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T H E S I S .

THE BENEFITS TO BE DERIVED

by the

STOCKMEN

from the

ERADICATION OF CONTAGIOUS DISEASES.

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R E F E R E N C E S .

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TWENTY-SECOND ANNUAL REPORT
of the
BUREAU OF ANIMAL INDUSTRY.--1905.

THE PATHOLOGY OF INFECTION.
Diseases of Animals by Moore.

TWENTY-THIRD ANNUAL REPORT
OF THE
BUREAU OF ANIMAL INDUSTRY.---1906.

ORDERS AND REGULATIONS ISSUED TO INSPECTORS
IN THE FIELD.

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O U T L I N E .

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- I. Classification and Beginning of Stock Industry.
 - (a) Upbuilding of Breeds.
 - (b) Weakening of Vitality.
- II. Diseases and Their Beginning.
Classification.
- III. Description of Diseases Under Government Inspection
That are Being Fought Most Bitterly.
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THE BENEFITS TO BE DERIVED BY THE STOCKMEN FROM THE
ERADICATION OF CONTAGIOUS
DISEASES.

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As an industry stock raising is classed as one of the highest. Since the beginning of man the horse, cow, and other domestic animals have been his companion, his beast of burden, have furnished material for his clothing, have served as his food; even back in Bible times we read of herds of cattle being raised and used as a means of profit by the people.

When the New World was discovered the old Free Booters or Buccaneers found a place where the raising of cattle and horses could be indulged in profitably to themselves and unprofitably to honest men. Thus it was through them that the first cattle ranches of the great southwest were started. The life was a wild, easy one, and from it developed the characteristic ranch life of the past fifty years, which has gradually lost its romantic phase as the wire fence and next, the small farmer and stock-raiser descended into its midst. With the wire fence and the more conservative method of stock raising naturally came a better grade of stock, and the better grade of stock naturally not being as hardy as the former native-bred inhabitants (i.e., not being acclimated), diseases soon came which the natives could withstand but which caused the better bred class to die off by the hundreds.

In this instance it was not a survival of the fittest. Instead of degenerating back to the old Texas Free Booter style,

the cattle, sheep or horses have gradually been improved in quality. This was due to the persistent labors of determined men with the aid of the Government Bureau of Animal Industry. For many years the people imported to these southern places male animals of superior grade to those they formerly had, and although many of these animals lost their lives they finally succeeded in bringing about a cross which, in many cases, is better for some purposes than the northern more pure bred stock. For instance, the Panhandle steer with his long horns, rather long body and native wild manners of the old southern cow, but with the meat quality of the Hereford bull. He makes a good feeder and the packers say the meat is of good quality. As a short-feed steer he cannot be surpassed because of his foraging propensities, and as butcher stuff he has but little waste, because of his undeveloped digestive organs. Being accustomed to live on the native grasses of the southwest, he is not called upon to develop much of an internal system.

The small Spanish horse has been bred up in much the same manner. He was formerly nothing but a mere wild animal, but by proper crossing we get a horse that serves the dual purpose of cow, horse and farm animal in the southwest. They are good breeders and good foragers.

For the up breeding of its stock the U. S. Government has enacted laws, as have almost all civilized countries, in regard to pedigrees. In many cases these laws and regulations could be more strict and they possibly will be in the future at some time, especially in the case of the horse. The automobile is rapidly taking the place of the common horse, but never can it

take the place of the well bred horse, the pride of every true sportsman, the companion of man.

I will now speak of the diseases that effect the stock industry and the relation of the U. S. Government to them.

TYPES OF DISEASES THAT COME UNDER THE U. S. INSPECTION:

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| Actinomycosis. | Measles. |
| Tuberculosis. | Scabies. |
| Caseous Lymphadenitis. | Eczema. |
| Hog Cholera. | Erysipelas. |
| Texas Fever. | Cancer. |
| Echmococcus. | Tumors. |
| Abcesses. | Anemia. |
| Pneumonia. | Ancites. |
| Pleurisy. | Jaundice. |
| Carditis. | Asphyxia. |
| Enteritis. | Arthritis. |
| Peritonitis. | Leukemia. |
| Metentis. | Pulmonary Apoplexy. |
| Nephritis. | Cysticerus Tenucollis. |
| Uremia. | Melanosis. |
| Mormmitis. | Causes from shipment as |
| Septicemia. | downers, too young, |
| Pyemia. | Hernia. |

Some of these diseases are determined by post mortem inspection and others by ante mortem inspection. These inspections are made under the Department of Agriculture. This

department was organized in 1884 under Dr. Salmon as Chief of Bureau. Dr. Salmon resigned his position in 1905 and upon his retirement, A. D. Melvin, at that time Ass't. Chief, was appointed to fill the vacancy. At the beginning of the fiscal year the department consisted of ten divisions or offices: (1) Inspection Division, in charge of the meat inspection, the inspection of animals for inter-state movement and for export, the inspection of vessels for carrying of export animals, and for the eradication of contagious diseases, (2) The Quarantine Division, charged with inspection and quarantine of imported animals and keeping accounts of the Bureau, (3) Pathological, (4) Biochemic, (5) Zoological, (6) Dairy, (7) Experiment Station, (8) Animal Husbandry Office, (9) Editorial and (10) Library. Some of these divisions have been changed since the last report.

It is with the Inspection Division that the American Stock Raiser should coincide, mostly. They should lend their every effort in the struggle that the Bureau is waging against the contagious diseases.

Out of the list of those diseases that I have already mentioned can be picked a few that are of special importance today and are being fought bitterly by the government. These are Texas Fever, Scabies, and possibly soon Tuberculosis, with these may be named Blackleg, and Foot and Mouth disease.

The Texas Fever is caused by cattle ticks, (*Boophilus Annulatus*). A short sketch of its life history would not be out of place to show how the tick works and give an insight into the methods of eradication. The adult tick produces 1500 to 2000 eggs of a brown color and with a glistening surface. From the

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eggs are hatched six-legged embryos or seed ticks. These seed ticks are very active and at the first opportunity they attach themselves to the host. The ticks molt or shed their outer covering twice and do not leave the body of the host until completely matured. After the first molt they are eight-legged and when they have emerged from the second molt, they are sexually matured organisms. Copulation occurs after the second molt after which the female tick drops to the ground. After producing eggs the tick dies and the process begins again. These ticks will grow on many animals but will grow best on cattle. Attempts to grow them on Guinea pigs and poultry have failed, but they have been grown on donkeys, horses and dogs. The average length of time required for the various stages in the life history of cattle ticks is:

- For Oviposition, or egg laying, 7 days.
- For Incubation, or hatching, 25 days
- For growing from larvae to adult, 22 days.
- Total life cycle 54 days.

These figures were taken from observations extending over a dozen years. The observations were made by the Bureau Experiment Station and for the climate of Washington, D. C. It is surprising what variations may occur from the above figures, These variations merit special attention as they may be of use in the question of tick extermination. It is found that under normal conditions of warmth the average length of time before the adult female has completed laying her eggs is seven days. But the actual time that may pass before the female begins to lay,

may be one to ninety-six. That is, she may begin to lay eggs on the day she drops from the host, or she may lay dormant for some time and then produce the eggs. Warmth hastens egg production and cold retards it. If exposed to a great degree of cold, the tick becomes torpid, but when again exposed to a high degree of temperature they become active. Thus, the tick may live over the winter in infested territories in the form of the adult female.

There are also great variations in the time of hatching. The average time for the tick to hatch is twenty-five days, but they have been known to hatch in twelve days. They have been known to lay without hatching for two-hundred nine days. The young tick when hatched is very active and is ready to take hold of the host at once. It can stand much cold, but cannot stand drying. Apparently it makes no difference how much adversity the mother, eggs, or larve ticks have experienced. If the ticks reach a host and have the strength to begin their career of parasitism, their chances to grow and produce young are uneffected. All this shows that they are excellently prepared to make a hard fight against extermination. Even though we do not take into consideration the fact that cattle ticks are the only known agent through which Texas fever is transmitted from animal to animal, that the destruction of the tick will be attended by entire removal of the disease, and merely consider the tick as an external parasite of cattle, we will even from this point of view find that its record is sufficiently bad to justify the most strenuous efforts towards its extermination. Relative to the damage suffered by cattle

that are immune from the fever, we find that the tick will cause death. It is the very life blood of the cow or steer that the tick lives on. It thus causes more work for the animal to forage sufficiently to keep up the proper amount of nutrition. Not all ticks will cause Texas fever. Ticks when they come from a host which has not been infected with the disease will not give it to cattle, even that are susceptible to the fever. When a cow has the fever and recovers, she contains in her system a virus which, when transmitted to a susceptible cow, causes the disease. It is the tick that transmits this virus from the blood of one cow to the blood of another. Ticks grown on horses or donkeys when placed on a susceptible cow will not cause the disease. It is the red blood corpuscles in the animal that contain the organism which causes the infection to take place in the next cow.

Every stock man of the South knows the enormous losses that are suffered by the cattle industry every year from the tick and the disease which it causes. Even though he does not know the aggregate loss, he does know full well the loss that he as an individual suffers. It is with the object of suppressing this loss that the U. S. Government has enacted laws placing certain sections under quarantine. It is for the same object that many inspectors are hired each year to aid in carrying out the methods that have been devised to eradicate the tick. There is more than one method, but the one most in use now and the one that promises to give the most satisfactory results, consists in dividing the infected pasture into two parts with a double line fence between. The cattle are all put into one pasture and at the end of six

months are dipped and moved to the other pasture. This other pasture has contained no cattle during this time and the ticks which were in it have been dried up and destroyed. The cattle are now free from ticks and at the expiration of six months, the first pasture or division is also free. Care must be taken that the cattle are kept separate from all cattle that may be infected with the tick. In this manner the dreaded Texas fever may in time be entirely eradicated, as no other known organism can transmit the disease.

Another disease upon which the Bureau is waging relentless war is the Scabies--both of sheep and cattle. I have had practical work with this disease for a few years, both as an employee of the government and as an individual. It is a contagious disease caused by a parasitic mite. Cattle are affected with but two varieties of the mite; those belonging to the class Arachnoidae. These two are the Psoroptes and the Symbiotes. The psoroptes is the more prevalent of the two, and does by far the more damage. It lives on the surface of the skin and by biting it irritates and itches. It manifests itself in pimples, exudations and scaling off of the skin; causes the hair to fall out and forms a dry grayish-brown scab. The skin becomes stiff and wrinkled and has the consistence of leather. After the mange has acquired a foot-hold once, it causes the animal to lose flesh and become weakened, thus being unable to fight off the disease by itself. At the same time the diseased vigor of the animal causes the mites to multiply much more rapidly and to further the intensification of the disease. Thus cause and effect work together until the disease proves fatal.

Variations in the condition have been noticed. Thus in summer the action does not appear to be so severe; while in winter, and especially in cold, wet spring, it is very bad. Scabies does not appear to afflict cattle that are doing well, nor to affect cattle over three years old unless they are in poor condition. It is noticed more frequently on calves, yearlings, and two-year-olds. The first symptoms of the mange is an itching of the neck and shoulders near the top. Gradually the disease

spreads over the back and down onto the brisket of the animal.

The other variety of mite that produces mange in cattle is the Symbiotes. It is merely a localized breaking out, generally on the depression on the back part of the croup of the animal. This variety is exceptional. The psoroptes live upon the surface of the skin, adhere to it and by means of their mouth organs produce an intense inflammation. The parasite is rather large and can almost be seen with the naked eye. It is oval shaped and has four pairs of legs. The females are larger than the males and lay from twenty to twenty-four eggs. From these emerge the larvae in about five days and these arrive at the stage of reproduction in from fourteen to seventeen days. On dry ground the eggs retain their vitality from two to four weeks. If in a dry place they lose their vitality in from four to six days. It has been estimated that one female can produce 1,500,000 individuals in ninety days.

Sheep are afflicted with the mites in the same manner as cattle. The mite on the sheep is of a different variety than that on cattle and is not so easily seen. Its damage to the sheep industry and to the wool crop is well known by every sheep raiser. Beginning on the top of the shoulders and over the hips it causes a scab to form in much the same manner as that on the cow. When the scab is rubbed it causes the sheep to lick its chops violently and grit its teeth. I have dipped sheep when the medicine upon penetrating the scab spot almost caused the sheep to go wild. The methods by which the Bureau of Animal Industry is eradicating these scabies is almost identical.

When the cattle quarantine was placed over certain sections of the country in which the disease was most prevalent, inspectors were given charge of these districts with orders to not allow any infected cattle to be shipped or trailed from an infected district to a non-infected one, without first being dipped in some recognized dip which was known to kill the scab. Laws were passed that prohibited the transportation companies from receiving any cattle not accompanied by a health certificate.

To abolish the scab on sheep the Bureau has hired the services of many inspectors, sent them into the field with orders to make a range inspection of all sheep. The sheep were classed as infected or exposed, nothing was classed as free. Then a general dipping ensued and all sheep classed as exposed were dipped once and infected sheep, twice. It can be readily seen why infected sheep were dipped twice at intervals of ten days, as it requires about this time for the larvae to develop. Since the mites may live for some time in old shaded places, it is advisable to burn or disinfect such places if near where the sheep are kept. The dips generally used are lime and sulphur and nicotine dips used in certain proportions are recognized by the Bureau. The medicine is furnished by the owner of the sheep or cattle and the Bureau furnishes the man (inspector) who superintends the dipping, and issues the certificates or bills of health, showing that the stock have been dipped and are freed of scab.

The Foot and Mouth disease the Bureau has kept entirely out of the country, or nearly so, by using very strenuous methods and destroying animals that showed infection. When it becomes

necessary to destroy such animals the department pays a recognized value for the animals.

For the prevention of black-leg the government has gone to a big expense by way of making vaccine remedies which have been dealt out free of charge over the country to any stock owner desiring them.

Thus it can be readily seen what a vast undertaking the Department of Agriculture has before it. In spite of the fact that they yearly spend millions of dollars to eradicate the diseases, the majority of stock raisers think an imposition is being placed upon them when it becomes necessary to comply with the regulations. Many of the stock men comply readily and seem to take an interest in the work of the Bureau whilst others do every thing in their power to discourage it. I have in actual experience known stockmen to cut out a few head of their stock that were infected, hiding them away and bring the remainder to the dipping vat so that the inspector finding no scab would turn their stock loose as free with but one dipping. Afterwards they mixed the stock again, and of course, the entire herd was again infected.

In conclusion I will say that although the undertaking is a vast one, yet with persistence and the right kind of men in the field, the end can be accomplished. A few years ago if a person even spoke of so vast a thing as our present day meat inspection system, he would be laughed at. Even that system can and will be improved upon. Therefore, who can tell what the future will develop in the line of disease extermination? It has been fully proven that tuberculosis can be contracted from the lower animals.

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I feel safe to predict that if once the American people learn these facts and see them in their true light, they will be very willing that congress vote a sufficient appropriation for the extermination of these diseases. The extermination of which means dollars and cents to the stock raiser if he can be forced to see it, and better health to the public at large.

