

FIRST ANNUAL REPORT

OF THE

State Veterinary Surgeon

OF THE

STATE OF IOWA,

FOR THE

YEAR ENDING JUNE 30, 1885.

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OFFICE OF THE STATE VETERINARY SURGEON, }
AMES, July 30, 1885. }

BUREN R. SHERMAN, *Governor of Iowa:*

Pursuant to Section 4, Chapter 189, Laws of the Twentieth General Assembly, I have the honor to submit my report for the year ending June 30, 1885.

M. STALKER,
State Veterinary Surgeon.

REPORT.

THIS report contains a synopsis of the work done by myself and deputies since my appointment to office, April 28th, 1884, together with a financial statement and brief descriptions of some of the more prevalent contagious diseases affecting domestic animals.

The extent to which demands have been made on this office far exceeds what I had expected. While no unusual epizootic diseases have prevailed during the past year, I have nevertheless found the calls to be greatly in excess of my ability to meet. Many of these calls have been made where nothing but the most trivial causes were found to exist. But it is not always an easy matter for local boards of health to determine where there is real cause for alarm, and I am of the opinion that these calls for service at the expense of the State, have in all cases been made in good faith.

In order to meet the increasing demands on the office, I have been compelled to ask for the appointment of two deputies, to assist me in this work. Commissions have been issued from your office to Dr. J. C. Milnes, of Cedar Rapids, and Dr. R. M. Nicholson, of Earley. Dr. Morse, of Des Moines, has also been appointed on special work of investigation in one or two instances. The services of these gentlemen have been of great value to me.

The creation of the office of State Veterinary Surgeon, and the appointment of deputies in different portions of the State, has opened up a new and fruitful enterprise to quacks and sharpers. In several instances unauthorized and totally unqualified men have represented themselves to farmers as acting under the authority of the State, and have done considerable mischief. A farmer in Crawford county was induced, on the representation of one of this class, to destroy a pair of valuable horses. It was claimed by the self-constituted officer, that all the horses on the farm were glandered, but all except the two in question would yield to treatment at ten dollars per head. I ex-

amined the remainder of the stock on the farm a few days later, and found a mild form of strangles prevailing. I would take this opportunity to warn farmers against the itinerant adventurers who are treating animals affected with contagious disease, and collecting pay for the same. None of them have any authority from the State.

The law is commending itself to the stock men of the State, and I am well assured that the live stock interest is being subserved by it in a most important way. Some dissatisfaction has existed, when from the pressure of business it has been impossible to visit promptly the localities where disease was said to exist. There have been a few cases of violent opposition when the State refused to pay for animals rendered worthless by reason of contagious disease. In the great majority of cases there has been a hearty compliance with the law, and a commendable disposition on the part of the people to aid in eradicating these contagious diseases.

Such rules and regulations as seemed necessary for the execution of the law, and for carrying out the intent of the executive proclamation establishing quarantine against States in which pleuro-pneumonia exists, have been adopted, with the approval of the State Board of Health and the Executive Council.

I would call your attention to the financial statement which follows, and suggest that the next General Assembly be asked to make a larger appropriation than that now provided by law for carrying on this work. Unless the work of the office should diminish, three thousand dollars per annum, the amount provided after the expiration of this year, will not meet the actual expense of conducting the examinations. In addition to the ordinary expense of conducting the office, the State is liable to be called on to pay for stock destroyed to prevent the spread of contagious disease. No such expenditure has as yet been made, for no stock has been destroyed, except such as was manifestly worthless from existing disease. A sum not less than five thousand dollars per annum should be provided, and an additional amount should be made available in case pleuro-pneumonia should be introduced into the State. I am of the opinion that the ordinary expense may be reduced somewhat during the coming year. I hope to have so far relieved the State from one or two of the most prevalent diseases before the end of another year as to materially lessen the number of calls. More than three-fourths of all the work done has been the inspection of animals having, or suspected of having,

GLANDERS.

The past year's investigations have developed the fact that this loathsome disease is alarmingly prevalent in many parts of the State. Three hundred and fifty cases of glanders and farcy have been found in the following counties: Adams, Audubon, Benton, Buena Vista, Black Hawk, Clay, Clarke, Calhoun, Clayton, Cherokee, Cerro Gordo, Chickasaw, Clinton, Crawford, Dallas, Delaware, Franklin, Harrison, Hancock, Hardin, Hamilton, Humboldt, Ida, Iowa, Jefferson, Jones, Kossuth, Lee, Linn, Lyon, Marshall, Mahaska, Monroe, Monona, Page, Pocahontas, Poweshiek, Plymouth, Sac, Sioux, Shelby, Tama, Union, Wayne, Webster, Winneshiek, Woodbury and Wright.

This does not include a large list of suspected cases that have been placed under quarantine. It will thus be seen that this insidious disease has gained a pretty firm foothold in the State, and that the annual loss from this source alone must aggregate no inconsiderable sum. There are many causes which contribute to the wide distribution of this disease. First, the period of incubation, or the time from exposure 'till the disease begins to develop, is quite variable. The poison frequently remains in the system for months, where there is no external evidence of the disease. Again, the early symptoms are so trivial in many horses of good constitution, especially where proper attention is given to sanitary conditions, that they are passed over with little or no thought. It is not an unusual occurrence for horses having the pure air and nutritious grass of the farm to be affected with this disease one or more years and show scarcely any evidence of debility. To one unaccustomed to dealing with the disease, these slight and seemingly unimportant evidences are anything but suggestive of the fatal ravages usually ascribed to glanders. But it must be borne in mind that the specific poison may be conveyed to healthy animals, from those suffering from this benign form. The discharge from the nasal passages, which is one of the characteristic signs, may be easily arrested for a time by the judicious use of astringents. If the animal has not become debilitated, it is an easy matter to palm off such a prepared subject as a sound horse. This fact is turned to account by unprincipled jockeys and professional traders, who procure these brutes for little or nothing, patch them up, send them off to other localities, and sell them at "a great bargain" to the uninitiated. I think I may say with perfect safety that in three-fourths of all the cases of glanders met with in my experience

during the past year, a *trade* was an important part of the history. These facts, together with the additional one, that horses are taken from their homes and traveled about the country more than any other class of live stock, watered at public troughs, and fed where hundreds of other horses have eaten, will furnish some explanation why the disease has become so wide-spread.

Glanders is fatal, with a uniformity scarcely known to any other disease. Though an animal may live for years with the poison in his system, yet the complication of some other disease, simple within itself, may develop a type of glanders so virulent as to run on to a fatal issue in a few days. Old age, exposure, starvation and over-work all tend to a rapid development of the disease.

There are widely different views entertained by educated men as to the cause of glanders. The weight of testimony brought out by writers on veterinary subjects, would seem to point to a spontaneous origin. That is to say, that protracted cases of debilitating disease may eventually develop into glanders, though the patient had not been exposed to glanders poison. For my own part, I have never seen a case that I thought could not be accounted for by other causes than spontaneity. In nearly every instance where these cases have come under my observation, I have been able to trace the cause to pre-existing cases, just as we trace the history of an outbreak of measles or small-pox. It is certain that contagion is the chief, if not the only, cause of glanders in this country. Man and animals of the equine species are the most susceptible subjects. Mules and donkeys are more subject to the acute type than horses; the disease not unfrequently proving fatal in three or four weeks. Equine animals contract the disease both by infection and inoculation, while man probably never contracts the disease except through the medium of inoculation.

There are two distinct and clearly recognizable types of the disease, namely: glanders and farcy. A typical case of glanders is readily diagnosed by the following symptoms: An adhesive discharge from one or both nostrils, small, pit-like ulcers on the membrane lining the nasal passages, which often run together, and give rise to raw surfaces of considerable extent. The membrane is of a dull lead color, with occasional yellow streaks. In advanced cases, the ulcers penetrate the cartilages and bones, and lead to extensive destruction of these tissues. There are hard nodular swellings between the lower jaws, not round and soft like those accompanying

distemper, but deep-seated, almost immovable, and having no tendency to form pus. But it is only an occasional case that shows all these symptoms in a typical way till the disease is far advanced. There are many other causes that so nearly duplicate these symptoms that it is impossible for any one but an expert to determine the difference. In fact, there are many cases that will defy the skill of the most experienced. Either the patient must be given sufficient time to definitely develop the disease, or another animal must be inoculated with some of the supposed virus, to test its activity. Diseased teeth, catarrh, the results of protracted cases of strangles, and many other causes, often produce symptoms bearing a close similarity to those I have just mentioned, and quite as alarming in general appearance.

Farcy is a mild form of the disease, which manifests itself by hard swellings on various parts of the body, varying in size from the bulk of a hazlenut to that of a walnut. These swellings are most likely to be seen on the inner side of the thighs, on the fore limbs near the body, and on the neck or rumps, but may appear on almost any part. These swellings have a tendency to form and discharge a thick pus, after which the swelling disappears, and only a slight scar remains. This condition may continue for years, with but slight alteration of general health. In time the disease is likely to attack the membranes lining the nasal cavities, or other parts of the air passages, and the animal dies from glanders.

It must be borne in mind that glanders and farcy originate from the same poison: in fact, that they are one and the same disease, simply showing different manifestations in different individuals. The virus from a case of farcy is quite as likely to produce a case of glanders as one of its own type, and *vice versa*. Mild cases of farcy, affecting animals of good constitution, will occasionally yield to treatment. But the danger is so great in proportion to the probabilities of benefit from treatment that I cannot recommend it. So soon as it can be definitely determined that a horse is affected with glanders or farcy, he should be destroyed and the carcass buried not less than four feet in the ground. The premises where such animals have been kept should be thoroughly disinfected before any other horse stock is placed upon them. It is not necessary to burn fences, and buildings having any value, but where those consist of a temporary straw sheds, or similar protections, this is the best method of disposing of

them. Wood-work or brick walls may be cleansed by scraping and then applying a thick coating of fresh lime whitewash. Thorough washing with a strong solution of concentrated lye, carbolic acid, or sulphate of copper, will also destroy the virus. The free application of boiling water is a cheap and convenient method of disinfection. Harness and other articles made from leather may be cleansed by immersion in oil as hot as the material will bear. All articles, as brushes, combs, blankets, etc., that have been used about a glandered patient, should be thoroughly cleansed, if they are to be afterward used on healthy animals. Wagon-tongues, neck-yokes, hitching-posts and all other objects with which the diseased animal has come in contact, should be similarly treated.

GLANDERS AFFECTING MAN.

The property interests alone involved, are quite sufficient to demand the strictest precaution against the spread of glanders. But there are other and stronger reasons why such precaution should be taken. The disease is communicable to man, and possesses for him the same fatality as for the horse. It is nearly always communicated to man, from the horse. This usually takes place from ignorance of the true nature of the disease, and consequent careless handling. Five authenticated cases of this kind occurred in the State during the past year, and I am of the opinion there were others, but have not entirely reliable proof of the fact. During the summer of 1884, I was called to inspect some stock in Crawford county, and obtained the following history: A poor German living about seventeen miles northwest from Denison, was engaged in breaking prairie. He owned two old horses, and made a purchase of a third one for a small sum, on account of the animal being diseased. The seller represented that the animal had contracted cold. In a few weeks the other horses with which he was put to work became similarly affected. One of these ran down rapidly, and died in a short time. The owner concluded to make a post mortem examination, with the expectation that he would make some discovery that would lead to successful treatment of the remaining two. Five days later the man was attacked with glanders, and died on the fifteenth day. I examined the horse that had been recently purchased, and the one with which he had been working, and found them both suffering from well marked glanders.

I recently examined some horses on a farm near Osceola, and found that glanders had existed on the farm for some time. The farmer and his wife had been handling and treating these horses for a long while. The wife became affected with an eruptive disease and died, a few days before my visit to the farm. I had an interview with the physician who attended the lady during her illness, and he informed me she died from glanders. A case has been reported in Pocahontas county, but I cannot vouch for its authenticity. These facts are of themselves quite sufficient to warn the public against the danger from careless handling of diseased animals. The popular belief that any one "who has been among stock all his life," is a competent judge of such matters is an erroneous one. The man who has been on the earth all his life, is not necessarily, in consequence of this fact, an authority on geology.

ANTHRAX.

This disease manifests itself under a variety of forms, and all species of domestic animals are liable to be affected. In this State, cattle are by far the most frequent sufferers. Other animals rarely suffer, except when they have eaten from the carcass of an anthrax subject, or been inoculated with the virus. Young and rapidly thriving animals are the individuals most likely to be attacked. The disease as a rule proves rapidly fatal, but only in rare instances extends to any considerable number of a large herd. The form of the disease most frequently seen in this State, is that which is known as black leg, or black warts. Most cattle men have had more or less experience with the disease. There are many remedies that have gained local, or more extended popularity, from the belief that they possessed unfailing virtues in the treatment of this disease. None of these would probably stand the test of a careful experiment. For the past few years most painstaking experimentation has been in progress in France, conducted with a view to discovering methods by which inoculation could be employed as a protective measure. The most complete success seems to have rewarded this research. In this country domestic animals are now protected against anthrax, by inoculation, with more positive results than human beings are protected against small-pox by a similar process.

There were a number of herds in the State affected during the past year, and no extensive losses occurred. I append a brief report of

one outbreak, which I gave to the local papers at the time of its occurrence. This will serve as an illustration of what occurred in probably a dozen localities, besides a number of instances in which a few individual animals were affected in a single form:

HONEY CREEK CATTLE DISEASE.

In August, 1884, the newspapers of the State contained more or less sensational articles concerning a fatal disease prevailing among the cattle in Honey Creek township, Iowa county. My duties in other portions of the State prevented me from giving personal attention to the matter until the 29th. On a visit to the farms where the disease prevailed, I ascertained that about twenty fatal cases had occurred. The disease was confined to five farms, situated along the valley of Honey creek, a small stream tributary to the Iowa river. Out of twenty-one well marked cases there was but one recovery. In a number of instances animals were found dead, that were apparently in good health a few hours previous. Twenty-four hours is probably the longest duration of any case after well marked symptoms were developed. In one instance the skin was removed from the carcass, and hogs were allowed to eat the flesh. Out of a herd of forty swine that got more or less of the carcass, twenty-eight died in a short time, and others were affected with swelling, and eruptions about the ears and other parts of the body. The man who removed the skin from the carcass received a slight scratch on the thumb, which was followed by moist gangrene and loss of flesh from a large part of the organ. All the other carcasses were buried without the skin being removed. The disease is a form of anthrax, known as splenic apoplexy. The highly fatal nature of the disease is sufficiently proven in the history of the cases given. Treatment after well marked symptoms are developed is not likely to be followed by satisfactory results.

By proper care and attention much may be done to prevent the spread of the disease and to mitigate its virulence. All healthy animals should be removed to pastures where there has been no disease, and if possible to high ground. It is not necessary that the grass should be very abundant, but it should be, as far as possible, free from the succulent, sour vegetation of damp, cold land. It is highly important that a full supply of pure water should be furnished. Give salt daily, and add to this for each animal one half ounce hyposul-

phite of soda, and one drachm chlorate of potash. If any animal is observed when first attacked, give one and one half pounds epsom salts; this should be followed by one drachm nitro-muriatic acid, and add twenty grains of quinine every two hours, till the symptoms change. Moderately active exercise is believed to be followed by beneficial results. There are those who believe that chasing the diseased animal will produce a cure in a large majority of instances. I do not speak on this point from either experience or observation, but give the opinion of some very successful farmers.

Carcasses should be deeply buried, or what is better, burned, together with all blood, excrement and litter where the animal has lain. The skins should never be removed, as they are likely to communicate the disease by shipment. Care should be taken by attendants to prevent the introduction of the virus into sores or abrasions, through blood or any of the secretions. Such inoculation is likely to be followed by very serious results. Careful attention to these precautions will soon arrest the progress of the disease, but neglect may work serious loss to the cattle interests of the neighborhood.

TEXAS FEVER.

Texas or splenic fever is a specific, febrile disease, affecting, in the Northern States, cattle only, so far as I am able to learn.

It exists in a latent form in nearly all cattle reared in the low, malarial regions in the extreme southern portion of the United States. Though affecting but slightly, if at all, the growth and general health of these animals, they readily communicate the disease in a highly fatal form to northern cattle when placed at pasture with them.

CONTAGION.

The reproductive elements of the disease seem to be contained in the bowels and kidney discharges.

Northern cattle can stand in the same stable or travel in the same car with Cherokee or Texas cattle, without appreciable danger. But when allowed to graze on pastures where these Southern cattle have been feeding or have been driven over, they readily contract the disease. Low temperature readily destroys the germs. So that after one or two hard frosts, infected pastures are rendered safe for the admission of healthy stock. After Southern cattle have remained north during the winter months, they are rendered innoxious. The

virus apparently loses its vitality with a single transmission, for Northern animals that have contracted the disease in ever so virulent a form will not in turn transmit it to others. The period of incubation varies greatly in different cases. Fifty-two days is the average time in the outbreaks I have investigated. Cases are recorded in which the disease has developed in two weeks or less from the time of exposure.

SYMPTOMS.

Marked elevation of temperature, reaching in one case I examined 107.5, pulsations from 100 to 135, respiration 80 to 100, dullness and stupor; the animal isolating himself from the rest of the herd, and standing with his back arched as if suffering from cold. In the early stages the surface of the body and horns is cold. This symptom alternates with rushes of fever. Ears pendant, and the nose resting almost on the ground. Slight cough accompanied with some frothy discharge from the nose, difficult locomotion, accompanied in some instances with partial paralysis of the posterior limbs, involuntary twitchings of the muscles over the shoulders and hind-quarters, constipation, bowel and kidney dejections tinged with blood. On the thin portions of the skin, drops of blood exude and become hard and firmly adherent. The hair looks dry and unhealthy, and there is pain or pressure over the region of the heart, and in some cases over the loins. The eyes are intolerant of light, become milky in color, and in some instances total blindness ensues. In some cases death is preceded by profound coma, or stupor, in others the animal becomes frenzied and rushes frantically about. In nearly all cases there is depraved appetite, the animal showing strong inclination to eat dirt, small stones and refuse matter. The average duration of the disease is three or four days. In a few instances animals die in an hour or two after they are known to be sick. Others live six or seven days after the attack. In the cases that recover, the aggravated symptoms begin to disappear in the course of four or five days, and the animals gradually regain health.

POST-MORTEM APPEARANCES.

In a few moments after death the carcass becomes firmly rigid. If the animal be destroyed by cutting the large vessels of the neck, there is a free discharge of watery-like blood from both veins and arteries. The pale, watery condition of the blood is one of the most

noticeable pathological conditions. There is usually a little swelling of the tissues in the inter-maxillary space, and occasional little vesicles filled with blood, immediately beneath the skin. With the exception of these slight alterations, the carcass when the skin is removed presents the appearance of a healthy beef. The spleen is enormously enlarged; the weight varying from five to five and one-half pounds when the normal weight would not exceed two. Its tissues are engorged with dark colored blood, and the whole organ appears to be undergoing decomposition. The liver is about double its normal weight, in one case I examined, weighing twenty-six pounds. Its tissues are reddish in color, with a tinge of yellow. The bile sack is enormously distended with a black mass, of the consistency of thin mortar, and the bladder contains six or seven pounds of wine colored liquid. The fourth stomach and the entire intestinal track are the seat of occasional congested spots, and erosions of the mucous membrane. Considerable quantities of watery infiltration are found in the brain cavity, and the brain substance is congested and much darkened in color. The surface of the heart, both external and internal, shows dark congested spots, and smaller discolored specks, are occasionally seen on the peritoneum and especially that portion investing the uterus.

One of the most fatal outbreaks I have ever seen, occurred at Le Mars last summer. Several car-loads of cattle were shipped from Mississippi to that point, and placed on the range for a few days, after which a portion of the cattle were shipped and the remainder driven to Dakota. About eighty cows owned in the town were taken during the day to graze on the Floyd river bottom near by. The Mississippi herd was turned on this range for four days before being forwarded to Dakota. Fifty-two days later the town cows were attacked with a highly fatal form of disease. I was telegraphed to make examination. I found splenic fever in its worst form. I afterward got the foregoing history of the Southern cattle. I believe the entire herd of cows died with the exception of one or two individuals. A large number of native cattle died along the line of march from Le Mars to the Dakota line. The loss was particularly heavy where the Southern cattle were herded for some hours on the range occupied by Northern cattle.

PRECAUTION.

But little good can be accomplished by treating the sick animals but very much can be done to prevent the spread of the disease if proper precaution be had. In every instance all native cattle should be removed from pastures where the infected herds have ranged, and should be kept off until frost. All cattle capable of communicating the disease should be quarantined at once, on the land they have been occupying, until the frosts of winter render them harmless to native stock. We have a law that is adequate for the protection of the cattle interests of the State against this disease, if the necessary information is given in time.

ENZOOTIC OPHTHALMIA.

This is a disease affecting the eyes of cattle. When it makes its appearance in a herd, a large proportion of the individuals suffer. Of the worst two outbreaks in the State during the past year, one was in Marion, the other in Clinton county. The symptoms are eloudiness of the eye, intolerance of light, constant weeping, and frequently more or less general constitutional disturbance. A tumor-like swelling often protrudes from the front part of the eye, causing temporary and sometimes permanent blindness. The disease rapidly spreads from one animal to another, until in some instances nearly every individual in the herd may be seen making an effort to protect the eyes in some shady spot, or groping their way about the fields. In the course of a week or ten days from the attack, all but the more severe cases will have made recovery, usually without injured vision. If the attack is a severe one the animal should receive treatment. This consists in placing him in a dark stable and keeping the eyes constantly fomented. A mild astringent wash should be used when the eye is badly affected. A drachm each of sulphate of zinc and carbolic acid in one quart of water, will form a suitable wash. The eyes should be bathed with this as often as possible. The disease is contagious and precaution should be taken to prevent its spreading to other herds.

CROTALISM.

I have invented the above term to designate a disease or a condition which I have found quite prevalent in certain parts of the State, and which, to me at least, is a new or unrecorded one. In the early

part of July last repeated calls began to be made on my office through letters from various localities between Council Bluffs and Sioux City, for information concerning a highly fatal form of disease prevailing among the horses. These letters came from towns in Iowa, Nebraska and Dakota, but in every instance from locations in the Missouri valley. I went out in answer to these calls and soon learned that the situation was one of sufficient gravity to justify alarm. After visiting a number of towns along the line of the Sioux City & Pacific railway, and making long excursions into the country, I gathered sufficient history to justify the estimate of fatal cases at several hundred.

The disease has been known in this region for three or four years, but had not until the present summer prevailed to such an extent as to attract public attention. But now the loss in horse stock on some farms was not to be counted by hundreds, but by thousands of dollars. The disease proved to be one that had not hitherto come within the range of my experience, nor had I information of anything exactly identical with it. I spent several days among the farmers on the Iowa side of the Missouri river, taking careful notes of the symptoms, and gathering the history of the progress of the disease. On some farms I found almost all the horses affected, and on others but a few individuals. Deaths were an almost daily occurrence, and the farmer who owned a large stock of horses did not know to day whether he would have teams for his farm work a week later. The disease in most cases is very slow in its progress, but proving almost uniformly fatal after a number of weeks or months. There is a general decline of bodily vigor throughout this period, and the only abnormal symptom in many cases is that of marked emaciation and consequent weakness. Horses that have been kept at pasture through the summer, without work, and where the grass grew in the greatest abundance, were so thin in flesh that they walked with the greatest difficulty. A critical examination of many of these patients revealed nothing more than the conditions resulting from starvation. This was not uniformly the case. In a number of instances there was marked coma or stupor, the animal often falling asleep while eating. In some instances the animals would remain standing for a whole week, sleeping much of the time, with head resting against some object. In a few instances the animals lost consciousness, and broke through fences and other obstructions. A number of diseased ani-

mals were placed at my disposal, and assisted by Dr. Fairchild and Dr. Milnes made post mortem examinations of five subjects with the most perfect uniformity as to the lesions presented. In every instance there was marked hæmorrhagic effusions into the fourth ventricle, the liver and spleen were abnormally dense, the walls of the intestines were almost destitute of blood, and the stomach enormously distended with undigested food. The stomach with its contents in some cases weighed as much as seventy pounds. These post mortem conditions, together with the clinical symptoms led me to believe that the animals were obtaining some poisonous principle with their food. The symptoms in some cases bore such a resemblance to those produced by eating *Astragalus Mollississimus* or loco plant of the western plains, as to direct my investigations to that family of plants. A careful examination of the meadow and pasture lands was not rewarded by the discovery of a single loco plant.

It took but little investigation, however, to find a closely related plant growing in great abundance, both in the meadows and pastures. This was the *Crotalaria Sagettalis*, or rattle-box. This is also known as the wild pea, and is accounted by many farmers as the best of forage plants. Knowing the bad reputation of some of its near relatives, I determined to make some experimental tests with the plant. I employed a boy to collect about thirty pounds of the green plants, which I brought with me on my return to the college. I procured a strong young horse, affected with incurable catarrh, and attempted to induce him to eat the plant. This he persistently refused to do, though I sharpened his appetite by a protracted fast. It is a matter of common observation that animals eat it with the greatest relish in localities where it grows. Failing to induce the animal to take the plant voluntarily, I prepared a strong infusion, and by means of the stomach pump gave the preparation obtained from about ten pounds of the plant. In twenty minutes stupor began to ensue, the eyes were closed, the head was rested against the side of the box, the breathing became stertorous, and all the symptoms developed that were to be seen in the patients previously examined. At the end of six hours the stupor began to disappear, the eye began to regain its brightness and in another hour the horse began to eat. The following day, when he had apparently recovered from its effects, he was given half the quantity of the drug as on the previous day. In this instance the symptoms were developed much more rapidly, the animal becoming unconscious in a short time and died in an hour and a

half. The post-mortem revealed the same condition of the brain as in the case examined in the western part of the State. I now resolved to make a second experiment, in which the animal should receive a small quantity for a number of days in succession. Having procured another subject for experimentation, and a bushel of the mature fruit or pods of the plant, I commenced on September 5th to give daily the infusion obtained from about one quart of the pods. On the fifth day of the experiment the characteristic stupor came on. The animal rested its head against the box and slept while standing. The symptoms grew more marked till the thirteenth day of the experiment, when the animal died. The post-mortem showed the same as in the other cases. These experiments leave no doubt in my mind that the trouble along the Missouri river is occasioned by the animals feeding on this little plant. It is from eight inches to a foot in height, with branching stems, bearing yellow flowers in July, and developing large pods resembling the pea, but containing a number of black, hard seeds. It grows on sandy bottom land, and is very abundant in the meadows and pastures in portions of the Missouri bottom. It is seldom seen among the tame meadow grass in any considerable amount. It thrives best among the wild grasses. Animals, doubtless, eat it much more than formerly, when the wild pasturage was better than at present. Cattle sometimes, though not often, suffer in the same way as horses.

The first question the farmer is likely to ask, is: "What shall we do?" You cannot rely on drugs to cure the disease. You must prevent its appearance. Feed wild hay free from the poisonous plant, tame hay, corn fodder, sheaf oats, straw—anything but the rattle-box. Plow up the land and put it in tame grass. The wild rye, which is taking much of the bottom land, is aggravating the disorder brought on by the rattle-box. By proper cultivation you will get rid of both at once. Animals placed on good green pasture, or supplied with other nutritive food free from the poison, will doubtless make slow recovery. Two ounces of Epsom salts, with two drachms of sulphate of iron and one drachm of nux vomica, daily, will tend to restore the tone of the system and promote digestion.

The following is a description of the plant, together with a cut prepared by Prof. Bessey, now Professor of Botany in the University of Nebraska:

THE RATTLE-BOX.

(Crotalaria sagittalis Linn.)

This plant is also known as the Rattlepod, and it has been named in some parts of the country Wild Pea, a name which should not be persisted in as it is in no sense a Pea. The name I have used—Rattle-box—is to be preferred, and should be used whenever the plant is referred to.

It has recently come into notoriety in Western Iowa as the cause of a fatal disease among horses, and to which the name of Crotalism has been applied by my colleague, Dr. M. Stalker, the State Veterinarian. On this account I have deemed it to be of sufficient importance to merit a special popular description, so that it may be readily recognized by every one. The accompanying figure drawn directly from fresh specimens will aid still further in its identification.

The plant is an annual, growing each year from the seed and not living over winter. When full grown it is from a foot to a foot and a half in height, and is repeatedly branched. It is at first leafy from the ground up, but later its lower leaves wither and die, leaving the lower part of the stem naked.

Its root is simple, running down and gradually tapering as a sort of small tap-root, as shown in the accompanying figure. The root sends out numerous side rootlets, but these never attain so great a size as to obscure the main root itself.

The stem as mentioned above, is branched and is covered with whitish hairs. It is round, or roundish throughout, but here and there it has broad wings attached to it; these are narrow below and gradually broader above, as shown at *st* in the figure.

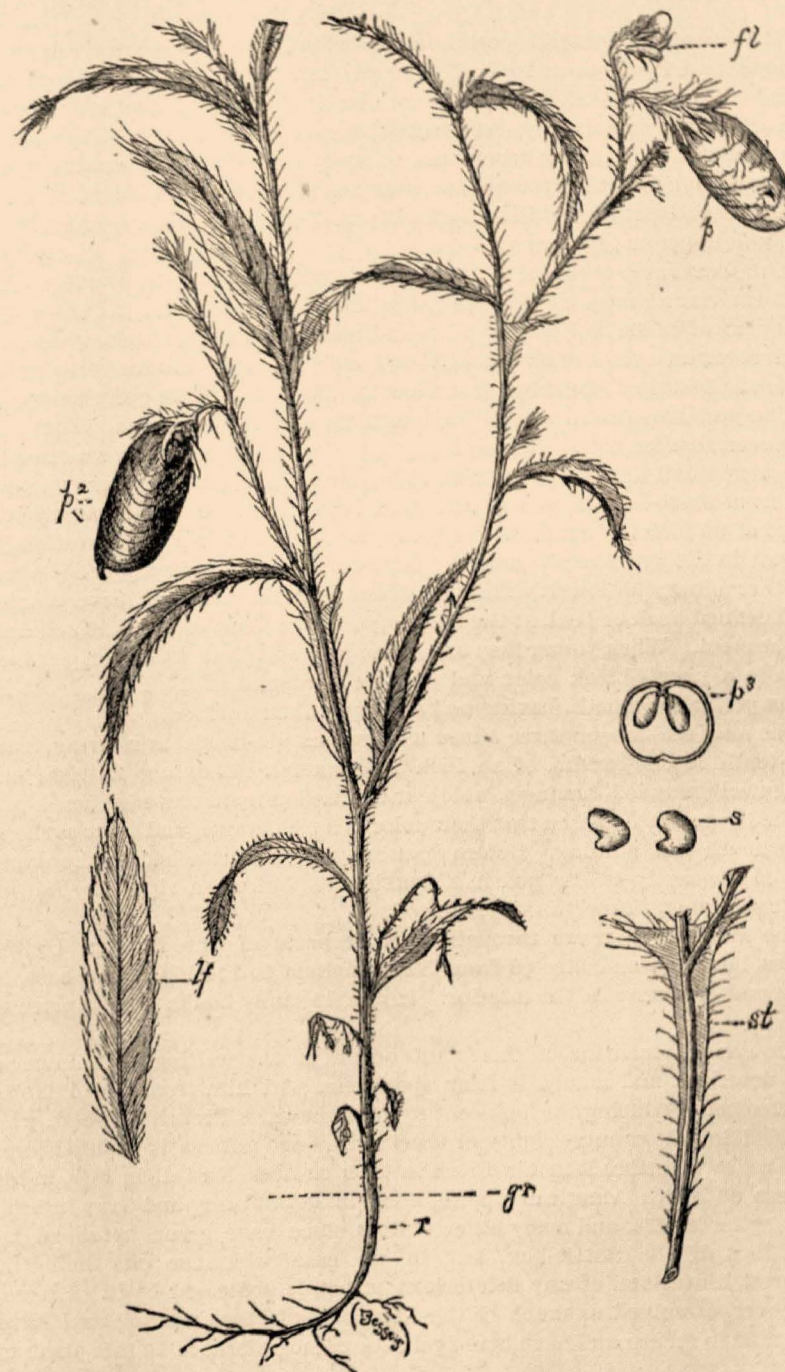


FIG. 1. THE RATTLE-BOX (*Crotalaria sagittalis* Linn) a little less than natural size; showing at *r*, the root; at *gr*, the ground line; at *fl*, a flower; at *p*, a young pod; at *p2*, an old pod; at *p3*, a pod cut across to show the seed; at *s*, two seeds about twice the natural size; at *st*, a portion of the stem showing the wings; at *lf*, a leaf, natural size. (From drawings by the author.)

The leaves in the middle portion of the plant, where they are the best developed, are from one and a half to nearly two inches long, and about one-third of an inch broad. They taper gradually toward each end so that their general shape is narrowly oval, with the ends quite pointed. They have a distinct midrib running from base to apex, and numerous small veins or ribs running from this toward the margin. The edge of the leaf is entire or but slightly wavy, and is fringed with whitish hairs, which are also found on both upper and under surfaces.

The flowers are small, being about one-fourth of an inch in diameter, and in form bear a pretty close resemblance to those of the common garden pea. They are of a decided yellow color, and usually several of them grow near each other on a slender branch of the plant. The little leaves forming the base of the flower (the calyx) as well as the flower stalks are quite hairy.

The pods also bear a resemblance to those of the garden pea. They are, however, smaller, although they are proportionately large when we consider the very small flowers from which they are developed. Full grown pods are from three-fourths of an inch to an inch in length and are about one-third of an inch in diameter. They are nearly round in a cross section (as shown in the figure at p3), having a little crease along the upper side, and another along the lower. They are blunt at both ends, and have a small well defined hook or beak at the end opposite the point of their attachment to the stem. When young they are green and soft, but as they ripen they turn to a purple-black color and become hard and stiff. They are at all times perfectly smooth, having no hairs upon their surface.

The seeds are two or three times as large as pin-heads, measuring from one-tenth to one-twelfth of an inch in diameter. They are flattish, and irregularly rounded, having a notch or depression upon one edge (as shown in the figure at s). When ripe their color is a rich brown, and their surfaces are smooth and shining. Before ripening they are attached to the upper side of the cavity of the pod in a double row, but when ripe they fall off and rattle about loosely in the stiff pod.

The Rattle-box grows throughout most parts of the Eastern United States, having been collected from New England to Florida on the east, to Iowa and Arkansas in the interior. It prefers sandy banks for its place of growth.

The earliest mention of this plant occurs in the writings of Linnaeus, who described and named it from specimens sent him from the Atlantic coast sometime during the last century. Michaux, a French botanist, who traveled in this country eighty or ninety years ago notices it in his Flora. Pursh also describes it in his Flora in 1813; so does Nuttall in 1818, in his Genera of North American plants, Beck in 1833, Torrey and Gray in 1840, Darlington in 1853, and many other writers since have given botanical descriptions of the Rattle-box, but in no case whatever was there the slightest hint given of any deleterious principle possessed by it. I have, moreover, examined as much of the literature of "loco plants" as I have been able to secure and have here again found no reference to this plant as

a source of any of the "loco" trouble. It may then be taken as certain that the Rattle-box has hitherto escaped suspicion.

A NEW ENZOOTIC.

The following report contains the history of a peculiar cattle disease, which, so far as I can learn, has been seen nowhere, except in the locality mentioned. Since the report was written I have learned through Mr. Samson, of Storm Lake, that the same conditions probably prevail in the water of that lake. There is no satisfactory proof that animals have been affected by drinking the water, but I have no doubt from Mr. Samson's descriptions, but the same vegetable growth is to be found in the waters of Storm Lake.

THE WATERVILLE (MINER) CATTLE DISEASE.

PROF. PORTER, *Prof. of Agriculture, University of Minnesota:*

MY DEAR SIR—I have the honor to make the following report on the cattle disease, that has prevailed along the border of lakes Sakakia and Tetonka in Leuseur county, Minn., for the past three years. The latter part of June, 1884, I was asked to come to Waterville, to assist in making some experiments, which might lead to the discovery of the cause, and prevention of the disease. I arrived at Waterville on July 1st, and proceeded to the work of investigation. The history of this enzootic, is as follows: The past three years a highly fatal form of disease has made its appearance among the domestic animals along the shores of these lakes. The greatest loss has been in cattle, but swine and horses are not exempt. The greater loss among cattle is probably due to the fact that they are kept under circumstances that expose them more to the poisonous agent, whatever this may be. The disease first made its appearance in June, 1882, and has reappeared about this time or a little later in the season, of each year since. Coincident with the loss of live stock, a peculiar vegetable growth makes its appearance in the waters of these lakes, and the testimony goes to show that only those animals which obtain water from the lake at this season, are affected with the disease. This plant is the *Limnatics minutula*, of which mention has frequently been made under the head of *Nostoc*. Prof. Arthur, of Geneva, N. Y., has been employed on the investigation of this plant for the past two years. The plant is the one to which you drew public attention a year or two since. The professor is still engaged in his investigation, and it is hoped he will in time be able to throw some important light on this, as yet, obscure question. I leave the scientific discussion of the vegetable growth to the professor, and will only give such a description of it as will render the allusions to it intelligible. This plant is a low form of *algae* or sea weed. It is spherical in form, of a green color, and about the size of a pinhead. It is first seen in the early part of June, rising from the shallow

portion of the lake, where there is much vegetation, and is freely suspended in the water in sufficient quantities to make it turbid. Later in the season these little green masses pass through various changes of color, begin to undergo decomposition and float on the surface in a thick scum. In this condition they will drift to the shore against which the wind is blowing, and sometimes accumulate to the depth of an inch near the shore or in the protected portions of the lakes. The decomposition of the plant is always attended with a most sickening odor, which pervades the atmosphere about the lakes. The date of the appearance of the plant in the water, and the subsequent decomposition, are subject to variations in different years. The lake usually begins to emit the odor in the early part of July. The loss of stock ordinarily occurs some days earlier. The testimony of all farmers who have lost stock is to the effect that,

1st. There have been no losses except among animals obtaining water from the lakes.

2d. In every instance where deaths have occurred, the wind had for some days previous blowed shoreward where the animals drank, and carried the plants to the margin of the lakes in large quantities.

3d. No losses have occurred after the odor from the lakes became offensive. These statements seem to be concurred in by all who have made observations on the subject. The course of the disease is rapidly fatal as may be illustrated from the history of Mr. Bullis' cattle. Mr. Bullis is a farmer living on the north shore of Lake Tetonka, about a mile and a half from the town of Waterville. On the 25th of June, 1882, Mr. Bullis found four of his calves and one cow dead. This was at 2 o'clock in the afternoon. The cattle were seen at noon and known to be all right. At sometime between these two hours they had been to the lake side and taken water. They were all found within a few rods of the shore. There was at this time large quantities of the *Limnactis*, in the water of the lakes. On the fifth of July of the same year seven more cattle and two hogs died at the Bullis farm. The cattle had not been getting water at the lake for some time, but this morning they got access to it about 8 o'clock. By half past nine they were dead. In addition to these, twenty hogs and a number of cattle were affected, but finally recovered. Mr. Bullis' family physician made post-mortem examination of some of these cattle. There was no peculiar pathological changes noticeable except in the first stomach, or rumen. In this organ the line reached by the water was clearly defined. From all that portion of the stomach with which the water came in contact, the mucus membrane was sloughing off as if it had been scalded. These statements were obtained from an interview with the physician. During the summer of 1883 a company of men employed in the construction of a railroad were encamped on the shore of Sakatah. One evening very soon after the horses had been watered, a number of them were taken violently ill. The fact was soon discovered that all the sick horses had received their water from the lake, while none of the animals watered at a brook a short distance from where it flowed into the lake were affected.

During the summer of 1884 Mr. Kerrick kept nineteen cattle in a pasture

bordering on the south shore of Lake Tetonka. On the morning of June 10th eight of these were found dead close to the lake shore. These had probably been dead a day or two from the appearance of the carcasses. In these last two instances the condition of the lake was the same as when Mr. Bullis' cattle died. These, with a number of similar instances which have occurred during the last three summers, make the case a rather strong one against the *Limnactis*, though additional experimental proof is needed to demonstrate the fact that the presence of the plant and the death of the animal stand in the relation of cause and effect.

On July 1st I commenced to collect the foregoing history, and preparing for some experimental work by means of which I hoped to gain some confirmatory proof. A horse and a calf were placed at my disposal. These I proposed to furnish with a water supply charged with the suspected vegetation. I procured a large quantity of the plant by dipping and skimming from portions of the lake where it existed in the largest quantities. After keeping the animals from water for twelve hours, and until they were quite thirsty, I gave them all they would drink of this water. There was such an amount of the slimy plant present that it gave to the water the consistency of linseed oil. Though the horse drank between three and four gallons, and the calf an amount in proportion to its size, not the slightest symptom of disease was produced. These animals were again prepared, and a second experiment tried the next day, which proved equally barren of results. I became convinced there was nothing poisonous in the plant during the stage at which I found it, whatever may be true of it at other seasons. The farmers about the lakes, however, all united in the opinion before the trial was made that it was now too late in the season. That as the "lake had begun to smell" animals could drink the water with impunity. Thus the experiment proved valueless so far as positive results are concerned. So far as I am able to learn, no animals have died in the vicinity of the lakes since these experiments were made. The fact that cattle having free access to the lakes are not attacked after this season of the year, does not disprove the existence of toxic properties in the earlier stages of growth.

Again it may be found that the appearance of this little plant is but a coincident, and has nothing whatever to do with the real cause of the disease, which may have been overlooked in the presence of what at first appeared the obvious explanation. I had no opportunity to make post mortem examination, or of seeing any animal affected with the disease; but according to the best history I could obtain the sudden death preceded by profound coma, and the peculiar lesions of the stomach would not seem to furnish a parallel to any specific form of disease known to veterinary science.

During the month of July I found the *Limnactis* in the water of West Okoboji lake, Dickinson county, Iowa. It existed in limited quantities as compared with what I found in Sakatah and Tetonka. I have not been able to find it in the waters of any of the other Iowa lakes. Nor have I been able to learn of the loss of any stock under conditions similar to those affecting the Minnesota cattle.

I hope to be able during the present summer to make additional observation and experiments on this subject.

ERGOTISM.

The public has heard so much of this for the last year and a half, that any further mention of the subject would seem to be superfluous. Most of this discussion grew out of the diseased condition of a few herds of cattle in southern Kansas during the early spring of 1884. As the real nature of the disease was still in dispute at the time of my appointment to the office of State Veterinary Surgeon, a brief allusion to it may not be out of place. The latter part of December, 1883, and the early part of January, 1884, a disease made its appearance among the cattle on a few farms in the vicinity of Neosho Falls and other portions of Kansas. The disease occasioned general alarm, and finally the attention of the general government was called to the subject. Experts in the employ of the U. S. Government were sent to Kansas to make investigations. The affection was pronounced contagious aphtha, or foot and mouth disease. When this opinion was given to the public a state of general alarm prevailed, and the newspapers for a time were flooded with literature on this subject. At your suggestion the General Assembly, which was at that time in session, passed a joint resolution, instructing me to go to Kansas and investigate the disease for the benefit of the live stock interest of our State. I did so, and developed the fact that the disease was not contagious aphtha, but was due solely to a local cause. The cattle had been fed on hay that contained an unusual amount of ergot. The disorder manifested itself almost uniformly by its effects on the hind feet of the animals. In some instances this consisted of a slight sloughing, but in many cases the entire loss of one or both hind feet was the result. The limb would be circumscribed at any joint below the hock joint by an indented ring. Below this ring the tissues became dead. A huge fissure or crack would define the limit between the dead and the living parts, and finally the limb would drop off at this joint. Amputation was thus performed without loss of blood, and frequently with but slight formation of pus. This is called dry gangrene of the extremities, and is explained by the peculiar effects of the ergot poison.

The protracted use of ergot has the effect of lowering the powers of circulation. This goes on to the extent of entirely arresting cir-

ulation in certain parts of the body. This will always occur, first in the extremity where circulation is carried on with the least force. The parts in which circulation is arrested will very soon die, and the peculiar sloughing is the result. The hind feet, and less frequently the front feet and the tip of the tail are the parts that usually suffer in this way. There are all degrees of severity, from a slight abrasion of the skin to the loss of a toe or the entire foot. I had seen the effects of ergot in our own State before going to Kansas, and have seen a number of cases since. I had no difficulty in tracing this outbreak to its true cause. This theory of the case was received with a great deal of skepticism by the owners of stock, and especially by the experts making the first investigation. The stock men of our own State were fearful for some time that this easy explanation would not be found to hold good. I do not know that any one now attempts to deny the correctness of this view. I have seen the disease die, and voluntarily, under change of diet often enough to clearly demonstrate the fact that there is no element of contagion in it.

The remedy would suggest itself. Discontinue the use of hay that contains ergot, and give strong nourishing diet. On one farm where I found the worst samples of ergotized hay I saw in Kansas, a liberal supply of corn had also been given. This so modified the depressing effects of the ergot that the cases were but few, and trivial in comparison with those seen in similar herds where hay alone was fed.

The following report of Convulsive Ergotism is furnished by J. C. Milnes:

CONVULSIVE ERGOTISM.

BY J. C. MILNES.

On October 8, 1884, I received a telegram from the mayor of Marengo to visit his city at once. Arriving there I was directed to go to the livery barn of Talbest, Carson & Borues, where it was said a violent and unknown disease had made its appearance.

Upon reaching the premises and making inquiry I was informed that the stock had been taken violently ill, and that they feared some one had administered poison. In fact the stomach of a young colt already dead was thought to show the action of some irritant poison. A portion of this stomach was sent to Iowa City for analysis, while the remaining portion had been carefully preserved and was then to be seen at the drug store.

I at once repaired to the store to inspect the specimen, but found it in a healthy condition, the supposition having arisen that the villous portion of the organ had been greatly subject to the action of some poison, owing to

the fact that it was so unlike the lining membrane of the left sac of the stomach. Finding no indication of poison in this specimen I made inquiry as to the history of the outbreak, which was given nearly as follows:

HISTORY.

Nine head in all had been afflicted. At this time one of the number, a weanling colt was dead, having been sick about seven days. Of the remainder two of them had been stabled here only three days before they were taken sick like the others, and no trouble of any kind existed among the horses in the stable at Iowa City where the two above mentioned belonged. On examination I found symptoms as follows:

No. 1. A heavy brown horse; temperature 101.4, pulse 26; in good condition; refused all feed; frothing at mouth and biting sides constantly; with the head highly elevated at times and the pupil widely dilated; breathing heavily; bowels constipated, etc.

No. 2. Gray mare; turns persistently to the left when placed in box stall; will not be permitted to be otherwise placed or moved in the opposite direction. Pulse 33; temperature 100.4; respiration 7, full and heavy; urine milky and pupils dilated; bowels regular.

No. 3. Black horse; very irritable and easily excited; temperature 100.8; pulse 28; respiration 6; persistently turns to the left when loose in box stall. This horse is one of the team brought in from Iowa City, its mate having been taken sick also but was at this time about recovered.

All the others, five in number, were at this time convalescing. The colt that died was sick three days and showed all the symptoms given in the three cases above cited, but in much more aggravated form.

As it at once became evident that some exciting cause existed, I turned my attention to a critical examination of the feed used. The animals had been fed upon oats and shelled corn mixed, and a close examination failed to reveal anything in it that could be in any way hurtful. On examining the hay a different state of affairs was revealed. The hay consisted of several coarse grasses and weeds, on some of which were found ergotized grain of the seeds, and the stalks were quite thickly studded in many instances with a thick yellow fungoid growth resembling a fine meal in powder. On inquiry I learned that a good article of hay had been fed up to a few days before the outbreak occurred, but this being all consumed a stack of hay cut from a wet marshy spot, a piece of ground that had not been mowed for three years, had been purchased, and a portion of it hauled in and fed. I at once suggested the propriety of condemning the entire stack and the purchasing of pure upland timothy. The stock slowly recovered without loss of any except the weanling colt as above stated. I attribute the recovery to the fact that as soon as the severe symptoms were apparent the animals refused food altogether, and when convalescing ate only a little grain up to the time the ergotized hay was removed. In two cases the animals were so dangerous to the attendants as to make it exceedingly unsafe for any one to approach them.

The following is a description of the ergot plant prepared by Prof. Bessey, which should be read by every farmer:

THE ERGOT.

(*Claviceps purpurea* Tul.)

There are few farmers who have not noticed the large black grains or spurs which sometimes appear in the heads of rye, taking the place of the proper rye grain. The accompanying figure represents such an affected rye head, there being two of these black grains present. Very often there are half a dozen or more, some being smaller than those shown, while I have often found them nearly twice as large. Observation has shown that stray clumps of rye which have sprung up from seed accidentally scattered by the roadside or in neglected places are much more subject to this trouble than the rye in the field. Why this is so I cannot now explain.

These black grains have been known for a long time by the name of ergot, and, moreover, it has been for many years well known to be due to a parasitic fungus.

Ergot contains a poison, which has a powerful action on the animal body, and on that account it has been made use of in medicine. The medical books contain full descriptions of these actions, and I need not repeat them here; it will be sufficient to say that one of its actions is such as to produce abortion in pregnant animals, while another is of such a nature as to produce gangrenous sores upon the body, especially upon the extremities. This last result has been called *Ergotism*, and in one instance at least (in Kansas late last winter) it was so prevalent and so injurious among cattle that for a time it was thought that there had been an outbreak of the "foot and mouth disease." These facts warrant me in describing this

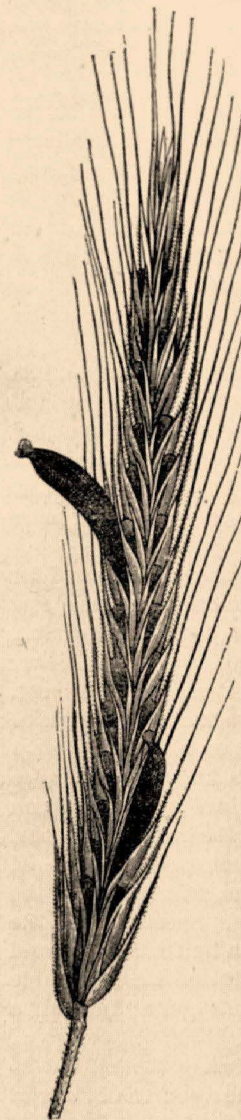


FIG. 7. The Ergot (*Claviceps purpurea* Tul.) on a head of rye. (From Luerssen.)

The first appearance of ergot is to be noticed when the grain is quite young. It is then a whitish, mould-like growth, creeping over the young

grain and penetrating its tissues. The grain soon begins to shrivel under the attacks of the fungus. At this stage the fungus produces myriads of excessively minute spores (analogous to seeds), which are readily blown from grain to grain and head to head, where they quickly germinate and produce more ergot. In this way, from a few infected heads the disease may spread until it involves great numbers.

After the spores are produced the fungus begins a rapid growth at the base of the now shriveled grain, and soon there is formed the dark colored body so well shown in the figure. There may still be seen at the top of each ergot grain a portion of the old and shriveled up rye kernel. The fungus now ceases its growth, and is now ready to endure the drouth of the autumn and the cold of the winter. The ergot of rye generally falls out and passes the autumn and winter upon the ground, but the ergots of some of our grasses appear to remain in connection with the plant for a much longer period.

This black, spur-like ergot is a resting stage of the fungus. It rests, just as a potato tuber does, or as an onion bulb, and, like them, when good conditions appear it renews its growth. This takes place in the spring upon the damp ground. The result of this growth is that in a little while a great many spores are produced, and by these new ergot may be produced. Thus the black ergot grains of one year become the means for producing more ergot the next year.

Ergot occurs not only on rye, but also upon many of the grasses used for hay or pasture. I have repeatedly observed it on common blue grass (*Poa pratensis*); but here, on account of the smallness of the flowers and grains, the ergot is not above a quarter of an inch long, and is but little thicker than a pin. It is, however, of the same shape, and in every other respect, except as to size, it is exactly like that on rye. I have known of cases of disease in cattle (ergotism) which were due to the ergot on blue grass.

Ergot also occurs abundantly on the large wild grass known as wild rye (*Elymus canadensis*), and here it attains a size almost if not equal to that on ordinary rye. As this grass is very frequently cut for hay on the prairies, the presence of ergot in its heads may become a source of great danger. It appears that the recent outbreak of ergotism in Kansas, referred to in the beginning of this paper, was due to ergot on wild rye. Specimens of the hay grasses were brought to me from the infected region by Dr. Stalker, and I found on examination that the wild rye, which constituted a considerable portion of the hay, was badly affected, many of the heads containing half a dozen or a dozen large and well developed ergot grains.

I have now and then observed ergot on timothy (*phleum pratense*), but so far as I am aware it is never abundant enough to become a source of danger.

“TEXAS ITCH.”

This disease is a virulent and highly contagious form of scabies or mange, which is brought into the State from the south and southwest. So far as I have been able to learn, it has not prevailed to any

considerable extent during the past year. I have seen the disease in Clarke and Webster counties during the present summer; and from accounts received from some other localities, it doubtless exists at other points in the State.

The following is a history of an outbreak which occurred in Grundy county, and was prepared at the time I made the investigation. This will serve as an illustration of what the disease is, and furnishes some suggestions as to methods to be employed in dealing with it.

AMES, IOWA, March 26, 1883.

A few days since I was called to your town to make an investigation of a disease that has made its appearance among the horses, and to a limited extent the cattle of your own (Grundy) and adjacent counties. The evidence goes to show that sometime during the summer or fall of 1882, several car lots of ponies were shipped from Texas and the Indian Territory to the vicinity of Reinbeck, Grundy county. Shortly after this arrival it became apparent that some of the ponies were afflicted with a form of skin disease. The symptoms were not, however, sufficiently to prevent farmers and others from investing largely in the novel little horses, for pets or profit. As cold weather came on, and the ponies were taken from the pastures to their winter quarters and put on a grain diet, the fact became apparent that the farmers had bought more than they had paid for. In short, an intractable contagious disease was thrown in with a large number of ponies purchased. These animals mingling freely with other horse stock soon communicated the disease to them, and the result was that before they were aware of it, considerable portions of Grundy, and to a less extent Black Hawk and Tama counties were inoculated. I did not visit all the farms or barns where the disease exists, but from the most reliable information I can obtain, from one hundred and fifty to two hundred cases have occurred, and about twenty animals have died. I saw but few cattle that had the disease, and those in a mild form. The disease has in three or four instances been conveyed to members of the human family, accompanied by practically the same symptoms as in the lower orders of animals.

SYMPTOMS.

The earliest symptom usually noticed is the appearance of wet spots on the body of the animal. Examination shows that an exudation is thrown out from the skin about these spots, thoroughly saturating the hair. This exudate, which at first has a watery appearance, becomes more pus-like, causing the hair to adhere in little tufts. There is evidently intense local fever; the steam will rise from the bodies of the animals as though they had been hard driven on a cold day. Vesicles soon form in the skin, filled with a watery liquid, which in a few days assumes more the character of pus. The hair soon begins to come away, and the disease spreads over the entire animal, almost denuding him, and leaving the body covered with firm scabs or raw

and festering sores. During all this time there is the most intense itching. The animal continues to rub itself against any fixed object that may be in its way with almost frantic violence. A more pitiable or loathsome spectacle is difficult to conceive than an animal in the advanced stages of this disease. If neglected, they become emaciated and die from nervous exhaustion, the result of constant and painful irritation.

NATURE OF THE DISEASE.

It is a parasitic skin disease—an aggravated form of mange, known as "Texas Itch." The altered conditions of food and climate render it more intractable here than in its Southern home, but it is apparently less violent in its working on our native horses than on those from the Southern countries.

TREATMENT.

In order to eradicate the disease, all afflicted animals should be kept carefully secluded from other stock. If this precaution is not observed there is likely to be an indefinite continuation of the trouble. The remedies are chiefly local, consisting of the application of more or less active agents to the parts affected.

Before any remedy is applied looking to the curing of the disease the animal should be thoroughly prepared for the application of the medicine. This preparation will consist of a thorough cleansing of the entire body by a copious application of soap and water, and the vigorous application of a stiff brush. After this work has been thoroughly done and the animal carefully dried off, the remedies proper are to be applied to every portion of the body showing the least signs of disease. There are many agents that may be employed, any one of which will prove successful if judiciously applied. Whatever remedy is used it is to be applied to the skin in such a manner as will insure contact with the diseased surface.

I present several prescriptions from which a selection may be made. 1st. Sulphur and fish oil, equal parts. 2d. Sulphur, two parts, lard, two parts, oil of turpentine, one part. 3d. Carbolic acid, one part, water, twenty-four parts. 4th. Kerosene, one part, lard, four parts. 5th. Oil of tar, one part, fish oil, ten parts. Corrosive sublimate may be used in the proportion of three or four grains to the ounce of water, if the animal is kept muzzled or otherwise prevented from licking himself.

The preparatory washing is only admissible when the weather is mild, or the animal can be comfortably housed and warmly clothed to prevent taking cold. Unfavorable results are not so likely to follow the application of cold water as warm, unless the patient is in very comfortable quarters. Any of the above remedies will have to be reapplied at intervals of a few days, until every evidence of the presence of the disease is removed. After this the skin should be kept dressed with lard, or some bland preparation to protect the surface and promote the growth of hair.

It must be borne in mind that the stables, bedding, fences, hitching posts

and other objects serve as lodging places for the parasites, and unless the premises are thoroughly disinfected a recurrence of the disease may be expected. This may be done by washing the wood work with hot lye, or by a thorough coat of whitewash. Bedding should be burned and floors treated to a thorough dressing of lime. All clothing should be boiled and harness dipped in hot oil.

VERMINOUS BRONCHITIS.

I have recently received several inquiries as to the cause and nature of a disease affecting calves in different localities in the State. Some serious losses have occurred from some of these outbreaks and grave apprehensions have been entertained by stock owners lest the disease might be the much feared lung plague. The lungs in every case are badly diseased, and as a number of animals have died in rapid succession out of a herd, the fears would not seem to be groundless that the disease is some form of epizootic. I received a bit of the lung tissue from a calf that had died from the disease. Examination of the specimen confirmed the opinion I had already formed as to the nature of the disease. It is due to the presence of parasites in the bronchi and minute air vessels. The parasites are minute round worms. Each species of our domesticated animals has one or more species of these parasites. Once introduced into the lungs they propagate with great rapidity and often destroy the life of the animal in a few days. Large numbers of the eggs, or even the adult worms may be coughed up, and the resulting young brood or unhatched eggs retain their vitality for a very long time. The eggs have been artificially hatched after being kept for several years. The young worms will cling to vegetation, live in ponds of water or moist earth while the eggs may be blown about as an impalpable dust. When any of these find their way to the lungs of a susceptible animal, a rapidly increasing colony is at once formed, and in this way the disease assumes the proportion of an epizootic. The method of reproduction and the general effects are the same in the different domestic animals. "Gaps" in chickens is due to a closely related parasite. The following description of symptoms is quoted from one of the letters I have received:

"The first symptom is a slight cough, which increases in severity, seemingly causing much pain. The animal seems to try to stifle the cough, making it generally more of a hoot. Quick and difficult breathing, drawing in of the flanks, a sudden failing of flesh in severe cases, and almost entire loss of appetite. Some drink milk as long as they can stand up, standing quiet

most of the time, with front legs apart, head drooping and an unnatural flow of frothy saliva. Some linger fifteen or twenty days after the attack, while others last but ten. The lean ones appear to linger the longest. The symptoms are clearly stated, and the presence of the worms complete the evidence necessary for diagnosis.

The species I have examined is the *strongylus micrurius*. The adult female is nearly three inches in length, the males attaining only about half of that measurement; the diameter being that of a fine thread. While this disease is by no means so alarming as pleuro-pneumonia, it is nevertheless sufficiently destructive to call for prompt and energetic treatment. Two results are to be sought—first, the destruction of the parasites, actually causing disease; and, second, the destruction of eggs and young worms that have found a lodgement where they will likely be taken in by the cattle. Fumigation offers the greater certainty of destroying worms lodged in the lungs. Sulphurous acid fumes and chlorine gas are the most reliable agents to employ. The former can be produced by burning sulphur, and the latter by thoroughly mixing equal parts of salt and black oxide of manganese and treating the mixture with sulphuric acid; using equal weights of the mixture and acid. The animals should be confined in a small, close stable and the gas should be produced in sufficient quantity to charge the atmosphere in the building. Care should be taken that the gas is not evolved so rapidly as to cause suffocation. The treatment should be kept up for half an hour and should be repeated every day or two for a week or longer. The building where the animals are confined should be as free from manure and decomposing matter as possible, especially when chlorine is used, as highly irritating gases are formed by these compounds. Pens, troughs, bedding, etc., should be thoroughly disinfected. Bedding that is liable to be contaminated should be burned and the pens whitewashed or otherwise purified. Oil of turpentine given internally, or kept where the animals will constantly inhale the fumes, is one of the most effectual remedies. The further treatment of the diseased animals will consist in overcoming the exhaustion and emaciation resulting from the disease. This last is best done by giving liberal supply of food of the best quality. Such tonics as sulphate of iron, in doses of one half drachm, or cychonia or gentian in drachm doses, may be given twice a day to calves a few months old. The lungs of animals that have died from the disease should be burned. Keep healthy animals away from diseased ones, and exercise care in regard to allowing young calves to feed on pastures where diseased stock have been. Older animals are least affected by the parasites, but animals of any age may be destroyed by them.

PLEURO-PNEUMONIA.

Iowa has so far escaped this, the worst of all calamities to the cattle interest. This is more by accident than timely precaution. The neighboring States of Illinois and Missouri, without more apparent exposure, have both received the plague within their borders. But

one herd in the State—that belonging to General Smith, near New Sharon—has been exposed to the disease, so far as I know. The time has long since passed when it would be possible for the disease to develop from this exposure. It remains for this State to prevent the introduction of the disease, in order to remain free from it. This will be a work involving no small amount of care and vigilance. The executive proclamation, and the rules for its enforcement, if strictly carried out, would furnish as much security as we could expect from local effort, while the disease is in close proximity on two sides of us. This system can prove effectual only for a time. The efforts of individual States will never eradicate the disease. A vigorous policy must be inaugurated by the general government. A commission should be appointed, with almost unlimited power, and provided with abundant means to prosecute the work of complete and final extirpation of the disease. Any other policy can do little more than retard the general encroachment of the disease, till finally the conditions in South Africa and Australia will be repeated in all the western territories. While the disease is not indigenous to this country, it is idle folly to depend on starvation and a temperature of forty degrees below zero for protection of the western plains against its insidious march.

Every good citizen should feel that he is especially commissioned to render the State any service in his power in preventing the introduction of the disease. If it is known that cattle have been shipped into Iowa from any of the States quarantined against, without proper certificates of health, notice should at once be given to this office.

It is quite impossible for any one not familiar with the disease, to determine between the symptoms of pleuro-pneumonia, tuberculosis, and other chronic lung affections. But all cattle suffering from protracted cough, and other evidences of lung disease, should be inspected. This becomes doubly important if the animals have been brought into the State from Missouri, or any point east.

RABIES.

There have been a few authenticated cases of hydrophobia, or rabies, in dogs during the past year. The public has been made familiar with one of these instances. This animal belonged to Mr. Andrews, of Des Moines, Assistant Secretary of the State Board of Health. It was safely confined, and passed through the several stages of the disease. Several dogs were known to have been bitten by the

same animal that bit Mr. Andrews' dog. These were all destroyed before any serious consequences resulted.

There have been three probable cases of rabies among cattle. Some six or eight cattle near Leon, Decatur county, were known to be bitten by a dog that was acting strangely. The dog was afterward shot. In nineteen or twenty days after the biting, these cattle were affected in a peculiar manner. They became frenzied, bellowed in a hoarse voice, ran at other animals and inanimate objects, and died after an illness of from one to four days. I did not see any of the affected animals, but the history of the case, as given by the owner, points quite conclusively to rabies. The members of the medical profession at Leon regard the disease as being hydrophobia.

The danger from the bite of rabid animals is too well understood to require any comments. As to the treatment, or prevention of the development of the disease after an individual is bitten, the public is not so well agreed. It is a well-known fact to the members of every branch of the medical profession, that the results are almost uniformly fatal, when once the virus has been absorbed into the system. Dr. Fleming, one of the best informed men in the world, on this subject, says: "It may be asserted in general terms, that nothing yet proposed has ever succeeded in arresting the fatal progress of this fearful complaint. Every known remedy has been tried, and all have failed. In the early and middle ages, magic, invocation, exorcism, appeals to supernatural powers, and charlatanism of the grossest character, had to give way to the terrible fatality of the disease."

Dr. Reynolds says: "From the fact that so few of those bitten by rabid animals actually contract hydrophobia, we should expect that a large number of specifics would have been proposed for its treatment. A credulous physician who happened to have administered some remedy to a few persons bitten by a mad dog, finding that no evil consequences followed, and forgetting that had nothing been administered, his patient would in all probability have enjoyed equal immunity, was only too ready to believe that he had at last discovered a specific for a terrible disease."

The only safety for the individual bitten by a rabid animal is in the hope that none of the saliva has found its way into the wound, or in the adoption of such measures as will prevent the poison from entering the circulation. Any measures looking to this end should be promptly employed. A very few minutes or seconds even may be sufficient for the poison to enter the circulation, and then all local

treatment would be unavailing. If such cases were properly treated at once, the danger would, to a very great degree, be averted. This may be done by suction, by excising the edges of the wound, by the application of strong caustics or a hot iron, or by copious washing. If powerful suction be applied by means of the mouth, the patient taking pains to spit out all blood drawn from the wound, the danger is but slight. Profuse washing is to be highly recommended. This will promote the flow of blood and carry off the saliva in which the poison is contained. The application of caustics or hot iron is one of the most effective remedies, if the application can be made with sufficient promptness. The application of caustic should never be neglected after employing suction, or washing. This should be adopted at the earliest possible moment.

I have received a fair share of criticism for warning the public against the popular superstition on the subject of "mad-stones." No one would be more gratified than myself to know there was in existence a means so efficacious as the virtues imputed to the mad-stone. But I would fall far short of my duty to the public if I were not to caution them against the employment of means in favor of which there is not a scrap of trustworthy evidence, to the exclusion of those measures that might be of infinite service. Men who have devoted a long lifetime with the most painstaking research to the study of this subject, with every facility that science can give, know nothing of the virtues of mad-stones. Geologists and minerologists have never been able to find one. They are unknown therapeutical agents to the world of educated medical men. They can be heard of in obscure rural districts, the haunts of an occasional stray witch, the "last of a once powerful race." In a word this is but one of a long list of imaginary remedies that have found favor from the earliest historic time in the minds of the credulous.

TUBERCULOSIS.

There are many cases of this disease especially among high bred cattle and those that have been subject to high forcing processes. In-and-in breeding has had much to do with perpetuating if not engendering the disease. The practices which prevailed a few years ago, and which have not been totally abandoned yet, in preparing animals for public sales, has done much to promote the increase of tubercular consumption. Cattle were kept for months in close stalls thickly wrapped in heavy blankets, and forced with stimulating food

to the utmost capacity of the digestive apparatus. These cattle frequently fell into the hands of men who furnished them no more adequate protection against snow and sleet than is offered by the side of a corn crib or a barbed wire fence. The natural result is that many such animals contracted cold which terminated in consumption. These animals gave rise to an enfeebled line of offspring, with marked tubercular tendencies, and in some instances this vitiated blood has been incorporated in a valuable herd to the very serious loss of the owner. There is a marked tendency for the disease to descend from parent to offspring. I have frequently been able to trace the disease through a herd for three or four generations. It is now also known that the disease can be communicated directly from one animal to another by careful inoculation, or by feeding tubercular matter to healthy animals. It is also highly probable that the disease may be communicated by infection.

If healthy animals are kept in tightly closed buildings, with tuberculous patients, the chances are that the contagious character of the disease will be made manifest. It will only be communicated in this way, under very favorable circumstances. The fact that the milk of tuberculous cows is charged with the poison germs should cause it to be rejected in every instance as an article of food. Tuberculosis has been experimentally developed in the lower animals by feeding the milk of cows affected with the disease. As tubercle in man and the bovine species is identical, the conclusion is inevitable that a similar experiment on man could be followed by a similar result. The fact that consumption prevails to an alarming extent in this country, and the same disease is frequently seen in cows that contribute to the milk and beef supply of our people, renders the subject worthy of the most careful investigation by sanitarians.

The disease is characterized by deposits of cheesy like matter in various parts of the body, especially in the lungs, mesentery and lymphatic glands generally. The animal suffers with persistent cough, which is attended with more or less pain. The secretions become scanty, the mucous membrane becomes of a dark, ashy hue, the hair is rough, the eye dull, the back arched, and the animal usually occupies a standing position. Diarrhœa, rapid emaciation and death, follow the foregoing symptoms. The patient usually lives from a few months to a year, after the attack. There is no remedy that can be relied on to do more than palliate the disease. When the case becomes well marked the animal should be destroyed.

FINANCIAL STATEMENT.

The following financial statement gives an exhibit of the expenditures of the office from the date of appointment of State Veterinary Surgeon, April 28, 1884, to June 30, 1885:

| STATE OF IOWA, | | DR. |
|---|-------------|-------------|
| <i>To M. Stalker:</i> | | |
| To 280 days service at \$5 per day | \$ 1,440.00 | |
| To personal expense | 1,489.77 | |
| To cash expended in experimentations | 21.75 | |
| To J. C. Milnes, 168 days service, at \$5 per day | 840.00 | |
| To personal expense | 720.14 | |
| To A. B. Morse, 6 days service, at \$5 per day | 30.00 | |
| To personal expense | 13.75 | |
| | | <hr/> |
| | | \$ 4,555.41 |
| By amount appropriated by the State | \$10,000.00 | |
| To amount expended as above | 4,555.41 | |
| | | <hr/> |
| By balance unexpended | \$ 5,444.59 | |

LAW CREATING OFFICE OF STATE VETERINARY SURGEON.

[CHAPTER 189, LAWS OF 1884.]

VETERINARY SURGEON.

AN ACT for the appointment of a State Veterinary Surgeon and Defining his Duties.

Be it enacted by the General Assembly of the State of Iowa:

SECTION 1. The governor shall appoint a state veterinary surgeon, who shall hold his office for the term of three years unless sooner removed by the governor; he shall be a graduate of some regular and established veterinary college, and shall be skilled in veterinary science; he shall be a member of the state board of health, which membership shall be in addition to that now provided by law. When actually engaged in the discharge of his official duties he shall receive from the state treasury as his compensation the sum of five dollars per day and his actual expenses, which shall be presented under oath and covered by written vouchers before receiving the same.

SEC. 2. He shall have general supervision of all contagious and infectious diseases among domestic animals within or that may be in transit through the state, and he is empowered to establish quarantine against animals thus diseased or that have been exposed to others thus diseased, whether within or without the state, and he may with the concurrence of the state board of health, make rules and regulations such as he may deem necessary for the prevention, against the spread, and for the suppression of said disease or diseases, which rules and regulations, after the concurrence of the governor and executive council, shall be published and enforced, and in doing said things or any of them, he shall have power to call on any one or more peace officers, whose duty it shall be to give him all assistance in their power.

SEC. 3. Any person who willfully hinders, obstructs or resists said veterinary surgeon or his assistants, or any peace officer acting under him or them when engaged in the duties or exercising the powers herein conferred, shall be guilty of a misdemeanor and punished accordingly.

SEC. 4. Said veterinary surgeon shall on or before the 30th of June of each year, make a full and detailed report of all and singular his doings since his last report to the governor, including his compensation and expenses, and the report shall not exceed one hundred and fifty pages of printed matter.

SEC. 5. Whenever the majority of any board of supervisors, city council, trustees of an incorporated town or township trustees, whether in session

or not, shall in writing notify the governor of the prevalence of, or probable danger from, any of said diseases, he shall notify the state veterinary surgeon who shall at once repair to the place designated in said notice and take such action as the exigencies may demand, and the governor may in case of emergency appoint a substitute or assistants, with equal powers and compensation.

SEC. 6. Whenever in the opinion of the state veterinary surgeon the public safety demands the destruction of any stock under the provisions of this act he shall, unless the owner or owners consent to such destruction, notify the governor, who may appoint two competent veterinary surgeons as advisers, and no stock shall be destroyed except upon the written order of the state veterinary surgeon countersigned by them and approved by the governor, and the owners of all stock destroyed under the provisions of this act, except as hereinafter provided, shall be entitled to receive a reasonable compensation therefor, but not more than its actual value in its condition when condemned, which shall be ascertained and fixed by the state veterinary surgeon and the nearest justice of the peace, who if unable to agree shall jointly select another justice of the peace as umpire, and their judgment shall be final when the value of the stock does not exceed one hundred dollars, but in all other cases either party shall have the right to appeal to the circuit court, but such appeal shall not delay the destruction of the diseased animals. The state veterinary surgeon shall, as soon thereafter as may be, file his written report thereof with the governor, who shall, if found correct, endorse his findings thereon, whereupon the auditor of state shall issue his warrant therefor upon the treasurer of state, who shall pay the same out of any moneys at his disposal under the provisions of this act; *provided*, that no compensation shall be allowed for any stock destroyed while in transit through or across the state, and that the word stock, as herein used, shall be held to include only neat cattle and horses.

SEC. 7. The governor of the state, with the state veterinary surgeon, may co-operate with the government of the United States for the objects of this act, and the governor is hereby authorized to receive and receipt for any moneys receivable by this state under the provisions of any act of congress which may at any time be in force upon this subject, and to pay the same into the state treasury to be used according to the act of congress and the provisions of this act as nearly as may be.

SEC. 8. There is hereby appropriated out of any moneys not otherwise appropriated the sum of ten thousand dollars for use in 1884 and 1885, and three thousand dollars annually thereafter, or so much thereof as may be necessary for the uses and purposes herein set forth.

SEC. 9. Any person, except the veterinary surgeons, called upon under the provisions of this act shall be allowed and receive two dollars per pay while actually employed.

Approved April 14, 1884.

RULES AND REGULATIONS.

OFFICE OF THE IOWA STATE BOARD OF HEALTH, }
DES MOINES, December 28, 1884. }

PURSUANT to authority vested by Chapter 189, Laws of the Twentieth General Assembly, the State Veterinary Surgeon by and with the approval of the State Board of Health, the Governor, and the Executive Council, does hereby make and establish the following rules and regulations for the prevention and restriction of contagious diseases among domestic animals:

DISEASES.

RULE 1. All neat cattle that have been reared, or kept south of the parallel forming the north boundary of Indian Territory, or 37° north latitude, and that have not subsequently been kept continuously at least one winter north of said parallel, and which may be brought within the limits of this State between the first day of April and the first day of November following, except for transportation through the State on railways or boats, shall be subject to quarantine; and all land on which such cattle may have been kept or fed, within this State, shall in like manner be subject to quarantine.

RULE 2. All cattle, as defined in Rule 1, while in transit through this State, which may be removed from any car or boat, within this State, for the purpose of feeding, watering, re-shipment, or other cases whatsoever, shall be confined in yards, stables, or enclosures, separate and apart from all other animals, and no other cattle shall be permitted to come within such yards, stables, or enclosures, or in contact with such quarantined and enclosed cattle.

RULE 3. Between the first day of April and the first day of November following, no cattle whatsoever, except such as are defined in Rule 1, shall be placed within any stable, yard, or other enclosure where cattle have

been quarantined under Rule 1, unless such yards, stables and enclosures have been previously thoroughly cleansed and disinfected.

RULE 4. All cattle brought within this State from any county or parish within the United States where pleuro-pneumonia is known to exist, shall be subject to quarantine for a period of not less than sixty days.

RULE 5. The carcasses of all animals that have died from anthrax, shall, without removal of the hide, or any part of said carcass, be burned, or buried not less than four feet deep in the ground, and thoroughly covered with kerosene before covering with earth.

Reasons for Rule 5. To prevent the possibility of a recurrence of this disease from germs existing in the grave, which if not destroyed by some powerful agent will retain their vitality for a number of years, so as to impart the disease.

As anthrax is communicable by inoculation to human beings, great precaution should be used in handling animals affected with this disease.

RULE 6. No person owning or having the care or custody of any animal affected with glanders or farcy, or which there is reason to believe is affected with said diseases, shall lead, drive, or permit such animal to go on or over any public grounds, unenclosed lands, street, road, public highway, lane, or alley; or permit it to drink at any public water trough, pail, or spring; nor to keep such diseased animal in any enclosure, in or from which such diseased animal may come in contact with, or close proximity to, any animal not affected with such disease.

RULE 7. Whenever notice is given to the trustees of a township, or to the health officer of a local board of health, of animals suspected of being affected with glanders or farcy, said trustees, or health officer, shall immediately require such suspected animals to be isolated and kept separate and apart from all other animals until released by order of the State Veterinary Surgeon or some person acting by his authority.

RULE 8. An animal must be considered as "suspected" when it has stood in a stable with, or been in contact with an animal known to have the glanders; or if placed in a stable, yard or other enclosure where a glandered animal has been kept.

RULE 9. Whenever any animal affected with glanders or farcy shall die, or shall be killed, the body of such animal shall be immediately burned, or buried not less than four feet deep, without removing the hide from the carcass.

RULE 10. No animal diseased with glanders or farcy shall be deemed to have any property value whatever, and no appraisal thereof will be made.

Reasons for Rule 10. Glanders is an incurable disease, and there is no warrant for expending public money in appraising property manifestly worthless, and which can be compensated for only at "its actual value in its condition when condemned." Also to prevent the introduction of diseased animals into the State, and the inoculation of worthless ones for speculative purposes.

RULE 11. Whenever the owner, or person having in charge any animal declared by the State Veterinary Surgeon or other authorized person to

have the glanders, shall neglect or refuse to destroy said animal, the premises whereon such animal is kept shall be quarantined until such animal is destroyed and the premises thoroughly disinfected.

QUARANTINE.

RULE 12. The term "quarantine" shall be construed to mean the perfect isolation of all diseased or suspected animals from contact with healthy animals; as well as the exclusion of such healthy animals from the yards, stables, enclosures, or grounds wherever said suspected or diseased animals are, or have been kept.

DISINFECTION.

Among the most efficient and convenient agents for destroying disease germs, are heat, solutions of carbolic acid, sulphate of iron, caustic soda, or sulphate of copper; fumes of sulphur or chlorine; chloride of lime, slacked lime, lime-water, whitewash and kerosene oil.

HEAT. This is conveniently applied by means of boiling water or oil, and is especially recommended for disinfecting fabrics of all kinds, leather or wood. Articles of iron or other metals may be purified by heating in a fire. All bedding, litter, excrement, etc., that have accumulated about animals affected with any form of contagious disease, and the carcasses, together with all blood, or other fluid elements that have escaped from such carcasses, should be burned, as the surest means of eradicating the disease.

Dirt or earth floors of stables wherein animals affected with glanders or anthrax have been kept, should be removed to the depth of four inches and burned.

SOLUTIONS.

Carbolic Acid. Add one part of the acid to five or ten parts of water or oil.

Sulphate of Iron, Copper and Caustic Soda. Add as much of the substance to a given quantity of warm water as will be dissolved.

Whitewash. For disinfecting interior walls of buildings, feed-boxes, mangers, yard fences, etc., the application of a coating of whitewash prepared from lime in the ordinary way, so thoroughly done as to completely cover every part of the surface designed to be cleansed, is an economical method.

FUMIGANTS.

Sulphur. Fumes of sulphur are adapted to disinfecting buildings that can be closed so as to confine the fumes, and especially such parts of buildings as are not readily accessible for cleaning. They may be generated by placing a few pounds of sulphur in an iron vessel, adding a small quantity of kerosene oil, or alcohol, and setting fire thereto.

Chloride of Lime. Chloride of lime and slacked lime for disinfecting floors, yard, carcasses and ground where dead or diseased animals have lain,

in fine powder, should be scattered over the surface of objects to be disinfected thickly, so as to form a complete covering.

Chlorine. To generate, take peroxide of managanese (to be obtained at any drug store), place in an earthen dish and add one pound of hydrochloric acid (sometimes called muriatic acid), to each four ounces of the peroxide of managanese. Care should be taken not to inhale the gas.

After the floors, walls, etc., of a contaminated building have been cleansed, they should be fumigated by some of the foregoing agents. The doors should be closed, and the building otherwise made as tight as possible. Fumes should then be evolved in the building for not less than half a day, and the doors kept closed not less than twenty-four hours, when air and sunlight should be freely admitted.

BURIALS.

Kerosene Oil. Carcasses buried in the earth, where there is danger of exhumation by other animals, should previous to burial, be thoroughly saturated with kerosene oil. This will tend to destroy the virus, and will prevent carnivorous animals disturbing the carcass and thereby spreading the disease.

FREEZING. It has been demonstrated repeatedly in Iowa, that the frosts of winter thoroughly disinfect pasture lands that have been poisoned with the virus of Texas Fever by herds of Southern cattle during the summer months. From the first of April to the first of November, the virus is likely to retain its vitality, and the strictest precaution is necessary to prevent communication of the disease to Northern cattle. The purifying effect of frost, however, cannot be relied upon for destroying the virus of any other disease than Texas Fever, liable to attack live stock in Iowa.

It is for the interest of every community, on the appearance of contagious or infectious diseases among animals, to adopt speedy measures to eradicate the same, and to co-operate with the State Veterinary Surgeon in securing such results in the shortest possible time.

M. STALKER,

State Veterinary Surgeon.

Approved:

L. F. ANDREWS,

Acting Secretary State Board of Health.

W. S. ROBERTSON,

President State Board of Health.

B. R. SHERMAN, *Governor.*

J. A. T. HULL,
J. L. BROWN,
E. H. CONGER, } *Executive Council.*

A PROCLAMATION.

STATE OF IOWA, }
EXECUTIVE DEPARTMENT. }

BY THE GOVERNOR.

WHEREAS, Reliable information from the State Veterinary Surgeon, and otherwise, has reached me, that the dread epidemic, pleuro-pneumonia, exists in virulent and contagious form in many of the States of the Union, among the cattle thereof; and,

WHEREAS, In view of the prominent position held by Iowa as a cattle producing and cattle feeding State, being first in value and rank therein among all the States and Territories, and the immense investments in such stock held by our people; and,

WHEREAS, It is of greatest importance that this vast interest, involving many millions of valuable property, should be protected to the people of the State, and to the end that the good name of the State as a stock and food producing district shall be maintained.

Now, therefore, I, BUREN R. SHERMAN, Governor of the State of Iowa, by virtue of the authority in me vested by the constitution and laws of the State, do hereby declare and establish quarantine at the boundaries thereof, against all animals infected with said disease, pleuro-pneumonia, or that have been exposed thereto, and I do hereby absolutely prohibit the importation into the State, all cattle shipped or driven from the States hereinafter named, unless the same shall be accompanied by a certificate of health given by the State Veterinary Surgeon of said States, who shall have first made careful examination of such cattle, viz.:

The States of Connecticut, New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Delaware, Ohio, Kentucky, Tennessee, Indiana, Illinois, Missouri, and the District of Columbia. All railroad and transportation companies are hereby forbidden to bring into this State any cattle from the localities above named unless the proper health certificate, as above specified, shall accompany the shipment.

I appeal to all good citizens to assist in the enforcement hereof, and especially direct all sheriffs, constables, and other peace officers, and the boards of health throughout the State, and the State Veterinary Surgeon and his several deputies, shall see that this proclamation be obeyed.

In testimony whereof, I hereunto set my hand, and caused to be affixed the great seal of the State of Iowa. Done at Des Moines, this 29th day of April, A. D. 1885.

[SEAL.]

BUREN R. SHERMAN.

By the Governor:

FRANK D. JACKSON, *Secretary of State.*

RULES AND REGULATIONS GOVERNING QUARANTINE AGAINST PLEURO-PNEUMONIA AMONG DOMESTIC ANIMALS.

OFFICE OF THE IOWA STATE BOARD OF HEALTH, }
DES MOINES, June 1, 1885. }

WHEREAS, Buren R. Sherman, Governor of the State of Iowa, did on the 29th day of April, 1885, by proclamation, establish quarantine against introduction into this State of all cattle from the following named States, to-wit: Connecticut, New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Delaware, Ohio, Kentucky, Tennessee, Indiana, Illinois, Missouri, and the District of Columbia, except such animals are accompanied by a certificate of health, signed by the State Veterinary Surgeon of the State from which the animals were shipped.

Now, therefore, by, and with the concurrence of the Governor, the Executive Council, and State Board of Health, I. M. Stalker, State Veterinary Surgeon of the State of Iowa, in order to provide more adequate protection to the cattle interests of the State, by virtue of the power vested by chapter 189, section 2, Laws of the Twentieth General Assembly, do hereby promulgate the following rules and regulations governing quarantine and the introduction of cattle into the State of Iowa from the above mentioned subdivisions of the United States, against which quarantine has been established.

RULES AND REGULATIONS

First. The owner, shipper or attendant of all cattle coming into this State from localities quarantined against, will be required to furnish the following evidence that said animals are free from contagious disease:

(a.) Certificate of health signed by the State Veterinary Surgeon of the State from which the cattle were shipped; or by some other competent veterinary surgeon commissioned by the Governor to make inspections and grant such certificates; or by a veterinary inspector of the United States Bureau of Animal Industry.

(b.) Affidavit of two disinterested citizens of the county from which the cattle were shipped, that they have personal knowledge that the animals have not been exposed to contagious Pleuro-Pneumonia during a period of four months immediately preceding the date of shipment.

(c.) Affidavit of owner made at the point of entry into this State, that the cattle are the identical animals described in the bill of health, and foregoing affidavit; and that they were shipped in cars free from virus of pleuro-pneumonia; and that they have not been exposed to any contagious disease while in transit.

Second. The foregoing evidence shall be submitted to the mayor of the nearest city or town in this State to the point of entry.

Third. A copy of the above evidence shall be furnished by such mayor to the State Veterinary Surgeon of this State.

Fourth. All cattle coming into this State in violation of the proclamation of the Governor, or the foregoing rules and regulations, may be held in quarantine for ninety days at the expense of the owner.

M. STALKER,
State Veterinary Surgeon.

APPROVED:

W. S. ROBERTSON, M. D.,
President Iowa State Board of Health.

J. F. KENNEDY, M. D.,
Secretary Iowa State Board of Health,

BUREN R. SHERMAN,
Governor.

J. W. CATTELL,
FRANK D. JACKSON,
V. P. TWOMBLY,
Executive Council.

The foregoing embraces the laws providing for the appointment of a State Veterinary Surgeon, the proclamation of the Governor against the importation of cattle from districts affected with pleuro-pneumonia, and the rules framed for carrying out the intent of the proclamation. These embrace all the law and the rules pertaining to the work of this office that are now in force.

All of which is respectfully submitted.

M. STALKER,
State Veterinary Surgeon.

Ames, June 30, 1885.

BIENNIAL REPORT

OF THE

STATE LIBRARIAN

TO THE

GOVERNOR OF THE STATE OF IOWA,

JULY 1, 1885.

MRS. S. B. MAXWELL,
STATE LIBRARIAN.

PRINTED BY ORDER OF THE GENERAL ASSEMBLY.

DES MOINES:
GEO. E. ROBERTS, STATE PRINTER.
1885.