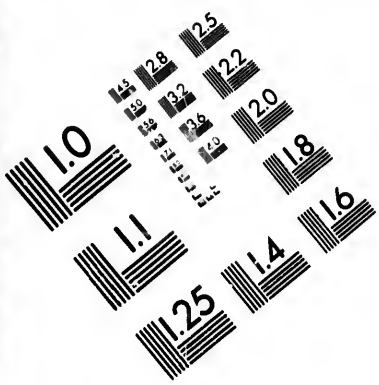

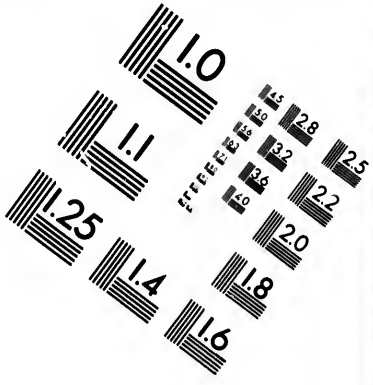

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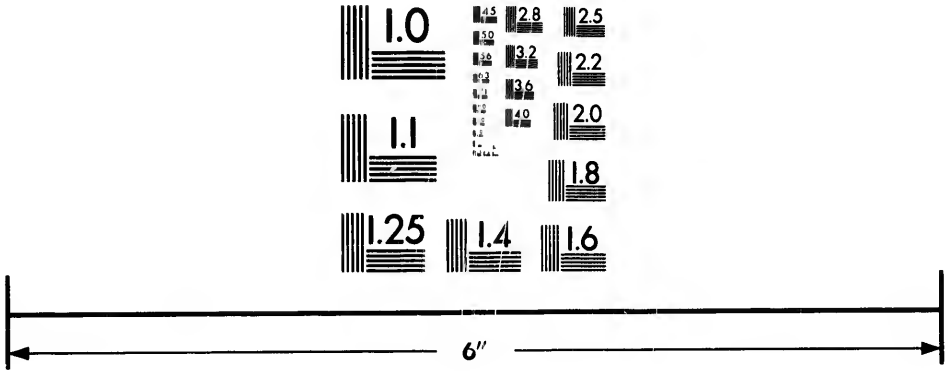

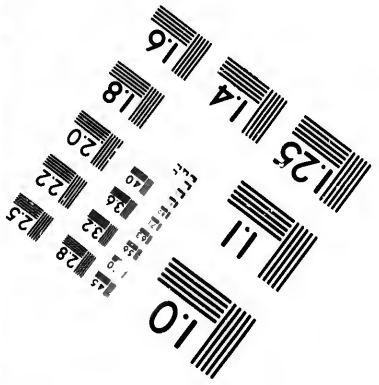

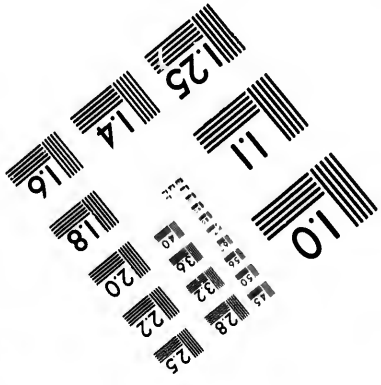

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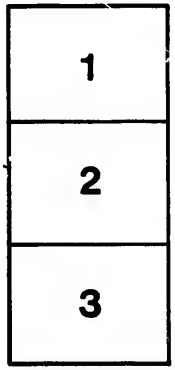

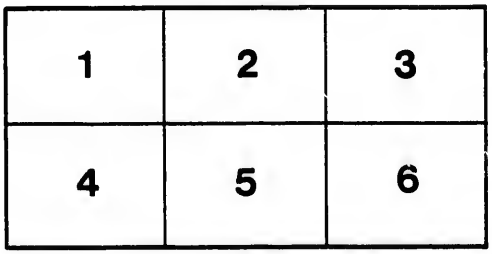

ON THE PREVENTION OF TUBERCULOSIS IN ANIMALS, WITH SPECIAL REFERENCE TO PREVENTION IN THE DOMINION.

BY

D. McEACHRAN, F. R. C. V. S., V. S. EDIN., D. V. S.

Dean of the Faculty of Comparative Medicine and Veterinary Science, McGill University ; Chief Inspector and Veterinarian of the Dominion.

Reprinted from the Montreal Medical Journal, June, 1899.

ON THE PREVENTION OF TUBERCULOSIS IN ANIMALS,

WITH SPECIAL REFERENCE TO PREVENTION IN THE DOMINION.[1]

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D. McEACHRAN, F. R. C. V. S., V. S. EDIN., D. V. S.,

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Considering that this paper is but one of several to be read to-night on this all important subject of tuberculosis, I have found it necessary in order to comply with the time allowance to restrict my observations to a few of the most important points bearing on the disease as it affects the domestic animals.

THE DANGERS ARISING FROM TUBERCULOSIS IN ANIMALS.

Without taking up your time in discussing whether the tubercle bacilli of man and the different species of animals are or are not identical we will premise that in the organism of the susceptible food producing animals the tubercle bacillus will live, thrive, and exercise its destructive operations, and will produce the disease in many of the lower animals which in turn become capable of transferring it to others and to man.

Experiments have determined beyond doubt that next to man the most susceptible to this disease are the animals most made use of for the food supply of the human family, viz: cattle, swine and chickens. These contract it in the natural way, but it can be produced in sheep, dogs, cats, rabbits, goats and horses, by inoculation with tuberculous material.

Of these food producing animals, cattle, swine, and chickens, are most exposed to the infection and are susceptible in the above order.

I

DANGER FROM TUBERCULOUS CATTLE.

Fortunately but a small percentage of the cattle affected by tuberculosis are affected in organs from which the bacilli can readily escape so as to become the infecting agents to other animals. There is a widespread, popular error on the subject of infection by this disease, and the question is often asked:—Why is tuberculosis not much more common than it is? The answer is, that only a small proportion of tuberculous people or animals are infective and that all people and animals are not equally susceptible.

[1] Being a contribution to a discussion on the "Prevention and Cure of Tuberculosis," at the Montreal Medico-Chirurgical Society 17th April, 1899.

We can separate affected animals into two classes, viz:—those that are *actively infective*, and those that are *possibly infective*.

The first includes milking cows with tuberculous udders; investigations have shown these to be very virulent. The infective milk from one diseased udder may render the whole milk of a dairy dangerous to people or young animals fed on it unsterilised. The milk from a diseased udder sent to a creamery or cheese factory may render its products, butter and cheese, infective to people consuming them:—and the by-products skim milk and whey may be the means of infecting calves, pigs or poultry which are fed on them. Milk from tuberculous cows with healthy udders is seldom infective.

Of 7 calves fed on the milk of such cows at the Outremont Experiment Station last year, not one contracted the disease as we proved by post-mortem examination—nor was the disease produced in 46 guinea pigs and 42 rabbits inoculated with the milk of these animals, with three exceptions, two being guinea pigs and one a rabbit. Milk from tuberculous animals is, therefore, but slightly infective when the udder is not tuberculous, whereas it is very virulent when it is diseased. Therefore as a preventive of communication of tuberculosis from cattle to man, milk should be obtained from healthy cows only; and should be protected from infection after it has been drawn from the cow.

The same preventive measures will apply to calves and pigs, as they being fed largely on milk and by-products of the dairy are equally exposed to infection from milk.

In animals suffering from thoracic tuberculosis especially when the tubercular masses communicate with the bronchial tubes, or when the laryngeal or peribronchial glands are the seat of the disease, the bacilli are coughed up and ejected in the sputum, dry up and in time are carried about in air currents, and, gaining entrance to the lungs of other animals, by inhalation, reproduce the disease. Such animals are particularly dangerous to other animals housed in the same building and cohabiting with them. They are also dangerous for attendants who necessarily spend a considerable portion of their time in close contact with them, and frequently inhale infective dust during the sweeping of the byre.

Animals suffering from tuberculosis of the intestines, kidneys, or liver, may also be considered actively infective, as the bacilli may be discharged in the effete products of these organs, and, once set free, there are many ways in which they gain access into the bodies of other animals there to work their destructive effects on the invaded tissues and organs of their hosts.

The second class, *possibly infective*, embraces by far the largest proportion of cases, in which, while the disease may be extensive and its effects severe, yet none of the organs above mentioned are involved and

escape of the bacilli cannot directly take place. A large proportion of tuberculous animals which show no clinical symptoms yet give a reaction to tuberculin, are included in this class. In some, the post-mortem lesions are very slight, and the tubercle will have to be carefully looked for. It may be found in a small gland in any part of the body, most frequently in the bronchial, peri-bronchial, or mesenteric, and occasionally in a bone or joint. The tuberculin test, while a valable aid to diagnosis, will cause as much reaction in these obscure cases as in more pronounced ones, and in animals suffering from advanced disease often no reaction follows injection owing to a superabundance of the toxine in the system already. We may have extensive miliary, mesenteric or pleural tuberculosis with pronounced symptoms, yet escape of the bacilli may not occur until an extension of the disease occurs involving the lungs, udder, uterus, intestines, kidneys, or liver, when they immediately become actively infective.

An animal or person may continue for years in the non-infective class, yet the change takes place so suddenly or so insidiously in many cases, that it would be very unwise to deal with any case of tuberculosis as non-infective.

Dr. Sims Woodhead referring to the subject, says (Report of Royal Commission) "A most important point is that the spread of tubercle in the udder goes on with the most alarming rapidity:—this I was able to observe in cows constantly under observation, but also noticed, on several occasions during the interval between fortnightly inspections carried on along with a Veterinary Surgeon, that the disease had become distinctly developed. It may be, of course, that the early evidence had been overlooked at the previous inspection, but whether this was the case or not the spread of the disease was so rapid, as to afford very good ground for alarm."

The very absence of any definite signs in the early stage is one of the greatest dangers of this condition. Both Dr. Martin and Dr. Woodhead insist that no tuberculous animal of any kind should be allowed to remain in a herd.

INGESTION OF FLESH OF TUBERCULOUS ANIMALS.

Of the danger from the consumption of meat from tuberculous animals, I wish to make it clear that the popular estimate of the danger from this source of infection is, on the whole, exaggerated, and as a matter of fact, except in advanced cases of generalised tuberculosis in cattle, it is very slight. Experiments have demonstrated that while intraperitoneal injection of muscle juice will produce tubercle, the ingestion of the same flesh will prove negative in nearly every instance. (Nocard).

It may be taken for granted that if meat from animals suffering only from localised tuberculosis, is carefully handled and no infective matter

smeared over it from the hands, knives, or saws of the butcher, is allowed to stand for a few days in a refrigerated chamber, and is thoroughly cooked, it can be eaten with impunity.

As a matter of fact tuberculous meat is frequently foisted on to the public and no bad results seem to follow, at least so far as is known. At the same time there is a certain danger from smearing with tuberculous matter, and from insufficient cooking; consequently it is clearly the duty of sanitarians to limit the sale of meat from tuberculous animals to cases of limited invasion and under very reliable supervision. The same remarks apply to pork in all its forms, but the danger from meat infection in pigs is even greater than in cattle, owing to sausages and hams being more frequently eaten under-cooked.

Tuberculous chickens are still more dangerous owing to the consumption of the giblets in which the tubercle may be concentrated. Fortunately, however, they are usually thoroughly cooked and raised to a temperature which kills the bacilli. Yet, reports show that chickens are not infrequently the means of infection in the human family, and while the chicken tubercle bacillus may not be identical with the human, yet the human bacillus will live and thrive in the organism of the chicken, producing tubercle, which, reintroduced to the human body will produce tuberculosis. The expectoration of tuberculous patients in poultry-runs should be absolutely prevented.

Rabbits, While rabbits contract tuberculosis when exposed to infection, the disease is unknown in them in the feral state, consequently, no apprehension may be felt in using rabbits as food .

While every conceivable precaution should be exercised to prevent the communication of animal tuberculosis from the food-yielding domestic animals to man, equal care should be exercised in preventing the communication of this disease from tuberculous people to these animals. Consumptive people are generally regarded as almost as dangerous to the health of cattle, pigs and poultry as are tuberculous cattle, pigs, and poultry to humanity. Here, however, mention must be made of Theobald Smith's recent observation that the bovine bacilli may be as much as thirty times as virulent towards the animals of the laboratory as are human bacilli.

Tuberculous patients, both human and brute should be isolated, and other people and animals protected against both direct and mediatory infection.

II

IS IT POSSIBLE AND PRACTICABLE TO ERADICATE TUBERCULOSIS ?

I have frequently stated my belief that it is both possible and practicable to rid Canadian herds of this disease completely; and that by the expenditure of an amount of money trifling in itself as compared with the enormous benefits that would accrue to the Live Stock industries of

Canada, which are rapidly growing, and even now represent a large proportion of the country's wealth, while yet it is even at the commencement of its development.

Considering that 45 per cent. of the population of Canada is engaged in rural pursuits; that the railroads depend on agriculture for one-fourth of the freight they carry, and the canals one-third; that the shipping interests depend chiefly upon the produce of the farms and ranches, and that more than one-half of the total exports are agricultural products—the value of which for 1897 *amounted, according to the Year Book, to the sum of* $55,533,592, (*of which* $9,937,723 *was the amount received for horses cattle, sheep, swine, other animals and poultry*)—*surely no reasonable expenditure can be justifiably withheld by the Government to eradicate any disease that interferes with the development of an industry of such importance to the country's prosperity.*

We have no statistical information of the number of animals or even of herds affected by this disease, so that it is impossible to estimate accurately what the cost of eradication of tuberculosis might be—but tests have been made during the past year to a considerable extent in every province of the Dominion, numbering over 10,000 head in *suspected* herds, and of these *only 5% have been found tuberculous.*

From the foregoing remarks it will be seen that the proportion of the affected animals which would have to be slaughtered and sacrificed (those only which showed clinical symptoms) is small; probably throughout the entire Dominion 10,000 such could not be found; which even at full value would not exceed $250,000. Those reacting to tuberculin would, of course, be much more numerous; but of these reacting animals 70 per cent at least could be fed and slaughtered for beef under supervision; certainly that percentage would be found very slightly affected and their meat would be quite fit for food, and this is what should be done with all cattle of no special value for breeding purposes. The remaining 30 per cent. of carcasses should be destroyed by putting them into the rendering vats, indemnity being paid in the manner subsequently recommended.

In the case of highly bred cattle, in which no clinical symptoms are discoverable, they may be kept in isolated buildings and bred from under the system carried out in Denmark, known as "Bang's system;" * as symptoms develop they should be slaughtered. The number that would require to be killed would decrease year by year, and the full compensation, while not amounting to much, would stimulate owners of diseased herds to have them tested and dealt with as found necessary.

* Prof. Bang has these animals isolated in special buildings or closely partitioned-off portions of byres, bred from, their calves removed as soon as dropped to non-infected buildings and fed on milk from tested cows or sterilised milk. They are tested semi-annually, any that react are killed. Over 90 per cent. of the calves can thus be raised healthy.

Just think what a safeguard to public health as well as health of animals it would be to have every animal showing clinical symptoms—those in fact which are most infective,—removed, and all known to be diseased prevented from being moved about, by quarantine measures.

It may be asked:—Would these measures not be attended by considerable disturbance of trade and general inconvenience? No indeed; it would stimulate the cattle trade. Those who are fortunate enough to possess healthy herds would find ready purchasers in those whose cattle had been killed and paid for; slaughter would immediately be followed by disinfection and restocking, in most cases by better bred, and in all cases by healthy cattle.

It is quite evident that if the above suggestions were carried out, tuberculous animals would be in a few years difficult to find in Canada.

Knowing as we do the intercommunicability of human and animal tuberculosis, we can readily understand that any attempts to eradicate the one must be simultaneous with like action in relation to the other—and here I wish to appeal to the medical profession to do their share of this great work of eradication.

No one nowadays doubts the contagious nature of this disease in either man or animals, yet while the Veterinary Profession, and Agricultural Departments throughout the civilized world have for years been moving strenuously to limit and prevent it in animals, but little has so far been done in this connection by the medical profession in dealing with human beings. Not only have they acted with unaccountable apathy so far as adopting any radical preventive measures among their patients, but little has been done to inform the people of the true state of affairs, or to point out to them the many ways by which the contagion is spread.

Surely, at least, the public should be told of the danger especially to young children, of being fondled and kissed by consumptives. Surely parents should be advised how to prevent the extension of this disease among members of a family by isolation. Surely the owners or tenants of houses occupied by consumptives ought to be compelled to thoroughly disinfect, and so renovate the walls and floors as to remove all danger to subsequent occupiers. Surely it is time that special carriages were provided for consumptives for the conveyance to those health resorts to which medical men send their patients, by the railroad companies over whose lines they travel. Time and again have I witnessed on Western roads leading to Colorado shocking disregard of all preventive precautions in this connection.

We need not go beyond our own city to look for instances of families in which members one after another have fallen victims to this disease through contagion, yet sympathetic friends, often accompanied by little children, are allowed unrestrictedly to visit the poor patients, who,

cheered by their visits and delighted to see and fondle the children, in their ignorance impart the infection to their young and susceptible bodies, setting a seal of death which will overtake them at an early age.

It was with more than ordinary satisfaction that I read the admirable address delivered by Sir William Broadbent a short time ago at a meeting convened by H. R. H. the Prince of Wales at Marlborough House to inaugurate the National Association for the Prevention of Consumption, the mission of which is "to carry into every dwelling in the land an elementary knowledge of the modes in which consumption is propagated, and of the means by which its spread may be prevented." "To this end, "he says," the public attention must be captured, the public imagination must be impressed, the defensive instincts of the general public must be aroused."

HEREDITY.

As most of my hearers have no doubt read the address I will make but one other quotation from it which I hope will impress everyone present as an endorsation of expressions which I have repeatedly made on the subject of heredity in this disease:

"It is now definitely known that consumption is a contagious disease, and communicable from animals to man; and that it arises in no other way. It is not an inherited vice in the constitution which declares itself in course of time; but, while some constitutions are more prone to it than others, and while an unhealthy mode of life and unwholesome surroundings predispose to its attacks, every case of consumption is derived from some pre-existing case."

III

THE TUBERCULIN TEST AND ITS RESULTS IN ANIMALS.

Happily in this country but little time was lost in conveying to our agricultural population a true account of tuberculin and its effects on animals; as a consequence, the objections raised against it in other countries as a result of ignorance of what it really is, had not to be combated here, to any large extent at least. The efficacy of tuberculin as a test, is well-known throughout the Dominion.

As previously stated, within the past twelve months over ten thousand cattle have been tested at Government expense from the Atlantic to the Pacific; and of the large number of post-mortem examinations made scarcely a failure to discover the tubercle has been reported; thus, of 100 post-mortems made by Travelling Inspector Dr. A. E. Moore every one was tuberculous; of sixteen killed at the Central Experiment Farm, in only one animal did we fail to find the disease. Of ten cows killed at the Outremont Experiment Station it was found in every one, although no clinical symptoms were presented during life.

We failed to find tubercle in seven calves from 6 to 9 months old which gave no reaction to tuberculin. Doctor Moore assisted me in

making twenty-seven post mortems in a herd in the Eastern Townships and we found tubercle in every single case.

Of 13 animals imported from England tested in the quarantine at Point Levis, tubercle was found in every one. Numerous similar experiences could be given.

I must not be understood, however, to say that there are no objections raised to the use of tuberculin in Canada. It is strongly objected to by owners of tuberculous herds, not on the grounds of being in any way injurious to the cattle, but on account of its remarkable accuracy in diagnosing the disease. It detects the slightest existence of tubercle, but it in no way indicates the extent of it, and where animals are condemned on its evidence alone, it is asserted that many are thus condemned which would have recovered;—but as a matter of fact no animals are condemned without a careful clinical examination.

This argument would have point if slaughter of all reacting animals was made compulsory, but such is not the case, nor is it ever likely to be so. Our experiments with tuberculin conducted at the Experiment Station, Outremont, clearly demonstrated the unreliability of second and subsequent tests. Seven cows when first tested at Ottawa gave a reaction indicatory of the disease; when tested thirty days subsequently only one of them reacted. Three months afterwards double doses were injected into two of them without reaction and five days later quadruple doses were given the same cows without result.

Tuberculin and other animal toxines should be placed under Government control as are chemical poisons.

The knowledge of the unreliability of any but the first test led to fraudulent practices by cattle dealers bringing stock into France, and M. Nocard and M. Roux together set to work and discovered a new tuberculin which will cause reaction no matter how recently Koch's fluid has been injected. This however, for obvious reasons is a Government secret which M. Nocard informed me he is not at liberty to make public or even divulge to professional friends.

IV

HOW IT IS DEALT WITH BY THE DOMINION GOVERNMENT.

So far the action taken by the Canadian Government has been confined to efforts made to inform the people of the nature of tuberculosis, how the disease spreads, how to prevent and how to diagnose it, how to deal with a diseased herd, how to disinfect premises and to dispose of tuberculous carcasses,—by means of bulletins, and itinerant lecturers who address farmers' meetings during the winter months.

Much has been accomplished by free testing by Government Veterinarians, appointed after special examination, who have been authorized

to do the testing throughout the Dominion. Dr. A. E. Moore is Travelling Inspector specially for instructing, testing, and investigating.

When an application is made on the prescribed form by an owner of cattle, an inspector is instructed to make the test and transmit the charts to the department for the decision of the Chief Inspector.

When any of the cattle react two degrees, they are pronounced tuberculous, provided that there are no attendant circumstances which account for the rise in temperature, a clinical report having to accompany each chart in which diseased or suspicious animals are indicated.

Diseased animals are forthwith removed from the herd, and placed in an isolated building where they are quarantined and thenceforth cannot be sold or removed, nor their products utilised under the penalties provided in the Animals Contagious Diseases Act, so that the herd is thus placed beyond the possibility of extending the disease.

No provision has so far been made by Parliament for the payment of indemnity for animals slaughtered and under ordinary circumstances no indemnity is paid.

All cattle imported from Europe, in addition to being kept three months in quarantine, must be accompanied by charts and certificates of testing in the country whence exported to Canada immediately prior to exportation, or else be tested in quarantine in Canada; and from the United States, all cattle to be admitted for breeding purposes shall be accompanied by:—

(a) A declaration made by the importer that they are actually for breeding and no other purposes.

(b) A certificate signed by a Government Veterinarian that they have been subjected to the tuberculin test and found free from tuberculosis. Such certificate must show the date of testing and chart of reaction with a description of the animal, giving age and markings. The importer may be required to swear that the certificate refers to the animal represented.

(c) A certificate of inspection signed by a Government Veterinarian showing that the animals are free from contagious disease and that no contagious disease of cattle (excepting Tuberculosis and Actinomycosis) exists in the district whence they came.

(d) When not accompanied by such certificates the animal or animals must be detained in quarantine one week and subjected to the tuberculin test.

(e) Should they be found tuberculous they must be returned to the country from which shipped, or slaughtered without compensation.

These regulations being reciprocal, and it being necessary for Canadian breeders who sell to American buyers to have their herds tested, much general good has been accomplished by this testing without cost to the Government.

The result of this method of dealing with it has been a marked lessening of the disease in the country at a minimum of expense. I know that I am within the mark in stating that as compared with five years ago tuberculosis has been reduced in Canada by at least thirty per cent.

This can be illustrated by the following facts.

In November last, owing to the experiments which were being conducted at the Experiment Station at Outremont having been completed so far as the cattle then on hand were concerned, they were slaughtered for post mortem examination.

The Station is now about to be opened, but I have found it impossible notwithstanding the number of Inspectors in the field to find cattle presenting clinical symptoms. I have heard of one man who owns a few, but he, believing that he has a corner in them, holds them at unreasonable figures; and as to diseased udders I have so far failed to find a cow in milk with a tuberculous udder, which we could procure for experimental purposes; some have been met with but not giving milk.

These facts while very gratifying from an economic point of view are far from satisfactory. Having educated the people and got them to realise the importance of the matter, why should energetic action be longer delayed, since delay is attended by so much prospective and continued detriment to the live stock interests of this great agricultural country ?

I have been asked to give you my views as to what special action and legislation would be necessary. In complying with this request I wish to state that it is not done in any official capacity but to meet your wishes in your praisworthy efforts to interest the public.

SUGGESTED ACTION AND LEGISLATION.

The time has surely come when more energetic if more expensive methods should be employed to terminate this menace to the health of men and animals. The Government acted wisely in moving cautiously in this matter, it took time and much patiently acquired experience to arrive at a full knowledge of the disease in all its relations in man and animals, before deciding on radical measures or large expenditure.

Hitherto professional men hesitated to recommend, and politicians refused to assume the responsibility of voting large appropriations for this purpose, and wisely, too.

Now, however, years of investigation and experimentation by scientific men in numerous and independent countries, having resulted in a clear elucidation of most of the moot points relating to tuberculosis in animals, and there now being no tenable argument for longer permitting this preventable disease to continue in our midst, when it can be shown, as I have endeavoured to do, that for a comparatively small amount, it can be completely stamped out, surely it is the duty of the government to take active measures at once for its eradication.

I trust that this association will endorse these views and will recommend that Parliament be asked to vote the necessary funds to enable us to get rid of at least every immediately infective bovine in Canada.

When we consider the direct bearing this disease in our cattle has on public health and on our agricultural prosperity which influences to such a large extent (as I have shown in my introductory remarks) the railroads, canals, and mercantile marine, we must admit that the stockmen of the country should not be called upon to bear the whole loss incurred in bringing about a more sanitary condition of the food supply of the people.

The country should share the farmers' burden, and when cattle have to be killed and sacrificed, I would strongly recommend that full indemnity up to the health value, not exceeding $50 for one animal be given as compensation,---*during the first three years.* After three years the compensation should be as provided for in the Animals Contagious Diseases Act, viz:—one third, for actually diseased, not to exceed $20; three fourths when killed for being in contact, in the case of grade animals not to exceed $50, and in case of thorough bred animals two thirds, not to exceed $150.

As already stated, of the reacting animals at least 70 per cent could be fed and killed for beef, under supervision.

The 30 per cent. so killed and sacrificed, in consideration of the cost of keeping and feeding should be compensated for at full value, ascertained by weighing the carcasses.

It might not be expedient to make testing compulsory; nor would it be necessary, as in a very short time no one would buy an animal without a test or guarantee of freedom from tuberculosis,

I have stated above that probably a sum of $250,000 would be paid out for compensation during the first year; this sum would be greatly lessened each year. The administration would cost about half as much more. Suppose $400,000 was voted as a special appropriation for this purpose for the first year, it would only be a pittance expended for the benefit of not only the farmers but the whole population.

The number which would have to be slaughtered the following year would be reduced by about 75 per cent. Three or four years of active work ought to come very near complete eradication, provided the owners of cattle coöperate in the work as I believe they will if just compensation be paid to them.

V

IMPORTED CATTLE SHOULD BE TESTED.

The alarming prevalence of this disease in Great Britain, France, Germany and Denmark, whence breeding cattle are imported for the improvement of Canadian herds, should lead our farmers to be very

careful in ascertaining beyond doubt that all importations are free from tuberculosis.

They should not only see that none but the most trustworthy agents are employed to purchase an animal in Britain, but that the agent has personally superintended the tuberculin test, and that he obtains a declaration from the seller that the animal has not been injected with tuberculin for three months previous to the date of purchase.

Our experiences at the Cattle Quarantines, especially at Halifax and Quebec, demonstrate not only the necessity for these precautions but the unreliability of testing done in Britain. One importation of fourteen high class short-horn cattle, which was accompanied by a chart of testing and a certificate of freedom from disease, on being tested in quarantine eight weeks after, showed thirteen to be diseased, one being in such an advanced stage that she died from it in quarantine. The remaining twelve were slaughtered and tubercle found in each; in two it was extensively generalised.

It is impossible to estimate the serious damage and losses that probably would have occurred among the short-horn herds of this country if this herd had not been tested in quarantine but had been allowed to be dispersed one here, one there, in perhaps a dozen healthy herds; or more properly speaking, it would be difficult to compute the saving to Canadian live stock interests by the testing at Point Levis of this one herd. Yet so blind are the breeders to their own interests that we find breeders' associations passing resolutions urging the Government to allow cattle to come in without being tested!

There is no defensible objection to tuberculin testing. Tuberculin as it is prepared contains only the toxine of the bacilli, sterilised by heat, filtered through porcelain. As well might we endeavour to produce barley from alcohol as tuberculosis from tuberculin; in fact it has been demonstrated beyond dispute that it does no harm whatever.

I am pleased to find, however, that the past year's experiences have induced several of the strongest objectors to the tuberculin test, men owning some of the largest and most valuable herds in the country to change their views, and several of them have had their herds tested, and it is to be hoped that before long there will be a voluntary and combined effort among Canadian stockmen to second the efforts and strengthen the hands of the Minister of Agriculture in his laudable desire to see this disease completely eradicated from our herds.

In conclusion, gentlemen, allow me to congratulate the Society on the interest manifested by you in this important subject—specially important as a matter of public health, very important as affecting the cattle industries of this great agricultural country, and of no less importance as affecting the commercial and trade interests of Canada.