Thirteenth Annual Meeting
OF THE
Inter-State Association
OF
Live Stock Sanitary Boards

Held in the Parlors of the Lexington Hotel, Michigan Avenue and Twenty-Second Street, Chicago, Illinois, September 13, 14 and 15, 1909
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Officers 1908-1909

President
Dr. W. H. Dalrymple, Baton Rouge, La.

Vice President
Dr. C. B. Nelson, Pullman, Wash.

Secretary and Treasurer
Dr. Chas. E. Cotton, Minneapolis, Minn

Officers 1909-1910

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Dr. Chas. E. Cotton, Minneapolis, Minn

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Secretary and Treasurer
Prof. J. J. Ferguson, Chicago, Ill.

Publication Committee

Dr. A. T. Peters,
Dr. John R. Mohler,
Dr. J. W. Connoway.
Meeting called to order by the President, Dr. W. H. Dalrymple, at 10:00 a. m.

The President—Gentlemen of the Association. The meeting will come to order. It is my pleasure to declare the thirteenth annual meeting of the Interstate Association of Live Stock Sanitary Boards open, ready for the transaction of business. The first item on the program is a few words of welcome to the Association by Hon. Phil. S. Haner, Chairman of the Live Stock Commission of the State of Illinois. [Applause.]

Mr. Haner—Mr. President and Gentlemen: I take pleasure, as a representative of one of the chief live stock states of the Union, in extending a cordial welcome to you who have gathered here from such wide spread territory.

To most of you the name “Chicago” immediately suggests stock yards, packing houses, and, in general, the centre of the world's live stock and meat traffic. Many of the states which you represent contribute freely to Chicago's leading position in the live stock world. Our great central market receives consignments of live stock from almost every state west of New York and east of the Rocky Mountains. Meat products from Illinois packers find their way to every city, town and village in the country, as well as the uttermost parts of the civilized world.

You will note from the program of your convention, that through the courtesy of the Chicago packers and officials of the Union stock yards, you are to have an unusual opportunity to see for yourselves the extent and magnitude of our live stock operations; also to note the wonderful developments in the way of improved equipment at this market. The Union stock yards have a capacity to handle daily, 75,000 cattle, 125,000 sheep, 300,000 hogs and 6,000 horses, for which are provided 500 acres of yards with 13,000 pens, 300 miles of railroad tracks and the manifold
equipment necessary to safely and speedily handle in a sanitary manner the millions of animals annually consigned. These yards have handled in one day 49,128 cattle; on another day 89,365 hogs and on a different date 59,362 sheep. Last year's total value of live stock receipts was $306,566,518.00.

Most of these animals are slaughtered and prepared for market in Illinois. To handle this immense trade there are numerous up-to-date packing houses, the larger of which have United States Government inspection and are thoroughly sanitary in their equipment and operation. All of these things you will be given an opportunity to inspect and study.

I trust that this meeting will be productive of great results, not only in systematizing the work along the lines of sanitation and control of contagious diseases among live stock, but that it may also be the beginning of a new and greater movement looking toward closer cooperation between the different live stock sanitary boards already existing. This great work of live stock sanitation has only begun. It presents an attractive and almost unlimited field for scientific investigation and practical application of reasonable methods for control of live stock diseases. In my opinion, the wonderful progress shown in the last two years along the line of state legislation, looking toward control of these matters, is only the beginning of what we may expect. While it is true in some instances, unreasonable state laws have been passed, most of the legislation is extremely valuable and can be added to as experience justifies. In this connection I believe good work can be done by this Association in working for uniform state laws regulating interstate traffic in diseased animals. While some contend that this is a work which properly belongs to the Federal Government and its Bureau of Animal Industry, a little consideration will show that most of it would necessarily go undone if left to the Federal authorities, who, in many instances are sadly overtaxed to provide men and funds to handle properly the work already under their charge. While regulation of interstate traffic in live stock is absolutely necessary to prevent infection of a state with a clean bill of health, it is, in my opinion, even more important to provide for interstate legislation which will prohibit the owners of diseased animals from passing them along to infect healthy herds. In my opinion the time is not far distant when breeders of pure bred animals shall be required to furnish certificate of health with each pure bred animals sold for breeding purposes. Such requirements may appear radical, but our work in Illinois convinces us that much of the tuberculosis found in the average herd can be traced to the infected sires bought outside by the owner.

I regret to confess that Illinois has not kept step with the march of progress along live stock legislation, but we are hopeful of great im-
provement and reasonable legislation in the near future. Without practical legislation behind them, live stock boards can accomplish but little, no matter how well inclined.

I hope that a full and free discussion may follow Dr. Luckey's report on Tuberculosis control in Missouri. Regardless of the vexed question of transmissibility to the human subject, every intelligent stockman knows that where control measures are wanting tuberculosis is steadily on the increase among farm live stock. Conservative men estimate that bovine tuberculosis costs the farmers and stockmen of the United States not less than $15,000,000 per year. Unless reasonable and universal action is taken this loss must steadily increase. Action rests largely with the members of this Association and I want to urge upon the convention the importance of giving this problem special attention.

I am pleased to report that through a recent Act of the Illinois General Assembly, the Illinois Board of Live Stock Commissioners is arranging for the equipment of a modern biological laboratory for the production and free distribution to the farmers of Illinois of such serum as may be necessary in our work against hog cholera, tuberculosis and other diseases. We are fortunate in having secured as the first director of this laboratory, Dr. A. T. Peters, so well and favorably known to the members of this Association, and also having such a valuable State Veterinarian as Dr. J. M. Wright, connected with our State Board, we should be in a position to render good service to the live stock interests of our State.

In conclusion, let me express the hope that this meeting may mark the beginning of a new era in this work. I trust that your stay with us may be pleasant and profitable and that great good to the interests we represent may result from our having come together. [Applause].

The President—I shall call upon Dr. Cary, of Alabama, to respond to the address of welcome. [Applause].

Dr. C. A. Cary—Mr. President and Gentlemen: I feel hardly able to respond to the welcome given us, because I do not feel able to represent the diversified interests that are represented here in this Association. Sometimes we do not realize the wide extent of the territory and the diversification of interests that are represented in this Interstate Association.

We certainly are glad to meet here in Chicago as the guests of the Illinois Live Stock Sanitary Board and the City of Chicago. I feel that today is but the beginning of the time when the veterinarian shall come into his own. I believe we are on the verge of the time when the veterinarian will stand in his true light in his relation to the health of life sustaining animals and the public. I believe he is going to get
his own and it is through meetings of this kind that we are going to achieve that result. The great work which is being taken up in all of the varied lines demands more than ever before. It demands a better quality of men, and we are prepared to furnish them. I can say this in general, that we certainly are thankful for the hearty welcome given us. And I hope that our meeting will do justice to the demands placed upon us. [Applause].

The President—The next item on the program is the president's address. I should like to say before giving my address, that, owing to having been abroad for the summer, I have had but little time to devote to preparing anything of an elaborate character. That would necessitate brevity, which, I do not suppose, will be a fault. It is only a small part of the program.

I should like to state that the Secretary informed me that last year there were seventeen states represented in the membership of this Association, and that this year there are twenty-eight states represented. This is very encouraging.

President's Address.

This meeting marks the thirteenth milestone in the onward march of this important and progressive national sanitary organization, and, I think, when we look back over those twelve years of endeavor and note the gradually increasing interest that has been manifested from year to year, we have every reason to congratulate the Association on the accomplishment of some real and substantial progress, and some actual and tangible good.

Some of the problems that have confronted the sanitarians of this country have, as all of you must know, been such as to "try men's souls." The stupendous task of coping with, and totally exterminating contagious pleuro-pneumonia from the United States stands as a monument to the professional ability, common sense and unflinching determination of our great national sanitary organization, the Bureau of Animal Industry of the United States Department of Agriculture.

The second victory, within very recent years, over that menacing plague to our national and international traffic in live stock, foot and mouth disease, places more stars upon our banner.

The extermination of the cattle tick, which it is estimated costs the southern states of our country annually, anywhere from 40 to 60 millions of dollars or more, and which requires only a little further time and a little more money to successfully complete the work, still further adds to our renown. And the more recent and successful results obtained from the valuable and painstaking investigations in connection with hog-cholera, again places us in the forefront, the civilized world over,
as not mere theorists, but a nation of doctors; or, in this particular connection, practical sanitarians.

These are but a very few instances of the things we have done, and are endeavoring to do, for the good of the country, and which are calculated to make the rest of the world "sit up and take notice."

But although we have accomplished so much, we must not "rest on our oars," as the work ahead of us is still of large proportions and will require that same indefatigable grit and energy characteristic of the true American spirit to successfully accomplish.

I think it may with truth be said that there is no branch of a state government that is of greater importance to the citizens of a commonwealth, from a health as well as an economic standpoint, than that which has the power to control and regulate the sanitary conditions of its live stock, and, when we consider for one moment that the farm animals of the Union represent in money value away up in the billions of dollars, and that a single disease of the zymotic class may destroy some millions of dollars' worth of live stock property in the course of a single year, the truth of my statement becomes doubly emphasized. In fact, the more this colossal subject engages our attention and our time, the more do we become convinced of its tremendous import, and of the urgent necessity for cooperation, nay, united effort, if we are to obtain the maximum of success in dealing with those destructive agencies which annually cost the community, the State and the country so much money.

Perhaps the most powerful factor that has still to be reckoned with today, as has been the case in the past, in preventing greater progress along sanitary lines connected with bacterial diseases, is an insufficiently educated public opinion, although writings on health are among the oldest in the world, and the subject has engaged the attention of the profoundest thinkers and the most renowned leaders of men.

The immortal Parkes, the founder of modern hygiene, and whom it is always my pleasure to quote, tells us that if we had a perfect knowledge of the laws of life, and could practically apply this knowledge in a perfect system of hygienic rules, disease would be impossible. That such a perfect knowledge of these laws is not likely to be obtained, or, rather, if obtained, is not likely to be acted upon, we have no reasonable doubt; the value of health will never be generally appreciated and the serious losses occasioned by disease seem only too readily effaced from the public mind.

It is the province of hygiene to seek out and determine the causes of disease, and to formulate rules and methods for their prevention and removal. It is a matter of impossibility, however, for the layman—and I mention layman here, because this Association has its lay as well as its scientific membership, and state live stock sanitary boards, gener-
ally, are largely composed of lay members. I say it is not possible for the layman to make a study of and familiarize himself with, all of the agencies at work in the production of disease. This implies a life-work, and, in the investigation of the numerous and contagious and infectious diseases of animals, a knowledge of the life histories of the various pathogenic or disease producing organisms—such as their identification, requirements for existence, methods of spread, the germicidal agents by which they may be effectually destroyed, the varying degrees of tenacity to life with which they are endowed, etc. These are matters which have to be left to the scientific investigator in the field of bacteriology, to whom we are so much indebted for the great advancement made, in more recent years, in the control of the many contagious and fatal diseases which have for centuries menaced the lives, both of mankind and animals throughout the civilized world. But it is possible, and a matter of the greatest importance, that the layman and the stock owning public in particular, should at least become acquainted with the more practical points demonstrated, and the more accurate conclusions arrived at, by scientists, in connection with this class of diseases, which may periodically occur to exterminate our flocks and herds and occasion pecuniary loss, and often financial ruin, to unfortunate owners and to the country.

It may not, of course, be necessary for the stockowner to know the minute differential characteristics that distinguish the germ of anthrax from that of tuberculosis under the microscope, nor their differences in measurement by microbs, but he ought to know and it would be to his advantage to know, and that as thoroughly as possible, the more intelligent sanitary methods to employ, in order to place a check upon, and limit the spread of, those dangerous enemies to his animals—the contagious diseases.

Wherever there exists a lack of such knowledge in this country, there is absolutely no good reason for it. Reliable literature bearing upon the subject abounds, and may be obtained free, or at a minimum cost, in the form of publications of the National Department of Agriculture, bulletins of our Agricultural Experiment Stations, in Farmers' Institute publications, and in many of the more reputable agricultural journals throughout the country.

But, notwithstanding these sources of information, it seems frequently to be the case, that, when a calamity, in the guise of a disseminating disease, attacks our live stock, we are found in supreme ignorance of the proper methods of attack and defense. We throw aside our judgment and open wide our doors to the inroads of the charlatan or the wily fakir, whose opportunity is our adversity.

In a section of the country where the value of livestock sanitation is not as yet appreciated as we would wish to see it, it has been my
personal observation that there are certain classes of individuals who are, during an outbreak of contagious disease, extremely dangerous, to say the least of it. One of these may be said to be the vendor of proprietary medicines who, though ignorant of the true nature of the disease, merely on the say-so of someone who has administered or applied his nostrum, advertises his drug or condition powder, or stock-food, as a “sure cure,” and to which the uninformed and unsuspecting stock owner “catches on.”

Another is the “would be benefactor” who has been similarly deceived into the belief that he has “hit” upon a specific which has “never failed,” and recommends it to his neighbor in adversity.

And a third, is the professional “fakir,” who neither knows nor cares what the disease may be, so long as he can “rake in the shekels” from the pocket of his credulous and confidence-reposing victim. This description may, however, apply to other sections of the country as well as my own. The danger here lies not in any special harm that may accrue from the remedy (?) per se, but in the reliability of the disease to spread, through the absence of any virtue—so far as the malady itself is concerned—in these so-called “specifics,” and the total neglect of any sanitary measures whatever, which, as we all know, are the only rational means by which to successfully combat the ravages of zymotic diseases.

Education or accurate information then, along such lines, alone, will release our stock owning public from the thraldom of such ignorance and empiricism. But it will do more, it will tend also to rob our contagious animal maladies of much of the terror and dread they have for so long held in the minds of the people.

Such a beneficient result would tend to relegate the errors of the past to the archives of a bygone age, to which they rightly belong and would permit the light of reason and intelligence to beam forth to obliterate the dark doings of empiricism, superstition and doubt, which have held such extended sway.

There is another point which I think will bear passing allusion. There are still some and these not all belonging to the laity, who still harbor extremely grave doubts, or, at all events, have very cloudy ideas, relative to the existence of those minute and lowly forms of life which we are pleased to denominate germs, bacteria, micro-organisms, etc. True, their existence would be more convincing to many of us, were they large enough to be “spotted” with the naked eye hovering around our cow stables, our hog-pens, etc., and if they could be exterminated by means of an organized “roundup” and a regular “germ-killing time.” But their microscopic dimensions and their insidious methods of conveyance, are by no means proof of their non-existence, and, although their parasitic mode of life often results so fatally to ourselves and our
domestic animals, they are not the result of spontaneous growth, but are a part of the creation of living things just as much as those higher up in the scale of creation.

It is very fortunate, however, that although bacterial forms of life are very numerous, and the majority of them of economic value in this progressive world of ours, the disease-producing forms are relatively few. Nevertheless, when some of the more dangerous of them are introduced into new or previously uncontaminated territory, their ravages frequently become so serious as to interfere with both national and international commerce in live stock, as was recently the case through the introduction of the infection of foot and mouth disease.

Contagion, or infection, then, is nothing more nor less than the presence of these lowly forms of life which we call germs, although it is a fact that those responsible for the production of some of our contagious diseases have not as yet been identified. This, however, is due, doubtless, to their very minute size and to the fact that, so far, instruments of sufficiently high magnifying power have not been produced to discern them. Foot and mouth disease, hog-cholera, etc., are examples, some of which are classed as filtrable viruses.

The sole aim, then, of the sanitarian, in whatever capacity he may be, whether connected with local health boards, State live stock sanitary boards or commissions, or the National Bureau of Animal Industry, is, by the employment of the most approved and effective methods within his power, to destroy these pathogenic organisms and thereby prevent their propagation, perpetuation and distribution. This, of course, requires training and accurate information on the part of the expert, but there is nothing chimerical about his methods; he is simply putting into practice the knowledge he has acquired from patient investigation and painstaking observation.

The infected area, however, is often permitted to extend for want of a proper appreciation of the importance of sanitary measures, on the part of stock owners, that an enzootic, or epizootic, of disease may possibly occur before the authorities are cognizant of its existence. On the other hand, if more accurate information regarding the laws of animal hygiene—which of course, includes sanitation—were acquired by owners of live stock, and, by their hearty cooperation with those having authority to deal with contagious diseases, many an outbreak which might otherwise assume the proportions of an extensive epizootic, would be "nipped in the bud" and great loss thereby be averted through the destruction and death of affected animals, representing a large sum of money, besides, as in the states recently infected with epizootic apthae, an embargo being placed upon our domestic and foreign trade in live stock from the infected territory.
A stock owning public, then, able (through more accurate information acquired) and willing to lend its united effort to assist those whose duty it is to labor in this important field of veterinary science would, in my humble judgment, be the most powerful agency for good in the prevention, control and eradication of those fatal animal plagues which, periodically, affect our live stock and carry such loss and devastation in their wake.

Gentlemen, the few remarks I have made may appear to the professional side of our organization as savoring, more or less, of the "kindergarten." However, as I have previously mentioned, there is a lay side also, and it occurred to me that a few plain sanitary facts, served up in an ungarnished manner, might be more intelligible, and be the means of stimulating this important element to greater co-operative activity in the work, although the great bulk of it must, of necessity, fall upon the shoulders of the executive officer, or expert sanitarian. Our scientific membership is already familiar with the necessary requirements for the carrying out of the sanitary procedure, each in his own state, and needs no special suggestion at my hand.

What we greatly lack, however, and which we hope to see crystallized into practical shape before this meeting concludes its deliberations, is some greater uniformity in the live stock sanitary laws in the different commonwealths. A strong committee was appointed at our meeting in Washington, D. C., last year to draft a law containing the fundamental principles of live stock sanitary laws, to be used as a basis in the framing of new laws and to report at this meeting of the Association. And I feel sure, from the personnel of this committee, that its report will be a most valuable aid in bringing about more uniformity which is so necessary for the maximum of success.

Another committee was appointed for, it seems to me, no less important a purpose, viz.: to draft a constitution and by-laws for this Association. We seem to have been drifting along for the past twelve years, very much like a ship, bearing a name, but not its port of entry. We are certainly old enough and important enough now, to be thoroughly organized, not only in name, but with our port of entry, and all the other requisites of an organization stamped upon our prow. It is to be hoped, in this case, also, that the committee having this matter in charge will be able to launch us afresh on our voyage of endeavor, more fully equipped to better accomplish the great work that yet lies before us.

Gentlemen, the President's address is but a very minor part of our program. We have before us a very full session's work. The papers are quite numerous and the subjects well chosen (thanks to the indefatigable energy of our worthy Secretary, Dr. Cotton), and it is to be hoped that the discussions will be extended and relevant and altogether in keeping with the importance of the topics treated. In fact, it is our
desire to see more real genuine good accomplished in behalf of the live
stock sanitary interests of the country, through the deliberations of this
organization at its thirteenth annual meeting, than has been the case
on any previous occasion, and that the more serious side of the work
may be so interspersed with the social, as to make our convention, not
only instructive and profitable, but pleasant and enjoyable, which I have
every reason to feel it will be. [Applause.]

THE PRESIDENT—The next item on the program is the roll call. The
following gentlemen responded to the roll call:

C. A. Cary, State Veterinarian and Secretary of the Live Stock Board,
Auburn, Alabama.

John Riechel, Bacteriologist, State Live Stock Sanitary Board, Philadel-
phia, Pa.

K. W. Stouder, Assistant Professor Veterinary Science, Manhattan, Kansas.

Paul Fischer, State Veterinarian, Columbus, Ohio.

J. J. Ferguson, with Swift & Company, Chicago.

Albert Dean, Bureau of Animal Industry, Kansas City.

S. H. Ward, Secretary and Executive Officer, State Live Stock Sanitary
Board, St. Paul, Minn.


M. H. Reynolds, State Live Stock Sanitary Board and State University Farm,
St. Paul, Minn.

G. Ed. Leech, City Dairy Inspector, Winona, Minn.

D. F. Luckey, State Veterinarian, Columbia, Missouri.

P. R. Barnes, Lawyer, Oxford building, Chicago, Illinois.


G. T. Bryan, Superintendent Live Stock, Guthrie, Oklahoma.

W. Lenton, Veterinarian, Experiment Station, Fayetteville, Arkansas.

T. M. Owen, Inspector in Charge, Bureau Animal Industry, Raleigh, N. C.

T. F. Russell, Member Board of Live Stock Commissioners, Illinois, Pana,
Illinois.

L. E. Willyoung, U. S. Army, Fort Sill, Oklahoma.


L. J. Allen, Veterinary Inspector, Oklahoma City, Oklahoma.

F. S. Schoenleber, Professor Veterinary Science, Kansas Agricultural College,
Manhattan, Kansas.

D. B. Clark, State Veterinarian, Madison, Wisconsin.

W. B. Mack, Veterinarian and Bacteriologist, University of Nevada, Reno,
Nevada.

Q. E. Dyson, 4201 Halsted st., Chicago.

Paul O. Koto, State Veterinarian, Des Moines, Iowa.

Paul Juckmiess, Deputy State Veterinarian, Lincoln, Nebraska.


G. E. Neson, Director of Agriculture, Manila, P. I.

M. Dorsett, Chief Biochemical Division, Bureau of Animal Industry, Wash-
ington, D. C.

B. H. Ransom, Chief, Zoological Division, Bureau of Animal Industry,
Washington, D. C.


W. F. Crewe, Executive Officer, State Live Stock Sanitary Board, Devils
Lake, North Dakota.
THE PRESIDENT—The next on the program is the report of the Secretary-Treasurer, Dr. Charles E. Cotton.

DR. COTTON—Gentlemen, my report is very short. You all understand that last year we had a complete stenographic report of the proceedings, for which we are indebted to the Bureau of Animal Industry. The report was so voluminous that I was afraid I would have to come to this meeting with a deficit, owing to the cost of printing it. I was afraid there would be a deficit in the neighborhood of one hundred dollars. But I got busy and kept sending out dunning letters until we succeeded in getting twenty-eight states enrolled in the membership. Oftentimes I was embarrassed by people writing to me wanting to know what constituted membership in the Association; what was necessary for them to do to become members; if the $10.00 was a membership fee or annual dues, and if the State paid the dues or membership fee, what representation they would be allowed in this body; in other words, if they were to have one representative with one vote, or if all of the
members of the Live Stock Board were eligible to membership on the one fee or dues and each had a voice in the meetings. You can appreciate my position. We had no constitution and by-laws. We never have had any that I know of. I took it upon myself to say that all members of a State Board who had paid their dues for the fiscal year would be considered members and each would have a voice on the floor of this meeting. I simply mention this to impress upon you the necessity for having a constitution and by-laws. There is another thing that is embarrassing me. This is a larger meeting than one we had a year ago, and the report will be larger. It looks to me as though the dues should be raised. This is simply a suggestion.

I will read my report as Treasurer: It is very short.

Dr. Charles E. Cotton, Secretary and Treasurer, in Account with the Interstate Association of Live Stock Sanitary Boards.

Balance in Treasury, September 16, 1908 ............... $ 42 85

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DISBURSEMENTS.

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Gentlemen, if you will allow me, I would like to suggest that the report be referred to a committee so that they can look over the receipts for the money disbursed, a Finance committee or Auditing committee.

A MEMBER—I move that such a committee be appointed by the President. Motion seconded. Carried.

THE PRESIDENT—I will appoint on that committee Dr. Cary, Dr. Reynolds and Dr. Nelson.

THE PRESIDENT—The next on the program is the submission of the minutes of the last meeting.

A MEMBER—I move that the report of the minutes of the last meeting, as published, be accepted as the minutes of that meeting. Motion seconded. Carried.

THE PRESIDENT—The next item is the report of the committees. Dr. Reynolds is the chairman of the Committee on Fundamental Sanitary Laws as a basis for the various States.

DR. REYNOLDS—We have had considerable correspondence during the year. We have our report drawn up simply in the rough. We have gone as far as we could until we should have an opportunity to meet here. Up to the present time the committee has not had an opportunity to meet and I shall ask for the privilege of deferring the report until later in the meeting.

THE PRESIDENT—If there is no objection, the committee will be given further time. So ordered.

THE PRESIDENT—The next is the report of the Committee on Constitution and By-Laws. Dr. Nelson, will you report for the committee?

DR. NELSON—This committee has never had a meeting and I believe practically nothing has been done. The chairman of the committee being absent, I recommend that a new chairman be appointed and that the committee be given a chance to consider the matter and report on the last day of the meeting.

A MEMBER—I move that the President appoint another member of the committee and that it be given time to consider and report on the last day of the meeting. Motion seconded. Carried.

THE PRESIDENT—I shall appoint on the committee Dr. Archibald, Dr. Nelson and Dr. Luckey.
THE PRESIDENT—The next is the Committee on Sanitary Laws and Regulations and the State officers of the various States. Dr. Melvin, chairman.

DR. MELVIN—Mr. President and Gentlemen of the Convention: In order that the report of this committee might be comprehensive in its scope, a request was sent to the Secretary of State or the State Veterinarian of each State for copies of all existing laws, regulations and proclamations relating to live stock sanitary affairs of the individual States. Responses embodying a greater or less degree of the desired information were received from all States with the exception of Arizona, Arkansas, Delaware and Iowa. From a study of the legislation presented, one feature assumes a prominence beyond all others—the remarkable advancement in the extent and character of tuberculosis legislation. This activity on the part of the State live stock sanitary officials and the veterinary profession is in harmony with the great wave of popular tuberculosis education which is surging over the people of this country, arousing public sentiment to the need of efficient legislation for assistance in the battle against tuberculosis both in the human family and in animals.

From our standpoint one of the fundamental steps to be taken by a State in an intelligent effort to control any disease is to make provision to prevent the entrance of diseased animals from other States. The States having legislation which in general requires that the freedom from tuberculosis of all dairy or breeding cattle shall be determined by means of a tuberculin test applied within a short time prior to their entrance into the State or immediately thereafter, are thirty-one in number. In fourteen the requirements were made previous to 1909: Alabama, Indiana, Massachusetts, Maine, Maryland, Minnesota, Montana, New Hampshire, New Jersey, North Dakota, Pennsylvania, Vermont (when deemed necessary), Washington and Wisconsin.

The present calendar year (1909) marks an epoch in this respect, that during nine months it has seen seventeen States, a greater number than in the combined previous years, create similar requirements: Colorado, Delaware, Idaho, Kansas, Kentucky, Michigan, Nebraska, New Mexico, New York, Oklahoma, Oregon, South Carolina, South Dakota, Tennessee, Utah, Virginia, Wyoming.

The admittance of cattle for exhibition purposes without complying with the tuberculin test requirement, which exception would seem to be particularly undesirable, is permitted by the following States: Minnesota, Montana, Washington, Wisconsin, Colorado, South Dakota.

New Mexico is the only State or territory requiring that all dairy or breeding cattle entering it shall be subject to a second tuberculin test applied after the expiration of three months. Ohio, in 1909, issued
a proclamation requiring the tuberculin test, but owing to a technical
error it has been canceled.

The compulsory testing of certain classes of animals within a State
is required by legislation in seven States. Kentucky and Utah provide
for the annual testing of all cattle used for dairy purposes within the
State. Minnesota, after January 1, 1910, requires that all pure bred
cattle within the State offered for sale shall be tuberculin tested. New
Mexico provides that all connected with the milk supplies of incorpo-
rated towns or cities shall be subjected to a tuberculin test. Oregon
states that the tuberculin test is required annually in all herds supplying
State institutions with milk, cream or buttermilk. Maine provides that
all pure bred cattle which are sold must be tuberculin tested before
delivery to the purchaser. The same requirement is in force for cattle
exhibited at State or county fairs. In Nebraska, cattle for dairy or
breeding purposes within the State which are sold at public markets
or stock yards must be free from tuberculosis, as indicated by the test.
Ohio made a requirement similar to that in Nebraska, but owing to a
technical error it, together with the interstate provision, has been can-
celed.

In 1909 three States made enactments restricting the sale and dis-
tribution of all tuberculins and malleins within their borders: Min-
nesota, New York and Pennsylvania. Serum laboratories have been
established in Illinois, New York, North Dakota and Pennsylvania.

Pasteurization or sterilization of creamery by-products used for
food purposes is required by Oregon and Vermont, in connection with
measures to prevent the spread of tuberculosis.

Compensation for animals which may be slaughtered on account of
communicable disease is provided for in twenty-five States. Some States
make compensation dependent upon the length of the animal’s residence
within the State, the disease for which it has been slaughtered and the
owner’s compliance with sanitary requirements. Where no compensation
is allowed, food animals are in some instances slaughtered, subject to
the United States meat inspection regulations. This is the case in
Nebraska, North Dakota and Utah. The following States provide
compensation: Connecticut, Florida, Illinois, Indiana, Kansas, Maine,
Maryland, Massachusetts, Michigan, Minnesota, Montana, New Hamp-
shire, New Jersey, New Mexico, New York, Ohio, Pennsylvania, Rhode
Island, South Carolina, Tennessee, Texas, Vermont, West Virginia,
Wisconsin, Wyoming.

Provisions appear in the legislation of the majority of the States
upon the subject of glanders. Compulsory slaughter may be said to be
general. Certificates of health accompanying horses entering a State
from other States are becoming a more frequent qualification; but the
mallein test is mentioned as a requirement by only Montana and Alabama.

Legislation in regard to southern cattle fever, scabies of cattle, and scabies of sheep is generally in harmony with the regulations and rules of the United States Bureau of Animal Industry.

The control of rabies is provided for most frequently in the middle Atlantic and New England States. Illinois is the only State having special enactments in regard to actinomycosis. The breeding of horses is under the supervision of stallion registration in Illinois, North Dakota and Pennsylvania. Meat inspection appears in the State legislation as follows: Pennsylvania and Colorado have systems designed to extend over the entire State. In Massachusetts and Michigan, cities and towns are authorized to establish meat inspection. Illinois provides for inspection when the presence of disease is suspected. With the preface of this general discussion, the committee presents a brief summary of the livestock sanitary laws of the individual States:

**ALABAMA.**

The State Live Stock Sanitary Board, with a State Veterinarian who is a professor of veterinary science in the Alabama Polytechnic Institute, supervise the control of communicable diseases.

J. A. Wilkinson, Montgomery, commissioner of agriculture and chairman of the Live Stock Sanitary Board, Dr. C. A. Cary, Auburn, State Veterinarian and Secretary of the Live Stock Sanitary Board.

Cattle for dairy or breeding purposes entering the state from any other state are required to be accompanied by a certificate of satisfactory tuberculin test, and the entrance of horses is subject to the mallein test.

No provision is made for detecting the presence of tuberculosis among the cattle of the state, but where such disease is known to exist the owner is required to notify the State Veterinarian. Tuberculous animals are maintained in quarantine or slaughtered under inspection. If tuberculous cattle are sold it can only be when accompanied by the declaration of the owner stating that the animals are tuberculous.

Regulations have been issued for the control of Texas fever, glanders, anthrax, hog cholera and sheep scabies. No provision is made for the appraisal of animals slaughtered on account of communicable disease. Meat or milk inspection is not mentioned.

**CALIFORNIA.**

The supervision of communicable diseases of animals in the State of California is under the control of a State Veterinarian, Dr. Charles Keanse, Sacramento. The State Dairy Bureau has entire control of the dairies within the state. In 1907 an act was passed providing for the appointment of a board of sheep commissioners, but this act is inoperative, as such a board has never been appointed. The following legislation was passed in 1909: An act requiring all veterinarians within the state to report immediately to the State Veterinarian concerning the presence or suspected presence of any communicable disease among animals. An act providing for the
eradication of scabies in sheep and requiring their dipping whenever considered necessary. An act providing for the control of Texas fever within the state and proclamations by the Governor concerning certain counties in California quarantined on account of Texas fever, and providing regulations for the transportation of such animals. Animals dying from any communicable disease are required to be immediately cremated or buried. There is no mention of meat inspection regulations.

COLORADO.

A State Board of Stock Inspection Commissioners together with a State Veterinarian supervise diseases of live stock in Colorado, L. B. Sylvester, Denver, President State Board of Stock Inspection Commissioners, Dr. Charles G. Lamb, Denver, State Veterinarian. Power is granted for the slaughter of animals to prevent the spread of communicable diseases. No provision is made for compensation. In accordance with an order of 1907 all cattle which are found to be tuberculous shall be branded with a perpendicular line not less than three inches long placed upon the forehead between the eyes. A proclamation by the Governor requires that after August 15, 1909, all cattle for breeding or dairy purposes entering Colorado from another State shall be accompanied with a certificate of satisfactory tuberculin test. Cattle may enter Colorado for exhibition at fairs without the tuberculin test when accompanied by a permit. Authority is given for the slaughter of diseased stock, but no provision is made for compensation. The branding of range cattle is under the supervision of the State and an official branding book is maintained. The branding or ear marking of sheep is controlled in the same manner. Regulations similar to those of the Bureau of Animal Industry are enforced for the control of splenetic fever and scabies of cattle, scab of sheep, dourine of horses and hog cholera and swine plague. In 1907 regulations were issued governing the slaughter and inspection of animals within the State, the carcasses or products of which were to be used for food purposes. These regulations embody sanitary conditions as well as the methods for the disposal of the diseased carcasses. The enforcement of these regulations is under the supervision of the State meat and slaughtering plant inspector.

CONNECTICUT.

Communicable diseases of domestic animals in Connecticut are under the supervision of a Commissioner on Domestic Animals, who is a practical farmer and stock breeder of at least 10 years' experience, but not a veterinarian, Herman O. Averill, Hartford, Connecticut, Commissioner on Domestic Animals. The quarantine and slaughter of animals is only permitted when the animals show physical evidence of disease and no quarantine shall be maintained for a period longer than 30 days. Animals which are ordered to be slaughtered are appraised and the full value of appraisal is paid. No animal which has not been within the State for more than six months is included in the above provision. The selectmen are specially designated, but all persons are required to report to the Commissioner any suspected cases of communicable disease. In 1905 an act was passed providing for the control of glanders among horses and mules and for the quarantine or slaughter of infected or exposed cases. In 1906 legislation was passed concerning the eradication of rabies, which at that time was prevalent in various sections of the State. Towns have the authority to offer a bounty for the destruction of any dogs not kept in conformity with all local regulations concerning
the taxing, licensing, etc. The tuberculin test is not required in any case except upon recommendation of the Commissioner. There are no regulations to prohibit the entrance of cattle from other states without the tuberculin test. A small amount of dairy inspection is carried on, but no mention is made of meat inspection.

FLORIDA.

In 1909 an act was passed placing the control of communicable diseases of animals under the State Board of Health and a veterinarian of that Board, Dr. James Y. Porter, Jacksonville, State Health Officer, Dr. Thomas J. Mahaffy, Veterinarian, State Board of Health. All persons are required to report the suspected presence of any communicable disease to the State Board of Health. Provisions are made for the effectual disposal of carcasses of animals dying from communicable diseases. Authority is given the State Health Officer to require the slaughter of diseased animals, in which case they may be appraised and payment made provided that no more than $75 shall be paid for any horse or mule and no more than $50 for any other domestic animal. Reimbursement is granted only when the animal has been owned and kept within the State of Florida during at least one year previous to its condemnation, and that said animal contracted the disease for which it had been condemned while in the State of Florida. No person shall be paid for more than 10 animals in any one year. Tuberculosis is only classed with diseases dangerous to live stock when it appears at advanced stages or as tuberculosis of the udder. No mention is made of meat or dairy inspection.

GEORGIA.

Communicable diseases of animals in Georgia are under the supervision of Thomas G. Hudson, Atlanta, Commissioner of Agriculture, there being no State Veterinarian. The regulations of the United States Department of Agriculture concerning interstate cattle transportation are adopted as a portion of the regulations of the Commissioner, this having special reference to Texas fever. No provision appears for the destruction of animals affected with communicable disease, although quarantine is authorized. There is no mention of meat or dairy inspection.

IDAHO.

In 1905, a State Live Stock Sanitary Board was created and the Governor authorized to appoint a State Veterinarian, Dr. George E. Noble, Boise, State Veterinarian. Power is given to require the slaughter of animals affected with communicable disease and the destruction of their carcasses. Such animals are considered to be without property value. April, 1909, the Governor issued a proclamation requiring that all cattle for dairy or breeding purposes entering Idaho from another State must be free from tuberculosis as indicated by the tuberculin test. This proclamation is to be enforced to December 31, 1909. The sale of meat or milk from animals infected with communicable disease is prohibited. Rulings are made to control sheep scab in accordance with the regulations of the Bureau of Animal Industry. Sheep entering Idaho from other States are subject to inspection and must be accompanied by a satisfactory certificate or shall be dipped. No mention is made of meat or dairy inspection.
ILLINOIS.

Communicable diseases of animals in this State are under the control of the State Board of Live Stock Commissioners and the State Veterinarian, W. E. Savage, Springfield, Secretary, Board of Live Stock Commissioners, Dr. J. M. Wright, Chicago, State Veterinarian. All persons in the State of Illinois are required to notify the commissioners or the State Veterinarian of the suspected existence of any communicable diseases of animals. The Board has the power to require the slaughter of diseased or exposed animals and the destruction of the barns, stables, etc., when disinfection would not be considered a satisfactory method to prevent the spread of such disease. Provisions are made for the appraisal of animals which may be slaughtered. In default of any appropriation for making investigations and reporting cases of tuberculosis, work in this direction, including the tuberculin test, can only be done at the expense of the owners. Official tuberculin tests are applied when the owner makes application, setting forth that he will take all necessary precautions in the control of tuberculosis upon his premises. All cattle which react to the tuberculin test are tagged and an accurate description of the animal, together with the tag number forwarded to the Commissioners. Regulations are enforced concerning the interstate movement of cattle or sheep affected with scabies, and cattle from the area quarantined on account of Texas fever. In 1894 special rules were adopted providing for the inspection and slaughter at the Union Stock Yards, Chicago, of animals affected with actinomycosis. In 1907 an act was passed providing for the inspection of any animal intended for human food appearing to be diseased and for the disposal of carcasses. A bill was passed effective July 1, 1909, establishing and maintaining a laboratory for the production of hog cholera serum, and other biological products for free distribution to the live stock producers of the State of Illinois. In June, 1909, an Act was approved creating a stallion registration board and providing for the registration of stallions.

INDIANA.

Animal diseases in Indiana are under the supervision of the State Veterinarian, Dr. W. E. Coover, Indianapolis. All persons within the State are required to report the suspected presence of any communicable disease among animals to the local health officer, who reports to the State Veterinarian. Tuberculous cattle may be either quarantined or slaughtered, the carcasses being disposed of in accordance with the meat-inspection regulations of the Bureau of Animal Industry. Reimbursement for cattle thus slaughtered shall not exceed the sum of $25. The proclamation of July, 1908, providing that all dairy and breeding cattle entering Indiana from another State must be accompanied by a satisfactory tuberculin test was made in 1909 an act instead of a proclamation.

KANSAS.

The Live Stock Sanitary Commissioner and the Veterinarian of the State Agricultural College supervise the animal diseases of Kansas, Dr. J. H. Mercer, Topeka, Live Stock Sanitary Commissioner, Dr. F. H. Schoenleber, Manhattan, Veterinarian, Experiment Station. March, 1909, a bill was passed for the suppression of tuberculosis in cattle. This provides that any cattle that are suspected of being tuberculous may be tuberculin tested, and if they should react they may be appraised and slaughtered. Provisions are made for the disinfection of premises under official supervision and at the owner's
The use of tuberculin is limited to persons licensed by the Live Stock Sanitary Commissioner, except in the case of owners of animals. May, 1909, regulations were issued providing for the tuberculin testing of all dairy cattle entering the State of Kansas from other States. The movement of cattle into and within the State is restricted in preference to the spread of Texas fever and scabies. No mention is made of meat or milk inspection.

KENTUCKY.

Communicable diseases of animals are under the supervision of the State Board of Health, and a veterinarian to that Board, Dr. J. N. McCormack, Bowling Green, Secretary, State Board of Health; Dr. F. T. Eisman, Louisville, State Veterinarian.

In 1909 the State Board of Health issued a proclamation requiring the tuberculin testing of all animals of the bovine specie, except those for immediate slaughter, entering the State from another State. It also requires the tuberculin testing of all dairy cattle within the State of Kentucky. Provisions are made for the slaughter or quarantine of diseased animals, but no mention is made of compensation. Meat inspection is not mentioned.

LOUISIANA.

The State Veterinarian is the executive officer of the State Live Stock Sanitary Board, Dr. W. H. Dalrymple, Baton Rouge, Veterinarian, Experiment Station. An Act makes it unlawful to bring into the State any animals knowing them to be affected with any communicable disease, but no mention is made of tuberculosis. Power is given for action in connection with Texas fever. No provision is made for appraisal. There is no mention of meat or dairy inspection.

MAINE.

The State of Maine Cattle Commissioners supervise communicable diseases. These Commissioners are not Veterinarians. All pure bred cattle entering the State of Maine from any other State must be tuberculin tested within thirty days following their arrival. The grade cattle are to be tested immediately after their arrival. No provision is made for recognizing the certificate of tuberculin test made by any other than a veterinarian in the employ of the State of Maine. All pure bred cattle which are sold within the State must be tuberculin tested before being delivered to the purchaser. Animals which are slaughtered on account of the presence of tuberculosis are appraised, in the case of pure bred stock at a sum not to exceed $100, grade stock not to exceed $50. Reimbursement is paid at the rate of 50 per cent. No payment whatever is made for animals which have not been within the State for at least three years. All pure blood cattle for breeding purposes exhibited at fairs shall be required to be free from tuberculosis, as shown by tuberculin.

MARYLAND.

The live stock diseases in Maryland are under the care of a State Live Stock Sanitary Board and a chief veterinary inspector, Wade H. D. Warfield, Secretary Live Stock Sanitary Board, Baltimore, Dr. F. H. Mackie, Chief Veterinary Inspector, Baltimore. Power is given for the issuance of
quarantine regulations, the destruction of diseased animals, disinfection or destruction of buildings and other contaminated material. When deemed necessary animals may be appraised before slaughtered and appraisal may be made for buildings, etc., which may be destroyed. No mention is made of the amount of appraisal. Veterinarians are required to notify the Board concerning all cases of suspected contagious disease among animals which may come to their knowledge. July 1, 1908, there became effective an order providing that all dairy cows and meat cattle shall be subjected to the tuberculin test either before entering the State or immediately thereafter. No provisions are made for meat inspection.

Massachusetts.

The Cattle Bureau of the State Board of Agriculture through the chief of the Bureau controls the communicable diseases of animals in Massachusetts, Dr. Austin Peters, Boston, Chief of the Cattle Bureau. The jurisdiction of the Cattle Bureau extends over the entire State of Massachusetts, with the exception of the city of Boston. According to an order of the Bureau in 1908, all cattle except those for immediate slaughter, or calves under six months old, entering Massachusetts from another State, must be tested with tuberculin by an agent of the Bureau after arrival at destination, the only exception being cattle brought in from foreign countries which have passed a test given by an agent of the United States Bureau of Animal Industry. Authority is given to require the quarantine or slaughter without compensation of animals affected with a communicable disease except that cattle which are slaughtered on account of tuberculosis after having been tested by an agent of the Cattle Bureau be appraised at a sum not to exceed $40. No compensation is given when owners have failed to comply with reasonable regulations relative to sanitation and disinfection. In cases where an animal is slaughtered and found to be free from a communicable disease, a reasonable sum shall be paid by the State. All persons are required to report the suspected presence of any case of communicable disease. The tuberculin test may be applied to cattle within the State upon the consent of the owner and without expense to him. Boards of Health of cities and towns may inspect the carcasses of all slaughtered animals and all meat products and regulations may be issued in conformity with those of the United States Bureau of Animal Industry. Orders have been issued for the control of glanders within the State, also to prevent the spread of rabies.

Michigan.

Animal diseases are under the control of the State Live Stock Sanitary Commission and a State Veterinarian, H. H. Hinds, Stanton, President State Live Stock Sanitary Commission, Dr. W. M. Morris, Cass City, State Veterinarian. In accordance with an act effective September 1, 1909, the entrance of cattle into the State for breeding or dairy purposes is prohibited excepting when such cattle are accompanied by a certificate of tuberculin test. This does not cover the movement of cattle on cars when consigned from one State through Michigan to another State. In the case of tuberculous cattle which are slaughtered, appraisement is made by the Commission and the owners receive 50 per cent of the value of the animal, not exceeding $50. Compensation is not granted unless premises have been previously kept in a sanitary condition and are disinfected in a manner to prevent the further spread of the disease. Tuberculous cattle may be slaughtered under Federal inspection, the price received for carcasses passed in such inspection being
deducted from the amount of reimbursement by the State. All cases of suspected or known communicable disease among animals are required to be reported promptly by any person having such knowledge. Local boards of health are required to investigate reports of communicable diseases among animals in their vicinity. A State Act gives any city or village the authority to appoint an inspector of animals and meat supplies and to regulate the sanitary conditions of slaughter houses. No mention appears of dairy inspection.

MINNESOTA.

The State Live Stock Sanitary Board and Dr. S. H. Ward, St. Paul, Secretary, supervise the communicable diseases among animals in Minnesota. Local boards of health are required to assist the Live Stock Sanitary Board. Regulations have been issued for the control of glanders, sheep scab, horse mange, cattle mange, and hog cholera and swine plague. An Act of 1907 provides that all cattle for beering and dairy purposes which are brought into Minnesota from other States must be accompanied by a certificate of a satisfactory tuberculin test. This requirement is not effective for cattle which are intended for exhibition at the various fairs. Whenever the Board decides upon the killing of an animal affected with tuberculosis or glanders the expense of transportation and yardage are borne by the State for the movement of such cattle to an abattoir within the State where United States meat inspection is maintained. Appraisals for cattle shall not exceed $35 per head and for horses $75, except in the case of pure bred animals when the maximum shall not exceed $75. If upon post-mortem examination the animals are found not to be affected with a communicable disease reimbursement is made for the full appraised value, but if found diseased three-fourths of the appraised value is paid after deducting for the sale of the carcass or hides. In 1909 an Act was passed regulating the distribution of tuberculin and mallein to licensed veterinarians and to prevent the discrimination among veterinarians by the State Live Stock Sanitary Board. This act requires that tuberculin and mallein be furnished to veterinarians of that State without regard to whether such veterinarians are graduates or not. In 1909 an act was passed restricting the sale of mallein and tuberculin and requiring that every druggist or other person in the State of Minnesota who shall sell or furnish mallein or tuberculin shall on the same day report to the Live Stock Sanitary Board, giving the names and addresses of persons receiving the products and the amount which they have received. An act passed in 1909 becoming effective January 1, 1910, prohibits the sale of pure bred cattle unless accompanied by a certificate of health, including a satisfactory tuberculin test. In 1907 an act was passed requiring that horses, mules, asses, cattle, sheep, or swine must be accompanied by a health certificate before entrance into the State of Minnesota is permitted. No mention is made of meat or dairy inspection.

MISSISSIPPI.

The Live Stock Sanitary Board, established in 1908, of which the professor of veterinary science at the Agricultural and Mechanical College acts as State Veterinarian, supervises the control of communicable diseases among animals in the State of Mississippi, Dr. James Lewis, Agricultural College, State Veterinarian. The Board has absolute power to deal with communicable diseases, special reference being made to Texas fever. Carcasses of animals which have been affected with a communicable disease shall be either burned or buried, and barns, etc., shall be disinfected at the owner's
expense, according to the directions of the State Veterinarian. Tuberculous cattle shall be quarantined and when slaughtered the carcasses shall be disposed of in accordance with the decision of a qualified meat inspector. The use of tuberculous cows in dairies is strictly prohibited. No special mention is made for the use of the tuberculin test as a diagnostic agent, nor are there any provisions for the appraising of tuberculous cows. Meat and milk inspection is not mentioned.

MISSOURI.

Live Stock Sanitary measures are under the control of the State Board of Agriculture with a State Veterinarian, George B. Ellis, Columbia, Secretary State Board of Agriculture, Dr. D. F. Luckey, Columbia, State Veterinarian. The tuberculin test is granted free to owners of permanent herds of cattle. No provision is made for the appraisal or slaughter of cattle on account of tuberculosis. In 1909 an act was passed for the control of Texas fever within the State and providing that certain animals which are deemed to be incurable may be slaughtered without compensation if they have been moved in violation of quarantine regulations, and the owner is held responsible for damage which they may have caused to other cattle.

MONTANA.

The State Live Stock Sanitary Board and the State Veterinarian supervise communicable diseases among animals of this State. The people of the State are required to report immediately the suspected presence of any cases of communicable disease. If tuberculosis is found to exist in a herd of cattle an official tuberculin test may be applied to the entire herd. Cattle which react may be held in quarantine or slaughtered under post-mortem inspection. The carcasses may be used for human food if tuberculous lesions exist to a slight degree only in the mesenteric and mediastinal lymph glands. Provisions are made for the appraising and for the reimbursement for animals which are slaughtered under the direction of the State Veterinarian, except that animals which are found to be affected with a dangerous communicable disease are without property value. In 1907 the Governor issued a proclamation requiring the tuberculin testing of all cattle for breeding or dairy purposes entering Montana from other States. A similar proclamation was issued in 1908 requiring the mallein testing of horses. According to a proclamation of 1907, all swine entering the State must be accompanied by a Federal or State health certificate. A board of Sheep Commissioners with the State Veterinarian supervises the admission of sheep from other States and the handling of sheep within the State in reference to sheep scab. In 1908 regulations were issued governing the exhibition of domestic animals at Montana fairs. Cattle for exhibition purposes are admitted when accompanied by a health certificate on physical examination, but the tuberculin test is required when such cattle are sold to remain within the State. Horses for exhibition or raising purposes are required to be accompanied by a health certificate, including the mallein test. Sheep and swine for exhibition are required to be accompanied by a health certificate and will not be permitted entry if they originate in a locality in another State in which communicable diseases of sheep or swine are known to exist.

NEBRASKA.

The Governor of the State acts as State Veterinarian and appoints a deputy who has charge of the work, Dr. Paul Juckness, Lincoln, Deputy State
Veterinarian. Regulations of 1909, effective Aug. 16, require that all cattle for dairy or breeding purposes entering Nebraska from other States shall be accompanied by a health certificate indicating freedom from mange and a certificate of satisfactory tuberculin test, also that all cattle bought at public market or stock yards in the State of Nebraska to be used for dairy purposes or breeding cattle eligible to registry in the State of Nebraska, must be held in quarantine and pass a satisfactory tuberculin test before being permitted to be removed. All cattle found to be affected with tuberculosis within the State of Nebraska shall be sold, subject to post-mortem inspection, only to such establishments where Federal inspection is maintained. Horses are admitted into Nebraska when accompanied by a health certificate indicating that they are free from such diseases as horse mange and glanders. Certain counties within the State are under State quarantine on account of the existence of cattle scabies. All persons are required to report the suspected presence of communicable diseases and the Deputy State Veterinarian has the authority to order the destruction without compensation of animals which are thus affected. A provision is made for the disposal of diseased carcases and for disinfection of premises which have been exposed to the infection of a communicable disease. No mention is made of meat or dairy inspection.

NEVADA.

Communicable diseases in Nevada are under the supervision of the State Veterinarian and a State Board of Sheep Commissioners, Dr. T. F. Richardson, Goldfield, State Veterinarian. Provisions are made for the dipping of all sheep within the State whenever deemed necessary by the Commissioner. The movement of sheep within and into the State is controlled in reference to scabies. No mention is made of communicable diseases of other animals nor of meat or dairy inspection.

NEW HAMPSHIRE.

The control of animal diseases is under the supervision of the State Board of Cattle Commissioners, N. J. Bachelder, Concord, Secretary, Board of Cattle Commissioners. The Commissioners are authorized to destroy animals affected with contagious diseases and reimbursement at the rate of one-half of the appraised value is provided in the case of those animals which have been in the State for at least three months. All meat cattle entering New Hampshire from other States must be accompanied by a certificate of satisfactory tuberculin test. Cattle for grazing purposes may be admitted without the test. Upon written application by the owner, including his agreement to disinfect his premises and take proper precautionary measures against the re-introduction of the disease, the Commissioners may cause the tuberculin test to be applied to his herd. There is no provision for meat or milk inspection.

NEW JERSEY.

Communicable diseases of animals are under the control of the State Board of Agriculture and the State Bovine Tuberculosis Commission, E. B. Voohees, New Brunswick, President State Board of Agriculture, Franklin Dye, Trenton, Secretary. All cattle entering the State of New Jersey for dairy or breeding purposes are required to be proven free from tuberculosis by means of the tuberculin test. Provisions are made for the slaughter of animals affected with communicable diseases and for their appraisal and re-
imbursement. Payment is made upon three-fourths of the appraised value, which is not to exceed $40 in grade cattle and $100 in registered cattle. The people of New Jersey are required to notify the State Board of Health or the Tuberculosis Commission concerning the suspected existence of communicable diseases. As early as 1864 legislation was passed providing for the destruction of horses which were known to be affected with glanders. Regulations are also effective for the prevention of the spread of rabies.

**NEW MEXICO.**

Communicable diseases of animals in New Mexico are under the supervision of the Cattle Sanitary Board and the Sheep Sanitary Board. E. G. Austen, East Las Vegas, Secretary of Cattle Sanitary Board, Harry F. Lee, Albuquerque, Secretary Sheep Sanitary Board.

According to an act of 1909 all persons are required to give notice concerning the suspected existence of any communicable disease. All cattle intended for dairy or breeding purposes entering this State from any other state must be accompanied by a certificate of tuberculin test, and must be tested within three months after arrival at destination in New Mexico by a veterinarian of the Cattle Sanitary Board.

All cattle connected with the milk supply of incorporated towns or cities shall be tuberculin tested. Animals slaughtered on account of communicable diseases are subject to appraisal not exceeding $100 for pedigree stock and $60 for an animal not pedigreed, and reimbursement is made. Regulations have been issued for the control of glanders. No mention is made of meat or dairy inspection. All brands are required to be registered with the cattle sanitary board.

**NEW YORK.**

The State Department of Agriculture controls communicable disease among animals through a Commissioner of Agriculture and a Chief Veterinarian. R. A. Pearson, of Albany, Commissioner of Agriculture. Dr. J. F. Devine, Albany, Chief Veterinarian.

Authority is given for the quarantine and destruction of all diseased animals. Cattle which exhibit physical evidence of tuberculosis may be ordered killed; but the owner has the right to apply for a tuberculin test. This test is also made upon the request of owner when they agree to disinfect their premises and slaughter or maintain under strict quarantine, under the direction of the commissioner of agriculture, all cattle which react to the test.

Provision is made for the appraisement and reimbursement of owners for cattle slaughtered on account of tuberculosis, and horses affected with glanders. The maximum appraisal allowed for cattle is $75 and for horses $125. Reimbursement is based upon the extent of the lesions found, in the case of cattle. If the carcass exhibits localized lesions, permitting it to be passed for food, 80 per cent of the appraised value is paid. If generalized tuberculosis is present, 50 per cent is paid. The meat of cattle which show localized tuberculosis, together with the hides, may be sold by the commissioner of agriculture, and the money turned into the state treasury. Reimbursement is not given for any cattle which have been in the State of New York less than six months.

Veterinarians are required to report the suspected presence of any communicable disease. An act of 1909 provides that all tuberculin sold within
the State must be reported to the commissioner of agriculture, giving the amount sold and the name and address of the purchaser. All tuberculin tests are required to be reported within one week. Animals which react shall be branded upon the forehead or right side of the neck with a capital T, or may be maintained in quarantine provided a satisfactory description of them is filed with the commission of agriculture.

According to an article appearing in the New York City Commercial, August 21, all dairy and breeding animals entering the State of New York from other states must be maintained in quarantine until shown to be free from tuberculosis by both physical examination and tuberculin test.

Dairy inspection is carried on under the supervision of the commissioner. No mention is made of meat inspection.

NORTH CAROLINA.

The supervision of communicable diseases of animals is under the board of agriculture, the commissioner of agriculture, and a veterinarian. W. A. Graham, Raleigh, Commissioner of Agriculture, Dr. W. G. Chrisman, Raleigh, Veterinarian.

No special mention is made of tuberculosis. Animals affected with glanders are required to be slaughtered. Regulations provide for the proper disposal of carcasses of animals dead from a communicable disease. The regulations of the U. S. Bureau of Animal Industry concerning Texas fever are adopted by the State Board of Agriculture. No mention is made of meat or dairy inspection.

NORTH DAKOTA.

The Live Stock Sanitary Board with its State Veterinarian supervise the control of communicable diseases. W. L. Richards, Dickinson, Secretary of Live Stock Sanitary Board. Dr. W. F. Crewe, Devil's Lake, State Veterinarian.

All persons are required to report to the State Veterinarian any suspected case of communicable disease among animals. All animals entering the State of North Dakota from another state are required to be accompanied by a certificate of health issued at the point of origin. In the case of dairy or breeding cattle a certificate of tuberculin test applied within thirty days of the date of shipment is required.

Swine entering the State for exhibition purposes are required to have been properly immunized against hog cholera by means of the Dorset-McBride-Niles hog cholera hyper-immune serum.

An act of 1909 provides that all tuberculous cattle shall be permanently marked by punching the letter T in the left ear. Regulations are enforced for the control of horse mange, cattle mange, sheep scab, hog cholera and glanders. The post-mortem inspection of food producing animals slaughtered by direction of the Live Stock Sanitary Board is made to conform with the rules and regulations of the U. S. Bureau of Animal Industry regarding meat inspection.

Another act of 1909 provides for the establishment of a serum institute for the manufacture and free distribution of such agents as may be useful and necessary in the eradication, prevention and control of various communicable diseases.

No mention is made of dairy inspection.
A State Board of Stallion Registration requires that all stallions must pass a satisfactory veterinary inspection before registration. Any condition which is believed to be hereditary or to constitute a transmissible unsoundness would bar the animal from registration.

**Ohio.**

The State Department of Agriculture has as an adjunct a Board of Live Stock Commissioners and a State Veterinarian, Dr. T. L. Calvert, Columbus, Secretary State Live Stock Commission, Dr. Paul Fischer, Columbus, State Veterinarian. The people of the State are required to report the presence or suspected presence of any cases of communicable disease among animals. The laws for a tuberculin test under the direction of the Board of Live Stock Commissioners upon the request of the owner with the agreement that all animals reacting will be destroyed, the premises disinfected, and cattle added to the herd to be tuberculin tested, and further that the entire herd will be re-tested annually. Cattle destroyed on account of tuberculosis have been paid for at the full appraised value less the amount received for hides and for those carcasses that passed inspection. In 1909 there was issued a proclamation providing for the tuberculin testing of cattle entering Ohio from other States, also for the testing of cattle in public stock yards which were sold for dairy or breeding purposes. Owing to a technical error this proclamation was canceled. Regulations prohibit introduction into Ohio of splenetic fever, hog cholera, glanders, sheep scab, and other communicable diseases. No mention is made of meat or dairy inspection.

**Oklahoma.**

The State Board of Agriculture supervises the control of communicable diseases among animals, and employs for its assistance two veterinarians. G. T. Bryan, Guthrie, Secretary of Live Stock Department of Oklahoma Board of Agriculture. Doctors J. K. Callicotte, Guthrie, and W. B. McAlester, Guthrie, veterinarians to the State Board of Agriculture.

A proclamation was issued in 1909 for the control of Texas fever, establishing special quarantine areas. By the same proclamation all cattle entering the state for breeding purposes and dairy purposes must be accompanied by a health certificate, including the tuberculin test. Quarantine lines were also established in reference to cattle mange.

All hogs entering the state for breeding purposes are required to be accompanied by a certificate of health in reference to hog cholera and the non-existence of this disease in the community whence they were shipped. Horses and mules are also required to be accompanied by health certificates. No mention is made of meat or dairy inspection.

**Oregon.**

The State Veterinarian, who is also State Sheep Inspector, is in accordance with an act of 1909 a member of the State Board of Health, Dr. W. H. Lytle, Pendleton. The same act provides for the tuberculin testing of all cattle for dairy or breeding purposes, except in strictly range cattle which enter the state from other states. There is also a section which requires that the tuberculin test shall be applied at least once each year to all cows supplying milk, cream, skim milk, or buttermilk to inmates of all state institutions. Animals affected with communicable diseases are slaughtered, but no provision is made for reimbursement. Cases of tuberculosis are al-
allowed to be quarantined unless they exhibit physical symptoms. All milk products returned from public creameries, etc., which are used as an animal food are required to be heated before leaving the creameries to a temperature of not less than 185 degrees Fahrenheit for at least 15 minutes. The sale of meat or dairy products from diseased animals is prohibited. Veterinarians are required to report all cases of communicable diseases among animals. The handling of sheep scab is in accordance with the rules and regulations of the Bureau of Animal Industry, power being given to quarantine areas within the State.

**Pennsylvania.**

This State controls its animal diseases by means of a State Live Stock Sanitary Board and a State Veterinarian.

Edwin S. Stuart, Harrisburg, Governor of the State and President of the Live Stock Sanitary Board. S. H. Gilliland, Harrisburg, Secretary of the Board and State Veterinarian.

In 1898 provision was made for the tuberculin testing of all cattle entering the State of Pennsylvania for dairy or breeding purposes. Tuberculin tests are applied to herds of cattle in the state without expense to the owners, after they have signed an agreement for the proper disposal of reacting animals, disinfection of premises, and testing of all animals which may be added to the herd. Cattle which are slaughtered for feeding purposes and found upon post-mortem inspection to be tuberculous may be appraised and payment made.

An Act of 1909 provides that the maximum limit of appraisal for animals which it may be deemed necessary to destroy shall be, for a horse or mule $60, for a bovine animal of common stock $40, for pure bred or registered bovine animals $70, for a sheep or pig $10; provided that the amount of appraisement shall not exceed two-thirds of the actual value. Carcasses of food producing animals which pass inspection shall be sold by the owners and the amount received deducted from the amount of reimbursement by the state.

The sale and the use of tuberculin within the state is required to be reported to the State Veterinarian within one week of the sale or test. Compensation is not granted for animals which have been in the state less than four months. Numerous acts have been passed relative to rabies of dogs. An Act of 1907 provides for a system of meat inspection, and in consequence rules and regulations governing sanitary conditions, marking or branding meats and the disposal of affected carcases have been issued.

Provision is made for the registration of all stallions in public service within the state. Before obtaining a license the stallion must pass a satisfactory examination by a veterinarian, showing that he is free from hereditary or transmissible unsoundness. A system of milk inspection is in force, and the board is empowered to assist local boards of health in relation to their milk supplies. All persons are required to report suspected cases of any communicable disease. Regulations are promulgated by the board from time to time for the control of any or all of the communicable diseases of animals. The appearance of epizootic lymphangitis among horses and mules was met by stringent regulations.

**Rhode Island.**

The State Board of Agriculture, with the Cattle Commission and a veterinarian, supervise the animal diseases of Rhode Island.
John J. Dunn, Providence, Secretary of the State Board of Agriculture; Dr. John S. Pollard, Providence, veterinarian for the State Board of Agriculture.

Cattle slaughtered on account of being affected with tuberculosis are appraised, if they have been within the state at least three months, at a maximum not to exceed $50 for native cattle, $75 for grade, and $100 for registered cattle. Payment is made at the rate of one-half of the appraised value, except in the case of errors in diagnosis, when the full appraised value is paid. The state veterinarian has authority to require the slaughter of any animal affected with any communicable disease and the proper disposal of the carcasses. All persons within the state are required to report the suspected presence of communicable diseases. No special regulations have appeared in reference to diseases other than tuberculosis, and no mention is made of meat or milk inspection.

SOUTH CAROLINA.

The Board of Trustees of the Clemson Agricultural College directs the college veterinarian, who acts as a state veterinarian for the supervision of communicable diseases of animals.

Dr. M. Ray Powers, Clemson College, State Veterinarian.

In 1909 an act was passed providing that all live stock entering the State of South Carolina for purposes other than immediate slaughter must be accompanied by a general health certificate; and in the case of cattle over six months of age the non-existence of tuberculosis must have been determined by the tuberculin test; but this does not apply to cattle for exhibition only. Provisions are made for the quarantine and slaughter of animals for communicable disease. Reimbursement is granted for tuberculous and glandered animals, provided that they have been owned and kept within the state for one year preceding their slaughter. The actual cash value of the destroyed animals immediately prior to killing shall be determined, and the value of the carcasses shall be deducted from the value of the living animal, and three-fourths of the remainder paid by the State, not to exceed $75 for a horse, or $35 for a cow. Regulations are promulgated for the control of Texas fever, in conformity with those of the U. S. Bureau of Animal Industry. No mention is made of milk or meat inspection.

SOUTH DAKOTA.

Communicable diseases are under the supervision of a State Live Stock Sanitary Board and a State Veterinarian. Dr. Thomas H. Hicks, Milbank, Chairman of the Board and State Veterinarian. C. L. Eakin, Blunt, Secretary of the State Live Stock Sanitary Board.

In 1909 the admission of cattle for breeding and dairy purposes from other states was prohibited unless such cattle are accompanied by a certificate of satisfactory tuberculin testing. Regulations have been issued for the control of mange in cattle and of anthrax.

TENNESSEE.

Communicable diseases of animals are supervised by John Thompson, Nashville, Commissioner of Agriculture, and J. H. McDowell, Nashville, Live Stock Commissioner.
According to an act of 1909, dairy cows and meat cattle entering the State for breeding purposes are required to have been subjected to a tuberculin test. Provisions are made for the control of Texas fever and sheep scab in conformity with the regulations of the U. S. Bureau of Animal Industry.

The State Live Stock Inspector is authorized to require the slaughter of all animals affected with communicable disease, and provisions are made for their disposal, reimbursement to be made by the county. No mention is made of meat or dairy inspection.

TEXAS.

The State Live Stock Sanitary Commission and a State Veterinarian supervise the communicable diseases of animals in Texas.

R. H. Harris, Fort Worth, Chairman Live Stock Sanitary Commission; Dr. E. R. Forbes, Fort Worth, State Veterinarian.

All persons are required to report the suspected presence of any communicable disease among animals. Provision is made for Texas fever regulations to conform with those of the U. S. Bureau of Animal Industry. Special rules have been made for the control of anthrax within the state, and prohibiting the admission of animals from without the state when originating in districts where anthrax is known to exist. There are rules in reference to glanders, hog cholera and sheep scab. Also a rule to limit the spread of verminous diseases of young animals within the state.

In reference to tuberculosis a rule provides that no cattle with tuberculosis shall enter the state for breeding or dairy purposes, but it does not specify that the tuberculin test shall be required. There is no provision for reimbursing owners for condemned animals, except in the case of glanders, when reimbursement is made by the county. No mention is made of meat or dairy inspection.

UTAH.

The health of animals in the State of Utah is under the supervision of a State Veterinarian who is appointed in accordance with an act of March, 1909, also a State Board of Sheep Commissioners, and the State Board of Health. Dr. A. Carrington Young, Salt Lake City, State Veterinarian; Dr. John Austin, President State Board of Sheep Commissioners; Dr. T. B. Beaty, Secretary State Board of Health. An Act of March, 1909, prohibits the bringing into this State of any cattle for dairy or breeding purposes, except when they are known to be free from tuberculosis as a result of the tuberculin test. Provision is made in the same act for the tuberculin testing of every cow used in the dairy business within the State of Utah, such tuberculin testing to be repeated at least once in each year. No provision is made for compensation for animals slaughtered on account of disease as they are considered to have no property value. Cattle which react to the tuberculin test are permitted to be slaughtered in establishments maintaining United States meat inspection and their carcasses disposed of in accordance with the regulations of the Bureau of Animal Industry. Diseases of sheep are under the sole control of the State Board of Sheep Commissioners.

VERMONT.

A State Cattle Commissioner is appointed to supervise the communicable diseases of animals in Vermont.
H. S. Willson, Arlington, Cattle Commissioner.

No provision is made for a State Veterinarian, although the commissioner is empowered to employ necessary assistance, including a veterinarian, when he deems it necessary. The tuberculin test is applied to cattle entering the state; and to cattle within the state only when it is deemed necessary. A previous injection of tuberculin for the purpose of preventing a truthful determination of the condition of the animal is made an offense. Animals which are ordered to be slaughtered may be appraised not exceeding $50, and reimbursement made upon 75 per cent of the appraisal. The state may sell the carcasses of such animals as pass inspection at an establishment maintaining United States meat inspection.

Animals which have reacted to the tuberculin test but show no physical evidence of the disease may be retained for breeding purposes, but when slaughtered the owner shall receive no compensation for such animals. Milch cows shipped from Vermont into the State of Massachusetts and which react to the tuberculin test in the latter state are paid for by Vermont upon the submission of proper evidence of their slaughter.

In 1909 an act was passed to prevent the spread of bovine tuberculosis by creameries. This act provides that all skim milk or buttermilk must be heated to a temperature of at least 175 degrees F., and that all skim milk or buttermilk brought into the state must have been thoroughly sterilized or pasteurized as indicated above. No mention is made of the control of other diseases than tuberculosis, nor does meat inspection appear to exist.

**Virginia.**

The State Live Stock Sanitary Board consisting of the Board of Control of the Experiment Station of the Virginia Agricultural and Mechanical College and Polytechnical Institute, appoints a State Veterinarian, Dr. J. G. Ferneyhough, Burekeville. November, 1908, a quarantine proclamation was issued on account of the foot-and-mouth disease against the States of Pennsylvania, New York, New Jersey, Michigan and Maryland. March, 1909, a proclamation was issued governing the movement of cattle within the State in reference to Texas fever. May, 1909, a proclamation was issued requiring that all dairy or breeding cattle entering Virginia must be accompanied by certificate of tuberculin test applied not longer than four months preceding the date of entry. No provisions are made for payment for animals which may be slaughtered on account of disease. Dairy inspection is carried on to a limited extent under the direction of the State Dairy and Food Commissioner. No meat inspection regulation.

**Washington.**

The State Veterinarian is the professor of veterinary science in the Washington Agricultural College and Experiment Station. Dr. S. B. Nelson, Pullman, State Veterinarian. He is vested with full powers to supervise communicable diseases in that state. Veterinarians are required to report the suspected presence of any cases of communicable disease. Animals entering the state from other states are required to have been examined and found free from communicable diseases; and in the case of cattle over six months of age to be used for breeding or dairy purposes the non-existence of tuberculosis shall have been determined by the tuberculin test. Animals for exhibition purposes are not subject to inspection or tuberculin test.

Special provisions are made for the control of diseases of sheep, with particular reference to scabies. These regulations are quite extensive, and
are in harmony with the regulation of the U. S. Bureau of Animal Industry concerning sheep scab. No mention is made of meat or dairy inspection.

**WEST VIRGINIA.**

The Board of Agriculture supervises animal diseases, and is empowered to employ consulting veterinarians. J. B. Garvin, Charleston, Secretary of Board of Agriculture.

The entrance of all domestic animals for breeding purposes is required to be reported to the Secretary of that Board. A consulting veterinarian shall examine, and if he deem it necessary shall apply the tuberculin test once yearly to all pure bred herds consisting of twenty or more cattle within the state which are kept for the purpose of producing animals for breeding purposes and to be sold to the public as such.

When it is found necessary to slaughter animals to prevent the spread of communicable disease, provisions are made for appraisal. The amount of appraisal is not limited by law, and is paid at the end of the fiscal year; the expense thus incurred must not exceed $5,000, and payment is made pro rata to keep within that limit.

Provisions are made for the proper disposal of the carcasses of animals dead from communicable disease. No mention is made of meat inspection.

**WISCONSIN.**

The control of communicable disease is vested in a Live Stock Sanitary Board composed of the bacteriologist of the State University, the State Veterinarian, Dr. D. B. Clark, Madison, State Veterinarian, and three members of the Wisconsin State Board of Agriculture, Mr. Herbert Lothe, Secretary State Live Stock Sanitary Board, Madison.

Cattle slaughtered on account of tuberculosis shall be appraised not to exceed $50 for any animal, and payment shall be made upon two-thirds of this value. Tuberculous animals are shipped at the expense of the State for slaughter under Federal meat inspection, and the amount of money received from the sale of hides and such carcasses as pass inspection is turned in to the state treasury.

Local boards of health are required to report to the state veterinarian concerning all cases of communicable diseases among animals. Cattle for dairy or breeding purposes entering the state from other states are subject to a tuberculin test, or must be accompanied by a satisfactory certificate indicating their freedom from this disease. Cattle brought into the state for exhibition purposes shall be subject to the tuberculin test only when sold to remain within the state.

The entrance of branded or range horses into Wisconsin is prohibited except when they are accompanied by a certificate of inspection indicating their freedom from glanders, mange, and other diseases. In this connection no mention is made of the mallein test.

No mention is made of meat or dairy inspection.

**WYOMING.**

The Board of Live Stock Commissioners supervise in general the communicable diseases of animals, while diseases specially pertaining to sheep are controlled by the State Board of Sheep Commissioners. Dr. Wm. F.
Pflaeging, Cheyenne, State Veterinarian. George S. Walker, Cheyenne, Secretary State Board of Sheep Commissioners.

All animals entering the state for breeding purposes are subject to inspection upon their arrival. Authority is given for the slaughter of diseased animals and the destruction of their carcasses. Appraisal is mentioned, but a maximum is not stated, and the right of indemnity is granted for those diseases which are considered to be generally fatal and incurable. Tuberculosis does not appear upon the list given in this connection. All persons are required to report the suspected presence of any cases of incurable disease.

In accordance with a proclamation in force from April 1, 1909, to April 1, 1910, all cattle, horses, swine, etc., entering Wyoming are required to be accompanied by a certificate of health; and in the case of all registered breeding or dairy cattle the non-existence of tuberculosis must be indicated by means of the tuberculin test. Restrictions are made concerning the movement of cattle from the Texas fever quarantine area, and in reference to scabies, in conformity with the regulations of the U. S. Bureau of Animal Industry.

Special rules in regard to the control of sheep scab are issued by the State Board of Sheep Commissioners.

Regulations have been issued for the control of anthrax within the state.

No mention is made of meat or dairy inspection.

The President—Gentlemen, I understand that we have today in our midst a gentleman who is taking a great interest and who has been of great assistance to the live stock sanitary work in the great State of Illinois. I refer to State Senator Humphrey. I am sure we all shall be pleased to hear from the Senator.

Senator Humphrey of Illinois—Mr. President and Gentlemen: I am here as a visitor. I am not prepared to make a speech. I expect to hear something that will give me information, pointers as it were, so that I might know what to do in the future.

I may state, so far as legislation in Illinois is concerned, that it has been up-hill work. To start out with, at the last session of the General Assembly, I introduced several bills which were drawn up by men who understood their business. These bills were referred to committees. The first thing I knew the committees were so framed that they would not report out the bills. The Chairman of the Committee having the bills was opposed to any regulations. He stated, upon his return from Chicago, where he had attended some meetings, that he had the bills in his pocket and that they would go no further. This was not very encouraging. I looked the matter over and talked with some of my friends. Later I introduced the bill again, and it containing an appropriation, had it referred to the Appropriations Committee, with the result that I got the bill out of committee, without the appro-
priation, had it passed and sent over to the House. After it got to the House I went to the Speaker and tried to get it out. It was reported to the House, ordered to second reading without reference, but when the Speaker found out what was in the bill, he never allowed it to go any further. It died there, not in the hands of the committee, but in the hands of the Speaker. But later on we passed a law, somewhat revising the old law in relation to the Live Stock Board, and that is the law on the statute books today. I think the time will come in Illinois when a proper law of regulation will be passed. We found the most trouble in a number of the counties bordering on the Wisconsin State line and Indiana State line. The owners of stock there were dumping their cattle into the State of Illinois to be sold, and the result was that the organization of the stock raisers were able to influence the committee in the Senate and certain members of the House, and that, I believe, is the reason we got no further. The general law that was passed is, I think, a great help. I believe Mr. Barnes, one of the lay members who was working on this matter all winter, knows more about the subject than I do, because I did not work with the committee and he did. Mr. Barnes is here and I think he can give you more information on the matter. [Applause].

**The President**—If the gentlemen to whom Senator Humphrey refers is here, we shall be glad to hear from him.

**Mr. Barnes**—Mr. President, and members of the Association: I presume this subject, judging from your program, will be taken up for consideration, especially bovine tuberculosis, after the paper on that subject has been read, and at that time, if I should be present and that discussion should be entered into, I should be pleased to take part then rather than to take the time of the Association now.

Here followed a discussion in regard to the adoption of a Constitution and By-Laws and methods of raising funds to meet the expenses of the Association. The discussion terminated in a motion being made, seconded and adopted, to the effect that the Committee on Constitution and By-Laws incorporate in its report, an article providing for the copyrighting of the minutes of the meetings and fixing a price at which the published copies of the proceedings of the meetings should be sold.

**The President**—The next item of business is the appointment of committees. I shall appoint on the Committee on Resolutions, Dr. Schoenleber, Dr. Reichel and Dr. Reynolds. On the Committee on Line and Open Season, Dr. Cary, Dr. G. T. Bryan and Dr. James Lewis.

On motion duly made and seconded, the convention adjourned to meet at 2:00 o'clock p. m.
AFTERNOON SESSION.

The convention was called to order by the President.

The President—The first item on the program this afternoon is a paper by Dr. A. D. Melvin, entitled, “Recent Outbreak of Foot and Mouth Disease.”

Dr. Melvin—Again the United States has been visited by an outbreak of foot and mouth disease, and again the contagion has been entirely stamped out after prompt and vigorous work by the Federal and State authorities in cooperation.

The disease was first observed early in November, 1908, near Danville, Pa., among cattle belonging to Jacob M. Shultz. Mr. Shultz had in his possession a publication of the Bureau of Animal Industry describing foot and mouth disease, and by comparing the symptoms in his cattle with this description he suspected that the animals might have that disease. He called in a local veterinary practitioner, Dr. J. O. Reed, who also regarded the affection as suspicious and reported the case to Dr. Leonard Pearson, State Veterinarian of Pennsylvania. The first news received by the United States Department of Agriculture was on November 10 from Dr. Pearson, who had examined cases near Danville and Watsontown and gave a positive diagnosis of foot and mouth disease. I at once went to Danville, accompanied by Dr. John R. Mohler, Chief of the Pathological Division, and Dr. R. P. Steddon, Chief of the Inspection Division, of the Bureau of Animal Industry, and after examination of some of the cases the diagnosis was confirmed.

A quarantine was declared by the Secretary of Agriculture on November 12 against the interstate movement of animals from the counties of Columbia, Montour, Northumberland and Union, in the State of Pennsylvania, these being the only counties in which the disease was reported at that time. Within a few days, however, cases were also found in several other counties in Pennsylvania and in the vicinity of Akron, N. Y., and on November 19 the quarantine was extended to include the entire territory of those two states. This quarantine prohibited the interstate or foreign movement of cattle, sheep and other ruminants and swine from either of the states named. Shipments were permitted by rail through those states provided the cars were sealed by the Bureau of Animal Industry before they entered the quarantined territory. Such shipments were allowed to be unloaded in transit only in pens designated by the Chief of the Bureau and which had been cleaned and disinfected. The shipment of dressed carcasses from the states named was permitted only when the hides and hoofs had been removed, and the shipment of hides, skins, hoofs, hay, straw, etc., was forbidden unless such material had been disinfected under supervision of the Bureau.

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On tracing the origin of the disease it was found that the cattle which carried it into Pennsylvania came through the Buffalo stock yards. It was at first suspected that the disease might have been introduced through Canada, but on further investigation the cattle in the two shipments were traced to New York, Ohio and Michigan as well as Canada. A few days later a suspicious disease was reported in several herds near Detroit and inspectors of the Bureau of Animal Industry were sent to investigate. The Secretary of Agriculture and Chief of the Bureau of Animal Industry went to Buffalo to give personal attention to the situation, and from there went to Detroit. On arrival at Detroit the reports from the inspectors were so positive that a quarantine of the State of Michigan was declared November 24.

A few days later the disease was also found near Lineboro, Carroll county, Md., just over the Pennsylvania border, and a quarantine was placed on the State of Maryland on November 27.

The areas in which the disease was found were as follows: In Pennsylvania, the counties of Clinton, Lycoming, Union, Snyder, Juniata, Montour, Northumberland, Montgomery, Lehigh, Dauphin, Lancaster, York, Chester, Philadelphia and Delaware; in New York, the counties of Niagara, Erie, Genesee, Orleans and Monroe; in Michigan, the counties of Lake and Wayne; in Maryland, Carroll county.

Promptly after the discovery of the disease in Pennsylvania an arrangement was made for co-operative work by the Federal and State authorities for its eradication, and similar arrangements were later made with the authorities of the other affected states. The plan followed was practically the same as that which had previously been successful in the case of the New England outbreak of 1902-3, namely, to enforce a strict quarantine, to slaughter and bury all diseased and exposed animals, and to disinfect the premises occupied by them. The owners of condemned cattle were reimbursed to the extent of the appraised value, the Federal Government paying two-thirds of this amount and the State one-third. The expense of disinfection, etc., were shared in the same proportions.

Dr. E. S. Bennett was placed in charge of the Federal work in Pennsylvania and Maryland; Dr. U. G. Houck in New York and Dr. P. H. Mullowney in Michigan. The State work in Pennsylvania was carried on under the direction of the State Veterinarian, Dr. Leonard Pearson, in New York under the direction of Commissioner of Agriculture, R. A. Pearson, in Michigan under the direction of the State Live Stock Sanitary Board, of which Mr. H. H. Hinds was chairman, and in Maryland under the direction of Dr. F. H. Mackie, State Veterinarian.

It was fortunate that in this emergency the Bureau of Animal Industry had a large force of trained veterinarians, many of whom had
had experience in the New England campaign of 1902-3, who could be promptly assigned to the work of eradication, and it was also fortunate that the affected states were all provided with live stock sanitary officials so that prompt action could be taken, and with laws under which such a situation could be dealt with. The value and importance to the country of an efficient central organization to look after the interests of the live stock industry was well demonstrated in this work, as was also the importance of states having proper officers and providing them with laws and funds. If it had been necessary to delay operations in order to organize a force to deal with the outbreak, the contagion would doubtless have spread in the meantime to the Middle West and probably to the range country of the far west, where its eradication would have been either impossible or attended with the greatest difficulty and expense. As it was, not a day was lost in beginning effective work, and the disease was confined to practically the areas to which it had already spread at the time of discovery.

Besides the work of slaughter, burial and disinfection, veterinary inspectors were sent to trace all rumors of foot and mouth disease and to locate any probable centers of infection. A large force was maintained in the infected regions, who made thorough and systematic inspections and reinspections of all animals from farm to farm. The Bureau of Animal Industry had engaged in the work of inspection and eradication a total of 572 employés, of whom 159 were veterinarians.

Some idea of the tremendous amount of work involved in these inspections may be obtained from the following figures: In Pennsylvania the Bureau employés made no less than 69,836 visits to premises in 24 counties; in New York they made 24,748 visits; in Michigan, 8,393; in Maryland, 4,884; besides 822 in Ohio, Indiana, Kentucky, West Virginia, Virginia, New Jersey, Delaware and Connecticut. The total number of visits thus made by employés of the Bureau of Animal Industry in their work of inspection was 108,683, and the total number of animals inspected, including re-inspections, was 1,565,699.

The number of animals slaughtered and buried, and their appraised value, are as follows:

In Pennsylvania, 1,232 cattle, valued at $49,993.94; 1,000 hogs, $8,317.78; 52 sheep, $346.50; 4 goats, $9.00. Total animals, 2,288, valued at $58,667.22, on 101 premises.

In New York, 520 cattle, $20,622.25; 246 hogs, $2,388.38; 214 sheep, $1,367.50. Total animals, 980, valued at $24,378.13, on 45 premises.

In Michigan, 242 cattle, $5,103; 23 hogs, $202; 9 sheep, $45; 3 goats, $9.00. Total animals, 277, valued at $5,359, on 9 premises.

In Maryland, 31 cattle, $1,066.20; 60 hogs, $562.63. Total 91 animals, valued at $1,628.83 on 2 premises.
In all there were slaughtered 2,025 cattle, 1,329 hogs, 275 sheep and 7 goats, a total of 3,636 animals, on 157 premises, at a total valuation of $90,033.18. As before stated, two-thirds of the appraised valuation of animals slaughtered was paid by the United States Department of Agriculture and one-third by the states.

So rapidly was the work of slaughter and disinfection carried on that by December 19, or within six weeks from the beginning of the work, all diseased and exposed animals, so far as known up to that time, had been slaughtered and buried. The disinfection was done as promptly as possible after slaughter. A few additional cases were found later.

The slaughtered animals were buried in deep trenches, the rule being to have the carcasses covered with at least 5 feet of earth. The usual method of slaughter was to lead the animals to the trenches so as to avoid the danger of spreading the disease by dragging the carcasses over the ground, and to kill them at the trenches by shooting. The hides were slashed and the carcasses were cut open and covered with quicklime.

The greatest precautions were taken by the inspectors to avoid spreading the contagion as they went about from place to place. These men were equipped with rubber coats, boots, hats and gloves, and with disinfectants, and care was taken to disinfect their apparel immediately after having examined suspected animals before proceeding to the next place.

The work of disinfecting premises was difficult and tedious. Various methods were adopted according to local conditions. Where disinfection was done on a large scale a large water tank filled with 5 per cent chlorinated lime solution was used with a steam pump, the steam being furnished in some cases by a traction engine. Walls were brushed and scraped, flooring and woodwork torn out, and the disinfectant was freely sprayed. Sometimes fumigation was used for the interior of barns. Every effort was made to have the disinfection thorough and complete.

The Federal quarantine was modified and partly released from time to time as conditions warranted, and was entirely removed on April 24, 1909. In view of the experience in the New England outbreak, when additional cases were found several weeks after it was supposed that eradication was complete, it was considered wise to keep the quarantine in force until sufficient time had elapsed to make it practically certain that none of the infection remained.

The origin of the outbreak was at first a mystery. As the Bureau of Animal Industry maintained a strict quarantine on imported live stock, and as the importation of ruminants from countries where foot-and-mouth disease existed was prohibited entirely, it was considered
highly improbable that the infection was introduced into the country with imported animals. Various other ways in which it might have gained entrance were suggested, such as that immigrants carried the virus on their clothing, that it was brought in on hay or straw used for packing or that it was introduced in biological products.

It soon became apparent that the outbreak started near Detroit, and when the disease was traced by inspectors of the Bureau of Animal Industry to calves that had been used in propagating smallpox vaccine by a Detroit establishment, it was considered highly probable that the vaccine was contaminated with the virus of foot-and-mouth disease and that this caused the outbreak. It was therefore decided to make a thorough investigation to determine whether or not contaminated vaccine virus was really the cause. As the United States Public Health and Marine Hospital Service of the Treasury Department is charged by law with the supervision of biological products used in human medicine, that service was requested to join the Bureau of Animal Industry in making the proposed investigation, and the work was confided to Dr. John R. Mohler, Chief of the Pathological Division of the Bureau of Animal Industry, and Dr. Milton J. Rosenau, Director of the Hygienic Laboratory of the Public Health and Marine Hospital Service. The particulars of their investigations have already been published as Circular 147 of the Bureau of Animal Industry, so a brief statement will be sufficient for this paper.

By careful scientific methods Doctors Mohler and Rosenau were able to demonstrate that the small-pox vaccine virus of the Detroit establishment was in fact contaminated with the virus of foot-and-mouth disease. It appeared that this firm had obtained this particular strain of vaccine in May, 1908, from a firm in Pennsylvania, and tests with the vaccine of the latter firm showed that it was likewise contaminated. While it is not positively known just how long the contamination had existed at the Pennsylvania establishment, it seems probable that it was introduced with vaccine imported from Japan in 1902 and that the New England outbreak of that year originated from the same source. Dr. D. E. Salmon, then Chief of the Bureau of Animal Industry, was inclined to suspect that the outbreak of 1902 was due to contaminated vaccine, and he had inoculation tests made at that time with suspected vaccine, but it failed to produce lesions recognized by the investigators as due to foot-and-mouth disease. The experiments of Drs. Mohler and Rosenau, however, demonstrated that animals vaccinated with the mixed virus as a rule show only lesions of cowpox or vaccinia, although the infectious principle of foot-and-mouth disease remains in the vaccinal eruption. In order to prevent the lesions of foot-and-mouth disease from being suppressed or obscured by those of vaccinia, Doctors Mohler and Rosenau in some of their tests used animals which had been vaccin-
ated and were therefore immune to vaccinia. By this method, and by
means of intravenous inoculation, they were able to detect the con-
taminating infection when it might not otherwise have been disclosed.

As soon as the facts as to contamination of vaccine became known
immediate and effectual steps were taken by Surgeon General Walter
Wyman, of the United States Public Health and Marine Hospital Ser-
vice, to eradicate all this contaminated vaccine virus in America. The
licenses of the two firms were at once suspended and all the suspected
vaccine virus on hand was destroyed and that upon the market with-
drawn and other measures of a radical nature were taken to accomplish
the desired object. The intelligent and prompt cooperation of these
firms in this process is commended. Further, every strain of vaccine
virus upon the market was examined, and it may be stated that there is
now upon the market no vaccine virus contaminated with the virus of
foot-and-mouth disease.

Hereafter manufacturers of vaccine for human use will be required
to test their virus for the presence of foot-and-mouth infection as well
as other infections, and regulations have been issued by the Public
Health and Marine Hospital Service with the specific object of pre-
venting the importation or sale in interstate traffic of vaccine virus
contaminated with foot-and-mouth disease or other infections commu-
nicable to men. I consider it highly important that similar control
should be given by law to the Secretary of Agriculture over biological
products when intended for the treatment of domestic animals. While
the Public Health and Marine Hospital Service has power under ex-
isting law to guard against contaminated biological products for use in
human medicine, there remain the danger that contagious diseases may
be brought in with veterinary preparations which are not regulated in
the same manner.

The circumstances as to the origin of the outbreak and the spread
of the infection may be summarized as follows: A firm imported cer-
tain vaccine virus which has proved to have been contaminated with the
infection of foot-and-mouth disease. This importation probably came
from Japan as far back as 1902, and the foot-and-mouth disease con-
tamination evidently persisted at the establishment until recently. In
May, 1908, a second firm procured some of the vaccine, and on Sep-
tember 23 and October 26 they vaccinated certain calves with it at their
establishment. These calves were obtained from a farm nearby, under
a contract by which they furnished the calves to the second firm for
vaccination purposes, the calves to be returned after the vaccine pulp
was removed. The owners of the calves received a rental price for
each animal and subsequently disposed of them to the public. The
calves used in this instance were returned to the owners October 16, on
which date they were driven to a Commission Company's pens, watered
and fed for two hours, and then taken to a town 15 miles distant, where they were dispersed. The appearance of foot-and-mouth disease among these animals, although not then regarded as such, was observed on October 18, by Mr., who purchased 10 of them, and by other purchasers about the same time.

A shipment of three car loads of healthy cattle from uninfected farms in Michigan reached Detroit October 20 and was placed in the same pens in the Detroit stock yards. All but thirty-two of these cattle were sold and slaughtered in Detroit, and the remainder were reshipped to East Buffalo, October 23, and carried the contagion from the infected pens to the Buffalo yards. These animals, with others, were reshipped to Danville and Watertown, Pa., where the disease afterwards appeared. From Buffalo the disease spread to certain points in New York State and Maryland, and from Danville and Watertown it spread to various places in Pennsylvania.

It is interesting to compare the recent outbreak of foot-and-mouth disease with that which occurred in New England in 1902-03. In the New England outbreak cases were found in twelve counties in four States, namely: New Hampshire, Vermont, Massachusetts and Rhode Island. In the outbreak of 1908 the infection was distributed over a much larger region, including twenty-three counties in the four States of Michigan, New York, Pennsylvania and Maryland. A larger number of animals were slaughtered, however, during the New England outbreak, namely: 4,461, as against 3,636 in the recent outbreak. Although the disease was of a somewhat mild type, the later outbreak was a much greater menace to the livestock interests of the country than was that of 1902-03, as it penetrated farther into the interior and came closer to the great stock-raising regions.

The cost to the Federal government of eradicating the recent outbreak was just within $300,000.00, or, to be more exact, $299,112.10. I have not exact figures as to all expenditures by the States, but these were probably between $100,000.00 and $150,000.00. The loss to the dairy and stock-raising industries, and to commerce, can not be estimated, but it was undoubtedly heavy. Not only was interstate traffic in live stock interfered with, but exports to foreign countries, especially to Great Britain, were seriously curtailed.

When we consider the enormous losses caused by foot-and-mouth disease in countries where it has gained a foothold, and that some of the European governments have struggled with it unsuccessfully for years, our own country is to be congratulated on the fact that every outbreak here has been promptly stamped out with comparatively slight damage. So quickly and effectively has the work been done that it is doubtful if many of our people realize the magnitude of the danger that threatened our livestock industry. The results have shown the wisdom
of the rigorous slaughtering policy adopted in this country. Such methods might be impracticable if the disease became so wide-spread that slaughter would involve the destruction of too large a part of the country’s supply of live stock, but so long as the infection is restricted to a comparatively small part of the country's area there is no question that the slaughter policy is the best. To temporize with a restricted outbreak by relying entirely upon quarantine and treatment would very probably allow infection to spread beyond control with disastrous results.

The President—This important paper by Dr. Melvin was to have been discussed by Dr. Klein, of Pennsylvania, but as he is not here, I shall call upon Dr. Noack, of Pennsylvania.

Dr. Noack—Mr. President and Gentlemen: We just have heard a paper read which I am glad to discuss, although there hardly is a point which he has not touched. Coming from Pennsylvania, which State was the first to be infected, I shall make some remarks for the sake of argument.

The first news of the outbreak of foot-and-mouth disease came from Danville. Soon reports were received that cases of the same character were found in the neighborhood of Watsontown, Northumberland county, and also near Lewisburg, Union county. All of these cases were traced to one dealer who had shipped cattle from Buffalo. On investigation it was found that other cattle had been in contact with these cattle, or had been confined in the pens occupied by them. Cases were also found in Lehigh county, Lancaster, Columbia, Philadelphia, Montgomery, Chester, Juniata, Delaware, Dauphin, Snyder and Montour. The officers of the State were promptly called upon and they cooperated with men from the Bureau of Animal Industry who had had experience in the outbreak of 1902. Soon they became masters of the situation, with an expense to the State of about one hundred thousand dollars and about 3,800 animals killed.

Referring to some statements, as I say, for the sake of argument, I would like to mention the quarantine, because it interfered very materially with the commercial interests. I think if the quarantine had been raised four to six weeks after proper disinfection of the infected places, that would have been a sufficient time for the quarantine.

Furthermore, I should like to mention one fact in connection with disinfection by formaldehyde which was used extensively. Formaldehyde very often causes some trouble by affecting the mucous membrane of the mouth and also the eyes. I think, instead, a solution of carbolic acid could have been used as well, because 1 per cent solution of carbolic acid is sufficient to kill the germs of foot-and-mouth disease in about one hour’s time, and I think it takes about the same time for a 2 per cent solution of formaldehyde. These two points are about all I care to speak of.
The President—Dr. Reichel is present, perhaps we might hear from him.

Dr. Reichel—I have prepared a little data on this subject, knowing that Dr. Klein would not be here. I shall read it that it may be added to Dr. Melvin's paper.

The disease was introduced by cattle shipped into Pennsylvania through the stock yards at East Buffalo, New York. The infection was carried to East Buffalo stock yards by cattle shipped from the Detroit stock yards, which had been infected by some diseased cattle from Michigan. The occurrence of the disease in Michigan and the subsequent infection of the Detroit and East Buffalo stock yards was not known, however, until after the discovery of the disease in Pennsylvania. The disease was officially diagnosed here by the State Veterinarian on November 9th, and the Chief of the Bureau of Animal Industry of the United States Department of Agriculture and the Commissioner of Agriculture of New York were notified immediately by telegraph.

In the meantime a large number of shipments of cattle had been made through the infected pens at the East Buffalo stock yards to various points in Pennsylvania. Some of these cattle passed through the Lancaster stock yards, which had also received shipments of cattle from Michigan through the Detroit stock yards. Infected cattle were contained in eight of the shipments from East Buffalo to the following points: Danville, Watertown, Norristown, Lock Haven, Middleburg, Vera Cruz and Germansville. Some of these cattle were slaughtered immediately after their arrival, and before symptoms of disease appeared, but the greater number were sold to farmers in the vicinity of the points mentioned. Fifteen of the cattle in the Norristown shipment were bought by a dealer and removed by him to Chester county, near Newton Square, and subsequently sold to farmers in Chester, Delaware and Montgomery counties. In being driven from the unloading point to the place of sale, or from the place of the sale to the premises of the purchasers, some of these cattle came in contact with Pennsylvania cattle, or temporarily occupied premises subsequently used by Pennsylvania cattle. There were a few instances in which native cattle were removed to other farms from premises on which infected or exposed animals had been placed, after being in contact with the latter animals. In this manner the disease was carried to eighty-six farms, or other premises, in Chester, Clinton, Delaware, Dauphin, Juniata, Lehigh, Lycoming, Montgomery, Montour, Northumberland, Philadelphia, Snyder, Union and York counties. The disease was also found before the close of 1908 on twelve farms in Lancaster county to which cattle had been taken from the Lancaster Union stock yards, and on one farm in the same county, where the source of infection was not determined, a total of ninety-nine farms, or other premises, on which infection was
found prior to December 31, 1908, involving 1,183 cattle, 1,018 swine, 53 sheep and 4 goats. (These figures include all of the infection found except two farms in Lancaster county containing 32 cattle and 5 swine, where the disease was discovered in January.)

The Bureau of Animal Industry of the United States Department of Agriculture coöperated and assisted in this work. A large number of veterinary inspectors of the Bureau were brought into the State and worked in conjunction with the State force. The federal authorities also paid two-thirds of the total cost of expense incurred in the appraisal, destruction and burial of diseased and exposed animals, and of the cost of cleaning and disinfecting infected premises.

In addition to the tracing and examination of cattle shipped from East Buffalo, New York, and those sold at the Lancaster stock yards, the investigation of reports of foot-and-mouth disease of the animals on farms in counties in which the disease was found, a vast amount of work was required in the execution of the quarantine restrictions which were necessary to prevent the spread of infection. The efforts of the State and federal officials engaged in this work were greatly assisted by the cooperation of farmers and live stock owners, veterinarians and railroad officials.

I would like to add, Mr. President, to the remarks already made, that we might have used carbolic acid in place of formaldehyde, but I think those who are familiar with the results might have alleged that carbolic acid has been found to have very little effect upon foot-and-mouth virus.

DR. NOACK—I would like to call Dr. Reichel's attention to the fact that Dr. Hutyra and Dr. Marek mentioned the efficiency of carbolic acid in their text book.

THE PRESIDENT—are there any further remarks?

DR. MOHLER—In discussing the different methods of eradicating infectious diseases, the most important thing to be considered is the extermination of the infection, and we have ample justification for the methods that were in vogue during the recent outbreak of foot-and-mouth disease in 1908. It is probable that the lifting of the quarantine on disinfected premises after four to six weeks might have been successful in preventing the further spread of the disease, but the very fact that we could not afford to take any chances on a short period caused us to play this matter entirely safe. In the New England outbreak the raising of the quarantine was accomplished in certain instances after a shorter period than in the 1908 outbreak, and on several occasions reinfecions occurred as a result. In the recent outbreak we took no chances on a short period, but extended the time of quarantine so there would be no danger of reinfection. And it is a somewhat remarkable fact that not
in a single instance did the disease recur on the disinfected premises after the stables had been restocked.

With reference to the disinfection, the results demonstrated clearly that the methods employed produced the effects required. Carbolic acid might under certain conditions have been as satisfactory as formaldehyde, but our experience with formaldehyde in the New England outbreak justified us in using this disinfectant in the outbreak of 1908. As I stated before, we have ample justification in the use of the latter by the excellent results obtained with this method of disinfection.

DR. MELVIN—My paper did not touch one point and I would like to take this occasion to say that we had the heartiest coöperation imaginable from the railroads. They are entitled to a great deal of praise. They have been getting knocks more than praise the last few years and we want to give them praise where it is due. When we realized the large spread of this disease there was a long telegram sent over the signature of the Secretary of Agriculture to each railroad east of the Mississippi River, asking them to locate and disinfector all of their stock cars that had been in any of the four infected States during the period from October 10th up to the time of sending the telegrams. All of the railroads promptly undertook to do this, even some of the railroads located in the far south, where in all probability they had not a car which had been in the infected States. Large railroads like the New York Central and the Pennsylvania, where it would have taken a long time to trace their cars, started in and began to disinfect all of their cars, whether they knew they had been in the infected States or not. The stock yards companies at Detroit and Buffalo and Lancaster gave us the heartiest coöperation. They spent large sums of money in disinfecting their premises at their own expense, and in Buffalo particularly, the yards were shut up absolutely and they did no business for several weeks, and for a longer period a large portion of the yards were closed so that they did business in a limited way.

Regarding the killing of calves, Dr. Mohler can answer that question better than I can. If this second firm had pursued the same policy that the first firm had and killed their calves after they had removed the vaccine, we probably would still be unaware of any contaminated vaccine in the United States. The first firm used to sell their calves for veal, but that was finally stopped, first by the federal law and later by State law; then they used these calves in the manufacture of biological product which they prepared in their laboratories. The second firm, I understand, at one time used to slaughter their calves and sell them for veal, but the city law stopped that practice, so they disposed of them by returning them to the owners after removal of the lymph and paying a certain rental for them. But what I was most desirous of setting forth
was the coöperation we had received all along the line from every one who was interested in the question.

The President—If there is no further discussion on this subject, we will pass to the next one, "Mange in Cattle," by Dr. Paul Juckness, of Nebraska.

Dr. Juckness—There is no disease that is of such importance to the stockmen as mange in cattle, on account of so many thousands of head being affected, in most of the western states. Few can realize the great task for state and federal officials to cope with this disease, on account of its many perplexing difficulties, in trying to eradicate the same. Many hundreds of thousand of cattle have been dipped in the western states the last few years with varying success. Energetic efforts have been made to stamp out this disease, since 1895, by most of the state officials. Since 1900, however, most of the states have enacted laws to enforce its eradication.

Cattle mange or itch is a specific disease of the skin and is caused by the mange parasite Psoroptes Communis Varietas bovis. This causes inflammation and irritation of the epidermis and dermis, which is a characteristic symptom of the disease.

Cattle mange is spread by contact with diseased animals and through the medium of infected quarters, cars, etc. It may also be spread by any means by which the parasites or their eggs may be transmitted from one place or one animal to another, by permitting uninfected animals to come in contact with infected animals.

The first symptom is an intense itching. There is constant rubbing and scraping of the skin or there may be a tossing or throwing of the head around towards the infected places. It first commences in the region of the neck and shoulders. As the disease progresses the animal becomes very much emaciated and death may be the result, unless the animal is well taken care of and fed. On account of the rapidity with which the mange mite spreads through a herd of cattle, it is of importance to detect it in the early stages. An animal may show only a small area of infection and yet if it escapes inspection it may show severe symptoms in a few weeks and infect a great many animals.

It is not my intention to discuss at length the pathology and symptoms of this disease, but will speak of the manner of treatment.

In 1895 many of the stockmen treated small bunches of cattle by hand, using such ingredients as kerosene and lard or kerosene and water. Others tried to spray them with various kinds of dip. In 1900, many started dipping their cattle with the plunge vat. These vats were constructed in various ways, but it was the intention of having the animals swim through the vat and hold them in the dip from one to
two minutes. A great many aimed to re-dip their cattle within ten or twelve days so as to kill the mange mites that hatched after the first dipping. Great difficulty is usually encountered in trying to hold a large number of cattle at one place for from ten to twelve days, in order to re-dip them, on account of the scarcity of feed, and for this reason many of the cattle were only dipped once. When dipping was first started a great many did not lay enough stress on upping thoroughly, the cattle would just strike the water and would not be thoroughly immersed, consequently the dipping was ineffective no matter what preparation of dip was used.

In order to make dipping a success, it should be repeated within ten days. The greatest trouble that has been experienced in eradicating mange has been due first, to the lack of efficient laws regulating this disease; second, to the lack of sufficient appropriation for securing competent men to handle this most dreaded disease; third, the stockmen resisting the enactment and enforcement of laws for stamping out mange. Not being thoroughly familiar with the handling of mange, many mistakes were made in the construction of the vat, in preparing the dips, and also in the method of dipping.

On May 1, 1908, the Honorable Secretary of Agriculture and the Chief of the Bureau of Animal Industry decided to remove the federal quarantine from about one-third of our State and consented to cooperate with the officials of this State in the control and eradication of scabies. Since compulsory laws have been enacted and the stockmen have become familiar with the methods of dipping and the Government has recommended a uniform dip, much good is being accomplished. We have been succeeding admirably in our State since the Government has cooperated with us in handling mange. We have had a long struggle, however, merely for the lack of appropriation. Work could not be done in quarantining the ranches on which this disease existed, and where the owners would not dip. Now that sufficient inspectors are available and since they have become thoroughly familiar with the cattle in their district and know the diseased herds, we are rapidly cleaning up the mange in our State by enforcing our laws. It is through this method only that one can hope to clean up the disease. We need the persistent effort on the part of the inspector, who must be endowed with the faculty of not showing favoritism. He must treat all the stockmen alike if he wishes to succeed. Now and then there will be a stockmen who will not want to dip but by placing him in close quarantine and enforcing the same, he will soon be brought to time.

The problem of eradicating mange from the western states lies solely in (1) securing adequate laws; (2) enforcing these laws by having sufficient number of inspectors to cover the infected area, and
(3) by having the inspectors assist in supervising the dipping. The inspectors should make arrangements with the stockmen so as to be at as many places as possible where the dipping of cattle is in progress. It is also important that the inspectors be competent and that they know mange in all of its phases. They should also be familiar with the composition of the dip and how the same is prepared.

It has been demonstrated in Nebraska that it is necessary to have the dip hot and I believe every man who has had experience with dipping, will agree to this. It is essential to keep the dip at an even temperature, and I prefer it 5 to 10 degrees F. higher than recommended by the Department of Agriculture. I do not believe that as much damage will be done by having the dip a few degrees higher than by not having it hot enough. It is of sufficient importance that the animals remain in the dip long enough to be thoroughly immersed and until the fluid has soaked the crusts and penetrated through to the hide. There is little danger of the mange mite being left on the cattle that are dipped in this way. It is also necessary to pay some attention to the premises. The corral and feed lots should be thoroughly cleaned and disinfected. The owner should be advised that his cattle may become re-infected by coming in contact with the strayers, that is, with the animals that were not found at the first or second round-up. The inspectors should dwell upon the fact that dipping does not insure the cattle against this disease for any length of time if they come in contact with infected animals.

In Nebraska the cattle are usually affected with lice as well as with the scab parasite and in our experience we find that lime and sulphur does not kill the lice, but the tobacco and sulphur is very efficient for both lice and scab and is the most popular dip used in this State.

Since we have cooperated with the Government and have had sufficient inspectors, it has been found that we have greatly reduced the number of exposed animals at the stock yards, as shown by the following table. Comparative receipts of exposed cattle at South Omaha, yards, May 1, 1907, to April 30, 1908, and May 1, 1908, to April 30, 1909:

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<th>1907</th>
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<td>May</td>
<td>810</td>
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<td>1,911</td>
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<td>June</td>
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<td>July</td>
<td>1,935</td>
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<td>August</td>
<td>7,271</td>
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<td>9,260</td>
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<td>September</td>
<td>49,808</td>
<td>September</td>
<td>12,791</td>
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<td>October</td>
<td>55,079</td>
<td>October</td>
<td>9,977</td>
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<td>November</td>
<td>14,889</td>
<td>November</td>
<td>6,496</td>
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<tr>
<td>December</td>
<td>14,157</td>
<td>December</td>
<td>3,954</td>
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This clearly demonstrates to all the efficiency of cooperating with the Government, and if not with the Government, of securing sufficient competent inspectors to do the work. If all states would follow this plan it would only be a question of time until the disease would be eradicated.

THE PRESIDENT—You will see by the program that Dr. Lamb of Colorado was to have opened the discussion. You no doubt know that Dr. Lamb's absence is due to the sickness of his son. As I understand, Colonel Dean has consented to open the discussion on this paper, Mange in Cattle.

COLONEL DEAN—Mr. President and Gentlemen: I have a defective hearing and I was not able to hear all of the paper which has just been read. But I am somewhat familiar with the subject under discussion, having seen my first mange in cattle and horses about twenty-nine years ago. In the summer of 1878 I was brand inspector on the trail from Texas to the North, coming through Indiana Territory, or what was part of that country when the Cherokees had that strip. About the middle of the summer (we did not keep track of the time very well and did not know the days of the week) I met up with three droves of cattle aggregating about ten thousand, driven by George W. Littlefield. From the appearance of the cattle I knew they were from Central Texas. We used to know the part of Texas they came from by the style of the cattle in addition to our knowledge of the brand. They were driven in three droves. With the second drove were some men whom I had met before. They invited me to stay over night with them. I accepted the invitation to stay all night at their camp. The next day when we went out to get our mounts I noticed their horses and I said to the man in charge of the drove, "What is the matter with your horses?" He said, "That's some dope we have been using on the horses for those rough spots. The cattle gave it to the horses, and some of the men have got it too." I recognized the smell now as coal tar. I was a little leery shaking hands with the men and I did not sleep very close to any of them. That drove of cattle went up to Dodge City, Kansas. It didn't do "any good" as we call it—they didn't get fat. They have had mange in that section ever since. I do not pretend to say that was the introduction of it. The southern country and the Mexicans know the disease by the name of "aronia." I have been employed by the
Bureau of Animal Industry and have had charge of the inspection from the time the duty was lowered under the Wilson Tariff Act to admit Mexican cattle into the United States, until the first of last July, and we have never found any mange cattle from Mexico, so it doesn't look as though the disease came from down there, although as I said, the people down south knew the disease by the name "aronia." When the short grass country began to be fenced in, then this disease became an epidemic—it seemed to spread among the cattle to the extent that it was very noticeable.

For years before the regulations were put into effect governing the movement of cattle, they used to keep these diseased cattle back, because the northern men did not want them. They soon formed the policy that many are following to this day throughout that desert country lying between the Rocky Mountains and the One-Hundredth Meridian on the east. They build a small pasture that they call the hospital pasture and instructions are given to bring in every animal which shows the mange and there they are treated by hand largely, but if they get a sufficient number of them, in large ranches like the X I T, they build dipping vats in their hospital pastures. But as a rule they did not adopt any policy of eradicating the disease from the whole herd, the difficulty being the lack of water and grass to keep the cattle together for a second dipping, consequently their policy has been to clean up such cattle as they wanted to sell—just simply to take the cattle that don't show any lesions of the disease, simply the exposed cattle, and dip them once and then move them on after that one dipping.

The only part of the country that is under the Kansas City office that has undertaken eradication under State supervision has been the State of Kansas. When the restrictions were first placed on the shipment of scabby cattle, the Live Stock Board of Kansas adopted very stringent regulations, compulsory on all cattle men in a certain county or in a certain district. Their orders required everything in the county or district to be dipped, whether it was infected or not. That brought opposition to such an extent that they were not able to enforce the regulations. It was questionable whether they could compel a man to dip his cattle that were not infected, although his farm or pasture was joined to one that was infected. The Attorney General of the State of Kansas gave an adverse opinion on the ruling of the Sanitary Board and advised the Board that it would not be legal to force a man to dip all his cattle that were not actually diseased. The consequence was that the regulation was dropped. Nothing was done until three years ago when the law was amended changing their three-person commission to a one-man commission. In the meantime public sentiment had been growing. Proprietary medicine men had been among them and had caused a great disappointment. As a rule these remedies that they
offered were recommended to be just as good cold as hot, but their work was unsatisfactory and only a small percentage of cures was effected. But three years ago, under Commissioner Baker, sentiment had become ripe. We fought for an eradication policy, which, with the help of the Department of Agriculture, we secured. We got men enough to canvass each county that was known to have permanent scab infection. The State Commissioner put on these men as Agents in Scab Eradication, under the Bureau of Animal Industry. The Commissioner first advised that all he wanted of the Bureau of Animal Industry was to canvass the counties and point out the infected herds. He also delegated to these men authority, under the State laws, as State Deputies, to place a State quarantine on infected pastures or farms, and then to notify him. In order to get at the number of cattle in each county, they went to the county assessor's books and took a list of all the cattle returned by the county assessor. They then visited these farms as fast as they could and sent notices or copies of the quarantine notices to the State Commissioner, whose men were to follow up and compel the dipping of the cattle. That, however, as a rule we found to be unsatisfactory, for the reason that the farmers were not ready to have their cattle dipped; the vats had not been prepared and some of the State men were not familiarize with the mixing of the dip. The lime and sulphur dip was considered to be the most effective. So the Commissioner sent orders to have our men supervise the dipping as well as the location of the disease. Under that policy we have had fair success. We have entirely eradicated the disease from at least one-third of the area that was first quarantined on account of it. We have an equal number of counties that are nearly free where they are watching the result of the fall shipments of cattle to ascertain how effective the treatment has been. They do not always effect a cure. If the lime and sulphur is properly prepared and kept at the right temperature and the animals that show the lesions of the disease are treated by hand before they are put into the dip, one dipping is usually quite satisfactory, but in our experience two dippings effect a cure.

The State of Texas has no regulations governing this disease, at least nothing has been done there as yet. The individual ranchmen have done effective work and some have entirely eradicated the scab from their cattle, but there is no compulsory work done at all. We attempted last spring to effect county organizations and get the cattlemen to organize, but we had only fair success. In several counties I believe we can get the cattlemen to organize and eradicate the disease from their herds, but whether we can get the State itself to make regulations to keep those counties clean, I am not able to say. I believe that is all I have to say on this subject.

The President—Dr. Peters, do you care to say a few words on this subject?
DR. PETERS—Mr. President and Gentlemen. I believe that the United States Bureau of Animal Industry has done a good work in the western states by cooperating with the State departments. I can speak for Nebraska. I know in that state, if the present conditions continue, that Dr. Juckniess with the cooperation of the Bureau of Animal Industry, in a few years will have eradicated mange from Nebraska. It is very well organized there now. They have held meetings all over the infected area and they are carrying on an effective campaign of education. Through this campaign of education they demonstrate to the ranchmen that there is not going to be any favoritism shown, but that they mean business; that if any one had infected cattle, these cattle had to be cleaned up and that they were not going to permit any exposed cattle to be sent to the stock yards. They have shown the ranchmen that it was dollars and cents to them. Many of the cattle men believed that if they were somewhat wiser and smarter than others, they could by some hook or crook, send their cattle past the inspectors to the market and there they would not be detected, but they found that when their cattle reached the market they were put in quarantine, and they have found that it is best to dip their cattle.

I believe we are making headway in one direction, and that is, the men are beginning to realize the best way to dip. Some years ago there was a great deal of confusion as to what kind of dip to use. That has been done away with largely. They know now what kind of dip is best, that is, the most intelligent breeders of the State know, and they are using that dip effectively.

I would recommend to all State men who are here that they try to keep in touch with the Bureau of Animal Industry, for it can assist you, and when the Federal men assist, I tell you it has a wonderful influence. I believe Nebraska will soon be out of quarantine altogether.

THE PRESIDENT—I am sorry that I do not know the names of those who are familiar with this subject. We shall be glad to hear from any one on this subject. Dr. Melvin, do you care to say anything on this subject?

DR. MELVIN—I do not think I have anything special to add. I might say, however, that the Federal work looking to the eradication of mange in cattle was taken up by the Bureau largely upon the request of the different stock shippers. Each State was doing the work by itself and was charging a pretty liberal fee for inspection of the stock that came into or went through the State. These inspections caused delays in the shipments. For that reason the law of 1905 giving the Federal government further supervision over such shipments was passed. The work has been progressing slowly. For several years it has been a work of education, although we have attempted to enforce eradication measures. We did not succeed very well until the stock owners themselves
began to appreciate the benefit to be derived from eradicating mange from their cattle. On my recent trip west one of our inspectors informed me of one instance of a large cattle concern where they formerly had been losing 25 per cent annually. This was attributed to various causes, but since that firm has eradicated mange their losses have been reduced to something like 2 per cent. Of course that firm is thoroughly convinced that this reduction in their loss was entirely due to the eradication of mange and lice from their cattle.

The President—If there is no further discussion on this paper, we shall proceed to the next paper, Progress of Live Stock Sanitary Work in Cuba, by Dr. Mayo. Dr. Mayo is not here, but he has sent his paper. If there is no objection the Secretary will read the paper at this time.

The Secretary reads Dr. Mayo's paper.

"Because of the intimate political and economic relations that exist between the United States of America and Cuba, relations that will probably be much closer in the future than in the past, it is well that this Association devote some attention to the live stock sanitary conditions of this neighboring republic, and I wish to thank your able secretary for the opportunity of presenting to you something regarding the live stock sanitary conditions as I found them five years ago, and a brief account of the efforts made in the past five years to improve them in "The Pearl of the Antilles."

Cuba is and probably always will be, an essentially agricultural country. She produces approximately one million five hundred thousand tons of sugar annually, and a large crop of the finest tobacco that is grown in the world. Yet the income from her live stock interests ranks second only to sugar. With a superb climate and large areas of fine pasture her live stock will continue to be one of her most important industries, necessary, not only to the development of the country, but to the maintenance of the natural fertility of her soil.

We Americans are liable to measure live stock sanitary progress by laws that may be enacted or enforced. These in turn are usually dependent upon an enlightened public opinion that demands such laws and insists upon their enforcement. We sometimes lose sight of the fact that the real progress is the actual benefit that results to the live stock industry as a result of such laws, or independent of them. That is, real progress usually comes before laws are enacted as a result of educating the people to the need of such laws, so that they will demand them.

Cuba is an intensely foreign country. The language, customs, laws, and methods of administration are radically different from this country, and there is very little public opinion as we know it, felt in the enactment of legislation. The average Cuban farmer takes very little in-
terest in public affairs and he seems to fear everything that pertains to laws or officials. His one desire is to be let alone.

On taking charge of the work I found an abundance of laws covering every phase of live stock sanitary work, real and imaginary, poorly enforced, or rather not enforced at all, and a serious lack of competent men to execute them. These laws are a mixture of old Spanish laws, military orders of the first intervention, and some laws enacted by the first Cuban congress. There is today a great need of revision and simplification of the live stock sanitary laws. Some of the strictly live stock sanitary laws are executed by medical sanitary men, some by the rural guard, and some by the department of agriculture. Owing to political conditions that need not be considered here, no attempt was made to change, radically, existing laws, as some measure could be found in case of need to cover the situation.

After a careful consideration of the subject, and with the approval and assistance of that true patriot, the late Thomas Estrada Palma, then president of the Republic, it was decided to attempt to reach and help the farmer and stockmen by means of a campaign of education and to try to gain his confidence by proving to him that we could really help him in his work. I can assure you that it was up-hill work. A large proportion of the Cuban farmers cannot read, and those that do, have not the breadth of view that we are accustomed to in this country. I ought to mention the national "manana" habit of "never doing a thing today that can be put off until tomorrow." I am not recounting what seem to be faults from an anglo-saxon point of view, in any fault finding or complaining spirit, because I like Cuba and the Cuba farmer and stockmen very much, but to point out to you some of the more important differences that exist in the two countries. I do not think the fact that I was a foreigner in a strange land was any hindrance to the progress of the work; rather, it was a help, as it inspired confidence. The attitude of the United States government toward Cuba and the efficient work done by the American army during the first intervention had developed a feeling of confidence among the common people.

During the war for independence, from 1895 to 1898, the Cuban cattle industry was practically destroyed. Cattle were the "sinews of war" for both sides. What one army could not eat, they destroyed, to prevent their falling into the hands of the other army, so at the close of the war, out of the 2,500,000 head of cattle that were in existence, according to statistics before the war, only 4 per cent were left. Following the war there was a very heavy importation of cattle from Florida, Texas, Mexico, Honduras, Columbia, Venezuela and Porto Rico. These cattle were admitted with practically no examination from a sanitary point of view, and it is remarkable that only one serious disease seems to have
been imported. According to general report, blackleg did not exist in Cuba before the war. Now it is rather common.

The most frequent transmissible diseases of domestic animals are anthrax, blackleg, glanders, and hog cholera. An infectious diarrhoea of calves also causes heavy losses at times, and tetanus among horses, mules and sheep is very common.

A careful watch has been kept to discover the presence of any transmissible disease due to blood parasites, but so far none have been found and I think the island is free from them.

During the first intervention a laboratory was established under the supervision of the national sanitary department for the manufacture and distribution of anthrax and blackleg vaccine. Three years ago this laboratory was transferred by Congress to the department of animal industry. As a result of circulars published and sent out dealing with these diseases, the use of these vaccines is general, and the results obtained are excellent. The vaccines are sent free to all stock owners who request them.

Live stock in Cuba, as in other tropical countries, suffers severely from the attacks of parasites. Ticks, screw worms and intestinal parasites being common. Ticks are the most important pest. To combat them an arsenical solution recommended by the department of animal industry is being used to free cattle from ticks when they are grossly infested. The solution is used either by hand dressing or dipping and is very efficient.

The greatest hindrance to efficient live stock service in Cuba is the lack of qualified and efficient men. It is to be hoped that this difficulty will soon be overcome, as the University of Havana has a department of veterinary medicine, established in 1908.

In reviewing the five years' work in a practically virgin field, I feel that little has apparently been accomplished, certainly but a small fraction of what I had enthusiastically anticipated when I took up the work. I did try to give them an efficient sanitary service that would be of real benefit to the stock owner. One of the most gratifying evidences of our efforts occurred when, after the dismissal of the Americans employed in the service of the department of agriculture by the present administration, a cattle growers' association in one of the best stock-growing regions of the island desired to retain the writer's services at their private expense. Of the present service but little can be said, but it is my hope that they will give an honest and efficient administration that will be of much value to the Cuban stockmen who need and are worthy of all efforts in their behalf.

THE PRESIDENT—The Secretary, when preparing the program for this afternoon, thought that the papers and their discussions would consume the time of the afternoon. The work outlined on the program
has been completed. What is the pleasure of the association? Shall we adjourn, or shall we take up the first subject on the program for tomorrow afternoon?

Motion was duly made, seconded and carried, that the convention continue with the program, taking up the first subject on the program.

The President—If Dr. Cary is prepared to take up his paper, we will have it at this time.

Dr. Cary—I must first report that when Dr. Cotton wrote me to report on tick eradication I had somewhat of a wrong conception of what was wanted. My impression was that he wanted a complete report of the work done in tick eradication. I did not take the matter up until late. I wrote to the different men in charge under the Bureau, but it seems that the Bureau is not in the habit of giving out this kind of information, and therefore I did not get a report. I am not going to attempt to give you such a report. The government publishes these reports and I suppose it is their business to give them out when they see fit. I am not here to criticize nor to say that they should or should not. I am not going to discuss the whole question of tick eradication, but I want to discuss one or two phases of it, and I hope there will be a general discussion of this matter. I want to bring out some points on the method of tick eradication, because I believe, as we are now getting down in the country where we have more ticks, we have more warm weather the year round, and we have different conditions than in the higher altitudes or further north.

We can divide this subject, for convenience of discussion, into three divisions, or under three heads:

First—The method of application.
Second—The picking of ticks.
Third—Rotation.

Now, as to the application, we have a variety of things we might put under that: coal tar products, arsenical dips and oil preparations. I am not going to discuss the first, because I am not competent. I have not used it enough, but what I have used of coal tar products under various names, have been very unsatisfactory to me. The arsenical dip is all right, with a few exceptions. It is more or less dangerous to put into the hands of the average man, and then it is no more effective than the oil preparations, if as effective. We have found, I think, in using it in strengths that will justify its use on the animal, it will not kill the large ticks, or all of them. The oil preparations have come into general use. Their objections are that they are not constant. Take all the oil or petroleum products that come from Louisiana or Texas and they are variable in their composition. The results are that we have various effects on the cattle and on the ticks. I don't doubt but what the sug-
gestion of the Bureau regarding these oils—that they should have a
certain composition—is a good thing, but the question of getting them
to the farmer is another question. I do not believe this problem is yet
solved from a practicable standpoint so that we always can get the
proper petroleum product to make the emulsion or to use it without an
emulsion. Then when we do use it in almost any form, there is always
this difficulty: it does not always kill the ticks. Many of the larger ones
will drop off and have sufficient strength to lay a good many eggs to
carry on the infection.

Now, I want to get back to just one thing I believe we have to
come to in the application, and that is the oil preparations; we must
have more frequent applications.

I notice this in particular: that when we can make applications of
oil products once a week we don’t have much trouble, but where we put
the application off for three or four weeks we have lots of trouble—we
do not get rid of the ticks in many instances. This is a point I would
like to have the inspectors discuss. I may be wrong. I do not claim
to know it all, but my observations have led me to this conclusion: that
we must have more thorough and more frequent applications of these
oil preparations, especially so if we have range conditions.

Now, let me repeat that we need more constant products. We need
more frequent applications, and I believe the oil preparations are the
ones we can use above all others. Of course, I am not going to discuss
the methods of applying them, because all of you know it is done by
hand, by spraying and by dipping. Any of these methods is sufficient
if it is done properly and thoroughly.

Now the question of picking. I believe we are going to have to
resort to picking, regardless of the method we use, because I yet have
to find an application that will absolutely kill the large ticks. I believe
in following this practice where you can pick all the large ticks off and
see that they are completely destroyed. Of course, in the picking method
all of the ticks cannot be reached and killed without the use of some
application.

Now I come to the third method: rotation. Here is where I believe
we can wipe out the ticks and it is the cheapest method, especially where
we are working in a State like the State from which I come, where
ranches are common in some regions. I always have believed it is
cheaper to build wire fences once a year rather than to be applying
grease or some other preparation once every three weeks or once every
week. I believe, furthermore, that it is easier for the inspector. Of
course, all this hinges on the conditions—the inspector and the farmer
and the condition of his farm. Now, right along this line there comes
up another question, and that is the inspector, especially where a great
many veterinary inspectors come fresh from the schools. I am not saying
this to criticize them. So far as I know, they are all right. The inspectors, the veterinarians, must learn something of the local agricultural conditions, so that he can discuss some of these points with the farmer and tell him what is best for him to do. If we are going to tell a farmer to take his cattle out of his pasture, say the first day of September, and keep them out of it until April or May, we must tell him what to do with his cattle. I do not mean in the way of putting preparations on them—that is an easy proposition; but he should be able to tell the farmer something about the crops, how he can feed the cattle and pasture them and take care of them. Now, you say this is out of line. It is not out of his line, neither is it impossible. I have come to the conclusion that you cannot lay down a formula that will apply all over any given State. There are sections of States that differ from other sections. For instance, there is north Alabama and south Alabama and central Alabama. The conditions differ in each section. I must be able to tell a farmer in north Alabama what is best for him under the conditions which surround him there, and I cannot give the same advice to the farmer in south Alabama. I must suit the advice to the particular section in which he lives. You see what I mean. Two or three years ago we had a school of instruction at Chattanooga and one at Richmond. That was the beginning, and these schools of instruction should be carried out so far as is possible, especially with the new men who come from the north. This should be done every year. Why? There are local conditions that must be brought out, and that can only be done in this way. The older inspectors can exchange their experiences and tell what they have been able to do in their respective localities; this is good information for the other inspectors to know. I will admit that the work that has been done at Washington and the work that has been done by the veterinarians and the experiment stations along the line of eradication has been a great help, but, after all, the men who are going to do the work of eradication must take into consideration the conditions that apply to the various localities.

Now, you say it is up-hill work to go to a man who never has had a pasture for different seasons and ask him to build a pasture for each season and rotate his pastures, having one pasture for winter and another pasture for summer in order to kill the ticks. I know it is. But we have done it and we have gotten good results in many instances, and in every instance where we have done this, it has been a long sight cheaper than the oil method or any other method we could suggest.

Taking it from an economical standpoint, it is the duty of the inspectors, both federal and State, to make this just as cheap as possible to the farmer. From this standpoint I believe we should take this point up and work it out more thoroughly than we ever have before, because we can work along the lines of least resistance whenever we get it firmly established in a community that it is the cheapest way to do the work.
These are the points I wanted to bring out—the question of summer and winter rotation, or summer and winter starving-out plans, as we may call them—they are all local questions. We can give a general rule, but the inspector should adapt himself to the local conditions. These points are local and I believe they can be determined by the local inspector to the advantage of the farmer, if he will study the conditions.

Now, then, I want to go to another point. When should this work begin in given localities? Now, that will vary to a certain extent. I do not see any objection to beginning at any time we have the ticks to work on. The last two winters in Alabama we could have killed ticks all winter, if we had had the men. Two or three years ago, when we started on the eradication work, the inspectors said: "You cannot do anything in the winter." We have had exceptionally warm winters and we have been able to locate the ticks all winter in the middle of Alabama. Of course, that has been unusual to a certain extent.

There is another point I want to mention. Where shall we work in a given State? My idea is this; to work along the line of least resistance and not work on geographical lines. I have run up against this proposition. We have had pressure brought to bear to begin work in a certain locality and we have had violent opposition; at the same time there were other counties clamoring for us to begin work there, where there was no opposition to speak of. There was no occasion for our undertaking the work in the face of the opposition when we could begin the work without any resistance. If we surround those counties where there is violent resistance, we soon shall have those counties wanting us to begin work in them.

The President—The discussion will be continued by Dr. Steddom.

Dr. Steddom—I was very much pleased to hear the remarks of Dr. Cary on this subject of tick eradication, and in a general way I think I agree with him. In so far as the applications for the destruction of ticks is concerned I cannot say very much about the coal tar preparations. I think it has been experimented with somewhat and with very good results, as the Doctor states. I am inclined to think that the arsenical solutions will eventually be the more generally used. They are being used a great deal now, as I understand, in the west—Texas, Oklahoma and California especially. Conditions there are quite different from what they are in the east where we have only a few cattle in a bunch to deal with and the larger percentage of people and babies to consider. I am inclined to think that fact should be considered, the danger of poisoning human beings from the use of arsenical drips, but if we can arrive at some well defined plan by which that can be obviated in the east, and if our present experiments show that this is superior to oil or oily preparations, in the destruction of ticks, I am sure it would be preferable. We have realized for sometime that the
oil preparations are not constant. We have experienced difficulty in getting emulsions that were just the same as those we had used. At the present time the Bureau is furnishing oil emulsion in some of the different localities for what we term the “follow-up” work. I do not think we should undertake to furnish disinfectants for the early work, but possibly we should in some localities, for the time being any way, furnish disinfectants for the few people who own infected premises or farms, who, for some reason or other, fail to disinfect their cattle.

The application of disinfectants to animals, I am quite sure, should be used at intervals not to exceed three weeks, and in the warm months they should be used oftener than that. I think, as Dr. Cary suggests, if the treatments are delayed for a period longer than three weeks in mid-summer, we would lose the benefit of the treatment, because the ticks in the meantime would have developed on the animals and dropped off on the ground.

I am inclined to think it makes very little difference when we begin this work of tick eradication, for the simple fact that the work primarily is a campaign of education. I believe in the long preliminary work in a county and not in undertaking to rush it for the first year, or possibly two years, but allow the work to be done largely by the local authorities and the cattle owners themselves, taking care as far as possible not to go into localities that are not prepared for the work of eradication.

This brings me to the point on which we always have had more or less difficulty, and that is the raising of funds in the states and counties for this work.

In states where a portion of the area is above the line and a larger portion is below the line, the one faction of the people in the quarantine area are opposed to the faction above the line or in the area outside the quarantine. In this way some of the states have found it very difficult to obtain means for eradicating the disease. I think, to follow up the thought of Dr. Cary, and as just previously suggested, to go into areas where they are ready for the work, would mean that in some states we might not be able to follow up the policy which has obtained heretofore to work along the non-quarantined area, but to go down into the interior or into some portion of the state where they were actually clamoring for the work and where they are ready for it. Now, with that sort of an understanding, with the state authorities and the government, to take up the work where they are ready for it, it seems to me it would wipe out the opposition that exists in states such as has been suggested, between the two factions, those below the line and those above the line, and thereby make possible the appropriation of funds by the state for this work that would be impossible otherwise.
THE PRESIDENT—Does any one else wish to discuss this subject?

DR. KIRKMAN—Mr. President and Gentlemen: I think we all agree in regard to this tick eradication, that in order to make progress, we must have the sentiment of the people with us. It is my belief that the thing which is creating sentiment in favor of tick eradication as well as the eradication of other diseases, is the quarantine line that has been established to prevent the movement of cattle from below that line. We find in our territory where the greatest interest is manifested is in the counties bordering on those in which the work of tick eradication is being conducted or has been conducted, or where the counties have recently been released from quarantine. The news spreads from the counties that have been released, and the value in cattle and the value in land have increased in some instances to a wonderful degree. Those people living in a quarantined area are just as eager for these improved conditions as those who recently have been released from the quarantine. The best element in these counties demand of their local authorities that they take up the work.

As to the different methods, none have been discovered within recent years in addition to those recommended at the outset of the work. From our experience the picking method is rather unreliable. At any rate it is very slow. In going over our records I notice that where the quarantine has existed for a couple of years the picking method is employed. Now if we pick out an ideal place and an ideal farmer who will follow ideal methods, then of course we could eradicate with the same degree of safety that we could with the oil method, but we have found that we have not come up to the ideals of the method recommended. The oil method, the use of disinfectants with the oil, has, to a great degree, been the most successful one we have tried. We have not overlooked the fact that there are other methods that can be employed successfully. The pasture rotation is what we are after all the time. We urge continually to the owners that they change their pastures when it is most convenient, with the point in view that no infection be carried from the old pasture into the new pasture. All of these methods can be employed to a greater or less degree of satisfaction. The owners in certain territories will follow certain methods better than the owners in other territories. When we find a change of method, or a different method, we devote our time to that method. They are all good methods. They all will succeed in eradicating ticks, and we use every one that can be applied.

We come here from year to year with recommendations for the release of areas that have been freed from ticks. I am very optimistic in this work and I feel that what we are accomplishing is satisfactory to those of us who are in the field, at least. We would like to do more; we would like to get to that state that is perfect, but what is being ac-
complished, so far as I can see, is done by the most strenuous effort. There is scarcely anywhere I have been that I have encountered the farmer who is so zealous to clean the ticks that it was not necessary for the inspector to make visits to his place regularly. They all need encouragement, and to make a success of the work means repeated visits. That consumes a great deal of time. A man can jump from place to place and your may say that he is a good worker and will clean up the territory quickly, that the farmers will do the work of their own accord. That may be true in some places, but I have not found anywhere as yet where I do not believe the best results have been accomplished by the persistent endeavor and frequent visits of the inspector.

As to the future of the work, I can only say that everywhere people are showing the most intense desire to get out of quarantine, not that they have any animosity toward the tick, but simply because of the enhanced value of the cattle in the free area. That has created a desire to make cattle raising a profitable industry. The best element in the counties are agitating the subject and it takes them to work upon those who are inclined to be slow in their work. As Dr. Cary suggested, we must look for the best men we can get to do this work. And when a good man goes into a territory that is infected, we say that that territory will be cleaned up quickly, at least a year or two sooner than other territory, because the better man is at work there. So, the best men we can get will show the best results every time.

The President—Dr. Ransom, I understand, has had considerable experience with the dipping.

Dr. Ransom—I might say that I expect to touch on this matter in a paper which I have prepared, which will be presented later.

The President—Are there any others who wish to discuss this subject?

Dr. Owen—This question has been discussed so thoroughly that I have no new suggestions to offer. However, I might add that the work in Virginia and North Carolina has been confined principally to cleaning up the unfinished territory and that our aim has been to find out the quarantined premises that have been in the released territory. In this connection I will say that we have been very successful. I attribute our success to the fact that the inspectors have supervised or assisted in the disinfection at the time of the inspection. This may be a little slow, but it counts. Under ordinary circumstances we get very good results, and that is what we are after.

The President—Dr. Lewis, do you care to say a few words on this subject?

Dr. Lewis—I think this subject has been pretty thoroughly discussed. We are engaged in tick eradication, and Dr. Kiernan, who has
just spoken, has our territory in charge, and we are making progress. We are getting along nicely, from what I can learn. We probably shall put quite a few counties above the line this year, if we are permitted to do so. Our methods are the same as those that have been discussed here. We find that the persistent work of the inspectors and frequent visits accomplish the results.

THE PRESIDENT—Any one else?

DR. NIGHBерт—There are two or three points I would like to mention. I wish to state that I agree fully with the gentleman from Alabama (Dr. Cary) with reference to knowledge of the farm conditions in the community where we are working. In order to bring this forcibly to your mind, I wish to mention the cotton crop, which is the staple crop in the southern states. Alabama produced last year 1,428,000 bales; Florida, 75,000 bales; Georgia, 2,118,000 bales; Mississippi, 1,673,000 bales; South Carolina, 1,981,000 bales; and the total crop was 13,825,000 bales. The estimated value of this is $683,794,000. This is one of the greatest obstacles I meet in the work of tick eradication, because this is the money crop of the southern states; this and tobacco. The cattle industry is in its infancy. The average number of cattle to a farm is from three to five. It is very difficult to get the farmers in our section to rotate their crops, but I am glad to say that in a number of instances they are rotating their crops and that the ticks are being eradicated by the starvation method.

The work of tick eradication in the states of South Carolina and Georgia is being conducted under the supervision of the local Bureau office at Spartanburg, S. C., and is as satisfactory as could be expected under the conditions that exist. The idea is now well established with the state officials and the people that the Bureau’s position is to assist them, the prime factor of the movement being with the officials and people of the state. My policy is to inform the people that the work of tick eradication is under the laws promulgated by their own State legislators, including the appropriations, which are paid by them through taxation, this seems to exclude the idea that Government men are invading their rights. I approve of the Roosevelt policy “that the best results are always obtained by helping those who are willing to help themselves.”

Freeing territory of the fever tick and forcing the quarantine line southward is not an easy task. The work proves to be harder each year and the responsibility with all concerned is greater. Many farms, and in some instances, quite an area of territory that has been freed and released is again infected, which means the loss of much work, time and vast sums of money. This situation is not hard to account for in a state where cotton is the main crop. The people seem to think that there is no necessity to look beyond cotton for a means of subsistence.
which occasions little or no study of the live stock situation. What cattle are raised, with the exception of a few well bred Jerseys, are scrubs and left to their own fate. Cattle in a general way are kept for necessity, that is, for a little milk and butter for family use and the surplus stock for local slaughter; therefore, we are faced with the problem that the cattle industry is of small value and profit. This, of course, accounts for the indifference toward eradication of the ticks by the owner himself. The knowledge imparted to the owner that eradication of the ticks means more cattle, better cattle and an open market is of little value to him, because he informs you that he has no cattle to sell; so we must tell him the idea is for him to get rid of the ticks in order that others who may be interested may do so; in other words, we are not trying to make cattle fanciers and a cattle country; we are simply trying to arrange a way for improvement of what stock is now on hand, that they may be profitable.

I do not wish to impress this convention that no good results have been obtained in my territory. I merely wish to show that there are great obstacles to overcome and I am glad to say that during the past three years there have been improvements in the way of laws and their execution, also in the sentiment and support of the leading people.

This year there is a marked improvement in the sentiment of the people toward the work and the cooperation of the state officials is satisfactory. The work and organization is better understood and I feel sure of good and lasting results.

I give the following conclusions:

First—The one encouraging feature for those executing the work is that we know that ticks can be eradicated from every farm.

Second—That the main hindrance to the work is the people themselves, because they have not realized that the cattle tick has hurt them in a financial way.

Third—The educational feature, time and persistency on the part of each individual engaged in the work, are essential.

Fourth—Drastic laws, both Federal and State, controlling the movement of quarantine cattle, will accomplish good results.

Dr. BRYAN—I believe everything has been said in connection with this subject of tick eradication that can be said at this time. Our experience in Oklahoma has been similar to the experiences of those who have spoken. We have found the best plan to be to go among the farmers and work up sentiment in favor of tick eradication. We have had little success in any neighborhood where we have not had the cooperation of the people. We have carried on a system of education among the farmers and we also have made it a point to work on the representatives in the Legislature and to get them to assist us in carrying out our ideas. At this time we have laws on our statute books which provide that the county commissioners of any county can appropriate money for tick
eradication and employ inspectors to supervise the work. Then we give them the inspectors from the State Board of Agriculture to act as State Inspectors, while they receive their pay from the county in which they are working. We thought this would be a good law, for the reason that the counties receiving the immediate benefit from the work would bear the greatest portion of the expense. Under the provisions of the law which went into effect sometime last June, the counties in Oklahoma have employed forty-seven live stock inspectors and they have built probably thirty-five or forty dipping vats. They are working in harmony with the State inspectors and also with the Federal inspectors. I think this a good move, for the county commissioners are usually influenced by local sentiment, and when the county commissioners have appropriated money for the work and we go in and assist them, they feel that they are doing the work instead of the State or Federal authorities. I think we get more hearty cooperation from them in this way than we would if they had nothing to do with the matter.

The President—Is there any further discussion?

Dr. Lenton—I have been representing the State of Arkansas the last three years at these meetings, but up until now I never have spoken. I have preferred to listen rather than to talk. But there are one or two things that have come up in the discussion this afternoon which I should like to refer to. The work of tick eradication was started in Arkansas three years ago when the whole State was below the quarantine line. The first idea was to take a row of counties across the State and eradicate the ticks from all those counties under U. S. quarantine, and then move down to the next row of counties. We found this to be impracticable for several reasons; probably because we had such a length of line, and breadth, too, that the work could not be attended to properly. For that reason the work was confined to two blocks of counties, one in the northeast part of the State and one in the northwest part of the State. Then when one section was cleaned up, instead of having a row of counties, we had a block of counties.

Dr. Cary spoke of the different agricultural conditions in Alabama. We have similar conditions in our State. We have different factions; we have the corn men, the cotton men and the fruit men; and the ease by which a section is cleaned up varies according to the different sections. Here is where I want to make another point. Some one has said that the best inspectors would always show the best results, by having their territory cleaned up first. Now, that would result in an injustice in our State, for we have two inspectors from the Bureau of Animal Industry, both good men, who have been in this work since it started in Arkansas,—one in the northeast and the other in the northwest. They work on somewhat different lines. I know them both and they both have had excellent results. In the northeast part of the State we have five
counties completely free from ticks, while in the northwest part of the State we have one county above and two counties provisionally above. The conditions in those two corners were entirely different. Of course, the five counties in the northeast stand to the credit of the inspector there, but it was found easier to get those five counties above the line (I do not want to make an unjust comparison) than the one above in the northwest, because of the difference in conditions. Therefore I want to say that it does not always indicate that the best inspector will get his territory cleaned up first.

We have relied almost entirely on the application of oil. Where the herds have been small we have used the hand application and they even have resorted to hand picking. The work has been carried on successfully where the inspectors have been in charge and have made frequent visits.

The building of fences and the pasture rotation is scarcely practicable in the State of Arkansas. There is lots of land there belonging to corporations and companies which is free range, and I do not believe it would be possible to build fences in Arkansas because of the difficulty in getting water for the stock.

Another point was brought out and I think it is a good one, and that is the new inspectors who start out on this work. They may be good men and well educated professionally, but still I believe for tick eradication we want not only well educated men, but men of special education who can adapt themselves to the circumstances. We have to go among the people and very often sleep at the farm houses, at least we used to, but now we are independent, for this year we started to live in camp wagons. I think the men should be able to mix with the people and know something about the crops and the conditions the farmers are working under, so that they can intelligently advise the farmers in regard to pasture rotation, wherever that is possible. Of course, I am speaking about an ideal method.

The President—I assure you that I do not want to overlook any one who desires to discuss this subject. Dr. Nesom, we should like to hear from you.

Dr. Nesom—I have been listening to the discussions here this afternoon as one amazed, because I can hardly realize after having left these shores more than five years ago that tick eradication is actually realized and that the work is now in progress and has been for sometime. My first connection with the work was when it was in its infancy and was not actually begun in any of the States, except possibly North Carolina.

In 1898 I went to South Carolina as State Veterinarian. I was like all of you have been at one time. I was just out of college, and while I knew in my own estimation a great deal, there were a few things—probably enough to make an almanac—which I did not know.
About the first report of ticks which I received was from a man who was feeding cattle. I proceeded to his place and found two or three dead animals. The conditions were very alarming. I tried to look wise, took careful notice and gave a noncommittal diagnosis and went back home to read up on the subject, and, after due process of time, I found Texas fever was one of the most common things in South Carolina and that many feeders actually lost 50 per cent of their cattle. After working in that State for nearly a year and finding the tick problem one of the most important questions to deal with, I went to Washington to discuss the question with Dr. Salmon. When I went into his office he asked me how conditions were in South Carolina and I blurted out that we had a serious time with Texas fever. He laughed at me and said: "Texas fever! Why, I didn't suppose they ever had that down there." It took a great deal of talk on my part to convince him that I was partially right. I don't know whether he ever did fully believe me or not, but all of you will believe me now. It was a year or two later that Dr. Butler came to North Carolina and began that great campaign with which you all are familiar. He was in a position to do a great deal more than I was, because he had more money with which to work and a better territory to work in. However, we carried the work along more or less, and when I left in 1904 the work was being carried forward in South Carolina, using one Federal inspector and one inspector furnished by the State, whom I detailed on the work. The work was outlined in bulletin No. 1 of the State Veterinarian's office, published about July 1, 1904, from South Carolina Agricultural College. I shall not give you the details of the plans, as you all know what they were; they were very crude in those days. I lost track of the work during my absence and was greatly pleased to learn upon my return to the United States that it was being prosecuted. I think that is one of the things that is going to be of great benefit to the animal industry, especially to the cattle business of the south. All of the bottom country, and in territory that is rangy and has no stiff clay soil and where it is too cool for growing cotton, is well adapted to the livestock business and more particularly to feed in the winter, and it is in that territory that the first permanent good is going to come about in consequence of the work along the line of tick eradication. I congratulate you upon the results already achieved. I regret that I have not been able to stay among your ranks and carry along the work in which I had the honor to be a pioneer. However, I have gone to foreign fields and have undertaken work there which is along similar lines, but deals with different diseases. It is true we have cattle tick there, but it is said to be a different species than the ticks here. The problem is not a serious one, from the standpoint of the United States.

The President—If there is no further discussion on this subject, I will ask Dr. Cary if he desires to conclude the discussion.
DR. CARY—I have a word or two, not to summarize, but I want to hark back a little to that agricultural problem that I touched slightly. You realize that the one-crop system is the great difficulty in the way of the cattle industry in the south, but I usually meet that problem with an argument something like this: Take Alabama, for instance; as a whole it takes about three acres of land to produce one bale of cotton, whereas every acre that is put to cotton should produce a bale. Now, this can be done only by the rotation of crops and putting in live stock to produce the fertilizer to increase the fertility of the land. It means more fences and more fertility, but a man can raise as much cotton on one-third of the land, and make more money. You will ask if this can be done? It has been done and you can do it again. We find that the more we get in touch with the farmers, the easier it is for us to get them to do what we want them to do. Now this brings up another point, and that is the personnel of the inspectors. So much depends upon them. They have to come in contact with the farmers and live stock men. They should study the conditions of the locality where they are working; they should know not only about their own particular line of work, but they should know about the agricultural conditions as well. In all lines of work, the man who gets in touch with the people he does business with and is able intelligently to discuss their business affairs, is the most successful. It is so in this work and that is why I want to impress it upon those who are here.

Announcements were made of the meetings of the committees, after which the convention adjourned to meet at 2:00 o'clock p. m., September 14th.

TUESDAY, SEPTEMBER 14, 1909.

The members of the Association and friends assembled at the hotel at 9:00 o'clock a. m., and were taken via the South Side elevated railroad to the Stock Yards, where the plants of Swift and Company, Armour and Company, and Libby, McNeil and Libby were inspected, followed by luncheon at the Saddle and Sirloin Club.

The convention was called to order at 2:30 p. m. The President in the chair.

THE PRESIDENT—I understand the Committee on Constitution and By-Laws is ready to report. Is it the pleasure of the convention that the report be submitted at this time, before the regular work of the program for the afternoon is taken up?
A motion was duly made, seconded and carried that the report of the Committee on Constitution and By-Laws be submitted now.

Dr. Archibald, on behalf of the committee, read the proposed constitution and by-laws. A general discussion followed the reading of each section, and the convention adopted the following constitution and by-laws:

**CONSTITUTION.**

**SECTION 1.** This Association shall be known as the "United States Live Stock Sanitary Association."

**SEC. 2.** The purposes of this Association shall be the study of sanitary science, and the dissemination of information and methods pertaining to the control and eradication of infectious diseases among live stock.

**SEC. 3.** The officers of this Association shall be a President, five Vice Presidents and a Secretary-Treasurer.

**SEC. 4.** The elective officers of the Association shall constitute the Executive Committee.

**BY-LAWS.**

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

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

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

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

**SEC. 5.** Any person engaged in live stock sanitary work for Federal, State, territorial, county or municipal governments shall be eligible to membership in this Association, and any other person interested in live stock sanitation may be elected to active membership upon the recommendation of the executive committee and a two-thirds vote of the members present.

**SEC. 6.** Each application for membership shall be submitted in writing and shall be referred to the executive committee for consideration and recommendation of the association.

**SEC. 7.** The revenue of this Association shall be derived as follows: Each member shall pay an annual due of one dollar, payable in advance. By the sale of the annual reports of the Association at a price to be annually fixed by the committee on publication, said annual reports to be copyrighted.

**SEC. 8.** Order of Business:

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

Sec. 9. The meetings of this Association shall be held annually at such time and place as may be designated by the executive committee.

Sec. 10. A suspension of the By-laws may be made by a two-thirds majority for the purpose of changing the order of business to facilitate important business.

Sec. 11. All proposals for the alteration of the Constitution and By-laws shall be submitted in writing, and no alteration shall be acted upon until it has been referred to the executive committee and presented anew by them at the next meeting of the Association.

**The President**—We will now proceed with the program. The next subject is the Control of Glanders, by Dr. Schoenleber.

**Dr. Schoenleber**—I am not going to give you anything new, merely a summary of a few facts which I hope will be followed by a general discussion. This subject was not given to me by the Secretary by virtue of my superior knowledge of the disease and conditions, but from the fact that it does not make very much difference, for, in a few years the horse will probably have become obsolete, in view of the new method of transportation, the automobile.

When we consider the control of any contagious disease it is necessary to consider:

*First*—The character of the contagium and special conditions favoring or retarding its development.

*Second*—The origin of the disease and the methods in which it spreads, and

*Third*—The methods available in locating and limiting the disease.

Each city, state or section of the country shows its own peculiarities in the virulence of the contagium and conditions favoring or retarding the development of any contagious disease, and in glanders we are only too familiar with them as they exist in each one's own little sphere. It might be well to mention here that plenty of sunshine and pure air is our best prophylaxis and the climate of Kansas and some of our western states is such that it retards the outbreak of the disease in many infected animals. In these states very little stock is kept confined to any very great extent in damp, dark, over-crowded and ill ventilated stables. I am told by a practicing veterinarian that a thoroughbred race mare in Southern Kansas was exposed to infection at the age of three years and it was not until after she was exposed to a bad storm at the age of nineteen and coming down with a case of congestion
of the lungs that she developed any clinical symptoms of glanders. This peculiarity of climate calls for double precautions in stamping out an outbreak of the disease.

My experience has been that in the country districts in the State of Kansas fully sixty-six per cent of the outbreaks are caused from animals, usually ponies, which are used exclusively as “trading stock.” Many of these “Western” animals seem quite healthy, showing only a slight nasal discharge, many times only periodically, but I have found quite a number of outbreaks where such an animal remained in this condition for several years, infecting many native animals with the acute form of the disease.

Another fertile source of infection in some sections is the “grading gangs,” where a large number of horses and mules are used for grading roads of various kinds. The resistance to the disease in these over-worked and poorly kept animals is usually at a minimum and when glanders once appears it usually infects the greater part of the herd. In the larger cities the drinking fountain is the main source of spread.

In controlling glanders it would seem that each state must be a law unto itself in the application of methods on account of the variable conditions encountered. But some of the primary necessities in each case would seem to be the abolition of the watering trough and common drinking fountains in cities, rigid quarantine against the importation of uninspected animals into the State and the destruction of all diseased animals, rigidly enforcing the quarantine and testing of all exposed and suspicious cases.

With reference to the agglutination test I have not found it as reliable as one could wish and am therefore not using it.

In the use of mallein, if you know you have a reliable product stick to that one; you can better compare results; and upon general principles where it can be avoided, I am opposed to the indiscriminate use of different “makes” of any drug. Kansas last winter enacted the following law: “In latent cases of glanders the final decision shall be governed by the results received from the proper application of any mallein approved by the U. S. Department of Agriculture.” A similar clause is incorporated into our tuberculosis law. This legally controls the situation and puts it up to the “men higher up.”

In testing mules I always use at least 1 1/2 the ordinary sized dose required for the horse—we get better reactions, yet the mule takes the disease much more readily than the horse.

In the application of mallein where there are no clinical symptoms we look for three reactions, a systemic reaction, a thermal reaction and a local reaction. If all three occur the diagnosis is easy, but this does
not always happen, and it would seem from our experience that it is not advisable to condemn an animal upon one of these reactions alone.

The systemic reaction may be so slight that we do not always observe it, but when we do see it, it means much in connection with the other reactions towards arriving at the proper conclusions.

A thermal reaction occasionally occurs independent of the presence of the disease, therefore it is not best to rely upon the temperature alone in deciding the fate of a suspected animal, although less than two degrees rise has decided cases for me when taken in connection with other reactions.

The local reaction seems to be the one most constant and reliable. While we occasionally get a slight local infection it has very few of the characteristics of the glanderous enlargement.

The most salient features in the control of glanders might be summed up as follows:

First—Quarantine against outside invasion.
Second—Rigid inspection of trading stock.
Third—Abolish the public watering troughs and drinking fountains.
Fourth—Mallein test all exposed or suspicious cases and destroy all clinical cases and reactors.

THE PRESIDENT—Dr. Wright has kindly consented to open the discussion on this subject. If he is in the hall, we shall be glad to have him open the discussion.

DR. WRIGHT—The speaker intimated that this subject would soon become obsolete, because the horse was going to be eliminated and there would be no further use for sanitarians, so far as the horse is concerned. He does not stop to think, when he says that, that there is a more serious disease affecting the automobile, and there is where we can turn our attention and have more troubles than we have in our present tasks. I do not believe the automobile is going to drive the horse over into the sea. The automobile has a place; it is useful. So is the horse, and as long as the horse exists on the face of the globe this subject will be one of interest to all who take part in sanitary work.

One year ago in Washington I was called upon to lead the discussion on this subject. When I finished that discussion I felt as though the subject never would be brought up again, because I bored nearly to death every one who was in the room. I do not have any new features to add to what I said at that time. I do not believe it is necessary to abolish the watering trough. It would be if they did not have an outflow as well as an inflow. Now, we will study that proposition from a practical standpoint.

To abolish watering troughs in a city like Chicago would do a great injury to the horses on the streets, where, often times, they do not
return home until night, after working hard all day. So, if it is an evil, it is a necessary evil. I do not think any city in the world had more horses with glanders up to ten years ago than did the city of Chicago. It was not an unusual thing to kill ten, fifteen, twenty or even thirty horses in one week. The principal source of spread was the big street car barns at that time, where the disease existed and was kept hidden in some of them, so the authorities could not get hold of them. The barns have passed out of existence.

Now, we have watering troughs in Chicago. If you will take notice as you go along the street, you will find that almost every one of them is constructed so that water is flowing in and flowing out constantly.

During the last two years I don't believe there have been more than a dozen of fifteen clinical cases of glanders in the city of Chicago. The disease has been reduced to the minimum. I think our method in handling the disease is very effective, although not so radical as one sometimes would feel like following. Now, don't misunderstand me. I have been misunderstood a few times in my remarks on this subject. It is a terrible disease, as everyone knows, and if it only existed in a small area, or in a few places, I would be one of the first to insist on killing every horse in that area if it was necessary to do so, in order to stamp the disease out of existence. But today it is everywhere.

Now this is the way we do at the present time. We kill all animals which show clinical evidence. We disinfect the premises and if they have private watering troughs which do not have an overflow as well as an inflow, we insist upon such watering troughs being installed. We permit the owners of exposed horses to use them on the public highways, provided they are not brought in contact with other animals, or are watered at public watering troughs, or hitched at public places, and we have them inspected once a week, or oftener, if the inspector feels that it is necessary. We are handling the disease successfully, and as we are handling it successfully in that way, we naturally want to continue along those lines.

Now there are times (it depends upon the inspector who is to do the work) where you feel as though it was necessary to make the mallein test, on account of the nature of the disease or the conditions. Other times, again, we might find a horse in a stable before it has reached the point where you can see any discharge from the nostrils, but it may be evident on other parts of the body. Now, it is hard to say how or where this horse became infected. He may have gotten it at some public watering trough of course; he may have gotten it by actual contact with a horse with the disease, or, it may have been in the system for several months or for a few years. I do not think the disease will stay in the horse's system, and the horse not develop the disease after a
reasonable length of time. Nor do I believe that a barn which once has been condemned should always be condemned. If you take the horses out of the barn and keep them out for two or three years and then you put healthy horses in there, I do not believe they will develop the disease or contract it from the barn. I believe the germ will not live outside of an animal for longer than 120 days, even under the most favorable conditions. I believe the bacteriologists tell us that. If you do vacate the premises containing diseased animals for the length of time stated, it is perfectly safe to put other animals in them.

Now, as to how long the germ will live in an animal before the disease develops, I have on record a case which came under my observation where two years and eight months elapsed before the disease developed. That horse was used for driving purposes by a lady and at the end of two years and eight months the horse showed developments of the disease. I do not believe the horse was reinfected. I am quite sure it was not, because it was kept in a separate barn. In a community where the climate is extreme, such as in Kansas, where it gets extremely warm, where the vitality is sapped out of the animal, if the germ exists in the system, clinical symptoms will be very liable to develop early. The same is true where you have to keep a horse housed and he breathes impure air, where there is not sufficient ventilation, there, too, the tendency is to cause the development of the disease early, if it exists in the animal. You take a horse that is worked moderately, where it is well fed and kept in good condition, it is less liable to develop the disease in a clinical form, even if it exists in the system. But you push that horse to the extreme so that he can scarcely stand the work, then, if the disease exists in him it is liable to develop more rapidly.

The President—This subject is an important one and we would like to have it discussed.

Dr. Ward—I should like to say a few words on this subject. Dr. Wright thinks it is not necessary to close the watering troughs; that it is a cruelty to animals to do so. In St. Paul and Minneapolis we had in the neighborhood every year of at least 250 cases of glanders in both cities. Three or four years ago we required the health officers to close those drinking fountains and substitute faucets from which the teamsters could draw water in their pails and water the horses in that way. A great deal of opposition was experienced at that time, but at present it is taken as a matter of course. Every teamster carries his pail and there is absolutely no cruelty and no neglect in watering the horses. During the last year we have killed in the cities of St. Paul and Minneapolis but one fresh case of glanders. It has been practically stamped out. Those animals which have been killed were the ones which were shipped in from other parts of the state or from Chicago.
In regard to glanders in the city of Chicago, I want to say that the western country was flooded with horses which were taken up into North Dakota, South Dakota, Montana and Minnesota and sold; they were shipped from Chicago when the street car barns were closed. It is for that reason that we have had such a large number of cases of glanders in those states. I think it is absolutely necessary, if glanders is to be stamped out, that the watering troughs in the large cities should be closed and faucets substituted, so the teamsters can water their horses from a pail.

We have experienced the same trouble in the lumber camps, where they have from 150 to 200 horses. You once introduce a horse with glanders into a camp and allow him to drink from the ordinary watering trough, and it is only a short time before you have a large number of cases. In those camps we have them educated now so that they have the teamsters water the horses with their own pail, and in this way we have prevented the spread of the disease.

With regard to Dr. Schoenleber's paper, I think it is absolutely necessary that the commercial mallein should receive the Government's approval, because some grades of mallein on the market are not reliable, and I think it would be a good idea to have Federal control of biological products.

In regard to the mallein tests and the reactions, the temperature, systemic and local, I would say that in Minnesota we do not take much stock in them. If we run into an outbreak of glanders we test all of the exposed horses. If some of the animals show any rise in temperature or show a pronounced swelling, we simply condemn them as diseased animals and they go the same way as the clinical cases. We simply aim to kill off everything which shows to any degree of certainty its being infected with glanders. If an animal has been exposed to glanders, I think it is a good idea to put it out of the way, because that animal in all probability will spread the disease to others. It is true that in light driving horses we quite frequently get a rise of temperature of one and one-half or two degrees, which by no means indicates glanders. We have experienced considerable trouble in animals shipped into the State from Canada. If they were not accompanied by a certificate from one of the Bureau officials they were held at the line and tested, and any animal which showed a rise of two degrees was refused entry. We retested a large number of those animals which were refused admission and of the rest, if there was no rise in temperature and practically no swelling, they were released. It has been my experience in the lighter horses that you will quite frequently have a rise in temperature of from one to two degrees and the animal not be infected with glanders; but I am of the opinion that every animal which brings a rise to 104 degrees from the normal—whether it be
98, 99 or 100 as a normal temperature—if it goes to 104, I think we are absolutely justified in killing it, because it is only a matter of time until the animal breaks down and it is impossible to keep a diseased animal from being exposed to other animals and thus spread the disease.

Dr. Luckey—The matter of public watering troughs in cities is of considerable interest to me, and I would like to discuss it pretty thoroughly, except I feel it would be intruding upon the time of those who are to follow. We have had some experience that points rather definitely to the results which follow the use of the common drinking fountain, and our experience occurred in Kansas City. The type of water fountain there was a round concern about 40 inches in diameter, kept full of water and frequently overflowing, and was high enough so that the horses could, by stretching around a little, drink without being unreined. We frequently found horses with well marked cases of glanders drinking at one of these fountains and as many as five, six or seven horses surrounding the fountain at the same time, with their noses coming in almost actual contact. Now the fact that such fountains overflow cuts very little figure, in my opinion, when horses are permitted to come in contact. Where one is affected, it is apt to communicate the disease to others. For instance, I know of an instance where some mules and horses became infected by nosing with an infected pony. The pony was turned into a lot and came up to the fence surrounding the lot. In an adjoining lot were the horses and mules and they came up to the fence and nosed the pony; in this way the horses and mules became infected and they all were condemned officially after developing well marked lesions of glanders.

The increase and decrease of glanders came up and went down with the opening and closing of the public watering fountains. I consider them not only dangerous things—even the overflowing fountains—but I consider them the disseminators of all the various contagious diseases. I am very radically opposed to any sort of watering fountain in the cities. We have much better results by providing faucets, and a pail for each team.

The President—Dr. Mohler is compelled to leave the city, and we have decided to exchange his paper with Dr. Ransom. We will now hear from Dr. Mohler.

Dr. Mohler—The subject of this paper is "Veterinary Tetanus Antitoxin, with Special Reference to Federal Supervision of Biological Products." It has been prepared in conjunction with my co-worker, Dr. Adolph Eichhorn, of the Pathological Division of our Bureau.

Of the various biological products prepared for the cure and prevention of infective diseases in animals, tetanus antitoxin has been probably the most extensively used by the veterinary profession. The good
effects which were expected from the administration of this antitoxin in the prophylactic and curative treatment of tetanus have not, however, been all that could be desired, and it is surprising to learn of the divergent results which are obtained from its use by various practitioners. It is, therefore, only natural that tetanus antitoxin has not gained the favor of the veterinarian, and is not used to the extent merited by such a valuable product. It has been suggested that the lack of uniform results which follows the administration of the antitoxin is primarily due to the variation in the strength of the product and following numerous requests from different sources it was decided to undertake the standardization of veterinary tetanus antitoxin prepared by different manufacturers, and also to determine whether these products are subject to any variations in strength. This work seemed particularly desirable in view of the address of Anderson before the June meeting of the American Medical Association in which he stated that his experiments showed veterinary tetanus antitoxin to contain as low as 17 to 25 antitoxin units per cubic centimeter, while similar examinations of antitoxin prepared for medical use contained from 150 units to 600 or even 700 units per cubic centimeter. The investigation below recorded was carried out in accordance with an Act of Congress making appropriations for the Department of Agriculture for the year ending June 30, 1909, which provides as follows:

That the Secretary of Agriculture is authorized to purchase in the open market samples of all tuberculin, serums, antitoxins, or analogous products, of foreign or domestic manufacture, which are sold in the United States for the detection, prevention, treatment, or cure of diseases of domestic animals, to test the same and to publish the results of said tests in such a manner as he may deem best.

You will notice that while power has been granted to purchase, test and publish upon these products, no authority has been given with reference to the supervision and control of their manufacture. The object in presenting this paper on tetanus antitoxin is to furnish a concrete example of the variation observed in this particular product at present on the market and to show the necessity for Federal supervision of all vaccines, serums, antitoxins, viruses and analogous products, including mallein, tuberculin, anthrax and blackleg vaccine, and hog cholera serum.

**HISTORICAL REVIEW.**

Prior to the discovery of the cause of tetanus there were various theories advanced regarding the nature of the disease. One of the most widely accepted views was that tetanus, which develops as a result of an injury, is occasioned by the tearing or contusion of some of the peripheral nerves, and as a consequence the changes produced are conveyed to the spinal cord. On the other hand, in the cases where no injury was associated with the disease, it was thought to be of idiopathic origin.
With the discovery of the tetanus bacillus by Nicolaier and its successful cultivation by Kitasato in 1889, the true cause of the disease was established. Kitasato in his investigations also found that the organism is not present in the blood of animals dying of the affection and accordingly he concluded that the fatal results were produced by an intoxication and not by the infection. In his subsequent work with the disease Kitasato, together with Von Behring, successfully worked out an immunizing method against tetanus in 1892.

In tetanus, unlike most of the other infectious diseases, the infection by the organism does not exert the destructive influence, but only the toxine of the organisms are responsible for the serious results of the disease. The tetanus bacilli therefore produce a specific substance which has the toxic effect. Kitasato came to this conclusion in the course of his experiments, when he succeeded in producing typical cases of tetanus in mice, guinea pigs, rabbits and other animals with the filtrate obtained by filtering tetanus cultures through porcelain filters. At the same time he found that it required only a remarkably small quantity of the toxin to produce tetanus with a fatal termination in these animals.

In the epoch-making work of Von Behring and Kitasato in 1890, on tetanus toxin and antitoxin, they published their successful method of immunizing against tetanus. They attributed the established immunity to the blood serum which was supposed to render harmless the toxic substances which are produced by the tetanus bacillus.

From the following experiments they obtained the results demonstrating that the serum has an enormous power of destroying the poison:

Of a tetanus culture ten days old which was freed from bacilli by filtration, 0.00005 cc. was sufficient to kill a mouse in four to six days and 0.0001 cc. was sufficient to kill a mouse with certainty in two days. However, 5 cc. of the serum from the tetanus immune rabbits were mixed with 1 cc. of this culture and the serum was allowed to act twenty-four hours upon the culture containing the tetanus poison. Of the mixture four mice were given each 0.2 cc., containing 0.0033 cc. of the culture or more than 300 times the dose otherwise fatal for mice. All four of the mice remained well. The control mice, on the other hand, died in thirty-six hours with 0.00001 cc. of the fluid.

As a result of these and other experiments the following conclusions were established:

First—The blood of tetanus immune rabbits possesses the property of destroying the tetanus poison.

Second—This property is destroyed by the extra vascular blood and the cell free serum obtained from it.

Third—This property is of such a stable nature that it is also effective in the bodies of other animals so that we are in position to accomplish noteworthy therapeutic results by means of the transfer of blood serum.
Fourth—The property of destroying the tetanus poison is absent in the blood of animals which have not been immunized against tetanus. If tetanus be given to susceptible animals the toxin may be demonstrated in the blood and other body fluids after the death of the animals.

Tizzoni and Cattain have also established that the blood of artificially immunized pigeons and dogs have a protective action on mice and rats against the tetanus toxin (one-half drop of the dog serum made 0.5 cc. of a toxic culture filtrate ineffective).

With these wonderful results as a foundation, the serum therapy of tetanus was established.

The practical application of this method was inaugurated after Schutz had found that horses and sheep can be also successfully immunized against tetanus and that they produce an active immunizing serum. Horses are now exclusively used for the production of tetanus antitoxin, as large quantities of blood may be drawn from an immunized horse, which constitutes a great advantage in the manufacturing of this product for the market.

The immunizing serum is prepared according to Von Behring's method in the following way: Eighty cc. of a virulent bouillon culture, of which 0.75 cc. kills a rabbit in three-fourths of a day, is mixed with sufficient trichloride of iodine to make a 0.25 per cent solution, 60 cc. with enough to make 0.175 per cent and 40 cc. with trichloride of iodine to make a 0.125 per cent solution, while 20 cc. of the culture is left without any addition. The horse is then injected every eight days commencing with 10-20 cc. of the greatest dilution and continuing successively with the weaker attenuations of the culture. Finally the pure culture is injected commencing with 0.5 cc. and every five days the dose is doubled, until no reaction to the culture is manifested and the blood shows the highest number of immunity units obtainable from that individual animal.

**THE STANDARDIZATION OF TETANUS ANTITOXIN.**

With the establishment of the principles of immunizing against tetanus by Von Behring and Kitasato, it became necessary to adopt a method by which the potency of the antitoxin could be accurately determined. In Germany the testing of the tetanus antitoxin is carried out in accordance with the Von Behring method, which provides that normal serum shall be a serum of which 0.1 cc. renders ineffective 0.03 grams of normal toxin. This normal or test toxin is a dried toxin, 1.0 gram of which has the virulence of killing ten million mice each weighing 15 grams. The Italian method of standardizing tetanus antitoxin is based on the work of Prof. Guido Tizzoni and Guisepppina Cattain. The toxin unit according to this method is that amount of toxin which will kill a rabbit weighing 1 kilogram in from four to five days. The Tizzoni
antitoxin contains 80,000 immunity units in every cubic centimeter; in other words, this amount of antitoxin will neutralize 80,000 toxin units.

The French method of standardizing tetanus antitoxin is carried out by the subcutaneous inoculation of a series of guinea pigs with quantities of serum equal to 1/500,000, 1/1,000,000, 1/1,500,000, etc., of their weight. Twenty hours later these test animals are given a single fatal dose of toxin and the immunizing power of the serum is then considered to be 1/500,000 or 1/1,000,000, etc., dependent upon whether the animal receiving this proportional weight of serum has survived the toxin which proved fatal to the control guinea pigs.

THE AMERICAN METHOD OF STANDARDIZING TETANUS ANTITOXIN.

The method of standardization which was carried out in connection with the testing of the veterinary antitoxin followed the exact lines of the method known as "The American Method," which has been adopted officially under the biological product act of July, 1902.

This method, which is the result of several years work on this subject in the Hygienic Laboratory, is a highly creditable achievement by Drs. Rosenau and Anderson, as it not only simplifies the standardization of this valuable serum, but it is also perfectly reliable in its accuracy.

The method was also unanimously adopted by the Society of American Bacteriologists after a special committee made the following report:

The tetanus antitoxin be standardized by the tetanus toxin furnished by the Public Health and Marine Hospital Service. The unit is ten times the least amount of serum necessary to save the life of a 350 gram guinea pig for ninety-six hours against the official test dose of a standard toxin. The test dose is 100 minimal lethal doses of a precipitated toxin preserved under special conditions at the Hygienic Laboratory of the Public Health and Marine Hospital Service. It was decided that the minimal immunizing dose for a case of possible infection through a wound should be 1,500 of such units. It was decided that after April 1 the new unit should be adopted by all producers of tetanus antitoxin.

J. J. KINYOU, Chairman,
HERBERT D. PEASE,
JOSEPH McFARLAND,
THEOBALD SMITH,
E. M. HOUGHTON,
M. J. ROSENAU,
WILLIAM H. PARK, Secretary.

In this method the immunity unit for measuring the strength of tetanus antitoxin is fixed so that it shall be ten times the least quantity of antitoxin serum necessary to save the life of a 350 gram guinea pig for ninety-six hours against the official test dose of a standard toxin.
furnished by the Hygienic Laboratory of the Public Health and Marine Hospital Service.

Thus it is required from the manufacturers of the "human" tetanus antitoxin to state the number of units their products contain, which not only insures serum of reliable strength, but also establishes a uniformity among the producers of tetanus antitoxin in America. On the other hand, the antitoxin destined for "veterinary" use is still under no control whatever, there is no uniformity in the method of standardization of the antitoxin, and the potency of the product is absolutely left to the honesty of the manufacturer. This state of affairs of course does not assure the veterinarian of any uniformity of the product either of the same manufacturer or still less of the different manufacturers. Only one of the different veterinary tetanus antitoxins on the market states the number of American units the immunizing or curative dose contains. The others fail to make any declaration and in one particular tetanus antitoxin the number of units is given in the hundred thousands, whereas the human antitoxin of the same firm of course complies with the requirements of the law, stating definitely the number of American units that particular antitoxin contains. These conditions alone should suffice to point out the necessity for supervision of this veterinary product and the establishment of uniformity among the producers of veterinary antitoxin. It is very essential that the veterinarian should have some assurance of the strength of the antitoxin upon which his standing as a professional man may depend.

The samples of tetanus antitoxin (veterinary) which were standardized in connection with this work were obtained from various drug stores in Chicago, New York and Washington. They were kept at a temperature from 50 degrees to 60 degrees C. until the tests were made, care being taken not to expose them to any condition which might affect the potency of the antitoxin.

The toxin was obtained from the Hygienic Laboratory of the Public Health and Marine Hospital Service through the courtesy of Surgeon General Walter Wymann and represented the dried standard toxin which is used in the standardization of the tetanus antitoxin in the Hygienic Laboratory, and furnished to the manufacturers of antitoxin. In the determination of the value of the antitoxin the L—close is the test dose of the toxin. L— dose is the smallest quantity of tetanus toxin that will neutralize one-tenth of an immunity unit, plus a quantity of toxin sufficient to kill an animal in just four days. The L— dose of the toxin which was used in these tests contained 100 minimal lethal doses (M. L. D.) for a 350 gram guinea pig. The toxin was kept in a dark, cold place and during the course of these tests its virulence was controlled by several repeated tests with an antitoxin of known value.
The guinea pigs used in connection with this standardization were carefully selected, being vigorously healthy animals of from 350 to 370 grams in weight.

The glassware which was employed in this work was selected according to the recommendation of Rosenau, and was not used for any other purpose. The mixing cylinders and mixing masks were the kind designated by Rosenau. Ehrlich's delivery pipettes graduated into hundredths as well as special delivery and capacity pipettes were used. The syringes employed were a modification of the old Koch syringe in which the barrel tapers gradually to the needle so that the last drop runs out readily.

The necessary measures against bacterial contamination were taken during the execution of the work. All the glassware was first rendered chemically clean and then sterilized for one hour at 120 degrees C.

All the various steps in the procedure were followed carefully in order that the results would be accurate and reliable. The method of the standardization was executed in every particular as described by Rosenau and Anderson in Bulletin No. 43, Hygienic Laboratory on "The Standardization of Tetanus Antitoxin."

The number of immunity units contained in a cubic centimeter of serum is determined by the quantity of antitoxin which saved the life of a guinea pig for ninety-six hours against the official test dose of the toxin. This quantity of antitoxin represents one-tenth of an immunity unit. For instance, if a guinea pig receiving 0.0015 cc. of the antitoxin with the official test dose of toxin is saved for ninety-six hours, this quantity of antitoxin contains one-tenth of an immunity unit. Accordingly, the following equation is represented—\(0.0015; 0.1; 1:X\), which indicates that one cubic centimeter of the serum contains sixty-six units.

In the following tables the results of the standardization are given which were obtained from the tests of the various samples of veterinary tetanus antitoxin examined:

**Table I.**

<p>| H. K. Mulford Co.'s. Tetanus Antitoxin Serum for veterinary use. Immunizing dose. Labeled to contain 500,000 units. To be exchanged after May 1, 1910. Laboratory No. 2960. Syringe contained 7.6 cc. or a total of 615 units. | 84 |</p>
<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose</td>
<td>Antitoxin</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>.000,6</td>
<td>.001,0</td>
<td>1 day 20 hours.</td>
</tr>
<tr>
<td>2</td>
<td>.000,6</td>
<td>.001,1</td>
<td>1 day 26 hours.</td>
</tr>
<tr>
<td>3</td>
<td>.000,6</td>
<td>.001,2</td>
<td>3 days 10 hours.</td>
</tr>
<tr>
<td>4</td>
<td>.000,6</td>
<td>.001,3</td>
<td>5 days 22 hours.</td>
</tr>
<tr>
<td>5</td>
<td>.000,6</td>
<td>.001,4</td>
<td>Symptoms—</td>
</tr>
<tr>
<td>6</td>
<td>.000,6</td>
<td>.001,5</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>.000,6</td>
<td>.002,0</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>.000,6</td>
<td>.002,5</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>.000,6</td>
<td>.003,0</td>
<td></td>
</tr>
</tbody>
</table>

**Table II.**

Parke, Davis & Co.'s. Anti-tetanic Serum (veterinary). To be exchanged after November 24, 1910. Unit value not stated. Syringe contained 10 cc. or a total of 1,250 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose</td>
<td>Antitoxin</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>.000,6</td>
<td>.000,6</td>
<td>1 day 12 hours.</td>
</tr>
<tr>
<td>2</td>
<td>.000,6</td>
<td>.000,7</td>
<td>3 days 7 hours.</td>
</tr>
<tr>
<td>3</td>
<td>.000,6</td>
<td>.000,8</td>
<td>4 days 12 hours</td>
</tr>
<tr>
<td>4</td>
<td>.000,6</td>
<td>.000,9</td>
<td>Symptoms—</td>
</tr>
<tr>
<td>5</td>
<td>.000,6</td>
<td>.001,0</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>.000,6</td>
<td>.001,5</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>.000,6</td>
<td>.002,0</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>.000,6</td>
<td>.002,5</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>.000,6</td>
<td>.003,0</td>
<td></td>
</tr>
</tbody>
</table>

**Table III.**

H. K. Mulford & Co.'s. Tetanus Antitoxin Serum for veterinary use. Immunizing dose. Labeled to contain 500,000 units. To be exchanged May 15, 1910. Laboratory No. 2960. Syringe contained 7.5 cc., or a total of 607 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose</td>
<td>Antitoxin</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>.000,6</td>
<td>.001,0</td>
<td>2 days 12 hours.</td>
</tr>
<tr>
<td>2</td>
<td>.000,6</td>
<td>.001,3</td>
<td>4 days 7 hours.</td>
</tr>
<tr>
<td>3</td>
<td>.000,6</td>
<td>.001,6</td>
<td>6 days 8 hours.</td>
</tr>
<tr>
<td>4</td>
<td>.000,6</td>
<td>.001,9</td>
<td>Slight symptoms.</td>
</tr>
<tr>
<td>5</td>
<td>.000,6</td>
<td>.002,2</td>
<td></td>
</tr>
</tbody>
</table>
**TABLE IV.**

Pasteur Laboratories, Paris-France. Anti-tetanic Serum for veterinary use. Unit value not stated. Bottle contained 10 cc., or a total of 1,000 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose</td>
<td>Antitoxin.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.000,6</td>
<td>0.001,0</td>
<td>4 days 2 hours.</td>
</tr>
<tr>
<td>2</td>
<td>0.000,6</td>
<td>0.001,3</td>
<td>Slight symptoms.</td>
</tr>
<tr>
<td>3</td>
<td>0.000,6</td>
<td>0.001,6</td>
<td>No symptoms.</td>
</tr>
<tr>
<td>4</td>
<td>0.000,6</td>
<td>0.001,9</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.000,5</td>
<td>0.002,2</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE V.**

Lederle Antitoxin Laboratories. Tetanus Antitoxin (veterinary). Immunizing dose. Labeled to contain 1,500 units. Laboratory No. 19A. To be exchanged June 21, 1910. Syringe contained 10.4 cc., or a total of 1,601 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose</td>
<td>Antitoxin.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.000,6</td>
<td>0.000,35</td>
<td>1 day 18 hours.</td>
</tr>
<tr>
<td>2</td>
<td>0.000,6</td>
<td>0.000,30</td>
<td>1 day 13 hours.</td>
</tr>
<tr>
<td>3</td>
<td>0.000,6</td>
<td>0.000,55</td>
<td>4 days 3 hours.</td>
</tr>
<tr>
<td>4</td>
<td>0.000,6</td>
<td>0.000,30</td>
<td>Symptoms—</td>
</tr>
<tr>
<td>5</td>
<td>0.000,6</td>
<td>0.000,55</td>
<td>No symptoms.</td>
</tr>
</tbody>
</table>

**TABLE VI.**

Parke, Davis & Co.'s. Anti-tetanic Serum (veterinary). To be exchanged after December 8, 1910. Unit value not stated. Syringe contained 10 cc., or a total of 1,250 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose</td>
<td>Antitoxin.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.000,6</td>
<td>0.000,5</td>
<td>3 days 1 hour.</td>
</tr>
<tr>
<td>2</td>
<td>0.000,6</td>
<td>0.000,8</td>
<td>5 days 20 hours.</td>
</tr>
<tr>
<td>3</td>
<td>0.000,6</td>
<td>0.001,1</td>
<td>No symptoms.</td>
</tr>
<tr>
<td>4</td>
<td>0.000,6</td>
<td>0.001,4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.000,6</td>
<td>0.001,7</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE VII.

Parke, Davis & Co.’s. Anti-tetanic Serum (veterinary). To be exchanged after December 8, 1910. Unit value not stated. Syringe contained 10 cc., or a total of 1,250 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose.</td>
<td>Antitoxin.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.000,6</td>
<td>0.000,5</td>
<td>2 days 21 hours.</td>
</tr>
<tr>
<td>2</td>
<td>0.000,6</td>
<td>0.001,1</td>
<td>Symptoms—</td>
</tr>
<tr>
<td>3</td>
<td>0.000,6</td>
<td>0.001,7</td>
<td>Slight symptoms.</td>
</tr>
<tr>
<td>4</td>
<td>0.000,6</td>
<td>0.001,1</td>
<td>No symptoms.</td>
</tr>
<tr>
<td>5</td>
<td>0.000,6</td>
<td>0.001,7</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE VIII.

Parke, Davis & Co.’s. Anti-tetanic Serum (veterinary). To be exchanged after January 14, 1911. Unit value not stated. Syringe contained 10 cc. or a total of 1,000 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose.</td>
<td>Antitoxin.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.000,6</td>
<td>0.001,0</td>
<td>4 days 5 hours.</td>
</tr>
<tr>
<td>2</td>
<td>0.000,6</td>
<td>0.001,4</td>
<td>Slight symptoms.</td>
</tr>
<tr>
<td>3</td>
<td>0.000,6</td>
<td>0.001,7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.000,6</td>
<td>0.001,7</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.000,6</td>
<td>0.002,6</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE IX.

H. K. Mullford Co.’s. Tetanus Antitoxin Serum for veterinary use. Immunizing dose. Labeled to contain 500,000 units. To be exchanged after May 15, 1910. Laboratory No. 2971. Syringe contained 8.0 cc. or a total of 472 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose.</td>
<td>Antitoxin.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.000,6</td>
<td>0.000,5</td>
<td>2 days 1 hour.</td>
</tr>
<tr>
<td>2</td>
<td>0.000,6</td>
<td>0.001,1</td>
<td>2 days 18 hours.</td>
</tr>
<tr>
<td>3</td>
<td>0.000,6</td>
<td>0.001,4</td>
<td>2 days 20 hours.</td>
</tr>
<tr>
<td>4</td>
<td>0.000,6</td>
<td>0.001,7</td>
<td>6 days 4 hours.</td>
</tr>
<tr>
<td>5</td>
<td>0.000,6</td>
<td>0.002,0</td>
<td>Slight symptoms.</td>
</tr>
</tbody>
</table>

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TABLE X.

Pasteur Laboratories, Paris-France. Anti-tetanic Serum for veterinary use. Unit value not stated. Bottle contained 10 cc. or a total of 1,110 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose</td>
<td>Antitoxin</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.000, 6</td>
<td>0.000, 6</td>
<td>2 days 20 hours.</td>
</tr>
<tr>
<td>2</td>
<td>0.000, 6</td>
<td>0.000, 6</td>
<td>6 days 7 hours.</td>
</tr>
<tr>
<td>3</td>
<td>0.000, 6</td>
<td>0.001, 2</td>
<td>Symptoms—</td>
</tr>
<tr>
<td>4</td>
<td>0.000, 6</td>
<td>0.001, 5</td>
<td>No symptoms.</td>
</tr>
<tr>
<td>5</td>
<td>0.000, 6</td>
<td>0.001, 8</td>
<td></td>
</tr>
</tbody>
</table>

TABLE XI.

Pasteur Laboratories, Paris-France. Anti-tetanic Serum for veterinary use. Unit value not stated. Bottle contained 10 cc. or a total of 1,530 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose</td>
<td>Antitoxin</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.000, 6</td>
<td>0.000, 50</td>
<td>3 days 6 hours.</td>
</tr>
<tr>
<td>2</td>
<td>0.000, 6</td>
<td>0.000, 65</td>
<td>4 days 18 hours.</td>
</tr>
<tr>
<td>3</td>
<td>0.000, 6</td>
<td>0.000, 80</td>
<td>No symptoms.</td>
</tr>
<tr>
<td>4</td>
<td>0.000, 6</td>
<td>0.000, 95</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.000, 6</td>
<td>0.001,10</td>
<td></td>
</tr>
</tbody>
</table>

TABLE XII.

H. K. Mulford & Co.'s. Tetanus Antitoxin Serum for veterinary use. Immunizing dose. Labeled to contain 500,000 units. To be exchanged after May 1, 1910. Laboratory No. 2690. Syringe contained 7.5 cc., or a total of 607 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose</td>
<td>Antitoxin</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.000, 6</td>
<td>0.000, 7</td>
<td>1 day 14 hours.</td>
</tr>
<tr>
<td>2</td>
<td>0.000, 6</td>
<td>0.001, 0</td>
<td>3 days 7 hours.</td>
</tr>
<tr>
<td>3</td>
<td>0.000, 6</td>
<td>0.001, 3</td>
<td>Symptoms—</td>
</tr>
<tr>
<td>4</td>
<td>0.000, 6</td>
<td>0.001, 6</td>
<td>No symptoms.</td>
</tr>
<tr>
<td>5</td>
<td>0.000, 6</td>
<td>0.001, 9</td>
<td></td>
</tr>
</tbody>
</table>
TABLE XIII.

Lederle Antitoxin Laboratories. Tetanus Antitoxin (veterinary). Immunizing dose. Labeled to contain 1,500 units. Laboratory No. 19A. To be exchanged June 21, 1910. Syringe contained 8.5 cc. or a total of 1,972 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose.</td>
<td>Antitoxin.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.000,6</td>
<td>0.000,24</td>
<td>1 day 16 hours.</td>
</tr>
<tr>
<td>2</td>
<td>0.000,6</td>
<td>0.000,333,3</td>
<td>2 days 22 hours.</td>
</tr>
<tr>
<td>3</td>
<td>0.000,6</td>
<td>0.000,43</td>
<td>Symptoms—</td>
</tr>
<tr>
<td>4</td>
<td>0.000,6</td>
<td>0.000,63</td>
<td>No symptoms.</td>
</tr>
<tr>
<td>5</td>
<td>0.000,6</td>
<td>0.000,60</td>
<td></td>
</tr>
</tbody>
</table>

TABLE XIV.

Pasteur Laboratories, Paris-France. Anti-tetanic Serum for veterinary use. Unit value not stated. Bottle contained 10 cc. or a total of 1,530 units.

<table>
<thead>
<tr>
<th>Number of guinea pig</th>
<th>Subcutaneous injection of a mixture of—</th>
<th>Time of death</th>
<th>Units per cubic centimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toxin test dose.</td>
<td>Antitoxin.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.000,6</td>
<td>0.000,35</td>
<td>1 day 14 hours.</td>
</tr>
<tr>
<td>2</td>
<td>0.000,6</td>
<td>0.000,50</td>
<td>2 days 20 hours.</td>
</tr>
<tr>
<td>3</td>
<td>0.000,6</td>
<td>0.000,65</td>
<td>4 days 5 hours.</td>
</tr>
<tr>
<td>4</td>
<td>0.000,6</td>
<td>0.000,80</td>
<td>8 days 10 hours.</td>
</tr>
<tr>
<td>5</td>
<td>0.000,6</td>
<td>0.000,95</td>
<td>Slight symptoms.</td>
</tr>
</tbody>
</table>

The results of these tests clearly demonstrate the variations in the potency of veterinary tetanus antitoxins at present on the market. While the preparations of the individual manufacturers do not show such marked differences in strength, yet they do not uniformly contain in strength, yet they do not uniformly contain the same number of units.

In accordance with the law of 1902, the manufacturers of human antitoxins are required to state on the labels of the packages, the number of units that particular antitoxin possesses. Should it be found on investigation that the antitoxin does not come to within 10% of the strength stated on the labels, the manufacturer is immediately informed to recall from the market all that particular antitoxin. Thus if a physician intends to use the antitoxin either for immunizing purposes, or as a curative agent, he is accurately guided in the dose by the
statement on the label. It does not matter who the manufacturer of the antitoxin is. This latter fact is also of great importance as frequently the drug stores carry antitoxins of only one or two manufacturers.

On the other hand, the veterinarian has not always the good fortune of knowing the number of units an antitoxin which he purchases contains. Only one of the manufacturers states on the label the number of American units contained in his veterinary antitoxin. One other manufacturer still uses for his veterinary antitoxin a standardization by which he can label the product in the hundred-thousands, yet his antitoxin for the human gives the units in the American standard. Why should two different standards be maintained, one for the human and the other for veterinary antitoxin?

The veterinary tetanus antitoxins are marked in immunizing doses and curative doses. The immunizing dose is supposed to contain 1,500 American units. The volumetric quantity of this dose was found to be accurately 10 cubic centimeter in the Parke, Davis and Pasteur Co.’s product, while the Lederle’s serum contained from 8.5 cc. to 10.4 cc. and the Mulford syringe from 7.5 to 8 cc. Now should it be desired to administer to a horse an immunizing dose of the antitoxin it can be readily seen from the results obtained in these tests, as indicated by the tables, that while the immunizing dose of some of the sera contains the desired 1,500 units, others, on the other hand, possessed less than one-third of that strength. For instance, according to the test shown by Table IX, the syringe contained 8 cc. of serum with 59 units per cubic centimeter; thus the immunizing dose in this case represents only 472 units, and of course the curative dose is correspondingly low. This alone is sufficient to indicate the urgent necessity for some uniformity in standardizing the veterinary antitoxins and also for federal legislation by which they could be subjected to a periodical control with reference to their potency.

Under the present conditions there is the constant uncertainty in the strength of the serum, as the veterinarian has no assurance whatever of its potency, and is solely dependent on the reliability of the manufacturer.

CONCLUSIONS.

1. The veterinary tetanus antitoxins prepared by the different manufacturers have not a uniform potency, and the variation amounts in some instances to about two-thirds less than the strength which it should possess.

2. In order to insure a uniform strength, the manufacturers of veterinary tetanus antitoxin should be required to use the American standard, and to state on the label the number of American units the dose contains, as is required for human tetanus antitoxin.
3. The immunizing dose for a horse should contain at least 1,500 immunity units of the standard established by the U. S. Public Health and Marine Hospital Service.

4. It will be seen that the veterinary tetanus antitoxins vary extravagantly in the unit strength, and some are comparatively weak in antitoxic potency, which bespeaks for the same supervision by the U. S. Department of Agriculture over biological products used in veterinary medicine, as the U. S. Public Health and Marine Hospital Service now has over similar products used in human medicine.

5. The request for such supervision should have the endorsement of the veterinarians and live stock interests of this country.

THE PRESIDENT—Dr. Mohler has given us a very important piece of information, especially to the profession. We have another important paper from a practical standpoint. I hope all those who can, will remain and hear it.

Dr. Cary—I would like to make a motion to the effect that the Committee on Resolutions bring in a suitable resolution to correspond with the suggestions of Dr. Mohler.

Motion duly seconded and carried.

THE PRESIDENT—The next paper will be of great interest to many of you. I know it will be of interest to me. Dr. Nelson's paper is on the "Proper Method of Disposal of the Carcasses of Animals Dying from Contagious and Infectious Diseases.

Dr. Nelson—The diseased carcasses which we generally have to deal with are glanders, anthrax, and mange in horses; anthrax, blackleg, contagious foot-and-mouth diseases, mange, and hemorrhagic septicemia in cattle; and hog cholera and swine plague in hogs. Of these diseases, anthrax is caused by facultative aerobiotic bacterium, and blackleg by an aerobic. All the rest are aerobic, of course with the exception of parasitic diseases, such as mange.

The disposal of carcasses of diseased animals depends primarily upon the facilities available for disposal, and secondarily upon the disease from which the animal has died. For instance, it would certainly be highly improper for me to prescribe a manner of disposing of animal in an open country by advising the building of a huge log fire and placing the carcass on it in order that it might be cremated. Likewise, in a heavily wooded country it would be just as improper for me to describe a method of disposing of the animal by placing it on top of a strawstack and burning it. The disposal of the carcass depends somewhat upon whether the animal has died from a disease caused by an aerobic or an aerobiotic bacterium. In the one case, burial might be the proper thing, while in the other, it would be improper.

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The disposal of carcasses in a city where there are crematories is easily solved. Here the precaution must be especially taken in the conveyance of the carcass from the place of death to the crematory. After that there is no question in the disposal of the carcass. If the animal is alive, for instance a glandered animal, found in the city, I do not think it wise to shoot the animal on the premises and have it hauled off. I much prefer to have the animal led to the crematory, and there have it shot, and the carcass burned. Whenever it has been necessary to lead a glandered animal through the streets of a city, it has been our habit to cover the nose with a grain sack, so that none of the discharges would be distributed on the streets and become a source of new contagion.

In the country, or in the settled rural communities, disposal of carcasses is simply a question of burial or burning. Oftentimes it is only a question of convenience, as to which of these methods is to be used. In the case of burying, if there is only one carcass, it may be thrown into a hole that has been dug for it and simply covered up. In other cases, where there is danger of stray dogs digging up the carcasses, they should be covered with lime prior to the earth being thrown over it. This is especially necessary when dealing with contagious or infectious diseases. In mange, such a precaution would not be so necessary. When burning is deemed wise, as in a grain country, where the straw is not very valuable, it is convenient to slightly level out the stack, place the animal on top of it, and set fire to it. The abdomen may be opened or not, it scarcely makes any difference. The carcass burns a little better, provided the abdomen is opened, so the fat may be reached and thus become an aid in feeding the fire. A strawstack smoulders for days and days, and gives off an intense heat. In our western country this is one of the favored modes of thorough destruction of diseased carcasses. As straw becomes more valuable, it is probable that we will have to change to some other method.

Where an animal, or a number of animals, are to be buried, we have found that unless the ground is exceedingly hard, a ditch 30 or 40 feet long may be plowed and scraped out with a scraper very easily and then replowed and rescraped until of sufficient depth and size to roll the carcass into, after which they are very easily covered. This is merely a method of preparing a hole for the carcass by the use of a team and scraper, instead of having to dig a hole by hand. In commencing to excavate with the plow and scrapper, the ground should be broken 8 or 10 feet wide, because as you go down, the sides slope in and the hole is liable to become too narrow by the time it is deep enough.

In some of the wooded western sections, burning is the only method by which carcasses are destroyed. The usual method is to dig a short, shallow trench, over which pieces of timber and logs are placed. The carcasses are then placed on the pile of wood, and fire is built under it.
I find that the digging of a shallow trench, so as to give a little draft, aids materially in causing the rapid cremation of the body. In all cases the abdomen is opened that the internal fat may be liquified and assist in burning the carcass.

But we have also to deal with the open range on which we have many cases of mange, blackleg, and similar diseases to deal with, and where the total destruction of the carcass is imperative. The stockmen are beginning to demand the complete destruction of the carcasses. Here, especially along scab rock, where the soil is shallow, burying is an absolute impossibility, and burning seems to be the only feasible method of disposing of the carcasses. In most instances it is utterly impossible to obtain wood, straw, or other common fuel. In these cases, if it is possible, a little sage wood, or grease wood is gathered, and placed around the carcass, the carcass is slit open and then is completely saturated with kerosene. According to the size of the carcass, it takes from two to five gallons of coal oil for the complete destruction of a carcass. It is much easier to bring five gallons of coal oil to where the carcass is than it is to bring any other form of inflammable material. After the fats in the body and a part of the meat has become charred so that it will burn, the rest of it will burn rapidly, although it takes from twelve to thirty-six hours for it to be completely burned.

The President—Gentlemen, do you care to have this paper discussed?

Dr. Melvin—I wish to state that in my opinion it is a very valuable paper, one of the most valuable that comes before the meeting, because it emphasizes the necessity of the proper disposal of animals dying from infectious and contagious diseases. It has been neglected a great deal, particularly in sections from which Dr. Nelson comes. In the east and in thickly populated sections it is more necessary to dispose of the animals because they the more readily become a public nuisance. But in the farming districts and in the west where that does not apply, the paper is of interest. We have seen this in the scab disease of sheep—it is becoming quite prevalent in the sheep districts of the western range. [I thought Dr. Ransom was in the room. (A voice: “He is.”) He can go into particulars and give you more information.] The disease is quite prevalent in Wyoming and in Montana and it is spreading on account of the herders not destroying the sheep which die. The dogs have access to the sheep and they spread the disease. It is becoming quite a serious menace in those sections.

Dr. Lewis—This is indeed a valuable paper. You take in Mississippi, they know nothing about the disposal of carcasses, you might say. They are exposed—just thrown out and left to the buzzards. We have those birds to prey upon the carcasses and they are a menace to the State. There is a law protecting these scavengers from being killed, and I would
be glad to see some steps taken to try to repeal the law and permit the destruction of the buzzards. I have traced hog cholera all over that country this past year. Sometimes they throw the carcasses into the rivers, and they will float down to some drift-wood and there they will lie and immediately thereafter it is no trouble at all to track the outbreak.

DR. CARRY—I move that the Committee on Resolutions bring in a resolution to the effect that States which have laws making it a crime to kill buzzards, repeal those laws and enact laws offering a reward for the destruction of such birds.

The resolution was referred to the Committee on Resolutions.

THE PRESIDENT—This is a very important subject to many. I would like to have it discussed. Dr. Connaway, do you care to discuss it?

DR. CONNAWAY—If I should speak on this subject at this time, it might be that I would anticipate things I want to say tomorrow. But it is opportune to say at this time that I regard the disposal of hog cholera carcasses as one of the most important things in the control of the disease.

DR. CARRY—I would like to have some of the sanitarians who have had experience in burning carcasses give us their views of the best and most economical manner of burning carcasses, where they do not have wood or straw, but where they have to buy the material.

DR. LUKEY—I realize the importance of burning the carcasses of animals which die of contagious diseases, and I have had some occasion to keep track of this work in the outbreaks of hog cholera, particularly. I find it is a very easy matter to burn up a carcass with very little fuel by providing a trench and laying some pieces of iron or some green posts which will not burn too quickly, across the trench and then lay the carcass on this pile and cut it open. The opening under the pile, the trench, will afford a draft, and as the fat runs down over the carcass, it takes very little fuel to burn it up, or at least burn it so that there is no danger of infection from it. This method was employed by one farmer who had an outbreak of hog cholera and lost practically all of his hogs. The farmer next to him had no cholera at all. It seemed rather singular to me that the disease did not spread to the next farm, and that fact must be attributed to the burning of the carcasses of the hogs which, in many cases, were killed before they were permitted to die from the disease. This method is probably the surest way of burning carcasses in communities where they have fuel with which to burn them. Where there is no fuel to burn then, of course, the carcasses must be buried, and then I believe they should be covered with lime to destroy the germs.

DR. LENTON—What I have to suggest is not new or original, but it is what I have used in the burning of carcasses. I think it is a good idea. In place of a single trench, build two trenches in the form of a cross (illustrating), and the fire, of whatever material you use, build at
the intersection of the two branches. In that way there is a draft from four ways and we get the most intense heat where it is wanted. In a single trench the draft is apt to go through and in that way you lose a great deal of the heat. I do not offer this as original.

Dr. Luckey—Where hogs dying from cholera or other animals dying from infectious diseases are buried, the germs may live for a long while under the ground, and they can be brought to the surface in many different ways and thereby start a new outbreak. As I stated before, I think carcasses which are buried should be covered with lime or antiseptic to kill the germs.

Dr. Dorset—We have been unable to carry out experiments so as to determine accurately how long the germs of hog cholera will remain alive in the ground. We have had some virus in the laboratory where the air and light have been excluded and it has been kept there for six, eight and even ten months, and as long as we kept it it has remained alive. It seems to me that burning is much better than burying.

Dr. Connaway—Was this virus kept free from other infections?

Dr. Dorset—It was blood from an hyperimmune.

Dr. Connaway—I have kept supplies of virus for several weeks until it thoroughly decomposed, and I was under the impression that the decomposition destroyed the vitality of the virus.

Dr. Dorset—In regard to Dr. Connaway’s statement that he has observed that the vitality of hog cholera virus is affected by decomposition, I may say that Prof. Uhlenhuth of the German Imperial Board of Health has reported observations showing that the putrifaction of blood containing hog cholera virus causes a destruction of this virus.

Announcements were made of the meetings of committees, following which the convention adjourned to meet at 8:00 o’clock p. m.

The convention re-convened at 8:00 p. m. The President in the chair.

The President—The first paper will be one by Dr. Ransom, Chief of the Zoological Division, Bureau of Animal Industry, Washington. You will notice the subject is different from the one on the program. “Arsenical Dips for Cattle Ticks” is the subject of the paper to be read by Dr. Ransom.

Dr. Ransom—Arsenical dips have been more or less extensively used in the treatment of sheep scab since the early part of the last century, and have proved to be fairly efficient remedies in this disease. Owing to the extremely poisonous nature of arsenic, and the consequent necessity of most scrupulous care in the use of arsenical dips, other less dangerous, and even more efficient, remedies, such as tobacco, lime and sulphur and coal-tar dips, are preferred at the present time, and it is because of the risk attending the use of arsenic and because other better
and safer remedies are available that the U. S. Department of Agriculture has never approved arsenical dips for the treatment of sheep scab.

As a remedy for cattle ticks, arsenical dips seem to have been first used in South Africa. They have also been used to some extent in Australia, in South America, in Cuba, and, during the last three years, in this country, especially in Texas.

The reports on arsenical dips for ticks from countries where they have been used, especially South Africa, have on the whole been favorable, and in year 1906 Dr. N. S. Mayo reported from Cuba very successful results from the use of a dip whose ingredients were arsenic, sodium carbonate, pine tar, soap and water.

At a conference of State and Federal representatives called to consider the matter of tick eradication, which met at Nashville three years ago, there were reported the results of some trials conducted under the direction of the Chief of the Bureau of Animal Industry, of an arsenical dip consisting of arsenic trioxide, eight pounds; sodium carbonate, twenty-four pounds, boiled together, to which was added one gallon of pine tar, and finally sufficient water to make 500 gallons. This report was so favorable that the matter was considered worthy of further investigation. Certain drawbacks had been found in the use of the only dip which had heretofore proved effective against ticks in this country, namely, crude petroleum, particularly the difficulty of obtaining suitable grades, its expense, its considerable bulk, and the liability of injury to cattle exposed to extreme heat or cold after dipping. It was evident that if an arsenical dip could be effectively used without injuring cattle, it would prove of great value as a substitute for crude petroleum, in spite of the very poisonous nature of arsenic.

In the fall of the year 1907 I conducted some experiments near Quanah, Texas, in which I used 20 and 25 per cent of crude oil in soap emulsion with water, the arsenical mixture in the proportions which have been given, and a combination of the arsenical solution and oil emulsion. Several different oils were used and the results varied considerably both as to effects on the ticks and on the cattle. In no case were all the ticks killed with one application of oil emulsion, arsenical mixture, or a combination of the two. The last injured the cattle more than either of the other two; the arsenical mixture was somewhat less injurious than the oil emulsion. The injuries noted were slight soreness of the skin in certain places, with some thickening, followed by more or less exfoliation. A few of the animals moved stiffly for a day or two. As the weather at that season was no longer very warm, and as the animals had plenty of shade, the experiments did not indicate anything in regard to the possible ill effects of heat on cattle dipped in oil dips, of which so much complaint has been made.
Such of the ticks as survived the treatment were in the adult and nymphal stages. Some larvae may have survived but, under the conditions of the experiments, this could not be determined. It was noted that the eggs laid by ticks surviving the treatment, especially in the case of the arsenical dips, were not only relatively fewer in number than those laid by undipped ticks, but that a large proportion of them failed to hatch when kept under the same conditions as eggs from undipped ticks.

It was concluded from these experiments that the arsenic-pine-tar-soda dip in the proportion of eight pounds of arsenic trioxide to 500 gallons of water, might be useful in eradication work in cases in which, though desirable, it was not absolutely necessary that cattle be freed immediately and entirely from ticks, but that the dip could not be substituted for oil in other cases, as, for example, when cattle are dipped to free them from ticks preparatory to moving them to noninfected areas. In this connection it should be noted that the dipping of cattle in oil of proper composition not only destroys the ticks which may be present at that time but also protects them for a considerable period from reinfection, much longer than arsenical dips, whose protective action lasts probably only for a few hours at most.

In June and July of last year a series of experiments in the treatment of cattle for ticks was carried out in Oklahoma. A variety of dips was tested, of which the arsenical mixture, based on the formula given above, proved the most effective and the least injurious. The oil emulsions used in these experiments were a distinct failure, due, it is believed, to the unsuitable character of the oil, one defect being its very light specific gravity. Kerosene emulsions were failures. Some coal-tar creosote dips, which were tried at more than double the strength suitable for the treatment of sheep scab, were much less effective than the arsenical mixture, and produced greater skin injury. A few nymphs and adults survived the arsenical treatment. It was again noticed that fewer eggs were laid by the engorged ticks which survived the arsenical treatment than by normal ticks, and that only a small percentage of the former hatched.

In August of last year I carried out a little experiment in the laboratory in which I dipped 123 fully engorged ticks removed from cattle the day before in an arsenical mixture composed of arsenic trioxide, one part; sodium carbonate, three parts, boiled together, with 463 parts of water, a mixture which, accordingly, contains slightly more than the equivalent of 0.21 per cent arsenic trioxide. The ticks remained in the mixture two minutes, were dried on filter paper, and placed in a petri dish. As a control experiment 105 ticks collected at the same time from the same cattle were placed in a second petri dish. This experiment was begun August 8, and thereafter the two lots of ticks were kept under precisely the same conditions. Some of the dipped ticks died without
laying eggs, and those which laid eggs did not begin to do so until several days after the undipped ticks began oviposition. The appearance of the two lots of ticks September 1, twenty-four days after the beginning of the experiment is shown in the accompanying photographs. The total number of eggs deposited by the 105 undipped ticks weighed 13 grams and a fraction, those laid by the 123 dipped ticks, 2 grams and a fraction. Nearly all the former afterwards hatched, none of the latter did.

In October two calves were dipped which had been artificially infected with ticks by placing larvae upon them every other day for several weeks, so that at the time of dipping they had a liberal supply of all stages of ticks from newly attached larva to engorged adult. A third calf similarly infested was reserved undipped as a control. The dip used was the arsenic, soda, pine tar mixture. It was desired that this mixture should contain the equivalent of eight pounds of arsenic trioxide to 500 gallons of water or nineteen-hundredths of 1 per cent plus. An attendant, however, allowed the contents of the cauldron in which the soda and arsenic were boiled, to boil over during the preparation of the mixture, and though it was thought at the time that scarcely any of the arsenic had been lost, an analysis of the diluted dip as used showed an equivalent of only about 0.15 of 1 per cent arsenic trioxide.

After dipping, the calves were removed to noninfected pens, as was the undipped calf. All of the fully engorged ticks present on the two calves dipped were removed immediately after dipping. Those on the undipped calf were collected at the same time. Thereafter the ticks which had reached engorgement were collected every day, morning and afternoon, from all three calves, together with any which could be found on the board floors of the pens in which the animals were kept. The dipping was done October 12, each animal remaining in the bath two minutes. The first week after dipping up to and including October 19, 1,400 engorged ticks were removed from one animal, and 1,922 from the other, while from the undipped animal during the same period 1,066 engorged ticks were removed. Subsequent to October 19, seventy-three engorged ticks appeared on one of the dipped animals, and forty-one on the other, while more than 1,000 were taken from the undipped animal. The last engorged tick appeared on one of the dipped animals November 7, on the other November 9, while on the undipped animal the infestation continued ten days longer. The total number of eggs laid by the ticks from the two dipped animals was in one case somewhat less than one-third the total number laid by ticks from the undipped animal, in the other case about one-fifth the number laid by ticks from the undipped animal. About 50 per cent of the eggs laid by ticks from the undipped animal hatched, whereas less than 1 per cent of the eggs laid by ticks from the dipped animals proved viable.
The rather weak arsenical mixture, containing an equivalent of 0.15 per cent arsenic trioxide, therefore had in this experiment the effect of reducing the progeny of the ticks present on the cattle at the time of dipping to about one two-hundredth of the number which would have been expected if the animals had not been dipped, judging from a comparison with the number which resulted from the ticks taken from the control animal. The longer duration of the infestation on the undipped animal indicates the probability that the ticks on the dipped animals which were in the larval stage at the time of dipping were all killed.

In the latest experiments which I have undertaken and which have not yet been fully completed, I have used three different arsenical dips. Taking into consideration the experience of the Europeans in the treatment of sheep scab, who have found that arsenic trioxide could be used in a dip in relatively large amounts if mixed with an astringent, which is supposed to lessen the danger of absorption of arsenic by the skin, I tried a mixture of 22½ pounds arsenic trioxide, 113 pounds of zinc sulphate, and 270 gallons of water; in other words, about 1 per cent arsenic trioxide. The dip, as finally used, probably contained somewhat less arsenic than indicated by the above figures. Arsenic trioxide is supposed to be soluble in 15 parts of boiling water, but after boiling all night in 20 parts of water there was still a small amount of undissolved arsenic.

Arsenical dip No. 1, therefore, exhibited one defect at the very beginning. Another important defect became apparent later, in that it seriously injured the skin of the animal dipped, and was also probably responsible for a fever which the animal exhibited during a few days after dipping. These two defects render this dip impracticable in spite of the fact that it was highly successful in destroying the ticks. The calf was dipped August 7th, and no ticks lived to reach the engorged condition after August 9th, two days later. These were few in number and all died without depositing eggs.

The second dip tried consisted of 11⅛ pounds of arsenic trioxide, 135 pounds of alum, and 270 gallons of water, or about ½ per cent arsenic trioxide. Less difficulty was experienced in this case than in the case of the arsenic and zinc sulphate dip since the size of the boiler permitted about twice as much water relative to the amount of arsenic to be used in effecting the solution.

It may be stated as a result of the experience gained in the preparation of these two dips that for the solution of arsenic trioxide it should be boiled in not less than forty parts of water, otherwise the operation will be very tedious, to say the least. It should also be noted that arsenic trioxide varies greatly in its solubility according to its physical state, so that the quantity of water required for its solution is always a matter of uncertainty.
The injurious action of the arsenic-alum dip on the skin was so slight as to be scarcely noticeable. This dip, like the first, was very effective on the ticks, but to a less degree.

The animal on which the dip was used, was dipped August 10. No ticks lived to reach the engorged condition after August 13, three days later. All of those removed immediately after dipping died without laying eggs. Some of those removed later on the same day, deposited a few eggs which all speedily shriveled, and similar results occurred in the case of those which were removed August 11 and 12. Out of the engorged ticks (six in number) removed August 13, the last day on which any appeared in this stage, one survived to lay eggs, which are at the present time mostly in good condition and will probably hatch.

Arsenical dip No. 3 consisted of the arsenic trioxide, soda, and pine tar mixture, in the proportion of 10 pounds arsenic trioxide, 30 pounds of sodium carbonate, 1 gallon of pine tar and 500 gallons of water, prepared in the usual manner. A dip prepared on the above formula would contain an equivalent of nearly twenty-four hundredths of 1 per cent arsenic trioxide. A tick-infested calf was dipped in arsenical dip No. 3 on August 13. No ticks developed to the engorged state on this animal after August 17, four days later. On August 20, one week after the dipping, a very few live nymphs and newly molted adults were present. On this date the calf was dipped again in the dip remaining in the vat from the previous dipping. Since the second dipping no live ticks have been seen on this animal. No fever occurred subsequent to either dipping. The skin injury was not serious and lasted but a few days, consisting in slight soreness where the ticks had been numerous on brisket and escutcheon, and slight soreness of the skin on the scrotum, and inside of forelegs, followed by slight exfoliation. Similar slight injuries were noted in the case of another calf dipped twice, first on August 26 and again a week later, September 2. The same dip remaining in the vat from the dippings of the other calf was used. In the case of the calf last dipped an artificial reinfection was brought about by the daily application of larval ticks following the first dipping, the application of larvae being continued up to the day of the second dipping. After dipping the second time the calf was removed to a noninfected yard. No ticks have developed to the engorged state on this calf since August 29, three days after the first dipping. A very few nymphs were found at the time of the second dipping, which were doubtfully alive. A thorough examination September 9 revealed no live ticks in any stage of development, but it is yet too early to determine with absolute certainty whether any larval ticks escaped the second dipping.

In the case of the first calf dipped in arsenical dip No. 3, some of the engorged ticks taken off after dipping on the same day, deposited a few shriveled eggs, none of which will hatch. The same is true of the...
engorged ticks taken off August 14 and August 15. On August 16, nine ticks were removed, seven of which deposited eggs, almost all of which have shriveled.

One tick which reached the engorged condition August 17, four days after dipping, the last surviving to develop to this stage, deposited eggs nearly all of which at the present time are in good condition and will probably hatch.

In the case of the other calf dipped in arsenical dip No. 3, some of the engorged ticks taken off August 26, the day of dipping, and August 27, have laid a few eggs which have shriveled and will not hatch. Of six engorged females which appeared on August 28, three have laid about the normal quota of eggs, which at the present time are mostly in good condition and will probably hatch. The last to appear in the engorged condition were removed on August 29, three days after dipping. There were nine of these, one of which survived to deposit a few eggs, which at the present time are mostly shriveled.

Upon the basis of the results obtained in the experiments which have been roughly outlined in the foregoing, I believe we are justified in drawing the following conclusions:

First—that an arsenical dip compounded on the formula arsenic trioxide 10 pounds, sodium carbonate 30 pounds, pine tar 1 gallon, and water 500 gallons, will kill nearly all ticks present on cattle, at a single dipping, period of immersion in the bath, 2 minutes.

Second—that no live ticks in the engorged condition will drop later than three to four days after dipping, except those few which may survive as nymphs and which may be expected to arrive at the engorged stage at a considerably later period.

Third—that a second dipping one week after the first dipping will destroy all the ticks which may have survived the first dipping as nymphs, and almost certainly also any larvae which may have attached as a result of exposure to reinfection after the first dipping.

Fourth—that this treatment is very likely to cause slight injury to the skin of cattle dipped. (No doubt much of this injury can be avoided by greasing the parts which are especially liable to be affected.)

Fifth—that the arsenical mixture properly protected from evaporation may be left in vats for several weeks without impairment of its efficiency.

Finally, I may say that it seems to me certain, so far as can be determined upon the basis of a limited number of experiments, and such observations as I have had opportunity to make on the practical use of dips for ticks, that the arsenical substitute for oil dips may be safely used even in those cases where it is desired to move tick-infested cattle, to clean territory, provided in such cases the animals are dipped twice with an interval of one week between drippings, and provided suitable precautions are taken to avoid reinfection subsequent to the second dipping. As a last word I would call attention to the extremely poisonous nature of arsenic, and would insist upon the necessity of every precaution
against the poisoning of live stock and human beings being taken, in every stage of its use from the time it leaves the druggist until every particle of unused residue is disposed of.

**The President**—This paper is one of great value to those engaged in the eradication of tick-infected sections of the country. It is now open for discussion and I hope the discussion will be quite full.

**Dr. Allen**—I started to take some notes, but Dr. Ransom's paper was so full of good points that I was afraid I would lose some of it by taking notes.

In regard to using the ten-pound arsenic trioxide solution, we have found in doing this work, in dipping a great many cattle in hot weather, and especially extremely hot weather such as has been obtained in Oklahoma this year (which, of course, is an unusual condition), that we could not use the arsenaic solution of the strength stated, namely, ten pounds of arsenic trioxide to 500 gallons of water. We use eight pounds instead and we could not see but what we got about the same results. I think I can use it much stronger in cold weather than in hot weather. It was used last fall as strong as fifteen pounds to 500 gallons of water, and we shall use about twelve pounds commencing about September or the first of October, with good results, and eight pounds during the summer. I believe with a little practice that we can dip cattle at intervals of several days without doing serious injury to the cattle. I understand, Doctor, that you dip at intervals of seven days?

**Dr. Ransom**—That was in cases where we desired to get rid of all the ticks.

**Dr. Allen**—Therefore there is no question but what the arsenaic solution is practicable for use in the eradication of ticks where cattle are dipped and turned back into the same pasture. That condition, of course, can be managed on small ranches. On the larger ranches it is impracticable to dip cattle and then turn them back into the same pasture. If they turn them back into the same pasture, we will get some of the same cattle twice. We are bound to notice that some animals will be killed by dipping them at intervals of a few days, but on the ordinary farm where everybody knows the cattle by name, if the dipping is done at intervals of two weeks and the treatment is done thoroughly, the ticks will be eradicated. It is undoubtedly much more easily applied and more satisfactory to everybody than oil in any manner in which it may be used, in the emulsion or crude product.

**Question**—Can it be used by a spray?

**Dr. Allen**—We have tried a dip with a hand spray, such as is convenient for inspectors to carry with them.

**Dr. Luckey**—Dr. Allen, we want to know what results you get from spraying the arsenaic dip, if it is practicable to spray?
DR. ALLEN—It is a good practicable spray. The arsenical dip can be applied as thoroughly with a hand spray pump as it can be by dipping. We have this additional advantage when the spray pump is used, that the inspector will naturally pick off any grown ticks which he may find. If he will dip at intervals of two weeks, he will not find any grown ticks—I say dipping, I mean treatment by dipping or spraying with pumps. As to the time the arsenical solution will render an animal immune from exposure, we have had no opportunity to gain any knowledge on that point—definite knowledge. The inspectors have covered the ground about twice every two weeks and usually after the second dip they never have found anything but nymphs. The stage we find ticks in would indicate that the animals became reinfected within at least two or three days. I don’t really believe that we can depend upon the arsenical solution to render the animals immune from reinfection longer than a day or two.

DR. KIERNAN—With reference to the size of the herds, what size herds do you think it is practicable to apply the arsenical spray on—where you have herds of 500 or 600 cattle, would it be advisable to use the spray?

DR. ALLEN—I should prefer the tank.

DR. NIGHBERT—Have you had any experience in the application by hand?

DR. ALLEN—By hand, does that exclude the pump?

DR. NIGHBERT—Yes.

DR. ALLEN—We made some experiments by hand. It was several years ago. I did not see the experiments myself. I asked one of our inspectors who made the experiments and he said he could not get the animals wet by hand.

DR. NIGHBERT—Was there any other reason?

DR. ALLEN—I presume you refer to the injury to the hand. You can take an arsenical dip and make it in double strength, that is, twenty pounds of arsenic to the corresponding amount of soda and pine tar, to forty or fifty gallons of water, and you can put your hand in it without any injury. It will blacken your nails a little bit. If you have sores on your hand, it will aggravate them. In the spring when it is very cold some of the men complain of their faces getting sore. The arsenic may have something to do with it in the main.

DR. NIGHBERT—that is a point that would have to be considered in a territory where there are only a few cattle, owned by an individual, who wants to use the arsenical dip. The solution would have to be taken away, that is the difficulty, it being a poisonous material. It seems to me it would not be safe. It would have to be left in the hands of the owner and would have to be applied by hand. Now, the application of
disinfectants is something that has worried me a great deal. I have not seen anything that has been absolutely satisfactory in every respect. Now, you take it this year, the oil emulsion in the early season was very unsatisfactory, for the reason that it kept raining every day for two or three months. A man would go out and spray his cattle. There were no sheds or barns to put them in, especially a bunch of ten or fifteen cattle, and it would rain on them and wash the emulsion off. In sheds they would be reinfested again. But, as a rule, I find that any oil preparation is far superior to anything I have observed in the past few years. Another reason, along the line of coal tar dips, they soon evaporate and the ticks are not killed. It seems to me if we could get some preparation that was reliable and safe, for instance in the territory I have in mind, where there are only three or four cattle owned by an individual, it would be one of the greatest things in the work of tick eradication.

Dr. Allen—In regard to putting this dip in the hands of the owners of cattle, I will say that sometime ago we abandoned any hopes of any degree of success by allowing the owner to do his own disinfecting. We try to notify the owner a day ahead and have him drive his cattle up about a certain time. If he will do that to show his good intentions, why, we do the rest. If, on the other hand, he leaves his cattle in the pasture and shows no disposition to do what he ought to do in the work, we make a practice of putting his cattle in charge of the sheriff. After that time we don’t have much trouble. As a practicable proposition we think it is best for the inspectors to do most of the disinfecting.

Dr. Nighbert—I think it is a good idea, too, but you take in a country like South Carolina and Georgia where there are from 150 to 250 places in a county, of course we could not keep enough men in there to do the work. We are able to do it now in a territory that is almost free, where there is probably forty to fifty places to be disinfected. One man can get around to those places about every eighteen days to three weeks. In this way we are getting good results. Of course, some object to having their cattle disinfected. It seems to me it would be impracticable to attempt to disinfect 200 to 300 places in a county—it would take too many men and too much time.

A couple of years ago we attempted to supervise the inspection of cattle in North Carolina. We made visits every two or three weeks. The owners at first promised if we would go in there and help them, they would get the cattle up and render all the assistance possible. After the first or second visit they either refused, or professed to be sick or were absent on the day regularly appointed for the disinfection, and our men who went there had to go down to the pasture and drive the cattle up. We found it was impracticable and abandoned the work at that time.

I would like to ask Dr. Allen, when the cattle are left in a tick infested pasture, how long he has continued and the number of disinfect-
tions he has applied before he felt that a reasonable number of the cattle were free from the infection, and what percentage of the herds have been cleaned up in that way?

DR. ALLEN—I do not know that I understand the question. You mean, commencing with a certain time, how many times we are required to disinfect?

DR. NIGHBET—Yes.

DR. ALLEN—I think there is no danger of the ticks maturing if the cattle are treated as often as every two weeks. Of course, the number of disinfections in an infested pasture will vary. Last fall we began to disinfect certain pastures; we had very little hope of absolutely cleaning any great percentage of them last fall. We went over about 35 per cent of the pastures this spring. We began about the last week in February and treated the cattle just the same as though they had ticks on them; we treated them every two weeks until July. In the meantime if we did not see any ticks, we extended the time of treatment to once every three weeks; and then if the ticks did not show up, we went four weeks. If no ticks showed up by the middle of August, we considered the premises free and released them. It seems to me if we commence the first of July and don't allow the ticks to mature, and treat every two weeks, by the first of December or the first of January, the premises will be free.

Question—In comparing that method with that of permitting the farmer to do the work, do you think your method warrants the expense—the expense of the supervision?

DR. ALLEN—I think it does. For this reason we have put the work on the county. We say to the county, that if they will raise the funds by which they can employ, say three or four men (the county to furnish its own man—but we see to it that they have the right man), we will put one county man with one State man, and one county man with one government man, and we leave the government man in charge of the work, to supervise it. In this way, one government man would have general supervision of perhaps 100 herds of cattle. We find the results justify the means used. Anyhow, we make the rounds perhaps every two weeks in order to see what they are doing. It does not take very long to spray the animals—in fact, it does not take much more time to spray them than it does to inspect them. After all, if the owner by some means, neglect or otherwise, fails to treat animals at regular intervals, all the work is lost. I believe more real good is accomplished by the same amount of work under the supervision method, provided we can get the counties to cooperate in the work.

Question—About how much do you use in spraying?

DR. ALLEN—About a gallon and a half.
THE PRESIDENT—Perhaps some other gentlemen would like to give their experiences. I realize that we want to get all the information we can. Of course the main point is arsenical dips. Dr. Cary, do you care to say anything on this subject?

DR. CARY—I believe I have said enough. No, I don’t care to say anything more on this subject.

DR. WRIGHT—In dipping the cattle you have to be careful not to allow their heads to go under more than once, do you not?

DR. ALLEN—We have experienced no difficulty in dipping, unless the stock is allowed to stay in the dip too long. I do not believe an animal drinks any of the dip when swimming through it.

DR. WRIGHT—In spraying, you have to be careful to cover the ground over?

DR. ALLEN—No, the amount of arsenic that would remain on anything that poultry would pick up is too small to poison them. We never have lost any chickens or poultry in this work.

THE PRESIDENT—Dr. Steddom, we would like to hear from you.

DR. STEDDOM—I do not think I have anything to offer. We have been considering more seriously the proposition of permitting the people to do the preliminary work themselves; to go in there first and show them how to do it and then let them go on and do the best they can for awhile; revisit them occasionally as we can; the revisits to be made by the federal, state or county inspectors; following that policy for the first year or so and then later on go in and help them out with the laggards—the people who refuse to help themselves. I am inclined to the opinion that that method will give the best results for the money expended. While this other plan of going in and rushing the disinfection rapidly can be done, I think it is rather expensive. Following the plan I have suggested, people will have an opportunity to become educated and to become in sympathy with the work.

DR. LUCKY—I would like to inquire as to the relative cost of the arsenical dip, to the gallon, what would be the cost of 500 gallons of the dip?

DR. ALLEN—the arsenic, buying it in large quantities, costs 10½ cents per pound. A gallon of dip ready to use costs something in the neighborhood of one-half cent a gallon.

DR. LUCKY—I do not know the exact cost of the emulsion, but I think it is close to five cents a gallon in Southern Missouri, and it takes a gallon to spray one animal. It takes a barrel to spray 200 cattle properly, and if you are fixed to handle the cattle nicely, so that you don’t hold the spray too long when it is not directed toward the animal, you can spray more than 200 with one barrel of emulsion; but when the animal does not stand still but is able to chase from side to side, the
time you are getting out of the way to keep from getting kicked or run over, the spray is going on and wasted and not doing any good, and it takes more than a gallon.

I want to ask a question of Dr. Ransom for information. I have studied ticks for fifteen years and have reached a point where I do not think I know anything about them. I want to get the proper explanation of the reason why the eggs that have been sprayed do not hatch. We have observed at certain times of the year the female on cattle and there would be no male present to fertilize the eggs. I have not worried about the female when there was no male with them, for the eggs would not hatch without fertilization, and I thought perhaps some of the dips which did not kill the adult tick outright, destroyed the male before fertilization had taken place. I would like to ask whether it is due to the destruction of the male before fertilization or whether it is due to the devitalization of the female that the eggs do not hatch?

DR. RANSOM—The effect on the eggs is certainly due to the direct effect of the dip on the female and not on the male. To recall one of the experiments which I related in my paper, I used a lot of ticks which had been collected, fully engorged, and simply dipped them; others I did not dip; in that particular case none of the eggs which came from the female dipped, hatched. I think there is no question but the arsenic produces its effect on the eggs through the female and not because it kills the male.

DR. LUCKEY—There is a ray of hope to be had from the statement that the eggs which had been taken from dipped cattle did not hatch. I always have found any dip which will kill mature ticks on cattle outright, will injure the cattle. I never have been able to get hold of anything that would destroy the ticks but what would, especially in hot weather, burn the skin of the cattle to such an extent that it would be highly objectionable to the owners. We have attempted to study this point so as not to injure the cattle in the least. That is one thing we have had to guard against in our work. After the first or second round we were in hopes of making a record in a badly infested area in one of the counties in our State. Later on we began to see mature ticks emerge from cattle after we had sprayed regularly. I became very much disappointed temporarily; but if those ticks lay eggs that will not hatch, that is an encouraging feature to me. I hope the eggs will not hatch. I was greatly in hopes of disinfecting a bad area so that there would not be a tick there next year. We may be able to do that yet. Unless those females are so devitalized that the eggs will not hatch, we have a chance to lose all our work, unless the range is burned over this winter.

THE PRESIDENT—Dr. Connaway, we would like to hear from you.
DR. CONNAWAY—I have been out of the tick business too long to add much. I recall some experiments that were made by Dr. Francis and myself on ticks some thirteen or fourteen years ago, in attempting to dip cattle for feeding purposes. That was in Missouri. Along about that time the United States government was making experiments of the same kind. Our dips at that time were with oils, with some crude carbolic acid added. Some of the shipments of cattle were almost free from ticks, but we never did get them entirely free, and the few ticks that were left always produced fertile eggs. Those experiments were abandoned. I believe the methods referred to here are all right for clearing up districts, but I believe the herds should be changed and put into fresh pastures; in that way after a time, great territories of the country will be cleaned up. I believe the problem is going to be solved, but it is going to take time. I see one gray haired man here who has been in this business for a great many years—possibly he can add something to what already has been said.

THE PRESIDENT—Colonel Dean, will you give us your experience?

COLONEL DEAN—I do not think I have anything to add to what has been said. I am out of the tick work now, and my experience when in that work was along the same lines as those which have been described here, only their experiments have been more thorough and they have kept track of the work better. I do not think I have anything else to say that would be of value to you.

THE PRESIDENT—Dr. Melvin, we should be glad to hear from you.

DR. MELVIN—I do not think I have anything to add to what has been said along this line. We have been rather reluctant to take up the arsenical dipping, on account of its poisonous nature, and also on account of some very bad results we have had in injuring cattle, and also owing to the fact that it has failed to kill all of the ticks. We never have found a method that has been entirely satisfactory, so we have had to do the best we could with what we had. In some sections oil emulsion seems to do the best work. I have personally supervised dipping a number of cattle in crude oil, with excellent results, and similar oil has been used at other times with disastrous results. There is no doubt that the season of the year has a great deal to do with the effects which you are going to obtain, not only on the ticks, but also on the cattle. In some seasons of the same year you will have excellent results with one dip and later in the same season, you will fail, where earlier you had reason to believe the results would be entirely satisfactory. There is no doubt in my mind but these dips do exercise a terrible effect upon the female tick, not only arsenic but oil as well. A number of observations I have made were along that line, where the female ticks had been dipped in oil, the eggs did not hatch at all, or, if at all, only
a very few hatched where others undipped, taken from the same cattle, were kept and hatched.

Dr. Allen—There is one matter that has not been touched upon, and that is in regard to driving cattle. We have found by experience that it does not do to drive cattle after the second dipping, for about a week or ten days. I was down in Texas recently and saw quite a number of dead cattle, and upon inquiry I found that they had been dipped but a short time before. I do not think it is safe to drive them within a week after dipping.

Dr. Nighbert—Don't you think it has a worse effect after dipping them in oil?

Dr. Allen—The effect is different. The effect subsequent to dipping in oil seems to be on the skin, while apparently arsenic has a more specific effect, other than effects on the skin, when driven after dipping.

Question—Does oil produce particular symptoms in Texas cattle in very hot weather and also in very cold weather, so that the oils are, under certain conditions, bad?

Dr. Allen—Bad effects from dipping or driving of dipped cattle are immediate. As they say in Texas, "they die right now." These cattle that I referred to were left on the road between Mr. Ledbetter's place and the corner.

Question—It might be arsenical poisoning?

Dr. Allen—Yes, it had the appearance of arsenical poisoning.

The President—If there is no further discussion, I will ask Dr. Ransom if he has anything else to say?

Dr. Ransom—I have nothing further to add except to state that in my paper I recommended two dips a week apart, for the purpose of freeing cattle from ticks. I did not intend that these dippings should be kept up continuously every week, except in cases where it was desired to free cattle from ticks and then move them to clean areas; I felt that could be accomplished by dipping twice at an interval of a week, and that they could very well stand without serious results.

Dr. Cary—If it is in order I should like at this time to make the report of the Finance Committee. We have to report that we have examined the accounts of the Secretary-Treasurer and we find them correct. There is a balance due the Treasurer amounting to $1.09.

Report accepted.

The President—We intend now to call upon Dr. Melvin to read his paper on the Work of the Various States in Immunizing against Hog Cholera, as the Doctor may not be able to be with us tomorrow. It has been arranged that his paper will be open for discussion tomorrow when similar subjects are under discussion.
At the last meeting of this Association, I presented a brief description of the method developed by the Bureau of Animal Industry for producing a serum to be used in immunizing hogs against hog cholera. It was stated at that time that the serum had been tested extensively in our own experimental pens and in the field by our Inspectors and had been found to be a very efficient agent for protecting hogs from hog cholera. As soon as we were convinced that the serum was effective, the results of the work were communicated to officials in all of the states and at the same time these states were invited to send representatives to our farm near Ames, Iowa, for the purpose of observing the methods of serum production. In response to these invitations, representatives of 26 states visited Ames and were shown the methods of serum production. These men were told that it was not the desire of the Federal government to undertake the preparation and distribution of this serum, as the Secretary of Agriculture was of the opinion that the work should be best done by the individual states, the idea being that, in so far as possible, this serum should be prepared and applied by State authorities either free or at cost price. The Department offered to cooperate with State representatives as far as possible in getting started in this work and we have furnished immune hogs and some serum to most of those who were present at the conference referred to above. In the communication to this Association last year, a tentative plan for combating hog cholera by the use of this serum was outlined, the main ideas being that the serum should be prepared by State authorities; that it should be furnished to farmers free or at cost price; that the administration of the serum should be in the hands of the State Veterinarian or State Live Stock Sanitary Board, and that, for the purpose of eradication, an effort should be made in the early spring to hold the disease in check by immunizing hogs on farms in the vicinity of centers of infection. Such a plan could not be expected to succeed late in the summer, when the disease becomes widespread.

In this paper, I desire to present to the Association a brief report of the progress which has been made by the various states in arranging for the production of this hog-cholera serum. The information which is given was very kindly furnished by the gentlemen whose names are given below, and I wish to express my thanks to them for their cooperation. The conditions in the various states are briefly as follows:

**Alabama**—Dr. C. A. Cary reports that Alabama has done no work along this line.

**Arkansas**—Dr. R. R. Dinwiddie reports that no money has been appropriated for the work. He has treated about 100 hogs, using both the serum alone and serum simultaneous method. The losses among treated animals in infected herds have been approximately 25 per cent. He seems to regard the
serum simultaneous method as preferable. The cost of the serum has been at least 50 cents per dose.

CALIFORNIA—Dr. Charles Keane, State Veterinarian, reports that no serum has been prepared, but he is endeavoring to secure funds for this purpose.

COLORADO—Dr. George H. Glover reports that no serum has been prepared, but he hopes to do some work during the present fall and winter.

DELAWARE—Dr. Charles F. Dawson, Veterinarian to the Delaware Agricultural Experiment Station, reports that he has treated a few hogs with serum prepared by himself with excellent results. It is expected that the State will appropriate about $500 for getting the work started. The serum will be prepared at the Delaware Agricultural Experiment Station and will be distributed and applied by the State Board of Agriculture free of cost to farmers.

ILLINOIS—Dr. J. M. Wright, State Veterinarian, reports that Illinois has appropriated in all $14,000. Of this, $4,000 is to be used for purchasing a farm, $6,000 for the erection of a laboratory building, and $4,000 per year for experts to have charge of serum production. The manufacture and distribution of the serum will be under the control of the State Board of Live Stock Commissioners and the State Veterinarian. The serum will be furnished free to farmers of the State.

INDIANA—Dr. R. A. Craig, Veterinarian to the Purdue University Agricultural Experiment Station, reports that the State has appropriated $5,000 yearly for the investigation of animal diseases, and a large part of this amount will be used for hog cholera serum production. The preparation and distribution of the serum will be under the control of the Experiment Station Veterinarian. It is proposed to prepare within the next twelve months about 10,000 doses of serum. Farmers will be charged 1 cent per cubic centimeter for the serum, which will be supplied, presumably free of cost, by the State Experiment Station. About 700 hogs have been treated, apparently the serum alone being used, and in the great majority of cases the herds were infected at the time of treatment. There were no losses among hogs in non-infected herds, whereas in badly infected herds the loss was from 20 per cent to 40 per cent of the treated animals.

IOWA—Dr. P. O. Koto, State Veterinarian Surgeon, reports that the Iowa Legislature appropriated $8,000 to be used in the manufacture of hog cholera serum by his department, the serum to be distributed to farmers or veterinarians at cost price of manufacture. The appropriation did not become available until July 4 of this year. Therefore little progress has been made in the work when Dr. Koto made this report.

KANSAS—Dr. F. S. Schoenleber, Professor of Veterinary Science, reports that the State Agricultural Experiment Station has appropriated $3,000. The serum preparation and distribution will be under the control of the Veterinary Department of the Agricultural College and the serum will be furnished to farmers at cost price, probably being applied by officials. No serum had been prepared at the time of this report.

KENTUCKY—Professor E. S. Good, of the State Experiment Station, reports that no appropriation has been made by Kentucky for this work, though some serum obtained from the U. S. Department of Agriculture and some from the Michigan Experiment Station has been used with good results. I understand from other sources that the State of Kentucky will probably make an appropriation for this work when the Legislature meets next winter.
LOUISIANA—Dr. W. H. Dalrymple reports that up to the present time Louisiana has had little occasion to use the serum and so none has been prepared.

MARYLAND—I have information from several sources that the State of Maryland has not yet begun the preparation of hog-cholera serum but contemplates doing this in the near future.

MASSACHUSETTS—Dr. Austin Peters, Chief of the Cattle Bureau, states that there are so few hogs in Massachusetts that they will probably not undertake the preparation of anti-hog-cholera serum unless conditions arise making this necessary.

MICHIGAN—Dr. Charles E. Marshall, Professor of Bacteriology at the Michigan Agricultural College, reports that $1,500 has been set aside for this work by the College. The preparation and distribution of the serum is under the control of the Bacteriological Department of the College and it is sold to farmers at cost price, 2 cents per cubic centimeter. It is stated that the serum will be applied by officials, veterinarians, and farmers. About 3,000 hogs have been treated, both serum alone and the serum simultaneous method being used. The results have been good except in five herds. In these herds loss occurred because the serum was not strong enough.

MINNESOTA—Dr. M. H. Reynolds reports that $12,700 has been appropriated. The serum preparation will be under the control of the Chief Experiment Station Veterinarian and the distribution and application will be made by the same official in cooperation with the Secretary of the State Live Stock Sanitary Board. The serum will be furnished to farmers at a slight advance over the cost, which is estimated to be 2 cents per cubic centimeter. The serum will be applied for the next year or so by officials. Nine hundred and seventy-five hogs had been treated at the time of this report, both the serum only and simultaneous methods being employed and both being used in infected as well as non-infected herds. Practically no losses occurred in the treated animals receiving serum only in non-infected herds. In the case of infected herds, the results varied greatly. The average loss in treated herds was 17½ per cent of the vaccinated animals and 89 per cent of those which were left unvaccinated as checks. Dr. Reynolds reports loss in one case from the serum simultaneous treatment but states that this did not occur where good serum was properly used.

MONTANA—Dr. M. E. Knowles, State Veterinarian, reports that no appropriation has been made for this work and no serum has been prepared.

NEBRASKA—Dr. A. T. Peters reports that the work was started with a five hundred dollar appropriation from the Agricultural Experiment Station, and the Legislature of 1909 appropriated $5,000 for the ensuing two years. The serum will be prepared by the Department of Animal Pathology of the Nebraska Experiment Station, which will also have control of the distribution in cooperation with the State Veterinarian. The serum is to be furnished free to farmers and will be applied by veterinarians only. No definite estimate of the cost has yet been made. Approximately 2,000 hogs have been treated by the serum alone and the serum simultaneous methods. No exact data is given concerning the losses in infected herds treated with serum. Dr. Peters reports, however, that in a certain number of non-infected herds treated by the serum simultaneous method loss followed vaccination. When symptoms of illness appeared following vaccination, some of these were re-treated with the result that the loss from vaccination did not exceed 2 per cent. In others which were not treated with serum again after symptoms of illness developed following vaccination, the loss was greater, reaching 11 per cent in one case.
NEW YORK—So far as I am able to learn, nothing has been done with serum production in New York State.

NORTH DAKOTA—Dr. L. Van Es, Professor of Veterinary Science, reports that the last Legislature of the State established a State Serum Institute in connection with the Veterinary Department of the Agricultural College carrying an annual appropriation of $3,000. The Professor of Veterinary Science of the College will direct the serum production and will also distribute and apply the serum under conditions prescribed by the Live Stock Sanitary Board. The serum will be free to farmers and it is intended that the serum shall be applied by officials. Dr. Van Es reports no losses from serum simultaneous vaccination although a large number of animals have been treated. He was unable to furnish exact data as to the number treated but results were good.

OHIO—Dr. Paul Fischer, State Veterinarian, reports that the State has appropriated $3,000 for the work exclusive of salaries. The preparation and distribution of the serum will be under the control of the State Veterinarian and the serum will be furnished at cost price and applied by veterinarians in the employ of the Board of Live Stock Commissioners. The estimated cost of preparing immune serum is 2¼ cents per cubic centimeter. 1,432 hogs have been treated. Of these, 866 were in non-infected herds, among which there was no loss whatever, all of these being treated by the serum simultaneous method. The remaining 566 animals in infected herds were treated with serum alone and the approximate loss was 2½ per cent.

OKLAHOMA—Dr. L. L. Lewis reports that the Oklahoma Experiment Station has approximately $2,000 for this work, to be expended during the present year. The preparation and distribution of the serum will be under the control of the Experiment Station. As yet no serum has been prepared.

PENNSYLVANIA—Dr. Louis A. Klein, Deputy State Veterinarian, reports that the State of Pennsylvania has appropriated $8,000 to be used for this work by the State Live Stock Sanitary Board during the ensuing two years. The preparation and distribution of the serum will be under the control of the State Veterinarian and will be used by veterinarians engaged by the State Sanitary Board. As yet no serum has been prepared.

SOUTH CAROLINA—Dr. E. Barnett, Veterinarian to the Agricultural Experiment Station, states that no money has been appropriated by the State or Station for this work, but a few experiments have been carried out with serum made by him in cooperation with the Bureau of Animal Industry. It is intended to do a little work in South Carolina and then to sell the serum to farmers at cost price, if there is a demand for it.

TEXAS—Honorable R. H. Harris, Chairman of the Live Stock Sanitary Commission, reports that no work has been done along this line in the State of Texas.

VIRGINIA—Dr. John Spencer, Veterinarian to the Experiment Station, reports that the Station appropriated $50 with which a small amount of serum has been prepared and applied by the Veterinarian of the College. The results of the serum treatment were entirely satisfactory, none of the treated animals dying except in cases where they were sick when the serum was administered.

WASHINGTON—Dr. S. B. Nelson, Veterinarian to the State Agricultural Experiment Station, reports that no work has been done by the State of Washington up to the present time. It is expected that the work will be taken up in the near future.
Wyoming—Dr. O. L. Prien, Veterinarian of the Agricultural Experiment Station reports that no work has as yet been done by the State of Wyoming.

Besides the states mentioned above, I have been advised that the Missouri and South Dakota legislatures have appropriated money for preparing this serum, but I have not been fortunate enough to secure from either of these states a report as to the work thus far accomplished nor am I sure as to the amount of money appropriated. A personal conversation with Dr. Connaway, who has had charge of the serum production in Missouri, indicated that his results had been very satisfactory and he stated also, that he had treated at least 10,000 animals. The State of Tennessee has done some work, but, so far as I know, sufficient funds have not been made available so that the work can be taken up on a large scale.

From the data just given, it will be seen that eleven states have each appropriated sums exceeding $1,500 per annum, and in several instances a much larger amount, for carrying out this serum production. It will also be seen that approximately 20,000 hogs have been treated during the past year with serum prepared by State authorities, and it is gratifying to note that the results have, on the whole, corroborated the work of the Bureau of Animal Industry. It is true that some of those who have experimented with the serum have not always had as good results as they hoped to secure, but in such cases the conditions of the experiment must always be carefully looked into, and those who have commented upon failure have in most cases stated that the losses which occurred were not to be attributed to a fault in the method but rather to some other circumstance, which, with more experience, it will probably be possible to obviate. There have been no reports, from any source, of injury to the hog by the injection of serum alone. In a few instances, losses have been reported as following the serum simultaneous injection. These losses have been shown to be due, in some cases, to a failure to give the required dose of serum with the disease producing blood. In other cases, it was found subsequently to the treatment that the serum was of a low potency and therefore in the ordinary dose did not afford sufficient protection from the diseased blood which was injected at the same time. It has been stated previously that this serum from hyperimmunized hogs is to be regarded as a protective substance rather than as a cure, and if a large percentage of an infected herd is to be saved by using the serum, it must be administered at the very beginning of the outbreak, before a large percentage of the hogs has become infected. In the case of the serum simultaneous inoculation, only carefully tested serum should be employed, and the herd should be kept under observation for two weeks after the treatment, so that the entire herd may be given serum alone if signs of illness follow vaccination. I may mention here that the Department is experimenting with a modified serum simultaneous process from which we hope to secure
benefit. This modified process is based upon the use of the serum simultaneous with disease-producing blood previously treated with a disinfectant, the disinfectant employed being strong enough to rid the blood of all disease-producing organisms except the filterable virus, which is the true cause of hog cholera.

It seems to be the general consensus of opinion among those who have been preparing serum that the cost will not exceed 2 cents per cubic centimeter, and this is certainly cheap enough to warrant its extensive use in practice. I may also express my personal belief that the ultimate cost of the serum will be considerably less than this figure when more experience has been gained in the work, so that advantage may be taken of the various opportunities for saving, such as the sale of the immune carcasses for food and of the carcasses of diseased pigs to rendering works for preparation of inedible grease.

In regard to the work of the Bureau of Animal Industry during the past year, we have made no effort to prepare serum on a large scale, nor have we conducted any extensive practical experiments with the serum. In a few cases, for purposes of demonstration, we have made practical tests in the states of Nebraska, Missouri, Iowa and Maryland, and have secured results in entire agreement with those previously reported to this Association. The most of the work carried out during the past year, however, has been devoted to attempts to improve the present system of vaccination and to a study of the biology of the filterable virus which is responsible for hog cholera. It has been found that the process of hyper-immunization, which was carried out at first by injecting the disease-producing blood into the immune subcutaneously, can be accomplished quite as well by an intravenous injection of this disease-producing blood, and the particular advantage in this is that a highly potent protective serum can be secured by using only half the quantity of disease-producing blood that would be required if the subcutaneous injections were made. In the case of immunes which have been treated intravenously, the carcass after destruction of the immune hog is in excellent condition and appears to be entirely suitable for food. As the cost of hogs for serum production is one of the chief items of expense in this method, this intravenous injection of the immune hog is regarded as a very valuable improvement in reducing the cost of serum production very materially.

One other fact which has been established by the work during the past year is that carbolic acid in the presence of albuminous substances is not a satisfactory disinfectant for hog cholera, as the virus is frequently found alive after 24 hours contact with a 3½% solution of carbolic acid, and the same was found to be true with regard to bichloride of mercury, this disinfectant failing to destroy the virus after an hour at a strength of 1 to 1,000. We have found, however, that the
disinfectant described in the last edition of the United States Pharmacopoeia as Liquor Cresolis Compositus is a very excellent disinfectant and destroys the virus of hog cholera promptly if used in a 3% solution.

Other work is being carried out, and I have no doubt that some of the states which have been manufacturing serum will have improvements in the process to report, as a result of their practical experience in the work.

It is gratifying to report, also, that scientific workers of the German Imperial Board of Health, as well as Professor Hutyra, of Budapest, have confirmed the work of our Bureau regarding the efficacy of a serum secured from immune hogs after these have been treated with diseased blood, and that the serum such as we have been using in this country is now on sale in Germany and is generally recognized by those who have tried it as an efficient agent for protecting hogs from hog cholera.

Looking over the work of the past year, we find no reason to believe that our previous results have been based upon error but are rather more confident than ever that in this serum from hyper-immunized hogs we have an agent which can be depended upon to protect hogs from hog cholera and which should serve as the basis for an energetic campaign looking to the eradication of hog cholera.

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WEDNESDAY, SEPTEMBER 15, 1909, 9:45 A. M.

Convention was called to order by the President.

THE PRESIDENT—Before commencing the regular program, I will ask the Secretary to read two or three short communications.

THE SECRETARY—You remember that last year we had with us Dr. Norgaard. I have a communication from him regretting that he cannot be with us this year. I also have another communication from Dr. Knowles and another one from Dr. Klein. [Letters read.]

THE PRESIDENT—A committee was appointed to draft some fundamental laws as a basis for the various States. If that committee is ready to report, we shall be glad to hear from them at this time.

DR. REYNOLDS—I can only say that we have had one session and have but partially outlined our work. We have not had time to consider the matter properly, on account of other matters occupying our time. There is still a probability of our getting together and finishing our work...
sometime during the day, possibly during the noon hour. If we do not succeed in finishing the work we hope to do at this meeting, then I think we shall simply report to the Association what we have been able to accomplish and ask for instructions concerning certain points in which we are in doubt ourselves and leave the matter until another year.

THE PRESIDENT—If there is no objection, the committee will be allowed further time.

THE PRESIDENT—This session will be taken up principally by the subject of Tuberculosis. Is it the desire of the Association to discuss each paper after it shall have been read, or to await until all the papers have been presented, and then let the discussions be had?

Mr. Ward moved that the discussion be deferred until all of the papers shall have been read. Motion seconded and carried.

THE PRESIDENT—The first paper is "Progress of Tuberculosis Eradication Work in Missouri," by Dr. Luckey.

Dr. Luckey—it may seem ironical to speak of progress at all, when only thirty-one head of tuberculosis cattle in a whole State have been officially quarantined, appraised and slaughtered. We realize that this is a mere beginning, and it might seem frivolous to speak of progress except for the fact that "well begun is half done."

Progress in a work of this kind cannot be reckoned by the number of cattle actually slaughtered. To get at the facts as to whether or not any progress has been made we will have to compare conditions and sentiment today with that of only a few years ago. It has not been backward beyond the memory of some men now living in the great State of Missouri, that profound ignorance prevailed along laymen concerning "consumption." The idea was abroad and deep rooted that it was hereditary and unavoidable, that it was, therefore, useless to try to stop it. All hope of the afflicted was anchored either to a patent medicine bottle, or a trip out west. Every afflicted person, even to the last hour, expected to get well. There was no light and no hope. When the warfare against consumption began and the disease was spoken of as tuberculosis, a great many people thought tuberculosis meant some new disease of which they had never heard, and some stumbled terribly in trying to pronounce the word. In clearing the deck for action against this formidable foe the hardest obstacles to remove were ignorance and that abominable "show me" spirit which was met everywhere in abundance. Those who had diseased herds were the most difficult to show.

The situation has changed swiftly. The fact that tuberculosis is a dangerous, contagious disease has been generally accepted, and laymen all over the State speak that difficult word glibly. Men of all classes are inquiring whether or not the cow they intend to buy is diseased with tuberculosis. Inhabitants of the towns and cities are now wanting to
know definitely whether or not the milk or butter they are using is from healthy or diseased cows. Even out in the rural districts, almost inaccessible to schools, the citizens are asking intelligently questions and are learning to avoid exposure to tuberculous people.

The State has erected a magnificent sanitarium for the study and treatment of tuberculosis, from which valuable and accurate information concerning the cure and prevention of tuberculosis is being disseminated throughout the State.

The whole State has courageously and calmly faced the greatest enemy of the human race. Efforts at the control of tuberculosis are being made in a cool-headed, reasonable manner. Plans for work are being deeply laid. The work that has been done was not the result of a fleeting spasm of sentiment, but was based on deep-rooted intelligence. Almost every citizen of the State is taking a quiet but steadfast interest in this work. It is anti-tuberculosis everywhere now. The cities and towns are almost universally taking steps to remove the various sources of infection. Everything possible is being done to provide a way to care for the afflicted, that some may regain health and the rest, at least, suffer as little as possible in their losing battle.

The State Legislature at its last session enacted two important laws bearing on the subject. One is known as the "vital statistics law," whereby some definite idea of the prevalence of the various contagious diseases may be ascertained, and we may know whether or not progress is being made in eradication work. We will be in possession of an accurate idea of conditions before the execution of plans that are now being well laid. By comparison with conditions five or ten years hence, every intelligent person will know of the splendid results, of which a few of us are confident in advance.

Another law passed by the last General Assembly provides for the prompt disposition of tuberculous cattle, and one which is entirely suitable to both the State and the owner. This law removes the last great obstacle in the way of stamping out tuberculosis from among cattle. The final lesson on the danger of the human family becoming affected with tuberculosis from dairy products from diseased cattle will be taught during the coming winter. The next Legislature of Missouri will appropriate whatever money is necessary to go through our dairy herds and completely rid them of tuberculosis and thereby stop one great source of infection to the human family.

Along with the education of the public there has come a wonderful change of sentiment. Personal contact with the people in every part of the State has shown me that the eradication work has solid backing. The whining of breeders, and of the old moss-back dairy men, who have tuberculosis herds, have about died away. The incentive of their objections has become too apparent, and with their own ropes they have about
hung themselves. The fight has been hard and in some cases bitter. The posts of ignorance and prejudice from financial interests have been successfully stormed, and the actual enemies to progress in eradication work have been routed. The ground plans have been carefully laid for the great work in the State, and although we have officially disposed of only one shipment of tuberculous cattle, a good beginning has been made, and what remains to be done will be much easier to accomplish than what has already been done.

The President—The next item on the program is a paper by Dr. Lamb, of Colorado. He is not with us, and I should like to know the desire of the Association in reference to his paper.

Dr. Cary—I move it be read by title and referred to the Committee on Publication.

Motion seconded. Carried.

Nerve Irritation as a Factor in Tuberculosis Extermination.

By Dr. C. G. Lamb.

I am presuming that we are all agreed that the eradication of tuberculosis from the human family is the great work of the present century and that you agree with me that one of the very important factors in this work is the eradication of the disease from the food producing animals.

It is not necessary in a paper of this kind, before an audience of this character, to go into detail as to the very large percentage of the entire death rate of the country which is caused by this great scourge; neither is it necessary to refer to the enormous economic loss occasioned by its prevalence among our people from expense of medical attendance, nursing, loss of productive ability of its victims, etc. We have all probably read the article published in a recent issue of the World’s Work in which the writer went into this phase of the question at great length and detail with the final deduction that the loss from this source amounted to the almost incredible sum of over a billion dollars. This audience does not need to be reminded of these things. They fully realize its importance and their own individual relation to the work of its eradication, and they stand ready to do, and are anxious to do, anything within their power toward the accomplishment of that end.

That the whole country is becoming alive to the graveness of the present conditions is evidenced by the various associations being formed, meetings being held, articles being written and the various means being adopted to disseminate among the people knowledge regarding the character of the disease, methods of dissemination, proper means to be adopted to prevent its spread and to effect a cure, or at least greatly prolong the lives of those afflicted.
We, perhaps more than any other body of men of similar size, more fully realize the intimate relation existing between the prevalence of this disease in the human family and its existence and constantly increasing spread among the food producing animals, and the writer is one of those who believe that if tuberculosis could be eradicated from all food producing animals, more especially the dairy cow, that a very long stride would have been taken toward its eradication from the human family, and I believe this is to be the one great task of the veterinary sanitarian of today, far exceeding all others in its importance and eventual benefit to the race.

This will of course prove to be a stupendous undertaking and one that must be approached only after the most careful and conservative consideration of its vastness and of the difficulties which stand between us and the accomplishment of the object. But it also must be approached with the enthusiasm and determination of those who fully appreciate its importance and understand the necessity of the work. While this is indeed a national matter and should, undoubtedly, be handled as such, we all realize that the National government cannot step into a state and do a work that the State can do, and ought to do, for herself. Consequently, in such a matter as this the initiatory steps, at least, must be taken by the state, and I have no doubt that any state evincing a disposition to do something herself in this matter would receive very general and generous assistance from the National government.

We all acknowledge that preliminary to a campaign of eradication, there must be a campaign of education. This educational feature has been carried on until at the present time the people as a whole are not only ready but anxious that tuberculosis be exterminated from the herds, and are beginning to inquire why something is not done in that direction and are inclined to severely criticise those who are, presumably, in a position to do it, for not starting toward its accomplishment. Apparently the only ones yet converted are the owners of cattle. Much legislation has been attempted, both by states and municipalities, in a more or less spasmodic manner and the principal opposition to any proposed legislation has come from the owners of the cattle liable to be affected by it and in most cases they have been able to defeat any measures of this character or at least so amend them as to render them inoperative or impossible of enforcement, and so long as legislators are human and subject to political pressure, this will probably continue to be the case until these men can be educated to the point where they will favor rather than oppose this work, and to their conversion our efforts should be directed, and when they can be brought to see the necessity of this work, the rest will be comparatively easy, and it may be well for us to ask ourselves "are we proceeding along the right lines
in our educational work, or are there not other methods of education which we have overlooked in our efforts?” It has occurred to me that there is one very important feature of this educational campaign which has perhaps not been given the important place it deserves, and I have given this the name of “Nerve Irritation.” I have not discovered any new nerve but am referring to a nerve which we all know seems to exist, though it has never been demonstrated anatomically. It seems to leave the brain through every foramen of the cranium and to leave the spinal cord at every segment of the vertebra. Irritation of this nerve seems to affect practically every sense. When it is irritated the person sees things in an altogether different way. Things sound differently and he feels differently about many things. After leaving the main nerve trunks, these nerves converge and finally all end in the pocket. If I were to suggest a name, it would be “Nerve Pocketerus.”

As illustrating the effect of irritation of this nerve, I was interested to read in the daily press that the insurance companies were having so many deaths from tuberculosis, as I remember it, one insured tuberculous person dying about every minute, that one company at least was sending an immense amount of literature to its patrons concerning the disease, the methods of its dissemination, proper methods of combating it, etc.; also sending lecturers to personally talk to the people along the same lines, establishing sanitariums for the care of the affected ones, all of these things showing the effect of irritation of the “Nerve Pocketerus” on the insurance companies. If the company could prolong by one year, the life of one hundred millions of insurance, they would at least be ahead the interest on that amount for one year, which, at 4 per cent would amount to $4,000,000, and they could well afford to spend $3,000,000 in the work.

A very interesting and instructive paper was that read by Dr. Melvin before the International Tuberculosis Congress and published in the April Review, in which he calls attention to the loss sustained by cattle and hog owners on account of the presence of tuberculosis in their herds. He estimated the annual loss at more than fourteen million dollars, and the annual loss from carcasses and parts condemned and destroyed by government inspectors at nearly $2,200,000. Now this first loss the owner does not appreciate, and I don’t know as there is any way to bring it forcibly to his attention so that he will appreciate it. Neither does the loss from carcasses condemned fall directly upon the owner, but none of us think for a moment that the packer buys at full market value and stands the loss of all these condemnations. No, indeed! He certainly protects himself either by buying at a price which will allow for a possible loss or by putting such a price on the finished product as will reimburse him for any loss he sustains, and possibly by both methods.
By the first method the loss falls on the producers irrespective of whether their herds are clean or not. By the second method the loss falls on the consuming public. In either case it is plain to be seen that the loss falls in the wrong place and not where it justly belongs, namely, on the producer of the condemned and destroyed carcasses. Now I have no doubt that the owners of a large proportion of these animals condemned were absolutely ignorant of the fact that the animals were diseased; or, if not ignorant, were in much the same position of a man who, after a satisfactory breakfast, reads in his morning paper of destitution, suffering and starvation in some distant country and complacently rubs his well filled stomach and deeply regrets that such a state of affairs exists in any part of the world. But as it does not personally affect him he soon forgets it. If his stomach was one of those contracted by starvation, if he and his were directly affected by the conditions of which he has been reading, then his view point would be changed and he would be a strong advocate of anything which would remedy the existing condition of affairs and wonder that any one should oppose any movement that would bring about such a change; so, if all these animals condemned had been bought subject to post mortem inspection and this $2,200,000 loss had been borne by the owner, the "Nerve Pocketerus" would have been decidedly irritated. And it would only require a very few such irritations to bring said owner to the mourner’s bench and convert him to the idea that in self protection he must rid his herd of the disease, and with several focii of this character in each locality a splendid start would be made toward the extermination of the disease in that section without any means of persuasion being used except “nerve irritation,” and I sincerely hope that the time is not far distant when all hogs and female cattle will be bought by the packers only subject to post-mortem inspection, as I am convinced that this would prove of incalculable assistance to us in this work, not only in more particularly locating focii of infection, but by irritation of the “Nerve Pocketerus” of the owner of the animals, soon result in converting a center of infection into a center from which would radiate a demand for the cleaning up of the animals in that locality. That there has been a change of sentiment already regarding this matter was brought to my attention recently at the meeting of the National Live Stock Commissionmen’s Association, held in Denver last July. We all remember what a fight these men made a couple of years ago when it was proposed by the packers to buy subject, and the commission man won. At this meeting in July a paper was read by Dr. Howe of the B. A. I. force upon the subject of tuberculosis, and it was wonderful what an interest was manifested. Several good, strong talks were made and it was evident that they had begun to give this subject serious consideration. It was plainly to be seen that most of them had been affected with irritation of the “Nerve Pocketerus” and that it was
beginning to have its effect, and the Association passed a strong resolu-
tion urging that as this matter was assuming such a serious aspect, and
was causing such enormous losses to the live stock interests, some means
be adopted at once to check its ravages; and I was convinced that if
this method of buying was again suggested, it would not receive the
same opposition as before at the hands of the commission men.

About half of the states now have laws of regulation requiring the
testing of breeding dairy animals before being brought into these
states. As the interstate movement of cattle is clearly a government
matter, I trust that the government itself will soon insist that breeding
and dairy cattle be tested before being moved interstate and that govern-
men men take exclusive charge of this testing. It may be said that this
would require a large number of men—more than are now available.
This is probably true, but we have started out with the understanding
that this is a stupendous undertaking and we must be prepared to meet
it as such, and the number of men employed and the money expended
must be commensurate with the magnitude of the task. If it was
universally known that a record was kept of all herds in which tuber-
culosis was found to exist, and credit was given to any herd after proper
testing and elimination of all diseased animals, and that information
regarding the condition of any herd could be obtained by any one upon
application to the proper person, the knowledge that his herd was on the
black list, would so irritate the "Nerve Pocketers" of the owner that
he would soon conclude that it was to his interest to have a clean herd and
as a matter of self protection he would at once proceed to have such a
one.

In my own state a certain kind of nerve irritation is responsible for
much of the opposition to any law or ordinance looking to the testing
of cows in any locality, and that is the cost of making the test, the argu-
ment being that as this is a movement for the benefit of the public,
why should the cattle owner pay the cost of the test and also lose the
reacting animals, and we must admit that there is justice in this
position and I would urge that whenever possible this objection be re-
moved by providing that the tests be made at the expense of the state,
municipality, or some one other than the owner. In this field the
government can very materially assist the states by furnishing men to
make these tests, thus relieving the owner of the expense, and furn-
ishing men having no personal or professional interests in the matter
further than to give a correct and impartial test. The owner knowing
this, would feel that he had been given a square deal, which might not
be the case if a local veterinarian had done the work.

In short, the thought I wish to leave with you is, that in this great
work we shall have to deal with all sorts and conditions of men, some
influenced by one consideration and some by another; but let us not
overlook those who can only be influenced, or who can be influenced most quickly and effectually by "Nerve Irritation," or in other words, "Self Interest," and I fear that the proportion of this class of persons is greater than most of us are aware. Consequently I urge that the movement, sale and use of any and all animals known or suspected of being diseased with tuberculosis, be made as difficult as possible and thus demonstrate to the owner that it is for his own interest to remove all suspicion from his herd and then by making it as easy and inexpensive as possible, to obtain a test; we shall then obtain many converts that could not be obtained in any other manner.

THE PRESIDENT — I now take pleasure in calling upon Dr. Dyson.

DR. DYSON — This paper was not written with the idea of presenting it before this Association. The object in writing it was to cover the situation in Illinois. It may not apply to some of the other States.

The urgent need of guarding public health against the transmission of contagious or infectious diseases through the consumption of infected milk, has been clearly and forcibly demonstrated as a result of every authoritative investigation of milk supplies that has been conducted during the past decade. It has also been fully disclosed by the innumerable investigations made, that ample protection can only be secured by a complete sanitary and hygienic control of dairy herds and the premises occupied by such herds, regardless of the fact that the dairyman’s empiric and ever-ready claim will be, that any official supervision of milk supplies is a pernicious interference with his perogatives upon the basis of a theory. Such claims, however, in the face of a knowledge of existing facts, are entitled to no further consideration, no matter from what source they emanate.

As a result of education, the recent trend of public opinion is that the well known unsanitary conditions now existing in connection with dairy herds and the handling of milk supplies, are entirely due to a lack of their authoritative control. Consumers are also awakening to the fact that State and Federal pure food laws, under which a partial control of milk supplies could be effected, are not enforced. Consequently dairymen, who for the sake of an economic gain, are willing to cause an unnecessary sacrifice of life, through infant mortality, due to infectious milk, are subjected to practically no restraint. Therefore the enactment and enforcement of more stringent laws, both State and Federal, in addition to municipal ordinances for the protection of milk consumers, would seem to be the only rational recourse.

From the standpoint of public health the fundamental principles involved in a hygienic milk supply are:

First — That all milk should be derived from healthy cows.
Second — That sanitary conditions under which milk is produced and
handled shall be such as to prevent it from becoming contaminated by the
filth of animal excretions or deteriorating bacteria incident to improper
handling and lack of sanitary precautions.

In order that the first principle may be observed, it is imperative
that all milk cows should be subjected to the tuberculin test, for the
reason that the test is practically infallible in the hands of any one
competent to administer it, and that it is the only means by which 99
per cent of the tubercular infections in cattle can positively be determined.

Although it is true that no definite percentage of human infections
can be traced direct to milk supplies, the consensus of opinion on the part
of those most competent to determine scientifically the frequency of its
occurrence, is that milk from cows affected with a generalized form of
tuberculosis constitutes a serious menace to the lives of children com-
peled to depend largely upon the milk from such cows for their
sustenance.

In this connection who would care to consume, unless pasteurized,
the products of a dairy cow known to be affected with tuberculosis,
regardless of a positive knowledge of the transmissibility of the infection
from animal to man? And to what authority can be cited the possibility
of a child having more resistance to a tubercular infection from infected
milk than a hog, which every veterinarian, at least, knows to be highly
susceptible?

Unfortunately a physical evidence of tuberculosis in dairy herds is
seldom manifested. Otherwise its eradication would have been accom-
plished long ago, simply by reason of the fact that public sentiment for-
bids the use of milk from cows manifesting any physical evidence of
disease. For that reason cows affected with lumpy jaw or discharging
abscesses are seldom found in dairy herds, although a decided preference
should be given to milk from such cows in comparison to the milk from
cows affected with a generalized form of tuberculosis. If all cows affected
with tuberculosis manifested a physical evidence of the disease similar
to that of lumpy jaw, the use of tuberculin as a diagnostic agent would
be unnecessary, as public sentiment would soon decree eradication of the
disease without regard to State or Federal legislation, or even the pro-
tests of dairymen or their political proteges.

Regardless of the well known prevalence of tuberculosis in dairy
herds, post-mortem vigilance on the part of the U. S. Meat Inspection
Service is now the only practical means employed to any extent to eradi-
cate tuberculosis in animal species. This service, however, only operates
with one object in view, and that is, to prevent the consumption of
meats from diseased carcasses; and, unfortunately, the principal feature
of the inspection is usually delayed in the case of dairy cows until they
have served their period of usefulness as profitable adjuncts to dairy
herds. Meanwhile they have, possibly for years, in addition to supplying
thousands of pounds of infected milk for human consumption, also served in the capacity of general distributors of the infection to others of their kind. Under present conditions, the cattle now being daily infected, will complete their cycle as distributing factors in constantly increasing numbers, until the prevalence of tuberculosis in dairy herds will become so great that no further thought will be given to its eradication on account of its political and economic relation to the dairy industry. In order then, that milk supplies may be used with any assurance of safety, pasteurization of all milk products will necessarily be the only recourse.

Reasoning from cause to effect, it is evident that tuberculosis in animals and the infection in man are now being encouraged and fostered through lack of ordinary intelligence being directed to the causative factor embodied in the system and products of the dairy cow, and that until the infected cow and her products can be eliminated as a distributing factor of the infection, the spread of tuberculosis will continue with its present unprecedented progress.

For the purpose of eradication, or at least the prevention of a further spread of tuberculosis in animal species, many theories have been advanced. None, however, has so far made much progress, principally for the reason, no doubt, that every plan except the Bang System contemplates the testing of cattle with tuberculin and the slaughter of all re-acting animals regardless of whether or not a physical evidence of the disease is shown.

To apply such a system to the average dairy herd without full compensation to the owner for animals slaughtered, would in perhaps 75 per cent of the cases prove disastrous to the financial status of the dairyman. Consequently, the average owner of a dairy herd who is in doubt as to the number of infected animals in his herd, has so far resisted, and will continue to resist by every possible means, the administration of the tuberculin test. On the other hand, the owner who has a positive knowledge of the condition of his herd can be depended upon to make even a more strenuous resistance to the subjection of his cattle to the test, than the man who does not know the extent to which his herd is affected. This condition of affairs has long served as a platform from which politicians from recognized dairy districts have projected themselves into the position of playing a prominent part in state and national affairs, and who incidentally have succeeded in blocking any legislation looking toward a rational solution of the problem of a hygienic milk supply.

Conservatives in the matter of protecting public health through the medium of a hygienic milk supply are usually those who hold some public office, through the political influence of a constituency having no regard for public health, those who own dairy herds consisting largely
of tuberculous cows, or those who through ignorance have no conception of the danger that exists.

In this connection I would suggest as being practicable under state and federal laws, the following classification of milk and milk products:

First—Milk and milk food products from cows annually tested with tuberculin under the supervision of state or federal authorities, and no reaction shown. The milk should also come within a certain standard with reference to its bacterial content.

Second—Milk and milk food products from untested cows. Such products to be subjected to official pasteurization before being offered for sale.

Third—Milk and milk food products from cows re-acting to the tuberculin test when no physical evidence of disease can be detected. Such cows should be permanently branded for the purpose of identification and kept in absolute quarantine, and their milk and milk products subjected to official pasteurization before being offered for sale. No attempt to segregate infected from non-infected cows should be permitted upon the premises of a dairyman.

If state and federal laws can be enacted and enforced with reference to milk standards as regards the percentage of fat, total content of solids, and adulteration by the addition of water or preservatives, I see no reason why the consuming public should not be protected against milk from tuberculosis cows, and have some assurance that its production and subsequent handling are conducted under sanitary conditions.

On the other hand, no dairyman with a healthy herd, who observes reasonable, sanitary precautions in the handling of milk and milk food products, should be compelled to meet in competition on equal terms the owner of a diseased herd surrounded by unsanitary conditions. If for no other reason, the difference in the cost of production makes competition under ordinary conditions practically prohibitive and decidedly unprofitable. Therefore some incentive should be offered to the dairyman with a healthy herd to enlarge upon his output of wholesome milk. In order that this may be accomplished, summary action should be taken to compel the executors of state and federal pure food laws to recognize in every sense of the word milk and butter as food products. State Boards of Health, at least, should recognize the danger of contagious and infectious diseases being transmitted through the agency of infected milk, and make some effort to safeguard consumers.

In the absence of state and federal laws and means for their enforcement, municipal control of milk supplies can only be made partially effective by city ordinances limiting the number of bacteria per cubic centimeter in milk previous to its delivery to the consumer. From a sanitary point of view a bacterial count is of vital importance and a positive proof of prevailing sanitary conditions under which milk has been produced or handled previous to its arrival upon the market.
The standardization of milk by limiting its bacterial content for summer and winter months, could, no doubt, be made to serve a practical purpose through the establishment of municipal depots with a sufficient number of inspectors and adequate equipment for making bacterial counts and otherwise determining its quality. All milk in bulk, no matter to whom consigned, should first be delivered to the depot in sealed cans and bear a registered mark of the producer. By this method it would only be necessary for inspectors to sample from time to time the product of each producer, to determine the sanitary conditions under which his dairy is operated. In the event of samples falling below a certain standard, the producer could be notified and prohibited from making further shipments until a standard product could be produced.

As previously stated, on account of the human element involved in the production of milk from a sanitary or hygienic point of view, the bacterial content permissible must be standardized for various reasons:

First—It is not within the legal province of any municipality to send inspectors into the field to determine by casual observation whether or not sanitary conditions under which dairy herds are maintained are favorable to the production of a wholesome milk supply.

Second—It would be practically impossible for the city of Chicago, for instance, to secure enough competent men to perform the necessary service. Furthermore, the only proof of competency on the part of the inspector would be a count of the bacterial content of the milk. Why, then, should any dependence be placed upon a visual inspection of the premises of any dairyman?

Third—Owing to the fact that sanitary conditions prevailing today might be reversed tomorrow, there is positively no dependence to be placed upon a personal inspection of the premises of any dairyman at irregular intervals.

The President—You will observe that Dr. Dyson offers a resolution. I presume the proper course would be to refer it to the Committee on Resolutions.

On motion duly made and seconded, the recommendation of Dr. Dyson were referred to the Committee on Resolutions.

The President—We have with us today a gentleman who stands in the forefront of the sanitarians of this country, a gentleman whose life work and best efforts are being spent in the interests of the public life of the great metropolis of the West. I am certain that the views from a gentleman of this character will be of value to the members of this Association. I take great pleasure in introducing to you Dr. W. A. Evans, Commissioner of Health of the city of Chicago.

Dr. Evans—I understood a doctor last week to say that the only relation of the veterinary profession to this matter of public life, especially the relation of the milk, was through the question of tuberculosis
and the possibility of spreading tuberculosis to the human subject by milk. It has seemed to me that in our fight to protect the people against tuberculosis, the veterinarian was an essential and a necessary factor; and, on the other hand, it has seemed to me that in your fight to protect not only the living stock interests, but the stock interests represented by the stock that goes to slaughter, it was necessary that you should have the support of the medical profession of sanitarians, and of the consumers, as distinguished from the producers of milk.

When you led the fight against tuberculosis in the ranks of stockmen you encountered very great difficulties. The speaker from Missouri (Dr. Luckey) has told you that he had met with considerable opposition from the breeders of fine stock in the State of Missouri. (Note—Dr. Luckey spoke extemporaneously and by his request substituted a paper previously prepared by him). I do not believe that has been quite the experience of the State of Illinois. I think those who breed fine stock, especially stock that is shipped from state to state for breeding purposes, have generally backed the laws and ordinances for the eradication of tuberculosis. But even taking cognizance of that which I believe to be a fact in the State of Illinois, the fact still remains that the stockmen up to the present time have not been able successfully to cope with this situation, and that such success as he has had is largely due to the fact that the consumer of milk and of meat has felt that he had a vital interest in the question of the suppression of tuberculosis in stock. My reason for mentioning this is that if we are to make headway, we must have your support and by that I mean, the support of those who are engaged in sanitation from the human standpoint, and I believe that it is equally true that you must have our support, and this being true, there is a community of interest between us.

I am inclined to think that as the result of the various meetings of stockmen and veterinary meetings that I have attended—as the result of the various things I have read, there is in certain quarters an idea that the only effort against tuberculosis that is being made by human sanitarians, is against bovine tuberculosis, or tuberculosis in animals.

I believe I will occupy your time for just a moment in attempting to correct what may possibly be an impression to that effect in the minds of some of you.

The effort that sanitarians who have control of the affairs of the people, the effort that they are making against tuberculosis, it seems to me, is relatively small, is, in fact, quite inconsequential as compared with the effort that is being made against tuberculosis that comes, or is supposed to come, in other directions. We have in the city of Chicago, or rather in the county of Cook, a total capacity for something over 400 consumptives in the latter stages of the disease. This is maintained by
the county government. We have, in addition, a home for incurables that is maintained by private munificence, and another for the care of the earlier cases of tuberculosis. We have, in addition to the hospitals that take care of deformatives, a hospital for tuberculosis maintained by the Hebrews; another tuberculosis hospital maintained by private charities that is non-sectarian in character. We have a tuberculosis institute that maintains seven dispensaries in the various parts of the city for caring for the earlier cases of tuberculosis. In addition, our people, by a vote of five to one, have just determined that they will tax themselves to the extent of several hundred thousand dollars for the establishment and maintenance of a hospital or sanitarium for the early cases of tuberculosis.

At the present time one-fifth of all of the people who die in Cook county from consumption, are being cared for directly at public expense, and this is a very considerable drain upon the public revenues. In addition to this group, there is a large number of hospitals that care for other cases, which hospitals are supported by charities, church charities and various private charities. So that at least one-fortieth, and that is a very conservative estimate, of all of the people that die from all causes in the city of Chicago each year, during the last months of their life, during the period of total disablement as the result of the disease, those people are being cared for at public expense, for consumption. And, gentlemen, this is a very considerable item. And then we are spending money in other ways that make this expenditure seem relatively small.

Consumption is the most disabling of all diseases. It is the great paupers' disease. It is not essentially a disease of paupers. We get reports of all living cases of tuberculosis and we put these on the spot map and our spot maps show, when we take into consideration the density of population of the different Chicago wards, that nearly as much per inhabitant consumption originates in the good wards as originates in the bad wards of the city. So that consumption is not essentially a disease of paupers, but it is essentially a pauper's disease. When the head of a family, after three years' illness, dies from consumption, the family is in dire straits for all time. The younger members of the family go into institutions, they go into orphan asylums, they go into the charitable institutions of the various sorts and kinds; they are cared for by older members of the family, or relatives, or else they go to work in the shops, in the factories, or stores, at a period of life when children should not be allowed to work. But there is a side of the question that is broader still and is far greater still from an economical standpoint; factories are being torn out and rebuilt as the result of factory laws and factory inspection that are made in the war against consumption. Great blocks are being torn out and tenements are being destroyed, and those breeding places of the disease are being converted into small parks and
into squares in order, more than anything else, that we may protect these other forms, let us say, of consumption.

All kinds of laws for the regulation of the people and of the limitations of the liberties of people are being passed and are being enforced, based upon the recognition of the fact that there is nothing that so limits the liberty of the people as this disabling and pauperizing disease.

Gentlemen, we are doing but little for bovine tuberculosis as compared with the great work that is being done in other directions. So, don't let any man go away from here with the idea that the farmer who owns tuberculosis cattle is being sought out. The man who runs his factory where consumption is contracted, is being proceeded against; the man who owns a tenement that makes for consumption is being proceeded against and the unfortunate man who has consumption, the man whose shoulders are already burdened with his sorrow and the direful outlook for the future, that man is still further being oppressed by laws that are of necessity oppressive, but by laws that are necessary for the common good. The farmer is not the only one who is bearing the burden in the fight against this disease.

Now, if you cannot get along without us and we cannot get along with you, then I believe it is desirable that we should devote some little attention to the man and the arguments of the man who has furnished the only scientific basis of these people who come out into the open and say that we demand too many laws and that they do not propose to submit to them. Now, then, until this man came into the open they had no scientific shield behind which they could retire and conduct their fight in defense of their interests.

To begin with, Dr. Koch became interested in this question? Why? Because he said he had read the article by Theobold Smith, and that article was one that dealt solely with the biological differences of the bovine bacilli as contrasted with the human tubercle bacilli. Dr. Koch cares nothing for the fact that the bovine bacilli may be found in the human body. It has been demonstrated that the bovine bacilli are transmissible to the human, but he says he cares nothing for that fact. He admits that it can be done, but he says it is entirely beside the question. Note this fact, gentlemen, that he at that point abandons the basis of his original argument. It is not natural that a man at his time of life should be easily converted to a different opinion. He says that no evidence conclusive to his mind has been offered that the pulmonary form in the human subject is due to the bovine bacilli. You will note that he says, "no evidence conclusive to my mind." He simply rejects the evidence of people whose reputation and standing are certainly in some measure comparable to him. Don't forget this fact, gentlemen, that during the last year not one item of investigative work has been done by Koch on his proposition. He simply stands as the judicial censor passing upon
the work of other men, not modified in great measure by his abundant experience and his careful observations many years ago, and not modified in any measure by any experience in recent years, and not modified in any measure by experiences that have occurred to him since this matter has been of great moment.

He says he is not convinced that any of the pulmonary form of human tuberculosis has been due to bovine bacilli. How does he explain the presence of these bovine bacilli in the sputum and in the lungs of the human subjects? He says that you have but the excluded evidence of the presence of bovine bacilli so-existent with, or subsequent to, human infection, as the result of taking milk, or of eating butter or maybe cheese. Let us say that that tentative argument should be allowed to stand. Let us say that we travel by way of the North Pole to reach Waukegan. What does it mean? It means, gentlemen, that he recognizes the possibility of the location in the human lungs of bovine bacilli co-existent with an infection of human bacilli, or that it came there after infection by the human bacilli. He explains the over-growing of bovine bacilli as compared with human bacilli, by saying that the bovine bacillus grows more rapidly if it finds conditions of health better prepared than does the human bacillus. Gentlemen, what is that but an acknowledgment of one of the fundamental principles of the factors in the infection and is it not simply an argument of itself to prove the opposite of his contention?

Gentlemen, you are administrators. You are here for the purpose of studying means to protect those who are well, as well as those who are sick, whether those who are well are human or animals, whether those who are sick are human or animals. You are here as protectors, to do everything that is reasonable and that should be done in order that you may succeed in protecting those whom it is your duty to protect. It has been established by Dr. Koch himself that the tubercle bacillus is responsible for tuberculosis. He then cannot say that it has not been proven that the bovine bacillus is not responsible for tuberculosis. It is unnecessary that he should prove it in a negative way, but in a positive way. It is necessary that he should prove that this rule which he has established, and which every man of importance in the world accepts, namely, that the tubercle bacillus causes tuberculosis—it is up to him to prove that the bovine bacillus does not cause human tuberculosis, and that the bovine bacillus constitutes an exception to the rule. And until he does prove it, I, for one, am not going to relax my efforts in any single direction.

Gentlemen, I have been greatly interested in the papers I have listened to this morning. I had the pleasure yesterday of reading Dr. Dyson's paper. That subject has been the subject of a great deal of thought on my part. I note what he has said as to the inefficiency of
farm inspection. I do not know whether I am ready altogether to agree with him on that point, and I do not know that I am ready to disagree with him. You will understand, gentlemen, that he does not propose to do away with farm inspection without substituting something for farm inspection, and that something is the bacterial examination of milk. I believe during the past year we have made more bacterial examinations of milk than have been made in any other health department in this country, certainly in the same length of time. It is now nearing the six thousandth examination since January 1st. That amount of bacterial work has been done by three or four men. Of course, those men have had inspectors in the field who were gathering samples. I know it has been of considerable help to us in getting after the dirty places in which milk was produced, and dirty places in which milk was handled. I remember when I was a smaller and younger man than I am now, it was my duty to feed three cows. I would put down three slop buckets and I would fill these buckets. As I began to fill the buckets there was one cow that would drive another cow whose nose was in the bucket away. The one driven away would go to the next bucket, and another cow would drive her away and she would go to the third bucket. You know there is always one cow in a herd that seems to whip all the other cows, and sometimes a smaller cow would whip the strongest cow. Now, we have found men selling milk that was very poor. We immediately sent him notice to stop selling milk. That man has turned around and kicked the farmer who sold him the milk, and then the farmer would take a kick at the health department. I know this has happened scores of times.

But, seriously, I do not know that the inspection has resulted in much good. No one will claim that it is entitled to be termed "controlling." It is rather suggesting. The inspector goes to a place and makes out a report on the score card, and makes certain suggestions, and these are sent in to the department. We then send out written orders. Until this year we found the orders seldom complied with, but this year these orders have been complied with in a great many instances. But even at that, it is merely suggestive. We have had ten inspectors for our twelve thousand farms, and you can see from the very nature of things that these orders cannot be other than suggestive. It does, however, keep us in touch with the farmers, and in that way does a vast amount of good.

I was very much interested in what the previous speaker had to say regarding the methods they are pursuing in the State of Missouri for the purpose of getting the testing done. I have been interested in the various methods that I have seen in the States adjacent to Chicago. At least three States furnish a large amount of milk to this city, and one or two others supply a smaller amount. Each of these States has had a method different from the others. It has seemed up to the present time that we have had to let the matter run along according to the individual
characteristics of the men who were on the job, modified in a considerable measure by the characteristics of the State in which the work was being done. For instance, in the State of Wisconsin they have pursued a decidedly more lenient policy than they have in the State of Indiana, let us say. Owing to legislative difficulties in the State of Illinois, the amount of work that has been possible here has been far less in Wisconsin or in Indiana, certainly in the northwestern part of Indiana.

But the time has come, I believe, when the work should in a great measure be standardized. We should not have three such States as Wisconsin, Indiana, and Illinois having such radically different methods of handling this proposition as we now have. I do not think that there is any question but that a very large number of tuberculous animals have been brought into this State from Wisconsin. Under the laws of our State, the Board of Live Stock Commissioners and the State Veterinarian have been powerless to cure this condition, which is radically wrong. I do not believe we are ready for a complete standardization. I believe there are elements in the situation that can not be standardized. The gentleman from Missouri said he believed the thing to do was to proceed through city ordinances and to have the various cities demand certain things of the producer. That is advantageous to a certain extent. But in most of the cities the city ordinance will be for the benefit of the consumers, consequently the cities can get ordinances that will cover the situation locally very much better than the State legislatures can cover the whole State, for the members of the legislatures are usually representatives of the interests of the producer. The city ordinances will mean a great diversity of laws, and this will mean that the situation will always be roiled up.

I see that you have a Committee on Fundamental Sanitary Laws as a basis for the various states, and a Committee on Sanitary Laws and Regulations and the State officers of the various states. It seems to me that it is the part of wisdom to have this Association try to find a common ground on which every State Board could act, and for which every State Board could stand shoulder to shoulder, with no break of ranks, and that certain other things could be left to the individual initiative and individual control of the different state and municipal officers. [Applause.]

DR. PETERS—I move that by a rising vote, we extend our thanks to Dr. Evans for his address to us this morning.

Motion seconded. Carried.

DR. EVANS—I thank you very much for your spoken words and for this expression of your appreciation. I am temporarily an officer of the city of Chicago. Before I became an officer of this city, I was greatly interested in this work. A year from next spring I shall cease to be an officer in the city of Chicago, but I shall not cease to be a worker.
in this fight against tuberculosis. In this fight I believe I can be of some service to you and I believe you can be of some service to me. I believe we each can be of service to the other, and the best thanks you can give me is to continue your efforts in this subject, and the best appreciation I can give you is to continue my efforts along this line. I thank you.

THE PRESIDENT—The next paper before the Association is one by Dr. S. H. Ward, of Minnesota, entitled, "A plea for more Uniformity of Tuberculin Testing for Interstate Shipment."

DR. WARD—During the past few years, upon the advice of authorities charged with the control of animal contagious diseases, a large number of states through their executive, or legislatures have enacted regulations and statutes restricting the importation of cattle into their commonwealths unless some assurance is given that cattle comprising the importation have successfully passed the tuberculin test. These regulations are made under state police powers. What that power is, it is difficult to define with precision. It has been established by common law to be such regulations promotive of domestic order, morals, health and safety.

A careful perusal of the regulations and laws adopted by various states, show them to be based upon one fundamental principle, the restraining of further introduction of tuberculous animals into the state. That those responsible for the promulgation of these restrictions have their own individual idea as to the length of time which should elapse between the application of the tuberculin test and the shipment of the animal, and upon whom the responsibility for the accuracy of the test shall fall, are shown by the varied periods prescribed as to when the test is to be made and by whom.

There are twenty-four states which have erected the tuberculin test barrier against the admission of diseased cattle. Some of these barriers are low and admit without trouble their overstepping. Others are high and cause considerable criticism.

Some state prefer, others are mandatory in their requirements. One state says tuberculin test record must accompany shipment, defining however, no limitation as to when test shall be made. Again other laws show an express limitation, i. e. immediately prior to shipment.

Again, a wide difference exists as to who is responsible for the tuberculin test. The terms given in many state laws are that certificates must be signed by a state or deputy state veterinarian, or a veterinarian for whose competency and reliability the authorities charged with the control of animal contagious diseases, will vouch.

It does not require any extended argument to convince us that the question to be discussed is the necessity for some uniformity. It is a difficulty inherent to the nature of the subject and is enhanced by the
conflicting character of the laws. As time goes forward, and the existence of tuberculosis is brought more forcibly to the attention of sanitary authorities of those states which at the present time have no restrictions it is of importance that some uniformity should be adopted whereby a settled rule could be put into action, which would serve the purpose for which we are all striving, and which could be adopted by the different states not yet having regulations.

It certainly cannot be claimed that any benefits arise from this present confusion and contradiction. Undoubtedly there exists a diversity of laws in all independent states and nations, and persons engaged in foreign or interstate trade must necessarily be put to some inconvenience. But the diversity and its accompanying inconvenience need not exist between the states of the Union.

It would appear the easiest way out of the difficulty would be the enactment of a Federal law governing the matter. If it should be objected that this legislation will oust the states of their jurisdiction, and render them subservient to the government, I answer that in this very effect consists the great benefit of a national system of uniform laws. It cannot be said that such a measure would interfere with any state rights or functions because the matter is now partially covered by existing Federal laws, which prohibit the interstate shipment of diseased animals. In view of the fact that state legislation affecting interstate commerce cannot be directed against any particular state, but must be national in character, that legislation must apply alike to all states. It would seem the only remedy which can be applied is along federal control. It is true a state may for self-protection establish a quarantine on animals arriving within its jurisdiction, and may demand reasonable inspection of animals prior to their arrival within its borders, provided, such inspection is not burdensome and does not interfere with commerce.

Were all veterinarians honest, applying and conducting the test personally, many of the present objections would be removed. Unhappily, however, we cannot pin our faith on the entire profession; yet we must accept, and common law looks upon everyone as honest until shown otherwise. We do have, however, some check upon the work when certificates are only acceptable from a veterinarian coated with authority.

In view of the fact that the matter is one of general concern, affecting all individuals dealing in cattle and the fact that cattle are classed as commerce, I see no reason why the Federal authorities cannot enact some legislation regulating the interstate shipment of dairy and breeding cattle. The constitution confers upon congress the power to regulate commerce among states, which power I have said is now partly in operation, and our laws regulating the admission of live stock, when
accompanied by a certificate of health, are merely concurrent measures and subservient to Federal authority.

The power to prescribe rules by which commerce in interstate traffic is to be governed is vested in Congress. As cattle are commerce, just as much as an article of merchandise, it would seem that the power of Congress is complete.

The plan I would suggest is, let regulations be drawn up by the Bureau of Animal Industry forbidding the transportation of dairy and breeding cattle into any state which demands a certificate of freedom from tuberculosis on dairy and breeding cattle imported into its commonwealth, unless such animals are accompanied by a certificate of tuberculin test, made in accordance with its regulations therein set forth. Let the regulations require tests to be made by Bureau officials, state authorities or certain graduate veterinarians appointed by state authority. The regulations should define how and when tests shall be made, the tuberculin to be used, number of temperatures to be taken, and form of certificate, which should be in the nature of an affidavit having thereon the rules of the test, and require it to be in duplicate, countersigned by a Federal officer or subscribed and sworn to. The blank certificates should be furnished by the Federal authorities. A penalty should be provided for any violation of these regulations.

The violation of a Federal regulation and the fear of the penalty provided for the non-observance of the regulations would have the effect of deterring the veterinarian from doing anything which would in any manner be contrary to the regulations.

The question as to the constitutionality of such regulations may be raised. I would point out that the power to regulate commerce covers a wide field, and while it perhaps calls for uniform laws, the power, it would appear to me, embraces the consent to adopt rules and regulations suggested by circumstances in force in different localities. There can be no doubt that Federal authority may interpose, whenever it is deemed necessary and formulate general or special laws governing interstate shipments.

Therefore, any rules formulated by Federal authority would be general, applicable to the citizens of all states who desired to ship live stock into a state which was exercising its police power to protect its live stock. Consequently federal laws covering the matter would be concurrent and of course take precedence over state laws. The important and primary question is:

Are the states willing to have the Federal authorities assume part of their responsibility in preventing the importation of diseased animals?

The President—Gentlemen, you have heard the different phases of this great subject as presented by the different papers and addresses. The general subject is now open for discussion.
Dr. Melvin—Mr. President and gentlemen, this is a pretty big question, one that we can deliberate over for several days. No matter how well we do, it will require a number of years and the expenditure of immense sums of money before we commence to make any considerable inroads in the elimination of this disease. Dr. Ward's paper presents some important features as concerning the Bureau of Animal Industry, and they are well taken, in many respects. At the present time it would be rather difficult to apply the suggestions that he has made, first, for the lack of funds. It would take a large corps of men—an army of men—and, while he has suggested that this work be largely delegated to the state officials and county officials and to certain veterinarians, I appreciate fully that the bulk of the work would fall upon the employees of the Bureau of Animal Industry. We have, in a very small way, undertaken to do work along this line. We probably now have fifteen or twenty men engaged in tuberculosis work of this character. But of course the work which they are doing is only touching the surface. They do not begin to cover the work which would be necessary if this was put into general effect. Under our present law, the Secretary of Agriculture would have authority to quarantine any state where tuberculosis exists and prescribe certain regulations for the shipment out of that state, of any live stock. We would not know where to commence, if we undertook to do the work suggested by Dr. Ward. We first thought we would have to apply the rule to all states, because there is no reason to believe that tuberculosis does not exist in every state in the Union, and you can see at once what a monumental undertaking this would be.

The suggestion has been in my mind for several months as to whether instead of trying to tackle this in its present aspect, it would not be better to make some preliminary work looking to the eradication of the disease within a comparatively small section. I had in mind the cooperation with some state which has sufficient laws and which can be enforced, along a line somewhat as follows:

We will take say two counties in some particular state where it is known that tuberculosis exists to a considerable extent. Those counties would be placed under both state and federal quarantine and no animals permitted to be shipped out. These cattle (I am referring to cattle entirely) should not be permitted to be shipped out of the district without being tagged, so as to identify the owner of them. In case any of the animals were shipped to a slaughter house, a record of their slaughter could be obtained and the authorities in the state from which they came notified of the existence of the disease upon the premises of this particular farmer. It then would be up to the state, cooperating with the Bureau, to quarantine this particular farmer's stock, and then undertake to eradicate the disease from that farm. In case it was desired to
ship animals from such a farm they would have to be tested before shipment, to determine that they were free from disease. In this way we would locate the particular farms in this area where tuberculosis exists. In the meantime it would be necessary to inspect and test all cattle that came from outside this quarantined district into the quarantined district, in order to protect this district from re-infection. In other words, we would handle it exactly as we would in the case of pleuropneumonia or any other disease of that character in this particular district. To my mind that is about the only way we will ever commence to handle this disease in a comprehensive and thorough manner. If any of the states represented here are favorably inclined to such a scheme of cooperation, I would be very glad to take the matter up with them and discuss it further.

DR. WARD—I regret that I did not make myself quite clear in the paper that I just read. It was not my idea to put additional work upon the Bureau of Animal Industry. The great trouble we experience is that there are so many transportation companies bringing live stock into the state of Minnesota that it is impossible to say that the law regarding certificates of health accompanying all the shipments is complied with, or to the extent that the certificate is signed by the proper officials. At the last session of our legislature a bill was passed that requires a certificate of freedom from tuberculosis to accompany the sale of all pure bred cattle which are sold within the State. Fully eighty per cent of our breeders of pure bred cattle have eradicated the disease from their herd. To obtain fresh animals, pure bred animals, it is necessary for them to go to other states; they go to the states of Illinois, Iowa, Indiana, etc., to buy cattle. They notify the owner that these cattle must be tested before they will be allowed to enter the State of Minnesota. These animals are tested probably by the veterinarian in the locality where they are bought. The buyer takes them to Minnesota and in six months they are retested and found to react. My idea was to have the Bureau of Animal Industry, if possible, or the Department of Agriculture, make some regulations which would further protect those states which are trying to protect themselves at the present time, and to require transportation companies to see that the certificate issued, was a certificate issued by the Bureau only, or by a veterinarian appointed by the Bureau, and if the shipment was not accompanied by such a certificate, it would be denied admission.

In regard to cooperation, I am satisfied that the State of Minnesota would be glad to cooperate with the Bureau of Animal Industry in attempting to clean up any of our districts in that State. Quite a number of the creameries in Minnesota require their patrons to present to the management a certificate certifying that the cattle have been tested for tuberculosis and are free from that disease. There are quite
a number of creameries which have refused to accept cream from any of their patrons unless such a certificate was presented. The record is that quite a large number of counties in that State have been cleaned up.

DR. JUCKNIES—Our last Legislature passed a law, which went into effect August 16th, this year, requiring all cattle bought in the public market to be tested, before they can be removed. We did some tubercular work prior to the time the law went into effect, and since that time we have destroyed nearly 300 cattle that were found to have tuberculosis, without any opposition. I believe we are making real progress.

At Omaha we tested twelve hundred cattle during the last four months, and we are going over them the second time. On the first test we found about thirty per cent reacted. Of course in South Omaha all the dairy cattle taken from the stock pens were submitted to test before being removed, and, upon reaction, they are slaughtered.

MR. HANER—Mr. President, we have with us today a gentleman from Illinois, who last winter spent much time considering this question of tuberculosis. He drew up a bill which was presented to the General Assembly of our State, and I believe we all would like to hear from him. I refer to Mr. Barnes.

MR. BARNES—Mr. President and gentlemen of the Convention: I appreciate the magnitude of the questions that are before you. I wish to say just a word, and I shall be brief, upon what seems to me is the legal side, or, to put it in another form, the constructive legislative side of this problem of bovine tuberculosis. I realize that there are scientific facts which you gentlemen can present, and there are conditions in connection with the application of the law with which you all are fully acquainted. There is a rivalry between those in the country in enforcing laws, and those in the cities who seek to pass laws. There ought to be a committee between the States on this subject. The United States government in enforcing its supervision in interstate law, has its place, and yet, it strikes me that in the analysis of these questions that are before you, when we realize that the producer is on the one side and is vitally concerned, the consumer is on the other side and is equally concerned. The government with its authority and its added authority which may be brought about, the States with their representatives and legislatures, and the cities which have a right to care for the health of their people, both from a moral and legal standpoint, that, unless in some way these scientific facts are so presented and remedies so formulated and shaped into some system of legislation enabling the enforcement and application of the law, that we will work to the disadvantage of the one seeking to accomplish results along one line, and to another in another line.
Let me state very briefly that the attitude taken by an organization which I represented some time ago. It was my pleasure and privilege during the past number of months to become associated with those men clothed with the authority and responsibility on the part of the State seeking the application of the law. It has equally been my pleasure to have become associated with the gentleman who spoke to you today, and who has had charge of the legislative side and the application of the law in this city, as related to the care of the health of the people residing here. Because of this peculiar relation that I have held and the interests which I represented from time to time, I have had the opportunity to stand here, as it were, and see this procession move along, getting a bird’s eye view of the situation and conditions.

Now, to give you a concrete example of the situation about Chicago and the larger questions and conditions and difficulties. These, you appreciate, are intensified in large centers like the city of Chicago and in the State of Illinois, where we are near the center. Sometime ago the city of Chicago had passed an ordinance, to go into effect on January 1st of this year, requiring that milk should be pasteurized, and that cows should be tested for tuberculosis. The provision of that ordinance was such that it gave the farmer considerable time in which to test his cows, but in the meantime the milk should be pasteurized. I received a telephone message to go to a point out in Cook county where a mass-meeting was being held among the milk shippers. In response to that message, I went to one of our villages where the farmers had gathered together. The room was full, there was no standing room in that large hall. On the platform several had spoken. I made this inquiry of a gentleman who had spoken on the platform, who was presiding at the meeting: “What position do the shippers take here regarding the ordinance that has been passed by the city of Chicago to go into effect now in about a month?” He said: “To hell with the city.” I then asked the question: “What is the attitude of the farmers here toward the State in this matter of bovine tuberculosis,” and he said “To hell with the State.” He said the city had no authority, and the State heretofore administering the laws took away their herds. I do not know, gentlemen, but that the State did make a mistake a few years ago in unwisely administering the laws in such a manner as to arouse the opposition of the dairymen. Be that as it may, there was the situation, and there was a good fight on. They were ready to raise money to fight the city. The cry was: “We will fight the city.” We talked the matter over carefully for some time. I asked them if it was not true that tuberculosis did exist among their cattle. They said, “Yes, that is true.” I asked them if it was not contagious and if it was not on the increase; if the surrounding States were not shipping diseased cattle into Illinois; if it was not true that the northern part of Illinois was the dumping ground for tuberculous cattle from Wisconsin. The chairman of the meeting said, “Yes, that
is all true." After talking the matter over, they finally agreed to it that
the city of Chicago had the right to provide reasonable laws for the pro-
tection of the health of the inhabitants of that city, and that those laws
could be enforced, and that a fight carried on between the farmers and
the city would not only be useless, but it would, in a measure, be disas-
trous to their business.

Then the question was, what is the next move to make. We were
all in the same swim with the rest of them about Chicago, but we hap-
pened to be well organized. Out of that turbulent meeting we each
gathered information. Finally a small committee was named. As a
result the milk shippers held quite a number of meetings and commit-
tees were named. We took the matter before Dr. Evans, the Health
Commissioner of Chicago, who knew all the while that we had come to
say that there was a certain relation between us and that no war should
be carried on. We agreed on this basis, if the farmers would make cer-
tain moves looking toward the State Legislature, the city would go half
way with them in being reasonable and just. The outcome of the whole
matter was, that instead of spending money fighting the city, they
turned toward the State as the friend who might in a large measure
help out, because the city had not the authority outside of the city limits
to bar the shipping of diseased cattle from other States. I do want to
tire you with the details, but will state that a bill finally was drawn, in
the line of legislation of other States. It was not a product of what I
had thought out; but the matter was taken up with the Live Stock
Commission of this State; it was taken up with the Agricultural Depart-
ment; it was taken up with the State Veterinarian; it was taken up with
those who represented the pure food legislation of our State. The result
was, that after full consideration, a bill was drawn up, having back of
it all of these organizations, a large number of the organizations of the
State representing the various dairy interests and stock breeding inter-
ests. That bill had three principal features: the prevention of the ship-
ment of diseased cattle in Illinois; tuberculin test at the request of the
owner; and some compensation for the cattle which were taken and
slaughtered. A few simple provisions backed by the strongest interests
of the State. We were unable to pass that bill. We found that the cattle
shippers from the southern part of Wisconsin had such a grip on those
in the legislature holding certain positions, that they could block legisla-
tion, and men said the bill was an excellent bill and that something
should be done; yet it was not allowed to pass.

Another thing, it is proposed to carry on a campaign of education,
and that is being done in this city, and among the live stock owners,
among the farmers, and all concerned. We regard this as being more a
campaign of education than anything else. The farmers themselves do
not really understand the effect of the bill. With those conditions before
us intensified, in this State we know that war with cities will do us more
harm than good; that while they may pass ordinances and enforce them, as they should do, yet, at the same time the greatest help will be in legislation by the States which will be uniform, with a provision for some compensation to those owners of stock who have their property condemned and slaughtered.

In conclusion, let me say to you here, with these large questions before you, I stand only on the side of what might be termed "the constructive legislation side," as I see the situation. Coming as you do from the northern sections of our country, coming as you do from the sunny south, from the golden west, or from the snow-capped hills of New England, I say these questions should formulate themselves into some kind of a means of application to conditions, known as "Constructive Legislation."

DR. LEECH—I believe this is one of the happiest moments of my life. I think we are in the period of evolution and that the psychological moment is almost here. We have only one thing more, I believe, to desire to make this circle complete. Ever since I can remember anything about this line of work, the M. D.'s have said "You fellows don't know anything about it."

We have had consumption taken up by the medical profession, and now we have an example of the medical profession recognizing us, by Dr. Evans, who has spoken to us this morning, and telling us that we must work together, and the legal side of the question coming to us with the same message, where, heretofore, it has been said that we had no right to try to enforce any laws. As Dr. Ward has said, it is up to us to bring the railroad companies to realize that we have the legal right to control shipments. I think we have shown that we are the only agency that will harmonize the various interests, on the part of the producer and the consumer, that they must cooperate with us, and we must be recognized as having authority in this work.

THE PRESIDENT—Are there any other remarks?

DR. CARY—There are one or two points that have been brought out which I would like to bring into discussion, not as critical points, but suggestive. I think up to the present time, especially the State authorities, municipal authorities, and possibly the government authorities, have expected too much of the inspector. I refer especially to the dairy inspector. If we had more competent inspectors in the country and did not give them too many dairies to inspect, and required them to make personal inspections frequently, we soon would have better conditions. Now, I do not know anything about the situation here, but it seems to me, as Dr. Evans says, with a few inspectors for all your farms, I do not see how they are going to inspect them as often as even once a year. I am not saying that they are not doing the best they can under the circumstances. To do the work properly and as it should be done, we
should employ more inspectors and give them a definite amount of work
to do, or a definite kind of work to do, and then see that it is done.

Now, to illustrate: A few years ago I went over to Atlanta to speak
at their association there. They had about one hundred and fifty dairy
herds, and they told me they had two men to inspect them. Utterly
impossible. You see what I mean. I can give you another illustration:
Not infrequently I find a veterinarian who has to inspect dairy herds,
inspect slaughter houses and carry on his practice. He may be qualified
for any one of the three, but he is not qualified for all three. Frequently
he neglects his practice to take care of the inspection, but more frequently
he neglects the inspection to take care of his practice. Now, why?
Because he is not paid enough by the city or by the authorities? Not
always, but sometimes.

Now, then, there is another thing, in regard to testing. I receive
a great many different records from different States and from different
veterinarians. I would not have believed previous to receiving these
reports that so many veterinarians would do such serious work in such a
careless way. I believe the testing should be regulated in some way. I
believe it is possible to have certain things standardized. I do not know
that we all would agree on every point, but we can all agree on some of
the essentials, and I believe now is the time for us to agree on some of
the essentials and get something more definite.

Dr. Wright—I would like to suggest that we invite a gentleman
who is present here today to talk to us a little while—a gentleman who
is the greatest live stock man in the State of Illinois, one who represents
greater live stock interests than any dozen men in this great State of
ours. His name is Mr. Eugene Funk, of Bloomington.

The President—We should be pleased to hear from Mr. Funk.

Mr. Eugene Funk—Mr. President and Gentlemen: I want to say
truthfully that it is a very great surprise to me to be here today, and
especially to be called upon to speak. I came here to learn something,
not to speak to you. We farmers feel and acknowledge to you that we
are ready to listen and to learn. This subject of tuberculosis is of very
great interest to the farmers. There is no question in my mind but it is
the greatest problem before the live stock industry today. Nine months
ago I would not have said that. Had you come to me and asked me to
speak, I should have said that it was all foolishness, that I did not believe
there was anything in it. I have had experience with tuberculosis (we
call it the "white liver" or some such name) for twenty-five or thirty
years.

I had the pleasure of being invited over to the University of Illinois
by Dean Davenport to meet Dr. Bangs and to listen to his address.
Unfortunately for me, I was called away before the session was over. In
a few days I received a notice that I had been appointed on a committee
to investigate into this matter of tuberculosis. Ever since then I have been greatly interested in it. Last winter, in company with Mr. Barnes, who has spoken to you, I had the pleasure of appearing before the General Assembly of our State when we were asking for legislation along this line.

The live stock industry of this country, and particularly the middle west, is now going through an evolution. There are people now who are thinking seriously whether it will pay them to continue in the business of raising stock. Take a young man who is just starting in to raise a herd of pure bred stock, and he hears this subject discussed, and he is told that a large per cent of the herds are infected and that the stock so infected must be destroyed, he will consider very seriously whether it is going to pay him to go ahead and try to raise a herd under such conditions. Should the young men about to undertake this business become discouraged, what will be the result? I will tell you. You will be paying more than 25 cents or 28 cents for beef steak in Chicago. The packers will be reducing their number of employés and they will be selling their pens for building lots.

The thing before us now, as I see it, is to get together, all sides, the lawyer, the veterinarian, the doctor and the farmer and the live stock men. I know some of the farmers are very radical. Some of them will say that they will take a shot at you if you go to their farms and try to test their cattle. I have heard men say that, but those fellows had tuberculosis in their herds. But let it hit who it will, it is a serious thing. How are we going to proceed? Not in a radical way. We are not going to wipe out the disease in a minute. If we wipe it out in twenty or twenty-five years, we will do well. But get together, gentlemen, and talk it over face to face.

Dr. Luckey—To me it is very gratifying to have men like Mr. Funk attend this meeting and to get in touch, as he says, with the representatives of the sanitary officers of the different States and to talk the matter over face to face and heart to heart.

The misapprehension, of which he has gotten rid, has been very prevalent with the breeders of live stock, many of whom have actually shunned the sanitary officers. They have had wrong ideas of the plans that are being laid by the sanitary officers and have oftentimes refused to become informed either upon the scientific phase of the disease, or upon the methods proposed for controlling it.

I have taken advantage of every opportunity to talk to the breeders of our State, on the train and at public meetings, and I must say that I have had them get up and leave public meetings when this proposition was being discussed, and often the members of the Board of Agriculture would absent themselves to keep from facing a common sense discussion of the proposition.
I must differ from Mr. Funk on one proposition. The eradication of tuberculosis will not decrease the milk supply and will not decrease the supply of cattle. Not one man in sanitary circles who has advocated the eradication of tuberculosis has had any idea that it would decrease the supply of milk or meat, nor increase the price of those products. On the other hand, the eradication of tuberculosis will increase both the quality and the quantity.

It has been repeated over and over, especially in the State of Missouri, that we advocated going and testing herds and killing every animal that we tested, and even the statement has gone out that we advocated the slaughter of healthy animals. In the eight years that I have been attending these meetings, I never have heard it advocated that it was proposed to kill the animals which reacted. I wish Mr. Funk would carry that idea back to the farmers and get as many of the breeders as possible in touch with this association, so that when we meet we can talk the matter over face to face and solve this greatest of all problems.

I made the statement that the eradication of tuberculosis will not decrease the number of beef animals. A few years ago I was called upon to test an elegant herd of short-horn, in the State of Missouri. In the herd I found two cows that reacted from the test. One of those cows was not a very choice animal. As soon as the calf was taken off, the cow was not used again, but was disposed of. The other cow was an excellent animal. We did not kill that cow. I never advocated anything of that kind. She was simply put off by herself. There was nothing said about it to attract the attention of buyers who might visit the premises. Since that time, that cow has brought four calves, for which the owner has offered a thousand dollars apiece. The balance of the herd is sound. If these two cows, or this one cow, had been left in the herd, the chances are that by this time a large per cent of the herd would have been diseased, and that a number would have died. Instead of that, this particular cow has produced valuable calves and the balance of the herd is sound.

Another owner of a short-horn herd kept adding to his herd tuberculous cattle. One year I made a test of his herd. We had to cut it squarely in two. I went back year after year and retested the sound herd, which we put on the east side of his farm, and the diseased animals across the railroad track on the west side. He is getting rid of his tuberculous animals and within a year or two he will have a sound herd and will have more cattle, as the result of this testing, than he would have had, had the herd been neglected.

I claim that with proper handling of this question, handling it absolutely fairly, letting the public stand a great deal of the expense, and the owners a little, and working it out along that line, it will be sur-
prising how quickly we can exteminate tuberculosis from our fine herds. Unless the animal is very valuable, it does not pay the owner to keep her for breeding purposes.

**MR. FUNK**—The gentleman misunderstood me when I spoke about decreasing the number of cattle, from testing. My idea was to present to you the facts in regard to the young men and the boys who are growing up, who are to be the future live stock men of the country. There is a tendency at the present time among a certain class, to advocate the doing away with herds of stock on the farm. The young men are going to the agricultural colleges, and those who do not go, get lessons from those that do. They say it is not necessary for a farmer to have live stock on his farm, that he can maintain the fertility of his land without live stock, and that he can make more money off of his land if he does not have any live stock. With such teaching, and with his attention called to the fact that this disease prevails in most of the herds, he is going to consider seriously whether it will pay him to try to build up a herd at all. I do not want to be understood as saying that testing cattle is going to reduce the number of live stock.

**DR. NELSON**—I have been very much pleased with the discussion here this morning on this subject.

We have taken a great interest in this matter in our State. Last winter we had a special demonstration train. We graded our typical beef animals and the dairy strains and we graded the best types of dairy animals we could find in the State of Washington which were tuberculous. It was astonishing the way we received orders for testing following the route of that demonstration train.

I have pursued a different policy from some of you, although the same line. I force the tuberculin testing on the dairymen and on the dairy herd owners. I have talked with them sometimes for hours, trying to show them all the phases and at last I say to him, “The law says I may test your herd.” He then gives in. If we don’t find anything, well and good. I say to the owner of a herd, if his herd is healthy, “Keep it so.” And if there is anything we can do to help him, we want him to call upon us at any time. I advise him to test all the cattle he buys. I go to a man with this kind of an argument—if you are going to buy a few cows, you had better have them tested. You would not go out and buy a spavined horse if you knew it—so don’t you go and buy a cow that is diseased and is likely to infect your entire herd.

When I get back home I shall call a meeting of the dairymen of Spokane county and shall try to get them to take advantage of Dr. Melvin’s offer. I believe it is possible for us to do that, and when we
get started, it will not be long before other sections of the State will be cleaned up.

You understand the work we have done has been done at great expense, because our herds are scattered. But nevertheless they stand for it. We have three men in the field at the present time who do nothing but test cattle for tuberculosis. We are making considerable headway.

Dr. Reynolds—I am delighted with the splendid spirit of optimism shown here, and especially on the part of Dr. Luckey. He apparently proposes to eliminate tuberculosis from Missouri without killing his cattle. One of the things upon which we need information is what to do with the average cow. We need also to know where the tuberculous herds are and we should have some means of knowing what herds have been tested and found to be healthy. I would like to suggest that we study these problems during the coming year, and some other that are just as essential. I wish Dr. Luckey might tell us now, or perhaps in a paper next year, just what to do with the ordinary grade of cow.

Dr. Luckey—I can tell you now. I acknowledge the disposition of the tuberculous animals is a problem, but compared to the results in view, we cannot afford to quibble very long on the price of a cow that is not giving enough milk to pay for her feed. We make it a rule to let the owner keep any tuberculous animals in isolation as long as he wants to, and, if the animals is not worth enough to keep in isolation, he can have it appraised. Our new law went into effect August 16th this year. It provides for compensating the owner for the animals destroyed, that is, a part of the appraised value. I have in mind now one man who had a herd of cattle tested. Only one cow reacted. It was appraised for $45.00, and he was paid $37.00 after it was destroyed. In other words, he lost $8.00 on one animal, and at the same time protected the balance of his herd from further losses from tuberculosis.

Dr. Ward—I would like to say just a few more words on this subject of the eradication of tuberculosis. It seems to me the best method of eradicating the disease would be for the live stock interests to get together, if possible, and obtain some legislation whereby there was a special tax levied for the purpose of reimbursing the owners of cattle destroyed because of tuberculosis. I do not think such a tax would be a very heavy burden on any one, and it would be an inducement to the owners of cattle to have their herds tested and the diseased animals destroyed. In this way their herds would be protected and the owners would not suffer such severe losses.

On motion, convention adjourned to reconvene at 2:00 o'clock p. m.
CONVENTION RE-CONVENED AT 2:00 P. M.

THE PRESIDENT—It may be of interest to you to know that sixty-two persons have registered and that forty have paid their dues.

The discussion of tuberculosis was left unfinished this forenoon. What is the pleasure of the association?

DR. CARY—I move the discussion on the subject of tuberculosis be closed.

Motion seconded; carried.

DR. PETERS—Owing to the fact that many have to leave at 4:30, I move that we now proceed to the election of officers.

THE PRESIDENT—Before the committees report?

DR. PETERS—Some of the committees are not ready to report.

DR. REYNOLDS—Our committee is ready to report.

DR. PETERS—I will withdraw my motion.

THE PRESIDENT—We shall be pleased to have the reports read at this time.

DR. REYNOLDS—I am instructed to say for our committee appointed for the purpose of drafting a statement on basic laws, that we had a meeting before luncheon and another meeting since luncheon. It has become apparent that we could not finish our work at this meeting so as to make a proper report. There is a great deal of work to be done in connection with such a report, and I offer the suggestion that the committee be continued and that it present its report at the next meeting of the association.

DR. NELSON—I move that the preliminary report of the committee be accepted and that the committee be continued for another year.

Motion seconded; carried.

DR. CARY—I would like to report the work of the Committee on Line and Open Season:

1. We recommend that the name of the committee be changed from “Line and Open Season,” to “Committee on Tick Eradication.”

2. We recommend that there be no Blue Area after April 1, 1910.

3. We also recommend that there be no open season after April 1, 1910.

4. We recommend that the following areas be released from quarantine:
   
   (a) In Tennessee, Putnam, DeKalb and Warren counties on November 1, 1909. Bradley and Jones counties on April 1, 1910.

   (b) In Mississippi, DeSoto, Tate and Tunica counties on April 1, 1910.

   (c) In Texas, Scurry county on April 1, 1910.

   (d) In South Carolina, Oconee, Pickens and Anderson counties on April 1, 1910.
(e) In Oklahoma—

1. Greer county, all west of the K. C. M. O. Ry.
2. Caddo county, north of main line of C., R. I. & P. Ry.
3. Canadian county, south of Canadian river.
4. Noble county, that part east of the A. T. & S. F. Ry. and south of the line between townships 21 and 22 N.
5. Payne county, all west of Range line between ranges 1 and 2 E. 3 M. and townships 19 and 20, ranges 2, 3 and 4 east.

(f) In Arkansas—

1. All of Poinsett, Mississippi, Benton and Washington counties.
2. Fulton, east of the Spring river.

(g) In Alabama, Georgia, Louisiana, California, Missouri, North Carolina and Virginia, we advertise no changes in the quarantine area.

C. A. Cary, Chairman,
Rice P. Steddox, James Lewis,
G. T. Bryan,

Committee.

DR. Peters—I move that the report of the committee be accepted.
Motion seconded; carried.

DR. Nelson—is it for this association to say whether the areas mentioned shall be put out of quarantine?

DR. Cary—We recommend it, that is all.

The President—Are there any other committees to report?

DR. Peters—in view of the fact that so many are going to leave on early trains, I move that we now proceed with the election of officers.

Motion seconded; carried.

The President—Under the new Constitution, there will be a President, five Vice Presidents, Secretary and Treasurer. I shall appoint Dr. Peters and Dr. Lewis as tellers, after the nominations shall have been made.

DR. Shoenleber—inasmuch as this association is now passing one of the most successful meetings in its history, and, inasmuch as the State of Illinois needs a little help and this Association needs a little assistance, I nominate Dr. J. M. Wright, of Chicago, for President of this Association for the ensuing year.

MR. Leach—in view of the high esteem which I have, and also believing that this Association has the same friendly feeling toward him, I nominate Dr. Charles Cotton, who has served this Association so well as its Secretary and Treasurer for the last two years and whose term ends with this meeting. I believe if he is promoted to the office of President, his election to that office will further the interests of the Associa-
tion, and I believe we owe it to Dr. Cotton to elect him to this office, for the valuable services he has rendered the Association.

DR. COTTON—I appreciate the complimentary remarks of the gentleman who has just spoken, but I feel that I am not in a position to accept the office. I should like to withdraw my name at this time for the office of President.

DR. WRIGHT—I am for Dr. Cotton. I believe he will make a better President than I, and I therefore withdraw my name in favor of Dr. Cotton. I move that the President cast the ballot of the Association for Dr. Cotton for President.

THE PRESIDENT—I cast the ballot of this Association for Dr. Cotton for President. (To Dr. Cotton—I have the honor to inform you that you have been unanimously elected President of this Association for the ensuing year.) [Applause].

THE PRESIDENT—We will now proceed to the election of the five Vice Presidents.

The following Vice Presidents were nominated and elected:

Dr. John R. Mohler, of the Bureau of Animal Industry.


Dr. Paul Juckniess, Deputy State Veterinarian, Lincoln, Nebraska.

Dr. C. A. Cary, State Veterinarian and Secretary Alabama Live Stock Sanitary Board, Auburn, Alabama.


THE PRESIDENT—It is now in order to nominate candidates for the office of Secretary and Treasurer. It is my understanding that this is a dual office, Secretary-Treasurer.

On motion duly made, seconded and carried, Mr. J. J. Ferguson, of Swift & Company, Chicago, was unanimously elected Secretary-Treasurer of the Association.

THE PRESIDENT—The subject for this afternoon is hog cholera and its prevention. You will recall that Dr. Melvin read a paper on a like topic and that the discussion of his paper was postponed until this afternoon. The paper to be read this afternoon is by Dr. J. W. Connaway, Veterinarian at the Agricultural Experiment Station, Columbia, Missouri:

Dr. Connaway's paper not in hands of publication committee, April 14th, therefore omitted.

DR. REYNOLDS—I think it is quite important that we should define what we mean by hog cholera. The definition as given not long since in a publication from the Bureau of Animal Industry has been very satisfactory to me. I quite agree with the statement given, viz.: It must be infectious by natural exposure; the antemortem and post-mortem symptoms must correspond with what we have usually known.
in America as hog cholera; the blood must be virulent, reproducing these symptoms on inoculation, and an attack followed by recovery must usually give immunity.

It is important to remember that we can have some of these specifications in a serious outbreak of disease among hogs without having all of them and without having hog cholera. I attach the greatest importance to the work of Drs. Dorset, Bolton and MacBryde in connection with a filterable organism as the specific cause of hog cholera and very great importance to the practical work of Drs. Dorset and Niles in perfecting and applying the scientific researches of European investigators to the development of a practical method of vaccination. In giving credit for this kind of work we must never overlook the man who has done the digging—the man who has spent years in working out the tedious but necessary details. I refer especially to Dr. Niles.

All these men deserve great credit and the gratitude of American stock owners and veterinarians.

The importance of hog cholera as a source of losses for live stock interests and general agricultural prosperity can not be accurately estimated and scarcely comprehended. Careful investigation has shown that Minnesota, a young state with very large portions of her agricultural resources totally undeveloped, has lost over $1,000,000.00, possibly $1,250,000.00 in one year from hog cholera. The losses in our corn and hog growing states: Michigan, Indiana, Ohio, Wisconsin, Illinois, Iowa, Minnesota, Missouri, Kansas, Nebraska, and the Dakotas would run into figures to make us dizzy if they could be known.

For some years I have believed that public sanitary authorities should pay more serious attention to hog cholera and not allow the disease to run wild without an attempt to control or check it simply because the problem was big and difficult.

It may not be out of place in this connection to mention our Minnesota law and regulations relating to hog cholera. Hogs may not be brought into Minnesota for feeding or breeding purposes or be shipped from point to point within the state except on certificate of health, they must be crated and shipped in other than stock cars; carcasses of hogs that die of any disease must be burned or deeply buried; it is forbidden to convey carcasses of hogs that have died of disease along a public highway, or over any land except that of the owner of the hogs; it is forbidden to permit sick hogs to run at large; only owners, authorized attendants, and medical advisors and sanitary officers may enter quarantined enclosures; hogs must not be removed from quarantine except as dressed carcasses killed under inspection or upon written permission; no hogs except those quarantined and their offspring may be placed in the quarantined premises; period of quarantine continues for six months after the last sick hog has died or recovered, except up-
on special written order; all railroads shipping pens are declared probable or possible sources of infection; hogs must not be taken through or removed from railroad shipping pens except for immediate shipment by rail for slaughter; any serious prevalence of disease among hogs must be promptly reported under severe penalty of violation; legal provision is made permitting owners to quarantine their own healthy hogs and premises in self defense against careless neighbors who may have cholera among their hogs at home.

Concerning this matter of hog cholera vaccine I feel that there is good outlook for great usefulness; that the Dorset-Niles serum has a legitimate and very important use in the recently diseased herd, among hogs on farms neighboring those whereupon hog cholera prevails, and as a general sanitary precaution limiting spread by vaccinating herds for suitable distances around the original infection. This coupled with suitable police control measures may be used I believe, to check a great many outbreaks of cholera and save very great losses to owners of hogs. It is certainly a great step toward a control work with this disease. I feel some disappointment in saying that best sanitary control work yet done with hog cholera has not been creditable. I hope to see federal appropriation made for a demonstration eradication experiment on a comparatively large scale and then if the information gained justifies in so doing, our federal authorities and our state authorities ought to get together on a comprehensive plan looking to the gradual reduction and ultimate eradication of hog cholera—a big task, of course, and a difficult task, but the losses are unmeasurable.

I believe, too, that private veterinarians should take a more active part and be more helpful in connection with outbreaks of hog cholera; that we should all be more active in teaching our farmer friends concerning the cause and dissemination of hog cholera, and make our patrons to know that hog cholera is not caused by some unwise system of feeding, and that it can be disseminated in any way that fine particles of dust or other matter can be disseminated. They ought to be better informed concerning the symptoms of hog cholera so that the disease may be more promptly recognized and control measures instituted. Private veterinarians ought to take an active and unselfish interest in helping their farmer friends to thoroughly clean up and get rid of the disease after an infection.

Our vaccine work in Minnesota has been very satisfactory on the whole. We have stubbed our toes a few times and we have even stumbled and had a few good hard falls but I am free to say that after an experience extending over nearly two years I would now lose faith in the ultimate success of this work if we were to stumble a dozen times in succession.
Our work began in November, 1907 with some work in which we undertook to satisfy ourselves concerning the immunity given by the Dorset-Niles serum. We wished to feel quite certain concerning its reliability and we felt the need of first hand information concerning the probability of scattering infection from the bodies of hogs treated by the simultaneous method which involved the use of virulent blood. Later on we took up the manufacture of this serum according to the Dorset-Niles method in a small way and our results in general have been very satisfactory with the serum. Up to a certain date, rather early in our work, we had vaccinated 251 hogs in herds where the disease was then prevailing with a loss of forty-four. Out of seventy-six hogs left unvaccinated in these same herds, sixty-eight died giving us great encouragement that the serum might be very useful in herds where the disease had already appeared. Among hogs where the disease had not yet appeared and which were presumably free from infection, we vaccinated 201, all of which were given exposure either in infected pens or by virulent blood inoculation with a loss of two animals, neither showing satisfactory symptoms of cholera. Since that time our work has continued in the main very satisfactory when we used full standard doses of tested serum on hogs in healthy herds. As I mentioned before we have stumbled several times and we had some surprises and some great disappointments but these can all be explained without any serious reflections upon the method or general plan. In one case we had serious losses in a herd of valuable hogs when using for the serum a syringe which only discharged one-half or two-thirds of the indicated dose with a full dose of virulent blood given at the same time. In another case we had serious losses in a garbage fed herd kept under extremely filthy surroundings where the losses were evidently due in part to septic infection, perhaps through a rather large needle wound and some of the losses were very plainly due to ordinary garbage poisoning or in this case the first lot of hogs vaccinated, were fed cooked garbage. The other hogs were kept in very filthy quarters and fed uncooked garbage and all of the losses occurred among these other hogs. With this same serum used on 78 hogs in another outbreak but a few days before and with extremely gratifying results and then used on this first lot of hogs belonging to the garbage dealer with satisfactory results, it is quite evident that the trouble was not originally in the serum, but perhaps in the vaccine and surroundings.

We have had potent serum lose potency when kept for a long time and under unsuitable conditions and then give unsatisfactory results in field trial. We have had some very practical experiences of this kind and I trust we have fully profited by them.

In another case we had disappointment in vaccination of healthy hogs where the only rationally apparent solution was septic contamin-
ation of the virulent blood used; but as I have already said our experience in the main has been satisfactory and encouraging, so much so that our last state legislature gave us $10,000.00 for special building and equipment in the Veterinary division of our State Experiment Station. We will soon have ready for use a very satisfactory building with two laboratories and two operating rooms, one of each for virulent blood work and one of each for immunizing serum work with suitable pens for experimental and infectious disease work. We will soon have our vaccine housed in a permanent brick building of good construction and put up expressly for this work.

In the further summing up of our experience I may say that it is very apparent that this immunizing method has some faults which ought to be overcome if possible. The serum is bulky and the dose large. It is rather expensive in production. We have no means of actually measuring its potency and must depend upon actual clinical trials. Permanent vaccination requires either the use of virulent blood in connection with immunizing serum or else pen exposure with the sick hogs. There may be always a possibility of virulent septic contamination from the virulent blood used and there may be difficulty in having suitable virulent blood on hand for use whenever the simultaneous vaccination is called for.

On the other hand we have reason to hope that some of these faults will be overcome. The cost may be reduced by increase of potency and corresponding reduction of dosage.

We should be able to utilize to good profit carcasses of virulent blood hogs and carcasses of hyperimmunes that may be unsuitable for human food purposes by cooking and feeding mixed with ground grain to living hogs kept on hand for the progress of the work. We should have some competent statement, perhaps from a committee of producers establishing a standard test of potency for the immunizing serum and a standard of virulence for blood suitable for hyperimmunizing.

We must avoid virulent septic contamination by clean and accurate technique, and finally we must take for granted that there will be some losses and disappointments anyway. This is probably inevitable with hog cholera just as it is with tuberculin or mallein or any other line of medical work.

There are limitations extending in many directions to our knowledge of hog cholera and hog cholera vaccination and this is to be taken for granted for this whole work is new and as Shakespeare phrases it, "What wound did ever heal but by degrees."

Dr. Fischer—I did not expect to make anything like an accurate report of the work of the Ohio State Board of Live Stock Commissioners with hog cholera protective serum, to this Association. Last night Dr. Dorset requested me to say something about our work along this line and
I have prepared a few notes from memory, which I thought might be of some interest to those engaged in this work.

It is impossible for me to give accurate figures, but they will be approximately correct.

In the first place I want it understood that we consider our work as mainly a repetition of that first outlined by Drs. Dorset and Niles, except that we are aiming mainly to develop and introduce the practical features of the production, and field use, of hog cholera protective serum. We have tried to repeat the different methods of producing the serum that have been recommended by the Bureau of Animal Industry, and to select and modify as time and experience suggested, those best suited for our conditions.

We have been handicapped in starting our work by delay in getting even the moderate funds that were placed at our disposal. We began our work in June, 1908, with a fund of $1,000.00, to put up buildings, pay labor and buy pigs and feed. We located an infected herd of swine at once and used the recovered animals as immunes. A second herd, more violently affected, furnished virulent blood for hyperimmunizing the immunes of the first herd.

In August, 1909, we had our first serum. We felt encouraged with the results and succeeded in getting $3,000.00 from our Legislature last winter for the equipment and maintenance of a temporary plant for further work along the same line. The $3,000.00 was used as follows:

- Buildings and equipment: $1,500.00
- Animals and feed: $1,500.00
- Salaries—pathologist: $2,000.00
- Labor, etc.: $1,320.00

The salaries are paid out of a separate fund. The $3,000.00 for equipment were made available in March, 1909, and most of this fund has been expended.

All serum produced is furnished to owners of herds at the rate of 21 1/4 cents per c. c., or 50 cents a dose. There is an unlimited demand for this and our plant, as soon as we have it in perfect running order, will produce 400 doses per day, four days in the week, or $400.00 worth of serum per week. This is ample to pay all expenses of manufacture.

We believe that we can reduce the cost of the serum to the State even much below 50 cents; perhaps 40 cents or less per c. c.

All serum is applied directly by our own field veterinarians at the expense of the State, just like all other service for live stock sanitary work.

At this time we have treated about 3,000 head of swine of all ages and weights. About 1,700 of these were infected or exposed and given
serum alone; about 1,300 were healthy animals and received the serum simultaneous treatment. We treated in all perhaps fifty herds. Of the herds given the serum simultaneous treatment, no losses occurred except in one herd of 120 animals, 20 animals got sick and 12 died. This was a mixed herd bought up from five surrounding farms. The deaths were practically limited to the pigs from one farm and are ascribed to the assumption that they were either more than ordinarily susceptible, or infected at the time of inoculation and to the fact that a P. D. hyperdermic syringe was used that was graduated for 20 c. c. and discharged only 13 c. c. Of the infected herds treated, all except the very sick animals which we bought from the owner to obtain virulent blood, stopped dying at once, except in two herds in which the serum had apparently no effect whatever. Later investigation proved these to be affected with chronic cholera.

In many of the healthy herds inoculated, check animals were left that died of cholera at a subsequent time when the herd became exposed. On the whole, our results have been surprisingly good.

In hyperimmunizing we have tried the intra peritoneal, the intra muscular and the intravenous methods, as well as the slow method. We had the same results, as far as serum potency is concerned, from each method. From economical reasons and because the treatment is neater, cleaner and more accurate, we now use the intravenous method only.

We think virulent blood is worth at least $5.00 per 1,000 c. c., and since the saving in this method over that of the intra muscular or subcutaneous or slow methods amount to just this much in a 200-pound pig, the item is a considerable one when eight or ten pigs are hyperimmunized in one day. It will more than pay for the difference in the salaries of a good man and an ordinary man. We have no trouble whatever in making the intravenous injections since we have been using small needles and taking our time for the operations.

We take pains to keep accurate records of all of our work; the temperature of all hyperimmunized pigs are taken daily for one week after hyperimmunizing. When possible we take temperature of all pigs in infected herds.

Each lot of serum is tested, as a mixture, on four or eight pigs. Four pigs are placed in an isolated pen; each receives 2 c. c. of virulent blood of certain definite animal. No. 1 receives 20 c. c. of serum for 50 pounds weight; No. 2 receives 10 c. c., No. 3 receives 5 c. c., and No. 4 no protection. We expect Nos. 1 and 2 to be strongly protected; No. 3 to be doubtful and No. 4 to contract cholera and die. In that case the serum is used in the field and with the same virus, if possible, that was used in making the test.

We have had our trouble in preserving our virus, but are now trying filtered serum and shall take up the use of a weak solution of carbolic
acid. We have tried to use ——— to prevent clotting of blood from the hyperimmunes. While this seemed to work effectively at first, the serum, after being kept a few weeks, gets stringy and unpleasant to use in a syringe, often clogging the needle. We made our first serum in August, 1908, and still have some of this on hand in an apparent perfect state of preservation. All serum as soon as is made is cooled in a refrigerator for a day or two, and then kept in a specially built cellar at a temperature of about 64 or 65 degrees.

Just a few more words in regard to the field work. Up to this time we have inoculated upon request of owners only. All owners make a formal application and agree to pay 25 cents per 20 c. c. serum used, or about 40 cents per 100 pounds weight of each pig, with the understanding that the Board of Live Stock Commissioners assumes no responsibility beyond the careful application of the serum, the potency of which has been tested at our laboratory. Each owner agrees after a certain date to make written report of results on forms furnished for that purpose.

Our Board of Live Stock Commissioners is well pleased with the results of the work at our laboratory, and the farmers over the State, as far as they know of our work, are very enthusiastic and we feel confident of getting support from the Legislature next winter that will enable us to do more and better work than ever before.

We made our first serum in August, 1908, and still have some of this on hand in an apparent perfect state of preservation. All serum, as soon as made, is cooled in a refrigerator for a day or two, and then kept in a specially built cellar at a temperature of about 64 or 65 degrees.

RESOLUTION No. 1.

WHEREAS, The cattle tick is directly and indirectly responsible for an annual loss of forty to sixty millions of dollars to the cattle industry of the tick infected states, and

WHEREAS, Recent federal, state and county work has completely eradicated the cattle ticks in a large number of counties; therefore, be it

Resolved, That the United States Live Stock Sanitary Association most heartily endorses the action of Congress, the various state legislatures and county boards of revenue, for appropriating funds to be used in eradicating the cattle tick; and be it further

Resolved, That this Association respectfully urge Congress, the legislatures and county boards to greatly increase the appropriations for tick eradication.

RESOLUTION No. 2.

WHEREAS. The swine industry of the United States has been greatly stimulated by the recent developments in the perfection of hog cholera vaccine as a preventive against the disease, whereby vast money interests have been served to the farmers of the United States; be it
Resolved, That the Association extend to Drs. Dorset, Niles and McBride of the Bureau of Animal Industry, United States Department of Agriculture, our appreciation of the valuable work and the gratifying results obtained, whereby the United States has been placed in the fore-ground and the method adopted by other countries.

RESOLUTION NO. 3.

WHEREAS, Buzzards and carrion crows spread the germs of anthrax, blackleg, hog cholera, etc.; be it

Resolved, That we suggest that all states which have laws making it a fine to kill buzzards and carrion crows, should repeal such, and if possible, enact laws offering suitable rewards for the destruction of such distributors of disease germs.

RESOLUTION NO. 4.

WHEREAS, The live stock industry of the United States is constantly menaced by the danger of foreign diseases of animals being introduced through the importation and sale of animal serums, viruses and other products; and

WHEREAS, The owners of live stock have no adequate protection against injury and loss due to the manufacture and sale of harmful or worthless serums, viruses and other biologic products manufactured in the United States; be it

Resolved, That Congress should empower the Secretary of Agriculture to exercise a control over the biologic products and viruses used in agriculture so that injury to the live stock interests through fraud or incom- petence may be prevented.

REPORT OF THE LOUISIANA STATE LIVE STOCK SANITARY BOARD.

Since the organization of the Louisiana State Live Stock Sanitary Board, December 17, 1908, at which time the rules and regulations, under which we are now working, were formulated, the absence of an appropriation has very considerably limited the work which might, otherwise, have been accomplished. The following outbreaks and conditions have, however, been investigated, from the date of organization up to August 31, 1909:

Glanders—Four localities were visited; three animals destroyed; mallein used twice.

Anthrax—The loss to the State from anthrax this year has been exceptionally heavy; probably three thousand, or more, head of stock having died, representing many thousands of dollars. When the Board receives a sufficient appropriation from the State Legislature to enable it to enforce the sanitary provisions of the law, such as the careful and effectual disposal of anthrax carcasses, we hope to be able to control, to a very large extent, the annual outbreaks of this fatal malady in the infected localities, in a few years.

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The following is the copy of a report on anthrax sent by Dr. A. D. Melvin, Chief of the Federal Bureau of Animal Industry, to Dr. W. H. Dalrymple, a member of the Louisiana State Live Stock Sanitary Board:

WASHINGTON, D. C., July 8, 1909.

Dr. W. H. Dalrymple, Baton Rouge, La.

Sir—In response to a telegram from Congressman Pryor on the 17th of June, this Bureau directed its veterinary inspector at New Orleans, Dr. C. E. Mauldin, to proceed to the vicinity of Lake Charles, La., for the purpose of investigating an outbreak of anthrax.

Under date of June 30th, Dr. Mauldin reports to this office that he arrived at Lake Charles on the morning of the 18th, and found that a large number of deaths had occurred from this disease. He reports that the country in that vicinity is level, flat and swampy, the section east of Lake Charles being prairie, and devoted largely to rice cultivation and cattle raising, while the lumber business is the chief pursuit west of the town. The cattle are permitted to run at large. The source of the outbreak is attributed to soil and pasture infection, as it seems that anthrax has appeared in this locality every summer for a number of years. It was thought by many, however, that the infection this year was brought up from Lake Arthur, where the disease was reported earlier in the season.

Dr. A. J. Perkins, a physician of Lake Charles, La., owns but few animals. His horses and cattle had been inoculated at the time of Dr. Mauldin’s visit. The tenants on Dr. Perkins’ rice plantation had lost heavily from anthrax. Several cattle were observed on the plantation unburned or ineffectually buried, notwithstanding Dr. Perkins had offered to give crude petroleum to all his tenants that would burn the dead animals.

Thomas Hay, rice farmer, Lake Charles, lost four mules out of six head owned by him.

J. Breaux, rice farmer, Lake Charles, lost one hog, one horse, and one mule out of seven owned by him. He also owned 175 cattle, five of which were reported dead at the time of Dr. Mauldin’s visit, but no action had been taken toward removing the dead animals. The horses and mules had received an injection of the double vaccine; the cattle were not vaccinated.

D. Breaux, rice farmer, Lake Charles, owned nine horses and mules, one of which had died and three others showed extensive swellings along the abdomen. The horses and mules had received the first inoculation of a double-dose vaccine after the death of the first animal. Mr. Breaux also owned 45 head of cattle, some of which had died, but none had been vaccinated.

D. Lebleu, rice farmer, Lake Charles, owned twelve head of horses and mules and 200 head of cattle. One mule had died and one other showed large swelling along the side. The horses and mules were being vaccinated during Dr. Mauldin’s visit. Several of his cattle had been reported dead.

Edgar Allen, rice farmer, Lake Charles, lost two animals out of thirteen horses and mules owned by him; had given only one injection of the double vaccine at the time of Dr. Mauldin’s visit.

J. C. Lebleu, rice farmer, Lake Charles, lost two work animals, and had one other with a large swelling about the breast and throat. Mr. Lebleu owns a considerable number of cattle, but none of them had been reported dead.
Baptist Orphanage, Lake Charles, owned a dairy herd of 40 cows, three of which had died, several others were sick. The cattle were vaccinated the day before Dr. Mauldin's visit.

J. G. Pilley, logging business, West Lake, owned 30 head of horses and work oxen. He had lost only one animal and was vaccinating at the time of Dr. Mauldin's visit.

A. Gillery, lumber business, West Lake, owned 15 head of mules, of which two had died; the remaining animals were vaccinated.

J. Deshetel, lumber business, West Lake, owned seven cows, two of which had died; the remaining animals were vaccinated.

While riding from premises to premises, Dr. Mauldin observed a number of dead cattle which no effort had been made to either bury or burn.

The following is the substance of advice given by Dr. Mauldin to each owner visited, after going over the conditions on his premises, with regard to the live stock:

1. That well animals be removed from infected pastures and vaccinated. These animals to be watered from a well and fed, until sufficient time had elapsed for immunity to be established. The owners were instructed to tie the animals so that they could not roll, and also sponge them over with a disinfectant solution that possessed Shoo-Fly properties, in order to render less liable infection by flies and other insects.

2. That the rubbish from infected stables be removed and burned, and the stables and mangers disinfected.

3. That all dead animals be incinerated.

4. That the cattle and hogs be vaccinated as well as the horses and mules.

5. That in the future all animals be vaccinated in the spring.

In compliance with a telegram sent on the 21st ult., Dr. Mauldin proceeded to Cameron Parish and arrived there on the afternoon of that day. He states that he heard of a great number of cattle dying in various localities, and engaged a conveyance for the following morning, but, evidently, owing to the fact that a quarantine notice from the Texas Live Stock Sanitary Commission had been sent on the same boat upon which he arrived, he found the people were uncommunicative in the morning, as a result of which he was unable to leave town except by foot the next day. He managed to visit several places by boat, but the cattle owners apparently thought that any information furnished him would be used to prejudice prospective buyers of their cattle. Mr. J. A. Wakefield, stockman, Cameron Parish, La., stated that 28 of his cattle had died. He and his neighbor, Mr. C. F. Henry, ordered vaccine to vaccinate their work horses.

Two other premises were visited; a horse at each showed characteristic swelling.

Many of the natives of Cameron Parish speak a French dialect, and a number of them were unable to talk English.

Dr. Carter, a physician, who lives 15 miles east of Cameron, stated that he had treated, during the past few years, thirty odd cases of anthrax which were contracted by the patients usually from skinning the dead animals.

\[ \text{Signed} \quad A. D. \text{Melvin,} \\
\text{Chief of Bureau.} \]

\text{Hog Cholera—Five outbreaks were investigated; infection in each case being introduced in imported hogs.}

\text{Rabies—Five animals (dogs) destroyed.}
Cerebro Spinal Meningitis—Very extensive in three localities in the State, with a loss of three or four hundred head of horses and mules.

Stomach Worm Disease of Cattle—One extensive outbreak. Cattle purchased at New Orleans abattoir and placed on farm of owner for purpose of fattening. Animals came to New Orleans from infected locality in Texas.

Pernicious Anaemia (Swamp Fever)—Five cases investigated; four deaths. All the cases occurred in low places, and were the property of levee and railroad contractors.

Tuberculosis—None brought to notice of Board. Two herds tuberculin tested, aggregating 100 head, with one reaction. The reacting animal was finally cremated. This cow was not from the home herd, but purchased, with four others, in another part of the State. The four others were, prior to the test, slaughtered for beef.

In addition to the above, four carloads of horses and mules, for shipment to Colorado and Oklahoma, were examined and certificates granted.

Certificate was refused on one carload of cattle for shipment to Missouri, as the animals were grossly infested with ticks.

At the present time the State is reasonably free from trouble of a serious nature, and we hope to be enabled, by the aid of an adequate appropriation at the next session of the Legislature, to bring about much better and more thorough sanitary conditions.

E. P. Flower, D. V. S.,
Secretary and Executive Officer of the Board.
Members and Visitors

at

1909 MEETING.

Evans, W. A. Commissioner of Health Chicago, Ill.
Barnes, P. R. Chicago, Ill.
Hughes, Joseph 2537 State st. Chicago, Ill.
Ferguson, J. J. Swift & Company Chicago, Ill.
Wright, J. M. 1827 Wabash ave. Chicago, Ill.
Dyson, O. E. 4201 Halsted st. Chicago, Ill.
Tomlinson, G. R. 5514 Ellis ave. Chicago, Ill.
Quitman, E. L. 547 W. Van Buren st. Chicago, Ill.
Davis, F. H. 2116 Warren ave. Chicago, Ill.
Pierce, Chas. A. Elgin, Ill.
Cooper, G. H. Orland Park, Ill.
Humphrey, John Orland Park, Ill.
Russell, T. F. Live Stock Commissioner Pana, Ill.
Holm, Fred. Worth, Cook county, Ill.
Haner, F. S. Live Stock Commissioner Taylorville, Ill.
Thimann, Wm. Arlington Heights, Ill.
Funk, Eugene D. Shirley, Ill.
Melzer, Adam Director Cook Co. Truck Gard. Assn. Glenview, Ill.
Luckey, D. F. State Veterinarian Columbia, Mo.
Wight, A. E. Veterinary Inspector B. A. I. Newport, Ark.
Melvin, A. D. Chief B. A. I. Washington, D. C.
Dorset, M. Chief Biochemic Div. B. A. I. Washington, D. C.
Steddom, R. P. Chief Inspection Div. B. A. I. Washington, D. C.
Mohler, John R. Chief Pathological Div. B. A. I. Washington, D. C.
Stouder, K. W. Asst. Prof. Veterinary Science Manhattan, Kan.
Dean, Col. Albert B. A. I. Kansas City, Kan.
Schoeneleber, F. A. Prof. Veterinary Science Manhattan, Kan.
Nighbert, E. M. Spartanberg, S. C.
Christman, W. G. State Veterinarian Raleigh, N. C.
Owen, T. M. Inspector in Charge B. A. I. Raleigh, N. C.
Craig, R. A. Lafayette, Ind.
Cotton, Chas. E. Vice Pres. Live Stock San. Board, Minneapolis, Minn.
LIST OF STATE VETERINARIANS AND LIVE STOCK BOARDS.

Alabama          Dr. C. A. Cary                         Auburn
Arkansas          Dr. W. E. Lenton                      Fayetteville
Arizona           Dr. J. C. Norton                     Phoenix
California        Dr. Charles Keane                   Sacramento
Connecticut       Herman O. Averill, Com. on Dom. Animals... Hartford
Colorado          Dr. C. C. Lamb                         Denver
Delaware          Dr. H. B. McDowell                    Middletown
Florida           Dr. Thos. J. Mahaffey, State Bd. of Health. Jacksonville
Georgia           Hon. Commissioner of Agriculture        Atlanta
Idaho             Dr. G. E. Noble                      Boise
Illinois          Dr. J. M. Wright, 1827 Wabash ave.    Chicago
Indiana           Dr. W. E. Coover                       Indianapolis
Iowa              Dr. Paul O. Koto                       Des Moines, Iowa
Kansas            Dr. F. S. Schoenleiber                 Manhattan
Kentucky          Dr. F. T. Eiseman, 222 Main st.       Louisville
Louisiana         Dr. W. H. Dalrymple, State Univ.      Baton Rouge
Maine             Hon. Board of Cattle Commissioners      Bangor
Maryland          Dr. F. H. Mackle, 916 Cathedral st.    Baltimore
Massachusetts     Dr. Austin Peters, State House        Boston
Michigan          Dr. W. H. Morris                     Cass City
Minnesota         Dr. S. W. Ward                         St. Paul
Mississippi       Dr. James Lewis                       Agricultural College
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<th>State</th>
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<td>Missouri</td>
<td>Dr. D. F. Luckey, Columbia</td>
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<td>Nebraska</td>
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<td>New Mexico</td>
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<td>New York</td>
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<td>North Carolina</td>
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<td>Texas</td>
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<td>Dr. John Austin, Pres. St. Bd. of Sneeep Com., Heber City</td>
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<td>Vermont</td>
<td>Hon. E. S. Willson, Cattle Commissioner, Arlington</td>
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<td>Virginia</td>
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<td>Washington</td>
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