

Mr. Callan, the chairman of our commission, is here and he would like to be heard.

Before Mr. Callan addresses you, I want to give you some figures. Texas has 1,063,000 dairy cows and 5,212,000 cattle, a total of 6,275,000 cattle, one-eighth of all the beef cattle of the United States, one-twenty-sixth of all the dairy cattle, and one-tenth of all the cattle in the United States. The leading states in beef production are Texas, Iowa, Nebraska, Kansas and Missouri; in dairy animals, Wisconsin, New York, Minnesota, Illinois, Iowa, Texas, Ohio and Pennsylvania; pure-bred animals, Ohio, New York, Wisconsin, Texas, Illinois and Missouri.

The fact is that the agricultural West, of which Texas is a part, must feed and will feed the commercial East, and so on, but let me sound this warning: Any resolution that savors the endorsement of this organization must be grounded in the common sense of economic soundness and fight its warrant there, or failing in that the Federal courts will point a way, regardless of what Dr. Carey or any other veterinarian might think of that decision.

MR. L. A. CALLAN: Mr. Chairman, Ladies and Gentlemen: I am just a little embarrassed to come before an organization of veterinarians and attempt to address them in the face of the prepared addresses of your schooled veterinarians and talkers, but I come before you as a man who was raised in the cattle business. I was raised on a ranch. I have been fighting ticks for forty years. I know ticks as well as any veterinarian in the United States; I know from experience. I know that many of the veterinarians know the work; I meet with many of them who know it. I meet with many of them who don't know a fever tick from a boll-weevil. These gentlemen who have been talking here have been talking to you about problems that I know nothing of. Un-
doubtedly they are talking about problems of their own state. We have no such problems as that. We haven't anybody who is fighting tick eradication in our state. We have a clean area in our state today larger than any of the Southern states that hasn't got a tick, that hasn't had a tick and that a tick won't live in. We have released from Federal quarantine in addition to that 10,000 square miles, bigger than Alabama and Louisiana put together. We are preparing to release 12,000 square miles in July. We have 37,000 square miles under systematic eradication. In my department I have 290 experienced lay inspectors. We are doing systematic eradication. We don't want to send any ticks to any state; we don't ask any state to receive our cattle until they are clean and are passed out with a Federal or state certificate for anything but immediate slaughter. Our law places it upon the sanitary commission of Texas to eradicate the ticks at state expense. We are spending $45,000 a month now in the eradication of ticks, not counting the supplying of the dip. That is all the money we have got to spend; that is all that we can spend sensibly.

These counties that are not doing systematic tick eradication in Texas today are waiting upon the sanitary board of Texas to come down and go to work. Our law provides that we shall take certain counties, and as fast as we can take them in we will, and eradicate the tick, but we have 250,000 steers in that area that expect to go to market in the spring of 1926, and I challenge any man in the live stock industry of any state to show me where a tick dipped in arsenical solution of 22 and loaded on the car which will not reach any other state in twenty-four hours will ever hatch one of those ticks. They will never hatch one of them, and nobody will be hurt by that movement. You will ruin a bunch of as good and as big citizens as there are on God Almighty's world if you try to stop them from shipping those cattle for immediate slaughter. I tell you now that whenever you undertake to stop them from immediate slaughter, I will move those cattle by the Federal Court of the United States. I am going to move those cattle and I am not going to give anybody any ticks. I don't propose to give anybody any ticks, and if they will prove to me that they can hatch those ticks after they have been dipped in that solution after seven hours, then we will dip them twice.

Gentlemen, I want to apologize to you for coming up here, but this tick business is something that, regardless of the fact that I am a political appointee, I know something about. I won't try to tell you how to cure any diseases of animals because I know you know more about it than I do, but I have spent forty years in the tick business. My father imported cattle from Indiana forty years ago and they died in Texas from tick fever, and I have been fighting them ever since. I want to fight them in a sensible, sane manner, and I am going to do that as long as I am in office.

We require now for the movement of any cattle out of a dirty county to a clean county in Texas exactly the same regulation that is required by the Federal Bureau for the movement of those cattle into
your state for any raising purpose or fattening purposes. They must be dipped twice, as much as twice, in an arsenical solution of 22, before they can go. Two dippings don't necessarily mean that they can go. That is the least they can go on.

Gentlemen, I thank you. (Applause.)

DR. MOORE (North Carolina): This is developing into a real tick meeting. I have had some experience in tick eradication. North Carolina will release all of its counties this year from quarantine.

Speaking on the motion made by Dr. Van Es, I want to say that we got down to about twenty counties some seven or eight years ago and couldn't go any further. I don't think the stopping or preventing of shipping cattle out of that county to those counties, though, was entirely responsible for those counties taking up tick eradication and completing it, but I believe it was one of the important things that made those counties take up tick eradication.

A lot of people told us that if we stopped them from moving cattle, that a large number of these counties were not cattle counties, and it wouldn't make any difference anyway, but we went ahead and tried it and it did. I know it worked a hardship on them. Some of them were my good friends. They hollered awfully loud, but it was one of the things that made North Carolina pass a law that made compulsory tick eradication and which enabled us to clean up the state.

Another experience I have had in the few years that I have worked in tick eradication was that one of the worst enemies I guess you might say in tick eradication is the fellow who says he is for tick eradication, but.

DR. BAHNSEN: Mr. Chairman, I believe I can present my case a little better by talking offhand than I can reading a paper.

The statements made by Mr. Callan are very interesting. In fact, it is interesting to know that Mr. Callan has been interested in this work for forty years and has fought it and has gotten nowhere with it. He didn't say it, but I know they haven't finished and they won't finish it.

MR. CALLAN: Will you yield just a minute? I just made the statement that since 1918 we have released by the Federal Bureau an area twice as large as your state.

DR. BAHNSEN: That gives me an opportunity to elucidate. If we look at the quarantine matter as brought out by Dr. Van Es, it looks as if we have made wonderful progress in tick eradication. If we had known as much about tick eradication in 1906 when the Federal Government with the state undertook systematic tick eradication, as we do now, we probably would have been through with it, and if we didn't know any more about tick eradication today than we did in 1906, we couldn't get anywhere. Our problem never amounted to anything until we got down to the open range area. As long as we had a few cows that we tied out at the end of a rope or cows kept in a small enclosure, we heard a hundred and one good, sensible arguments from people that
when they brought the cows to the lot the chickens would pick off the
ticks and eradicate them. In some instances they did, but it didn't

clean up a single county. They thought when they staked their cattle
at the end of a rope and continually changed the point where they

staked them and then ultimately turned around and cultivated the
ground, that they would eradicate them on a pasture rotation basis, but

as a matter of fact not a single county was cleaned by those methods,

and when tick eradication is ultimately finished you are going to have
to coerce somebody, make them do it; that is the only word that can

be used for it.

I know they have in size a state that none of us can compare with,

but believe me, their difficulties are no greater than our difficulties

within the Southeastern states. We have just as difficult territory;
in fact, I will venture to say that we can put the Kilkenny swamp in

Georgia against any territory I have ever seen, and in addition to

that we cleaned the cattle fever tick by getting the cattle in the Tobe-

sofkee swamp. Anybody who knows anything about the Tobesofkee

swamp will tell you it is impossible to get things out of there, but we

did get the cattle out of there and we got the cattle fever ticks out of

there, so the difficulties in Texas are no greater than in other states.

Until the state of Texas changes its attitude toward tick eradication
they will never complete the work. I am sure Mr. Callan will agree

with me; in fact, in a conversation we had yesterday we discussed the

western part of the state as compared with the eastern part of the state,

and he admitted that they were practically all large ranches, and that

they have an organization that will enable them to clean up tick infested

cattle in one year if they will make an effort. They have had an

opportunity to do that for many years. Did they do it? Not at all. Some

few did, but not many. They are still in the tick infested area;

they will be in that tick infested area twenty years from now unless

you close down on them, unless you tighten the lid, and then they

know the way to get out just as well as we do. (Applause.)

DR. J. V. KNAPP (Florida): I never can attend a tick eradication

meeting without getting up and saying something. I have attended

many in the South. This is my first privilege to attend one in the

North, in Chicago. It is indeed a great pleasure. If we continue this

meeting for some period of time we will have some large audience here.

On the point of quarantine restriction against the interstate move-

ment of cattle, my friend Dr. Bahnsen, State Veterinarian of Georgia,
some two years ago imposed a quarantine against a movement of cattle,
horses and mules from the state of Florida into or within the state of

Georgia. Nothing in the history of tick eradication in the state of

Florida has increased the public demand for tick eradication in that
state as much as this quarantine restriction by our sister state.

I am sure that many of our cattle men in Southern Florida desire
tick eradication. They will desire it in this manner: Instead of coming
to my office and other places and saying, "What can we do to move
cows out of here? What station can we use?" they will say, "Let's do
tick eradication. We are ready, we want to go." I am sure that that will be the operation of the plan we are asking you gentlemen of other states to put into effect from a national standpoint on Texas. If Texas has cleaned an area as large as the state of Georgia since 1918 and continues at that progress, this tick quarantine restriction that we are requesting will not interfere with the movement of cattle in that state to any great extent because they will be free of ticks.

It takes time to develop these things. We are asking that even the states as far north and west as Oregon and Washington place a restriction against the movement of cattle from quarantined areas in any manner. We don't expect to move cattle up to the states of Washington and Oregon, but it will lend moral support to the other states, and particularly to the states immediately north of the present quarantined areas. That is what we want, and if that is what we are asking for, we are not asking for any quarantine restrictions that will hurt Texas, Florida or any other state.

I have a situation in Florida very similar to the situation in many other quarantined states. The people there, as a rule, did not desire tick eradication up until the time when quarantine restrictions of Georgia created a desire on the part of the people to move watermelons. Strange as it may seem, watermelons don't carry ticks, yet we can't move watermelons out of the state of Florida (and they are large producers of watermelons there) unless those watermelons are handled in an absolutely non-tick exposed condition and moved in disinfected cars and clean material used for bedding. That creates a desire for tick eradication. You have had very splendid cooperative spirit and work on the part of Georgia, I assure you.

There are two types of men in meetings with reference to the subject of tick eradication; there are those who are absolutely for tick eradication without any reservation, and the other type are on the other side of the fence and have all kinds of reservations, such as, "I am in favor of tick eradication. I have been working for tick eradication and all of these things, but let's do it this way or that way, other than by the adopted principle that has proven 100 per cent effective, as of dipping cattle regularly every fourteen days in all areas." They are against tick eradication. (Applause.)

CHAIRMAN LINCOLN: Is there any further discussion?

DR. E. J. JARREL (Texas): It appears here that they want to give the impression that Texas is fighting tick eradication. It is not. We are very much in favor of it and are doing everything we can do.

I would like to ask the gentleman from Georgia how many counties in his state there are that are not clean now.

DR. BAHNSEN: The entire state has been released from state and Federal quarantine. We have two reinfestations.

DR. JARREL: How long have you been doing tick eradication?

DR. BAHNSEN: We took it up in 1906. The first few years we didn't do anything, we made no progress.
DR. JARREL: Comparing your state with what Texas has done, you fellows ought to be ashamed of yourselves for not being clean now, and that also applies to Arkansas and Alabama. (Laughter.)

Gentlemen, Texas is now doing all it can possibly do. We have reached the limit of our taxation. The state takes over the entire expense of tick eradication. They have held in Texas that you can't take a man's property without due process of law, and they have held you can't do that in tick eradication.

Texas has already spent this year nearly half a million dollars. We have reached our limit. We are going now on a $200,000 deficiency warrant for tick eradication. When you put this rule in, you force us to compel our cow man to keep his cattle on the ranch, and nearly all Texas cattle men have their cattle mortgaged as heavy as the banks will carry them. Now, if you add more to it you will break these men. Gentlemen, when you do it you are going to ruin tick eradication in Texas. Nobody opposes it; it is just merely a financial difficulty and a physical impossibility to do as much work in our big state as these fellows do there. We do as much work every year as they have done in twenty years, and they come up here and want us to clean up an area that is several times larger than their states, and they are still doing tick eradication.

Don't go ahead and put on any rules and regulations that are going to make it a hardship on these men. These cattle will not molest your state because the Federal Government requires them to go out clean for immediate slaughter, and as long as they are willing to go to the expense of cleaning these cattle and passing them into your state, permit them to do that.

We assure you that this inference here that we are not doing tick eradication is not well taken. (Applause.)

DR. BAHNSEN: I would like to ask Dr. Jarrel a question. You say you are doing as much every year as these other Southern states have done in twenty years.

DR. JARREL: I said your state.

DR. BAHNSEN: My state, that is fine. How much territory did you clean up and release this year?

MR. CALLAN: May I answer that question? We have released very little territory.

DR. BAHNSEN: Did you release any this year?

MR. CALLAN: I think not.

DR. BAHNSEN: Isn't it a fact that instead of releasing quarantined territory this year you have been putting several counties back on the quarantine list where tick reinfestation has taken place, instead of being cleaned up or being maintained?

MR. CALLAN: Will you let me answer that question?

DR. BAHNSEN: That is what I asked it for.

MR. CALLAN: We have many counties that we could have released this year. Now, wait; you said you would let me answer it.
We are asking for an appropriation to do tick eradication with, and if we had released a number of counties they would have said, "You don't need so much money; you have turned loose a lot of counties."

Again, let me say this to you: As long as I am chairman of the Live Stock Sanitary Commission of Texas we don't release counties that have got a reinestation or spot in them. They are going to be clean when they are released, with my signature. That is the reason we are not releasing them. We are simply trying to make our legislature give us money.

DR. BAHNSEN: You really haven't cleaned up any territory.

MR. CALLAN: We have plenty of counties that are subject to release the same as all other counties that have been released with small infestations in them.

DR. BAHNSEN: Isn't it a fact that the counties of Brooks, Duval, Kenedy and Jim Wells will be quarantined, counties that have been released?

MR. CALLAN: No, sir. There is a little area in there that Dr. Darvey of the Federal Bureau asked me about and we talked about requarantining that area.

DR. BAHNSEN: They will be requarantined, effective December 10.

DR. CARY: Mr. Chairman, there has been a long story about this work of tick eradication. Excuses are being offered for continuing what we call the old method, and that is the method of 1884, and this is the history of tick eradication nearly every place. Now, I am not saying here what Texas shall do; so far as Texas is concerned themselves, I am only saying what Texas shall do in its relation to my state and to other states; but this is the history. It reminds me of an old German whom I met over in Germany one time. I said, "Come over to America and see us."

He said, "You have no history over there."

I said, "Old man, if you will come over to America we will show you how to make history."

We have made some history in tick eradication. It is on record, and this is the record of it: Wherever you let people who have got cattle that are valuable to sell move those cattle out of the market for slaughter, and keep letting them do that year after year, what do they do? They sit right there and wait. And what do these cattle do? They come out of there and compete with cattle and territories and areas that have spent their money to clean their cattle. Is it fair? I say it isn't, and I want to say to you the history of the records shows you this: Whenever you shut up these areas, they find a way out. Now, I will warrant you those counties over there will be just like they are in some of the other states, they will say if they have got cattle to move, "We will go to work in active tick eradication." They can do it if they have to furnish their own money. Some say they are bankrupt. Why, if I have heard this one thing once I have heard it
I don't know how many times: "We haven't any money; we have reached our limit of taxation; we can't do anything."

I have gone into bankrupt counties where the United States judge had charge of the county finances and they found a way when they had to do it, and they didn't find it until they did have to do it.

(Applause.)

CHAIRMAN LINCOLN: We have a motion before the house, made by Dr. Van Es.

DR. CARY: I would like to suggest that the mover of that motion put on a Federal man.

DR. VAN ES: I will include that.

DR. COTTON: I will second the motion.

(The motion was carried to add a Federal man to the committee.)

CHAIRMAN LINCOLN: As I understand Dr. Van Ess's motion, it is that the three gentlemen who appeared on the program today be made a committee to draw up a resolution stating what they want and the Association would take action on that, and as amended the committee will include one Federal man. Is that correct?

DR. VAN ES: Yes, to state concretely what this organization can do.

(The motion was carried.)

DR. BAHNSEN: If it meets with the approval of the Association, we will offer a resolution to that effect right now.

CHAIRMAN LINCOLN: Is there any objection?

DR. CARY: I say as chairman of the Committee on Tick Eradication that committee has a report to give to this society, with the men present as appointed by this Association, and I suggest you hear that report at this time.

I make a motion that we hear the report of the Committee on Tick Eradication.

(The motion was seconded and carried.)

DR. BAHNSEN: The committee recommends the release of the following territory:

Alabama—The counties of Bibb, Shelby, and the remainder of Jefferson to be released, and the remainder of Mobile County to be requarantined.

Arkansas—The counties of Crawford, Cleburne, and the remainder of Van Buren and parts of Jefferson to be released.

Florida—The counties of Bay, Calhoun, Duval, Jackson, Liberty, Washington, and parts of Franklin, Holmes, Okaloosa and Walton to be released.

Louisiana—The parishes of Cameron, Calcasieu, Vermilion, and the remainder of Catahoula to be requarantined.

North Carolina—The counties of Brunswick, Carteret, Columbus, Craven, Jones, Onslow and Pamlico to be released.
UNITED STATES LIVE STOCK SANITARY ASSOCIATION

Oklahoma—Latimer County and parts of Choctaw and Pushmataha Counties to be released.

Texas—The parts of Brooks, Duval, Kenedy and Jim Wells Counties now released to be requarantined.

This is the report of the committee commenting on the release:

"Taken as a whole, this year's work in tick eradication does not differ greatly from the average, and results obtained have varied all the way from excellent to an actual loss of ground. A brief review of the condition in each of the states is as follows:

"Virginia—Following an inactive period of about three years, tick eradication was undertaken this fall in one quarantined county, and it is hoped that the work will soon extend to all of the infested area in the state."

There are three counties still in quarantine in the state of Virginia.

"North Carolina—Excellent results have followed the application of a tick eradication law which became effective during the spring of 1923. This law divided the quarantined area into three zones and provided that tick eradication be conducted in one of those zones each year. This program has been carried out, and a third zone will be released from quarantine in a forthcoming order of the Secretary of Agriculture. North Carolina will then join the list of free states wholly released from Federal quarantine.

"South Carolina—Fair headway has been made in reducing the infested area to a small section on the coast in four counties. They expect to wipe out this remaining infestation next season.

"The state of Georgia has been released from state and Federal quarantine and only two small reinfestations have shown up during the past year.

"Florida—After an inactive period of several years, systematic tick eradication was conducted in zone 13 during the past year. Work was also conducted in a few adjoining counties. The results were quite satisfactory and the area has been recommended for release from quarantine.

"Alabama—Good progress has been made in tick eradication and the quarantined area that has been maintained in the center of the state for a number of years has been wiped out. The quarantined area and the infestation is now largely confined to the southwest corner of the state.

"Mississippi—This state has been marking time during the past two years, practically all of our tick eradication efforts being directed toward trying to hold the quarantine line, with but indifferent success. This plan demonstrates the fact that tick eradication like many other projects will not stand still and must go forward or backward. Mississippi authorities will make an effort to secure legislation and state appropriation at the next meeting of their legislature, with a view of completing tick eradication in that state."
"Louisiana—This state in her tick eradication problems is in a position somewhat similar to Mississippi, and has been making an unsuccessful effort to hold her released area from reinfestation. This state also proposes to get a new law and a state appropriation in her next legislature.

"Arkansas—For the past two years Arkansas has confined her tick eradication efforts to the area north of the Arkansas River and has made good progress in completing the work in that section. The release now recommended will place all of this territory above the quarantined line. This will permit of concentrating practically all efforts and resources upon a block of four or five counties just south of the Arkansas River for next season's work. Tick eradication in Arkansas is now financed by state appropriation.

"Oklahoma—With the exception of a small area in the southwestern corner, the work in this state is in good shape. A shortage of state and county funds and the fact that this area is constantly exposed to reinfestation from the inactive quarantined area in Arkansas will delay the completion of tick eradication.

"Texas—Little progress was made in this state this season. Last spring Texas enacted a new tick eradication law, making several radical changes in the manner of conducting the work. Some delay and confusion naturally followed this change, and this, coupled with inadequate state appropriation and some internal friction, has not had a stimulating effect on the progress of tick eradication in the state of Texas."

The committee at the same time desires to offer the following resolutions:

"WHEREAS. The Texas fever tick has caused untold losses to Southern cattlemen and is a great barrier to the progress of cattle improvement in the South; and

"WHEREAS, The cattle fever tick is a possible carrier of foot-and-mouth disease, one of the most infectious and dangerous diseases of the entire world; and

"WHEREAS, Many states have at great expense of labor and money eradicated the Texas fever tick, only to be reinfested from the interstate movement of tick infested cattle; therefore, be it

"RESOLVED, That such laws, regulations and quarantine should be enacted both by state and Federal authorities so as to effectually prevent the interstate and intrastate movement of any cattle, horses or mules from any quarantine county of any state unless such county is actively engaged in systematic tick eradication under Federal and state supervision, and such cattle must be accompanied by Federal certificate. It is further

"RESOLVED, That a copy of these resolutions be forwarded to the Governor of each state, the State Veterinarian of the states, and to the chief of the Bureau of Animal Industry at Washington, D. C."

We offer that resolution for your consideration and adoption.

DR. CARY: Mr. Chairman, I move the adoption of the report and the adoption of the resolution as read.
(The motion was seconded by Dr. Mayo.)

CHAIRMAN LINCOLN: Is there any discussion?

DR. JARREL: To keep the records straight, I believe it would be a good idea to name the Federal member of that committee.

DR. CARY: I suggest Dr. McKellar, assistant in that department. (The motion was carried.)

DR. CARY: May I just say a word? I want to offer an apology for my remarks. I am satisfied. (Laughter.)

DR. JARREL: Texas expresses its gratitude for the consideration that has been given it. (Applause.)

DR. J. W. CONNAWAY: Mr. Chairman, I wish to recall just a little bit of history that is pertinent right at this time. This organization had its birth around a tick dipping vat. One of the men who was most responsible for the organization of this Association was the chairman of the Texas Live Stock Sanitary Association, and I believe the resolutions that have just been passed will gladden the heart of Robert J. Kleeberg. (Applause.)

CHAIRMAN LINCOLN: If we have disposed of the tick, we will proceed.

We will now call upon the Chairman of the Tuberculosis Committee.

DR. M. JACOB: Mr. Chairman and Gentlemen: I wish to state first that the report which I have to offer has the unanimous approval of the Tuberculosis Committee. You remember last year we had a report which did not have the unanimous approval of the committee.

I.

It is recommended that paragraph 13, Section E, of the Uniform Accredited Herd Plan be amended so as to read as follows:

Accredited Veterinarians, after proper authorization in writing from the proper state officials, may conduct tuberculin tests at the owner's expense on herds in process of accreditation. Provided, however, that in such herds Federal indemnity shall be payable only in accordance with the regulations of the United States Department of Agriculture, which provides, that when 15% of the total Federal indemnity allocated to such state is not sufficient to meet the demands in a given state, then an additional amount of state allotment shall be used, provided funds are available.

II.

It is recommended that Rule 3 and 4 of the Modified Accredited Area Plan be amended so as to read as follows:

Rule 3. Steers, range cattle (#) and semi-range cattle (#) of recognized beef type may enter the quarantined area for feeding and grazing purposes under special quarantine and confined separate from other cattle on the premises of the owner, or on such other premises as may be designated in the order of special quarantine.
Range cattle shall be construed to apply to cattle of other than recognized dairy breeds and which subsist entirely by grazing on natural forage.

Semi-range cattle shall be construed to apply to such range cattle which do not subsist entirely on natural forage.

Rule 4. Bull calves under six (6) months old of recognized beef type may enter the quarantined area for feeding and grazing purposes under special quarantine according to Rule 3, provided such calves are castrated within ten (10) days after arrival at point of destination.

Rule 4 of the present Modified Accredited Area Plan now becomes Rule 5 and shall be amended to read as follows:

All cattle, other than those described in Rules 1, 2, 3 and 4, must be subjected to an official tuberculin test before entering the above described quarantined area.

III.

It is recommended that the following be added as Section 25 to the Modified Accredited Area Plan:

Section 25. Modified Accredited Areas which, on the original test of all cattle in said area, the extent of infection did not exceed two (2) per cent, may be reaccredited if less than one-half (.5) of one (1) per cent react as the result of retesting at least twenty (20) per cent of the total number of herds, including the following:

a. All previously infected herds.

b. At least one (1) herd located in each township or district.

Section 26. Modified Accredited Areas in which the infection exceeded two (2) per cent on the original test, may be reaccredited by retesting all cattle in said area according to paragraph 22.

IV.

Dr. J. H. McNeil in his presidential address and others have offered a number of excellent suggestions to your committee as a means of giving added merit to the individual herd and area plans on tuberculosis eradication. This is especially true with reference to a possible zoning or state classification plan tending toward more restricted movement of infected cattle and greater freedom in the movement of cattle from comparatively tuberculosis-free areas. It is therefore urged that the United States Bureau of Animal Industry and the various states in co-operation with the Committee on Tuberculosis of this Association give proper study to this problem during the coming year, as a basis for such a plan.

W. F. CREWS,
CHAS. E. COTTON,
S. E. BRUNER,
J. A. KIERNAN.
M. JACOB, Chairman.

DR. JACOB: Mr. Chairman, I move the adoption of the report.
(The motion was seconded and carried.)
CHAIRMAN LINCOLN: We will proceed with committee reports. We will call for the report of the Committee on Resolutions. Dr. Gibson, Chairman.

DR. N. S. MAYO: Mr. President, Dr. Gibson has asked me, as a member of this committee, to present the resolutions.

"WHEREAS, Milk is recognized as being the most beneficial single food that nature produces, giving strength and disease resisting power to the living body and especially to growing children, and

"WHEREAS, Certain of the life-giving properties of milk may be destroyed by bacterial growth or may be lacking in milk produced by diseased cows, and

"WHEREAS, Such milk may be likened to a counterfeit product; now, therefore, be it

"RESOLVED, That the United States Live Stock Sanitary Association unhesitatingly condemns the sale of milk from diseased cattle and that we go on record as advocating that all milk, whether pasteurized or not, shall be produced only by cows that have passed a negative tuberculin test and which show no evidence of disease as demonstrated by competent veterinary inspection."

I move the adoption of the resolution.
(The motion was seconded and carried.)

DR. MAYO: "RESOLVED, That this Association go on record as favoring proper regulations requiring the cleaning and disinfecting of all stables at exhibition and race grounds, stock yards, stock cars and trucks or other vehicles occupied by equine animals, and that the Secretary be instructed to convey a message of this attitude to the regulatory officials of the various states and the Federal Bureau of Animal Industry."

I move its adoption.
(The motion was seconded and carried.)

DR. MAYO: "WHEREAS, There exists a wide-spread communicable disease of cattle known as bovine infectious abortion, due to a specific germ, Bacterium abortus (Bang), and

"WHEREAS, This disease causes enormous economic losses to the cattle breeding industry; therefore, be it

"RESOLVED, That the authorities having charge of animal health in each state take cognizance of this disease and institute measures adaptable to the cattle industry in the respective commonwealths tending toward its prevention and control; be it further

"RESOLVED, That such authorities be requested to report the progress made in the control of bovine infectious abortion to this Association next year; and be it further
"RESOLVED, That the Secretary of this Association be instructed to transmit a copy of these resolutions to the proper sanitary authorities of each commonwealth."

I move its adoption.

(The motion was seconded and carried.)

DR. GIBSON: Mr. Chairman, before going to the next subject I wish to inquire if the resolution proposed by Dr. Van Ess in a paper he gave in this meeting was put to a vote?

DR. VAN ES: Yes.

DR. GIBSON: I just wanted to say that the Committee on Resolutions would be pleased to approve that resolution and also the one on Dr. Bundesen's report.

CHAIRMAN LINCOLN: Dr. Munce will report on the Committee on Constitution and Policies.

DR. T. E. MUNCE: Mr. Chairman and Gentlemen: The 1923 meeting of this Association, by recommendation of the President, appointed a special committee to draft a policy. This committee found in performing their duties that the Association was practically without a constitution and by-laws, so we came back the following year and asked that authorization be given the committee to revise the constitution and by-laws. The committee at that time took the name of Committee on Policy—Revision, Constitution and By-Laws.

The committee is composed of Dr. David S. White of Ohio, Dr. M. Jacob of Tennessee, W. J. Butler of Montana, John R. Mohler of Washington, and myself. We will first give you the report which applies to the revision of the constitution and by-laws.

DR. MAYO: Mr. Chairman, in considering this, there is a question that should be decided now as to whether we will consider it as a whole or section by section as it is presented. I move it be considered section by section as read.

DR. BAHNSEN: Mr. Chairman, it seems to me that probably in passing on it section by section as read would create more discussion, not having heard it all. I, therefore, suggest as a substitute motion that it be read as a whole, and then if there is no objection, let us adopt it as a whole, and if there is objection, then go back over it section by section.

(The motion was seconded and carried.)

Dr. Munce read the report.
REPORT OF THE COMMITTEE ON POLICY AND THE REVISION OF THE CONSTITUTION AND BY-LAWS.

There has come about a realization that the purpose of the United States Live Stock Sanitary Association should be more clearly defined and that a more intimate relationship with the regulatory problems of the interests which it is obligated to serve, should be brought about. The time has come when its activities should cover a field national, and in some respects international, in its scope in order that efficiency in the study, prevention and eradication of transmissible live stock and poultry diseases may be in keeping with the needed growth and development of these respective industries.

A comparison might well be made with the work of the American Public Health Association which in its constant endeavor has kept pace with public responsibilities; and what that organization does for the conservation of human life, this organization should and can do for animal and poultry life.

With these thoughts in mind, there came about the appointment of a Committee on Policy and for the express purpose of drafting and submitting to this Association a definite policy, and with it a complete revision of the Constitution and By-Laws, all of which your committee now have the pleasure to submit.


Preventive Medicine.

Recognizing that prevention is the essential factor in the control and eradication of live stock and poultry diseases, this Association is committed to a policy of more general use of every established prophylactic measure.

Live Stock and Poultry Husbandry.

The conservation of live stock and poultry in order that these industries may grow and prosper is the primary and important purpose of an efficient live stock and poultry sanitary service. Those persons who are engaged in the various activities directly or indirectly related to live stock and poultry husbandry should be familiar with the work of this Association. They should be encouraged to obtain membership and participate in the proceedings. Such a policy would be the means of stimulating more intimate and constructive contact with these important industries.

Uniform Laws and Regulations.

This Association should strive to correlate sanitary laws and regulations and to work for uniformity in national, provincial, state, and local laws and regulations pertaining to live stock and poultry sanitation; also those relating to milk and meat hygiene. It should endeavor to secure the enactment of such legislation as will advance milk and
meat hygiene, also live stock and poultry sanitary prevention and control work, and thus promote and protect the live stock and poultry industries.

Public Health.

Since it is recognized that certain disease conditions frequently found in human beings can be attributed to direct or indirect transmission from animals, public health and animal disease prevention and control have become inseparable. Sanitary supervision covering the production and distribution of milk, meat and poultry products are logical problems for the consideration of this Association; and public health workers, especially veterinarians trained for such service, should be guided by its recommendations. Active identification on the part of such public health workers in the affairs of the Association should therefore be encouraged.

Regulatory Services.

No laws or regulations will succeed in preventing and controlling diseases of live stock and poultry unless veterinarians and owners are interested and sufficiently familiar to assist in bringing about such results.

Government control of live stock and poultry diseases has extended so that those persons actively engaged in any branch of the veterinary profession have of necessity dealings with state, provincial and Federal authorities. In order to promote a better understanding between private practitioners and regulatory officials and to permit greater freedom of individual effort, it is advisable that the following principles be observed:

(1) This Association recognizes the right of the Federal Government, the states and provinces to employ veterinarians for the purpose of giving free professional service for the prevention and control of transmissible animal and poultry diseases. It does not approve the governments of the United States, provinces, states or municipalities denying any class of qualified veterinarians the right to render such service.

(2) When state, provincial and Federal regulatory authorities authorize the work of any duly qualified class of veterinarians who have met state, provincial and Federal requirements, there should be no discriminatory regulation against the service of such veterinarians. When indemnities are paid to owners for animals condemned because of transmissible diseases, such indemnities should not be limited to animals condemned only by veterinarians regularly employed by the Federal, provincial, state or local governments, but should be paid when such animals are disclosed as a result of a diagnosis of any qualified veterinarian specifically authorized by the state or province, provided state or provincial and Federal regulations governing the same are complied with.

(3) It is the opinion of this Association that the exclusive use of special county, state, provincial or Federal employees for the performance of routine work, like tuberculosis testing, where animal hus-
bandry is developed and qualified private practitioners are available, is not a wise permanent policy in the prevention and control of animal disease.

Veterinary Biologics.

This Association should recognize only such veterinary biologics as have been approved by the United States Bureau of Animal Industry and not opposed by the American Veterinary Medical Association, and then only when their efficiency has been clearly demonstrated.

This Association is opposed to the use of biologics capable of reproducing disease, tuberculin and anti-hog cholera serum, by persons other than veterinarians, and is further opposed to the enactment of any legislation that will legalize the use of such products by any persons other than veterinarians.

Veterinary Practitioner.

This Association should at all times harmonize the work of the veterinary practitioner with that of the live stock and poultry sanitary regulatory officers. It advocates the employment, wherever practicable, of the local veterinary practitioner in live stock and poultry sanitary prevention and control work in their respective districts, under the direction of the state or provincial live stock and poultry sanitary officer in charge.

Veterinary, Live Stock and Poultry Associations.

The various veterinary, live stock and poultry organizations, whether national, provincial, state or local, offer logical opportunities to familiarize their members with the work of this Association. Such organizations should be encouraged to send official representation to our annual meeting and the report of said delegates should become a permanent feature in their respective associations' proceedings. This Association in turn should be properly represented at the important related association meetings.

Veterinary Research.

A prompt and correct diagnosis is of paramount importance to those engaged in preventing and controlling transmissible animal and poultry diseases. A research laboratory efficiently manned and properly equipped is of inestimable value to not only those engaged in live stock-poultry transmissible disease regulatory work, but also to those engaged in animal and poultry husbandry and veterinary practice. Research on unusual diseases, such as aphthous fever, rinderpest and fowl pest, etc., should be confined to laboratories under immediate Federal veterinary supervision.

The production and use of biologics and new diagnostic agents for transmissible live stock and poultry disease should be studied by laboratories under the supervision of the National Research Council, state or Federal research authorities, until their reliability and usefulness have been established.
Reliable diagnostic and veterinary research laboratories are essential to the work of this Association and should receive its fullest support.

Veterinary Education.

The problems of disease control and the progress that can be made is based upon education and research. The need of a properly trained personnel cannot now be questioned. The public has come to realize more than ever before the broad field of usefulness for the veterinary profession. On the other hand, the veterinary profession has not failed to meet her obligation, even though the remuneration for service has been relatively meager. The veterinary colleges have raised their entrance requirements, enlarged their equipment, strengthened their courses, and in fact have been meeting every condition in order to supply the needs, whether in the laboratory or in the field. It becomes extremely important at this time not to underestimate or disregard the place of the graduate veterinary practitioner. His position, from the standpoint of live stock and poultry sanitary control, is extremely vital, and any plan or policy which does not give him full consideration should be discouraged. Furthermore, any tendency towards placing the responsibility of work, which is truly scientific, into the hands of laymen is unsound and should also be discouraged. Added regard for the trained veterinarian and minimum conflict of endeavor in the field of practice, regulatory service and education will do much to harmonize and strengthen the entire live stock sanitary fabric. It will insure permanency to the limited but sufficient veterinary schools now in existence, and ultimately it is the public which will be benefited thereby.

There appears to be a sufficient number of veterinary schools at present to meet the demand. States that do not already have a veterinary school should provide means for those properly interested to take courses in veterinary schools that are already established.

Humane Measures.

This Association should support rational humane measures and assist in teaching and guiding the public mind in correct methods of handling animals and poultry humanely.

Finances.

The ultimate usefulness of this Association will be determined very largely upon its future financial program. Those who have been closely identified during the past few years with its business affairs have been made to realize the inadequacy of funds with which to carry on along progressive lines. The various Federal, state or provincial agencies, whether of regulatory or educational intent, should have continuous support and co-operation from this Association in order that the needs of the dependent and allied industries might be better served. Provision of the necessary funds would reveal unlimited possibilities through a constructive live stock and poultry sanitary program. Placing the Association on a sound financial basis is imperative and fundamental.
CONSTITUTION AND BY-LAWS OF THE UNITED STATES LIVE STOCK SANITARY ASSOCIATION

ARTICLE I.
Name.
The name of this Association shall be "The United States Live Stock Sanitary Association."

ARTICLE II.
Purpose.
The purpose of this Association shall be the study of live stock sanitary science, milk and meat hygiene, and the dissemination of information relating thereto; the unification so far as possible of the laws, regulations, policies and methods pertaining to milk and meat hygiene, and to the prevention, control and eradication of transmissible live stock diseases; to maintain co-ordination among the various live stock regulatory organizations, and to serve as a live stock sanitary science clearing house between this Association and the following: The live stock owner, the live stock sanitarian, the milk and meat hygienist, the veterinary practitioner, the transportation and stock yard companies, the milk and meat producing and distributing companies, and various other interested agencies. The word "live stock" as herein used shall be understood to include poultry.

ARTICLE III.
Membership.
There shall be two kinds of members—Official and Individual.
The live stock sanitary departments of each state, also the United States, and the Canadian, Cuban and Mexican governments, shall be eligible to official membership in this Association and be represented on the Executive Committee by the live stock sanitary executive official.
Any person engaged in live stock sanitary work for Federal, provincial, state, territory, county or municipal governments and any other person interested in live stock sanitation or milk and meat hygiene may be elected to individual membership.

ARTICLE IV.
Meetings.
The meetings of this Association shall be annual and special.

ARTICLE V.
Officers.
The officers of this Association shall be: President, First Vice-President, Second Vice-President, Third Vice-President, Secretary-Treasurer, and an Executive Committee.
The officers of this Association shall hold office for one year or until their successors have been duly elected and qualified.
Executive Committee.

The Executive Committee shall be composed of the executive officer representing the live stock sanitary departments of the various States and Territories, the Chief of the United States Bureau of Animal Industry, the Veterinary Director General of Canada, the executive regulatory officer of Cuba and Mexico, and the elective officers of this Association.

The Executive Committee shall constitute the administrative body of this Association and shall determine its activities and policies.

All recommendations and reports of officers and committees shall be referred for consideration to the Executive Committee.

The First Vice-President shall be ex-officio chairman of the Executive Committee.

The Executive Committee shall elect yearly a Secretary-Treasurer for the Association. The Secretary-Treasurer shall receive such salary and allowance as may be fixed by the Executive Committee.

The Executive Committee shall cause to be audited annually or oftener if deemed necessary, the receipts and disbursements of the Secretary-Treasurer, and shall have authority to hear and determine all complaints filed before it in writing re the conduct of any member; and shall have authority to accept or reject applications for individual membership properly placed before them. Three negative votes shall disqualify for such membership.

ARTICLE VI.

Program Committee.

The President, the Chairman of the Executive Committee and the Secretary-Treasurer shall constitute the Program Committee. It shall be the duty of the Program Committee to make the necessary arrangements and provide the program for the annual and special meetings.

ARTICLE VII.

Duties of Officers.

1. President: It shall be the duty of the president to preside at all meetings of this Association; to appoint all committees excepting the Executive and Program Committees; to call special meetings of the Association whenever he considers the holding of such meetings necessary for the good of the live stock industry or upon the written request of five members of the Executive Committee. The president shall be an ex-officio member of all committees.

2. First Vice-President: The first vice-president shall be chairman of the Executive Committee. In the absence of the president he shall preside at the meetings of the Association. In the event of the absence, disability or resignation of the president he shall perform all the duties of the president. He shall be an ex-officio member of the Executive and Program Committees.
3. Second Vice-President: The second vice-president shall assume the duties of the president in the event of the absence, disability or resignation of the president and first vice-president. He shall assume the chairmanship of the Executive Committee in the event of the absence, disability or resignation of the first vice-president. He shall be an ex-officio member of the Executive Committee.

4. Third Vice-President: The third vice-president shall assume the duties of the president in the event of the absence, disability or resignation of the president, first vice-president and second vice-president. He shall assume the chairmanship of the Executive Committee in the event of the absence, disability or resignation of the first and second vice-presidents. He shall be an ex-officio member of the Executive Committee.

5. Secretary-Treasurer: The Secretary-Treasurer shall keep an accurate record of the proceedings of the Association. Whenever authorized so to do by the Executive Committee he shall publish said proceedings and distribute them to the members of the Association. The secretary-treasurer shall also keep an accurate record of the proceedings of the Executive Committee and shall furnish a copy to each member of said Executive Committee. He shall forward to each Executive Committee member a copy of each regulation approved by the Association.

He shall keep an accurate account of all Association moneys received and disbursed. He shall also present to the Chairman of the Executive Committee a list giving the name, occupation and address of each applicant for individual membership for the approval of the Executive Committee. He shall perform such other duties as may be authorized and prescribed by the Executive Committee. He shall be ex-officio secretary of the Executive Committee, also an ex-officio member and secretary of the Program Committee.

ARTICLE VIII.

Amendments.

The constitution of this Association may be amended by a two-thirds vote of the members of the Association present and voting at an annual meeting, provided that the specific amendment to be acted upon shall have been presented in writing at the previous annual meeting and provided further that the amendment has received the approval of the Executive Committee.
BY-LAWS.

ARTICLE I.
Order of Business.
Invocation.
Roll Call.
Reading of Minutes.
President's Address.
Report of Secretary-Treasurer.
Report of Executive Committee.
Reports of Committees.
Unfinished Business.
New Business.
Reading of Papers, Discussions, etc.
Election and Installation of Officers.
Adjournment.

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

ARTICLE II.
Applications for Membership.

Applications for individual membership shall be made in writing to the Secretary-Treasurer. The application shall give the name, occupation and address of the applicant and shall be accompanied by a fee of two dollars ($2.00), which amount shall include the membership dues for one year. Applications shall be presented in proper form to the Secretary-Treasurer, who shall in turn submit them to the Executive Committee.

An individual member may be expelled for cause by the Executive Committee.

ARTICLE III.
Meetings.

The annual meetings shall, unless otherwise determined not less than thirty (30) days in advance by a majority of the members of the Executive Committee, be held at Chicago, Illinois, during the time of the International Live Stock Exposition. The place for holding the meetings in Chicago as well as the duration of said meetings shall be determined by the Program Committee of this Association.

The place for holding special meetings shall be determined by the President with due regard to the wishes of the members of the Executive Committee, the subject matter to be considered, accessibility, and the information to be obtained. The notice of time and place of holding a special meeting shall be mailed to the members at least thirty days prior to the date fixed for the special meeting.
ARTICLE IV.
Quorum.

Twenty-five members of the Association shall constitute a quorum. Five members of the Executive Committee shall constitute a quorum.

ARTICLE V.
Dues.

The dues for individual membership in this Association shall be two dollars ($2.00) per annum, payable in advance (on or before January 1st of each year) to the Secretary-Treasurer of this Association.

The dues for Federal, Dominion, Cuban, Mexican and state official memberships shall be twenty-five dollars ($25.00) each per annum, payable in advance (on or before January 1st of each year) to the Secretary-Treasurer of this Association.

ARTICLE VI.
Nominations.

Nominations for President and for the three Vice-Presidents shall be made from the floor. The nominations shall be made orally and shall not be closed until every member present has had an opportunity to present his candidate.

ARTICLE VII.
Election of Officers.

A majority of all votes cast shall be necessary to elect the President. If no nominee receives a majority of the votes on the first ballot, the nominee who received the lowest number of votes shall be dropped and a new ballot shall be taken, and so on until a nominee receives a majority for President.

The votes for Vice-Presidents shall be cast on one ballot and the nominee receiving the greatest number of votes for Vice-President shall become First Vice-President; the nominee receiving the second highest number of votes shall become Second Vice-President; and the nominee receiving the third highest number of votes shall become Third Vice-President.

In the event of but three nominations for Vice-President being made, or a tie vote, the rank shall be determined by the order in which the candidates were nominated.

The Secretary-Treasurer shall be elected in accordance with the provisions of Article V of the Constitution.

ARTICLE VIII.
Standing Committees.

The standing committees of this Association shall be:
Legislation.
Resolutions.
Tuberculosis.
Texas Fever.
Infectious Abortion.
Transmissible Poultry Diseases.
Transmissible Swine Diseases.
Parasitic Diseases.
Miscellaneous Transmissible Diseases.
Unification of Laws and Regulations.
Meat and Milk Hygiene.
Policy.

The Executive Committee may create special committees as needed.

ARTICLE IX.

Amendments.

The By-Laws of this Association may be amended in the same manner as the Constitution.

Respectfully submitted,
(Signed) DAVID S. WHITE,
(Signed) M. JACOB,
(Signed) W. J. BUTLER,
(Signed) J. R. MOHLER,
(Signed) T. E. MUNCE, Chairman,
Committee.

DR. MUNCE: I move that this constitution and by-laws be adopted to take effect upon the adjournment of this meeting.
(The motion was seconded by Dr. Bahnsen.)

CHAIRMAN LINCOLN: It has been moved and seconded that this constitution and by-laws be adopted to take effect at the end of this meeting.

The thought just occurs to me that we ought to revert to new members, so there will be nothing illegal about anybody voting.

Mr. Secretary, I understand you have about sixty new members. If there is no objection we will now elect the new members.

(Secretary Dyson read the list of new members.)

SECRETARY DYSON: I move you, Mr. Chairman, that all the applicants be elected members.
(The motion was seconded by Dr. Moore and carried.)

CHAIRMAN LINCOLN: The chair declares them elected members.
There is a motion before the house for the adoption of the constitution and by-laws as read by the Chairman.

DR. N. S. MAYO: Mr. Chairman, I move that Section 1 of the constitution and by-laws be changed to read, "This Association shall be known as the American Live Stock Sanitary Association."

I make this motion for the reason that the live stock industry of the United States and Canada and the rules and regulations governing the control of animal diseases in these two countries are so intimate
and so similar that it is but just that this Association should be called the American Live Stock Sanitary Association. The Canadians, it is true, have been admitted to membership, but I would feel (at least I would if I came from Canada) that it was sort of a province upon the part of this Association that they did take me in.

We have the American Public Health Association dealing with America so far as human diseases are concerned. We have the American Medical Association, taking in America. We have the American Veterinary Medical Association, taking in the veterinarian associations of the North American Continent, and I believe this Association should be called the American Live Stock Sanitary Association.

DR. GIBSON: Mr. Chairman, I take great pleasure in seconding this motion.

DR. BUTLER: I feel very much embarrassed. I, of course, appreciate what Dr. Mayo says, but really this Association was founded by our friends in the South; it was founded by these men who are fighting ticks, and they have built up an Association that is known all over the world, not only in this Western Continent of ours, but it is recognized universally. You have built up through a great deal of strife and trouble an Association that is known as the United States Live Stock Sanitary Association. I appreciate our friends from Canada very much indeed, but this Association has built up its reputation on the name, and if you change the name, they will say, "Is this a new Association? Is it taking away the power of the old United States Live Stock Sanitary Association?"

I believe it would be a technical mistake; I believe you are throwing away a tremendous lot of advertising, advertising that has cost a lot of money, and you will have to start all over again if you change the name.

I think we should maintain the old name, the United States Live Stock Sanitary Association that our friends in the South gave to it many years ago. I therefore make an amended motion that the name of the Association remain the same.

(The amendment was seconded.)

DR. MAYO: It isn't necessary to make an amendment. You can vote it down, and if you vote it down, it remains the same, that is all.

CHAIRMAN LINCOLN: The Chair would rule the statement just made by Dr. Mayo is correct. All those in favor of Dr. Mayo's motion will signify by saying "aye"; contrary the same. The motion is lost and the name remains the same.

DR. HAYS: As I got the reading of that report, in one place you say live stock sanitation and in another live stock and poultry sanitation. I think it should be consistent.

DR. MUNCE: That was an oversight in reading, I am sure, because we went over it and struck out "poultry" every place.

DR. MAYO: Mr. Chairman, in Section 3 of the by-laws, as I recall it, it said that the meeting should occur at the time of the International
Live Stock Show, if possible. I think the word "annually" should be inserted.

DR. MUNCE: "The annual meeting shall be held," is the way it starts.

DR. MAYO: That is all right.

CHAIRMAN LINCOLN: Are there any other remarks?

DR. CONNAWAY: In the enumeration of the different diseases that should be considered, it occurs to me that there is a possibility that some diseases occurring in other countries that we do not know of now in this country may find interest.

DR. MUNCE: That would come under miscellaneous.

CHAIRMAN LINCOLN: The question before the house is the adoption of the report of the Committee on Constitution and By-Laws.

DR. GIBSON: May we have the exact wording of the motion? Or, I will ask a question. Did your motion provide for a suspension of the rules? If not, I think it should.

DR. MUNCE: I plead guilty, it did not. I shall restate the motion again as near as I can.

I move that the rules be suspended and that the constitution and by-laws be adopted, to become effective at the end of this meeting.

(The motion was carried.)

CHAIRMAN LINCOLN: Dr. Munce will now present the report of the Committee on Policy.

(Dr. Munce read the report of the Committee on Policy.) (Applause.)

DR. MUNCE: Mr. Chairman, I recommend that this be adopted as the policy of the Association.

(The motion was seconded and carried.)

DR. ALLEN: May I ask Dr. Munce if that policy prohibits the use of anti-hog cholera serum by laymen?

DR. MUNCE: Discourages. Discourage does not mean prohibit.

DR. ALLEN: In Maryland we have nine counties, and other states have more counties, where there are no veterinarians and laymen are taught the use of it; it will save thousands of dollars worth of hogs if serum was not available for use by them.

DR. MUNCE: Mr. Chairman, in order to clarify the records, I move that the committee be dispensed with.

(The motion was seconded and carried.)

SECRETARY DYSON: Mr. Chairman, I have three more applications. (Dr. Dyson read the applications.)

I move you that these three applicants be elected to membership.

(The motion was seconded and carried.)

SECRETARY DYSON: That makes not less than sixty new members during this session. (Applause.)

(President McNeil resumed the chair.)
PRESIDENT McNEIL: Gentlemen, Dr. Williams advises me that Mr. Hovey, Secretary of the American Railway Association, who addressed us last year, would like to say a few words. If you will grant him that privilege I assure you it will be appreciated.

MR. H. F. HOVEY (Dallas, Texas): Mr. President and Gentlemen: Sometimes it does us all a little good to know what the rest of the world thinks about us, so I am not here to criticize you, but to let you know what some of the rest of the world thinks about you.

Last year I talked to you a few minutes about the uniform regulations, and, as you remember, when Texas had the foot-and-mouth disease last year, there were thirty-six states quarantined against the state of Texas. You adopted uniform regulations in last year's meeting, and this year when the foot-and-mouth disease broke out, only six states issued a quarantine against the state of Texas.

I came here today, gentlemen, with just that one thought in mind, to express to you the appreciation of the commercial world for the attitude you have taken. It would be a serious thing for a $600,000,000 cotton crop such as we have in Texas to be tied up because of quarantine, but such a thing as that is possible, and in future outbreaks of this disease or any other which might affect the general commerce of the country I hope that you will give that same consideration to the industries and the agricultural people in the territory that you did on this particular occasion.

I heard a good deal of talk here today about progress. Some said that you hadn't made progress in some things and some said you had. I want to say, gentlemen, that I can see a great deal of progress in this organization.

The American Railway Association, which I represent, is a great advocate of progress, and in any calamity that may occur within the United States, it is our policy to send a representative to that particular point to do what we can toward the welfare of the community. That is how I came to be connected with the foot-and-mouth disease in Houston. It was because the indications were that commerce would be seriously interfered with, and our business is traffic, whether it is in the supply of equipment or the moving of equipment after it is loaded, or whether it is in helping to clear up the wreckage after a cyclone. We are not a charity organization, gentlemen, but we are a progressive organization and we believe in everything progressive that is good for the community or for the country in general, and I can truthfully say and voice the sentiment of the commercial world in general that this is a progressive Association, this Association of the United States Live Stock Sanitary Boards, and I want to thank you gentlemen again for Texas for the leniency in which you have treated them in the past calamity. you might call it. I want to offer this suggestion: If at any time the state which you represent should become infected with the foot and mouth disease, call on the American Railway Association for assistance, because we are in position to create a co-operative spirit among the carriers.
I could tell you a good deal of history of what transpired there, but I know you want to go home and I don't want to take up your time. I will call your attention to just one incident. A few of our red flag followers down there thought that the state and the government had taken in a little too much territory and sued for an injunction against the movement of hay. That writ of injunction prohibited the Live Stock Sanitary Commission from interfering with either the state or interstate movement of hay from a certain area. You know what that means. The territory had been quarantined by the State Live Stock Sanitary Association because it was considered dangerous. They had refused the movement of hay from that territory. The judge who granted the injunction ruled that the hay was not dangerous. Now we are granting that the judge had good judgment, but he was not a veterinarian, and that is what you are going to be up against in every outbreak of this kind that you come in contact with. But neither the plaintiffs in this case, nor the judge, included the railroads in their injunction. The result was that when the hay shippers began to order equipment to move their hay, the individual railroads began to inquire of my office whether or not the cars should be furnished. My answer was no, that the quarantine had not been dissolved nor modified nor nullified, that the railroads had been served with these quarantine regulations and were obligated to abide by them, but the transportation officers of one railroad began to feel a little alarmed because the shippers had threatened suit.

They placed the matter in the hands of their attorneys. The attorneys ruled that the injunction superseded the quarantine regulation and that the hay must move, which left all you boys with your gates wide open. Of course the Federal regulations prohibited the movement interstate, but there was nothing to prevent the moving of the hay from this quarantined area to a point near the border line of that state and then being reconsigned.

Naturally, in our co-operative work with the railroads we find them just like the rest of the world—one railroad finds that the other one is doing something we have all agreed not to do, the first thing they do is call up and tell the boss. One night after I had gone to bed the telephone rang and a certain railroad advised me that the attorneys of this other railroad had ruled that the hay should move. The next morning, bright and early, I called a meeting of the executive officers of that railroad. We had the attorneys, who ruled that the hay should move, present at the meeting. You can rest assured that there was some pretty warm argument before we got through. The result was, however, that the attorney went right back to his office and wrote his decision on the case prohibiting the movement of hay.

That is only one of a large number of those little things that come up.

So again I want to offer you the assistance of the American Railway Association in case your states should become infected.

I thank you. (Applause.)
PRESIDENT McNEIL: Now, gentlemen, I want to express to you my feeling of appreciation for the assistance you have all rendered. This has been your meeting; you have made it what it is. All that I have done is to contribute by my presence and what little assistance I have been able to give the chairmen of the committees who have functioned so well in getting for us the extended program they have. I feel personally that the meeting has been a success. It may have been a little long; we have had to rush things a little too fast possibly sometimes, but we have used our best judgment in attempting to carry out the wishes of you gentlemen.

The next thing in order will be the election of my successor. I will entertain nominations for President.

DR. JARREL: Have you got to that subject of new business?

PRESIDENT McNEIL: What have you to offer?

DR. JARREL: This subject that I want to discuss is in relation to foot and mouth disease. I didn't think it came under the subject of foot and mouth disease here because this is merely a legislative matter and what recommendations that committee would make here would have considerable effect, and I didn't know that that would be the proper place to present it.

In Texas we have had foot and mouth disease. We have had two outbreaks recently. The other outbreak was handled very nicely. As soon as it was reported, the veterinarians over the state arrived on the scene. They had the people scared, and they were afraid to drink milk and afraid to eat meat. They were even afraid to drive down the road by the pasture where the infected cattle were. On that account, they had cooperation, nobody opposed them in any manner whatever. They did whatever the officials suggested. They didn't receive any pay for it; they didn't know whether they were ever going to get any pay for it, so in thirty days they stamped out that outbreak of foot and mouth disease, but in a few months it appeared again in the state. The state officials went down there. They didn't meet with the reception they met with before, because the people had learned that the foot and mouth disease was not a fatal disease to people nor to many animals. There are many foreigners in that country who have seen many cases of foot and mouth disease in other countries. Over there they can't control it; they try to cure it. As you know, most cases get well. Whatever medication they may have used they attribute to the cure of the animal to.

Now we didn't meet with the reception we wanted. We had no law in the state under which we could eradicate foot and mouth disease; we had no law under which we could take a man's property; we had no law by which we could condemn and kill animals; we couldn't quarantine those on the place; that wouldn't be effective in a foot and mouth disease campaign. So they began running our veterinarians off, they made them leave the premises and wouldn't allow them to do anything. We, by force, took the cattle away from the people in some instances. We even went so far as to put some of the men in jail. We knew at
the time we were doing this that it was unlawful, but we had no other way to control the situation; we had no money with which to pay the expenses of the veterinarian. The Live Stock Sanitary Commission made a note to the bank and borrowed $100,000 with which to conduct this campaign and pay the expense. They still owe that note.

We went before the Houston Clearing House Association and asked them for $300,000 with which to pay this expense. First, we sent an S. O. S. call out to the various states for this quarantine. This quarantine wasn’t sent out because the disease was getting away from us but on account of those injunctions and on account of having no funds. We thought if we would get these quarantines placed against the state and against the commerce of that state they would raise the money. They did that very soon after. They pledged us $300,000. The business interests underwrote that to the banks and the banks agreed to let us have the money. They commenced raising the quarantine against our advice. I said, “If you do this, we won’t get this money.” They raised the quarantines in a week; the business men’s affairs were going along nicely and they lost interest in the campaign. As a result, we didn’t get that money. We owe now for all our expenses there; we have managed to pay the wages. We haven’t any money with which we can pay these men for the cattle that have been lost. The state couldn’t issue any deficiency warrants because the constitution permits the government to only issue $200,000. That had already been received. Then it was placed before the bankers and they submitted it to their lawyers. Their lawyers then advised that the government may issue more warrants. They issued warrants up to $550,000, and now we can’t get any banks to take our warrants. Why? Because we have no foot and mouth disease there and they are not being hurt any. We can’t pay these men for the warrants because they can’t cash the warrants until 1927.

That is a situation that may come to any state. There are many states that can’t even do that well. I have talked with some of the representatives of states here and they say they don’t know how they could possibly raise $100,000 in their states. They have no laws under which they can control foot and mouth disease.

Now a proposition arises to us that the United States Government should take entire charge of this, especially the financial part of it, that is, let the states adopt certain laws, then let the United States Government, at the request of a certain state, which of course they couldn’t do in any other way, come in there and the state furnish the police power and the government pay the expense. It is a national affair. Suppose Texas had lain down here this time, gentlemen, and said, “We haven’t any money to pay this campaign. What can you do?”

“We will quarantine you.”

They did that anyhow, but you couldn’t stamp out the foot and mouth disease with a quarantine, neither could you keep it from entering your state. Now if that condition does ever arise, it is going to be a very serious situation. The states will probably have to come
in and contribute money to carry on a campaign within that state if
the government can't do it.

The proposition is this: We will have introduced in the next ses-
sion of Congress, which convenes right away, a bill to see if the United
States Government won't pay the entire expense incident to foot and
mouth disease eradication conditional on certain states as they have
done with the highway department; whenever a state will conform to
certain laws that the government suggests in reference to expense for
building highways, then they contribute certain amounts toward those
highways. That could be done in this case, I should think.

Gentlemen, that is a serious question. A state may lay down at
any time; you can't make them do it. Quarantine won't help you or
benefit you a particle. It will close their commerce; their commerce is
closed anyhow from the fact that the foot and mouth disease is in
their state. The situation will come to you sooner or later. It should
be done not only for that reason, but the United States Government
hasn't afforded us the proper protection from our coast and shipping
from overseas, because there are ships coming into our state every
week from some foreign country that have foot and mouth disease in
them. We have prepared a state regulation now to take care of that,
to prohibit coming in there these ships without being fumigated and
thoroughly cleaned and disinfected before they land.

This is a question that hasn't been presented to you before; you
may not have thought of it, but it is time to give it serious thought; as
this is a national affair, it should be taken up by all the states and the
states relieved of that particular condition.

PRESIDENT McNEIL: Is there anything further, gentlemen? If
not, we will call for nominations.

DR. BUTLER: Mr. Chairman and Members of the United States
Live Stock Sanitary Association: I want to place before you the name
of a man you all know. He is an outstanding man and he doesn't need
oratory to have his name presented to you. He is known to us on the
ranges; he is known in the South; he is known in the West; he is
known East; he is known in the North; he is known in Europe. He
is an outstanding character who has brought great credit to the or-
ganization. I desire to place before you for consideration the name of
Dr. John R. Mohler of Washington, D. C. (Applause.)

DR. HAYS: I believe it will do honor to Nebraska to second the
nomination of Dr. Mohler.

DR. MOORE: I move that nominations be closed and the Secretary
be instructed to cast the ballot.

PRESIDENT McNEIL: I declare Dr. Mohler elected by a rising
vote.

Nominations are in order for First Vice-President.

Dr. CREWE: I nominate Dr. W. H. Simmons of Kentucky.

(The nomination was seconded and carried.)
PRESIDENT McNEIL: Second Vice-President.
MR. MUNCE: I nominate Dr. Edward Records of Reno, Nevada.
(The nomination was seconded and carried.)
PRESIDENT McNEIL: Third Vice-President.
DR. BARGER: I nominate Dr. M. R. Thornburg of Des Moines, Iowa.
(The nomination was seconded and carried.)
PRESIDENT McNEIL: Fourth Vice-President.
DR. HART: I nominate Dr. William Moore of North Carolina.
(The nomination was seconded and carried.)
PRESIDENT McNEIL: Fifth Vice-President.
DR. MAYO: I understand you adopted a new constitution and only three vice-presidents are provided for.
PRESIDENT McNEIL: We are working under the old.
DR. KIERNAN: I nominate Dr. Corwin for Fifth Vice-President.
(The nomination was seconded and carried.)
PRESIDENT McNEIL: Secretary and Treasurer.
DR. BAHNSEN: I think the Association would really do itself great credit to reelect the present Secretary who has made such a wonderful success out of the present and preceding sessions since he was elected to the office. I, therefore, move that Dr. Dyson be elected Secretary.
DR. WILLIAMS: Texas finally finds common ground with Georgia and seconds the nomination.
(The motion was carried.)
PRESIDENT McNEIL: I believe that completes the business of the day and I presume a motion to adjourn is in order.
DR. CREWE: I move we adjourn.
(The motion was seconded by Dr. Bahnsen and carried and the meeting adjourned at four thirty-five o'clock.)
Adjournment.