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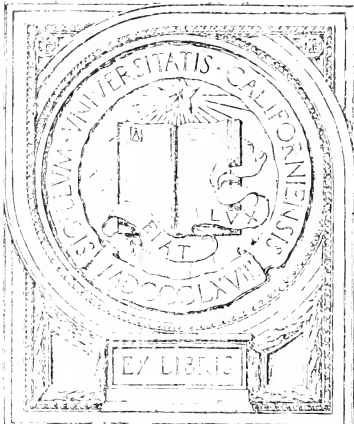
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# TEXAS FEVER

IN

## CALIFORNIA.

By D. E. SALMON, - - - CHIEF OF BUREAU.



SACRAMENTO:

A. J. JOHNSTON, : : : SUPERINTENDENT STATE PRINTING,  
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# TEXAS FEVER IN CALIFORNIA.

UNITED STATES DEPARTMENT OF AGRICULTURE, }  
BUREAU OF ANIMAL INDUSTRY, }  
WASHINGTON, D. C., April 24, 1896.

HON. J. STERLING MORTON, *Secretary of Agriculture:*

SIR: As requested by you, I submit the following report covering the most important information in the possession of this Department concerning the existence of the disease known as Texas fever in California. This disease is also known, and is referred to in quotations made below, as Southern fever, Splenic fever, Splenitic fever, and Spanish fever.

My attention was first called to the existence of this disease in California by reports made by Mr. A. S. Mercer during 1886. Mr. Mercer was at that time employed as an Inspector of this Bureau, and was under instructions to investigate the cattle industry of California. I quote the remarks concerning this disease which were included in his report for 1886:

## "SPLENIC FEVER.

"Splenic fever, or what is generally known as Texas fever in the country east of the Rocky Mountains, prevails to a very considerable extent in California. My attention was first called to this matter by a gentleman whom I met on the cars while crossing the Sierra Nevada Mountains in June last. He incidentally mentioned the fact that he had lost a good many cattle from a cause he did not understand, and, on being asked for details, stated that in 1877 he bought four hundred steers in Tulare, which were shipped to his pasture, near Stockton, two hundred miles north, and turned out to graze with about one thousand head of natives and Oregon cattle that had been in the field for several months. About twenty-five days after the Southern cattle were turned into the pasture, the natives and Oregon cattle began to die, and within a few weeks one hundred and sixty head died. These were all cattle that had cost him \$40 a head, and the loss of \$6,400 was rather startling. None of the Southern steers died, or even showed signs of sickness.

"Again, in 1885, his partner bought two hundred steers from the same Tulare range, then owned by J. M. Craighton, and after shipping turned them into a pasture near Stockton with four hundred Northern and native cattle. The experience of 1877 was had over again, sixty head of the Northern cattle dying in a few weeks, and the Southern cattle showing no symptoms of disease. A few of the dead cattle were opened, and, in the language of the owner, 'were found to have melt twice its natural size, and soft, like liver; the contents of the stomach were dry and crisp, looking like they had been partially burned. Some of the sick cattle passed bloody urine. Generally they would hump up for a day or two,

sometimes three or four, then lie down with a raging fever, and die in from six to twenty-four hours.'

"This satisfied me that it was the old-fashioned, straight, splenic, or Texas fever, and I promised to make an investigation of the matter in the autumn. Calling on this gentleman at his home in October, he repeated his former statements, which were verified by the words of other responsible parties. The Southern cattle were all killed by the butcher, and, in the language of one who assisted in the shop, 'they were all right, save the melt (spleen) was nearly double size, and the meat seemed to be of an unnatural color next to the hide.' The meat was all consumed in the neighborhood, and no evil effects resulted. The owner of the cattle says there were no poisonous weeds of any kind in his pasture, and that he had more or less cattle grazing in it every year; never lost any, except on two occasions, when Southern cattle were turned in and allowed to mingle with the natives, or those from farther north. He feels certain that the Southern cattle gave off the disease.

"A gentleman from San Francisco reports the shipment of a herd of cattle from Kern County to the northern end of the San Joaquin Valley, where they were placed in a pasture with native or Northern cattle, and as a result many of the Northern cattle died, while none of the Southern cattle showed symptoms of disease.

"Most of the trouble with this fever has occurred south of San Francisco, probably for the reason that there have been but few shipments of Southern cattle to points north of that city. The cities of Stockton, Sacramento, and other towns get their beef supplies from the local ranchmen, or from Oregon or Nevada, and in consequence have no fear. The only shipments known to have been made to Stockton have developed fever, and every shipment from the south to points on the upper or northern San Joaquin have caused trouble with the Northern cattle. As a rule, the gentlemen who gave me their experience did so after a promise not to publish their names, and that promise I must keep. But Mr. Miller, of the firm of Miller & Lux, San Francisco, probably the richest cattle-raising firm in America, gave me most valuable information, and did not require the suppression of his name. Owing hundreds of thousands of acres of land in Kern County, and having ranch property reaching almost connectedly from there to the northern end of the San Joaquin Valley, all fully stocked with cattle, and being at the same time one of the oldest and most experienced wholesale butchers on the coast, his opinions and observations are worthy of credence. He says that Texas fever developed on his ranches in 1878, and has continued to give trouble more or less ever since; less this year than formerly. Many cattle died in 1878, and the losses ran up into the thousands of dollars. He had been in the habit of mixing cattle from Kern County with those on the San Joaquin. Since 1878, he keeps the Southern cattle, when brought North, in fields by themselves. He thinks the disease was developed on the Coast by starvation and change of early conditions, the range too much crowded, and so many cattle on a given area that the food is befouled and poisoned. The germ being thus created, and the conditions in many places remaining the same, the infection continues. In support of this theory he cites the sickness near Mendenhall, a village in Alameda County, where, in 1877, all the cattle in the neighborhood died of a disease so similar in character to Texas fever that the veterinarians pronounced it identical with that which, in 1878, developed on

his ranch, and the nature of which leaves no doubt as to its being the true splenic fever. No strange cattle had ever been taken into, or out of, this community, and the germs must have developed there. In 1878 it developed forty miles south, on the head of Orestimba Creek, in Stanislaus County, and killed six hundred cattle out of a herd of nine hundred, in a few months. The spleen is always affected, very large, discolored, and soft. The other organs are affected differently in different cases. Generally the animal droops for a few days, eyes run, and hair rough, fever high, and death follows in a few hours after the animal lies down. Mr. Miller says he has tried the doctors and all kinds of medicines, but the only relief that has been obtained is by corralling the cattle and starving them until they will eat a little bran mush. At the same time he mixes copperas with the water in the trough, making it very strong. They will drink a little, and in this way he has saved a few. Mr. Miller is satisfied that cattle grazing near the carcasses of cattle that have died with the fever will take the disease, and accordingly he has issued peremptory orders for the burning of all dead cattle, and the grass in the vicinity of each one. The disease rarely, if ever, shows itself until the hot weather begins, and on the approach of winter subsides. Another feature is that the disease is not apt to develop on ranches where there has been no movement of cattle, save where it has been given off by eating grass around the carcasses of dead animals. This rule is not universal, as is instanced by the cases above cited in Alameda and Stanislaus Counties, but it is the general rule. Hence, it is suggested that the cattle should not be moved either north or south in the heat of the season, and that shipments should be made in the early spring or in the late autumn.

“The area of ‘big melt’ seems to be pretty clearly defined as extending from San Bruno, ten miles south of San Francisco, on down the coast to the State line; but the infected area is not continuous. One ranch, extending a few miles, will give off the disease, while the next one is free from infection. So clearly is the area defined that one farm will be rented for the aftermath from year to year, while the adjoining one can not be rented at all. Experience has proved that from ten to twenty per cent of the cattle will die on the range of one field, while none will even sicken in the other.

“The Hon. William Dunphy has a ten thousand acre ranch on the Salinas River, fifteen miles south of Soledad. He also owns a large ranch in Nevada. It has been his practice for years to ship over several hundred head of cattle from the Nevada range to the Salinas ranch in the fall, to ripen for the early spring market. These cattle generally arrive about October 1st, and are turned on the stubble-fields adjoining the ranch until the winter rains permit plowing to begin. Then they are turned on the bunch-grass and alfalfa pastures of his own ranch, and are thus in condition to fatten quickly, after the rainy season has passed. Mr. Dunphy informs me that he loses from thirty to sixty head of these cattle every year during the first forty days after their arrival, but none of the native or held-over cattle die. His experience is different from that of Mr. Miller and all the ranch men on the San Joaquin. Mr. Dunphy never burns nor buries the carcasses of dead cattle, and never has experienced any losses from such neglect. Neither was there any trouble from the dead cattle in the two herds above named near Stockton. This raises an important question in my mind: Are the diseases

that annually carry off a certain per cent of Mr. Dumphy's cattle and those which killed the cattle near Stockton identical with that which yearly shows itself on the ranges farther south? Mr. Dumphy lost thirty head in October last, but, unfortunately, I reached the ranch after the last death had occurred and decomposition was so far advanced that a *post mortem* was of no service, nor was I able to see a case on the more southern ranches. The disease had run its length previous to my visit, so I have no means of comparing the symptoms and *post mortem* appearance of the disease, as manifested in the two cases, other than the statements of the non-professional men who examined them. These descriptions I have had from at least fifty men, and they all agree, nearly, that the only conclusion is that the disease must be the same. Yet, here is the very important feature of inoculation from contact with a dead animal in the one case, and total exemption in the other. The disease in one case is similar in character and in surrounding circumstances to what we all understand of the splenic fever east of the Rocky Mountains. One of the most distinguishing features of our true Southern splenic fever is that cattle from south of the line of infection, when brought in contact with cattle north of that line, give off the disease, but do not themselves take it on. Another feature equally well established is the fact that the cattle which sicken and die will not give off the disease while suffering with it, or after death. I have seen hundreds of cattle die in Kansas and the Pan-handle of Texas with the splenic fever, and have seen many of them opened after death. After listening to the description of the disease on the Pacific by fifty or more men, as stated above, there remains no doubt in my mind as to the identity of the two diseases, but there are some conditions materially different, and these may account for the apparently different results. There are different types of splenic fever, and a *post mortem* of cattle on the San Joaquin may establish the fact that the disease is of a different type from that experienced on the Salinas and near Stockton. My investigations this year were begun sixty days too late to enable me to lay all the facts bare. The different conditions above referred to may be briefly stated thus: In the case of the cattle near Stockton, it was extremes meeting—cattle full of the fever germ coming in contact with those that were totally exempt from such infection. The same is true of the Salinas trouble. The Nevada cattle were free from the disease germ, and on coming in contact with them on their new range they were so susceptible that death resulted, while the located cattle were proof against it by virtue of a sort of every-day inoculation. On the other hand, the San Joaquin cattle sickened in what has, for many years, been an infected country, on their own range, and under such conditions as, perhaps, made the disease more virulent. This is not given as a satisfactory explanation, but merely to show the different conditions. Nothing short of a thorough *post mortem* will determine the true relations of the disease as it manifests itself every year in the different localities. Mr. Dumphy thinks his losses are occasioned by his cattle eating some kind of poisonous weed, inasmuch as the deaths always occur after the range is dry, and a green weed, though poison, would be tempting. Why, then, would not the native cattle die from the same cause? I spent two days on his range and rode all over it searching for the poisonous weed, but failed to find it. It is not there.



“One gentleman reports that a few years ago he bought eight hundred cattle in San Luis Obispo County. They were moved a few miles on to an alfalfa pasture. In ten or twelve days they began to die, and he lost five hundred of them in a few weeks. They showed no signs of bloat, such as cattle do when they get sick from eating green alfalfa. His explanation of the symptoms is as follows: ‘They were droopy for a day or two; the hair was rough; some of them ran at the eyes, and all had high fever; after they got down they died in from six to thirty-six hours; many of them passed blood both in the urine and the dung, and some in the urine alone.’ All of the cattle examined after death showed a spleen twice its normal size, and many of them had a diseased liver. ‘The contents of the stomach were hard and seemingly powder-burnt,’ was the way he expressed it. Those remaining alive were finally moved off to the mountains, where none died, except those that were sick when they reached the new range. The neighbors, of course, called it the ‘bloody murrain.’ The gentleman who gave me this statement is a practical cattleman and seemed anxious to give all the facts. It was evidently not blackleg, or anthrax, for there was an absence of such symptoms, and none of the sick ones recovered on the march to the new range, which would have been the case had anthrax been the trouble. Nor was it confined to young, fat cattle. Old cows, big fat steers, and youngsters all alike were stricken. The pasture was evidently infected with some fatal disease, and all the ascertainable facts point to splenic fever. If not that, what was it?

“This gentleman says he loses cattle to a greater or less extent every year from apparently the same causes, yet he thinks it is not ‘Texas fever.’ He attributes the origin of the disease to warm, dirty water, and to the fact that the grasses grow so luxuriantly that too many cattle are put on a given area—they befool the feed to such extent that it breeds disease. The cattle referred to in this case were healthy when purchased, no disease ever having been known to exist among them.

“Another gentleman says that he buys a good many cattle in San Luis Obispo County every year and drives to Soledad, about two hundred miles. He loses cattle every year from what the people call ‘big melt.’ In August last, he lost fourteen head out of a drive of two hundred and fifty. Almost without an exception, the largest and fattest steers died. He attributes the loss to long drives in hot weather and without water. The cattle did not mix with the native cattle about Soledad, so I cannot say whether they would have given off disease or not. So many persons have been blood-poisoned from skinning ‘big-melt’ cattle, that this gentleman did not open any dead ones. They were dead, and that settled the matter, so far as he was concerned.

“One gentleman bought three hundred and fifty cattle in San Luis Obispo County and drove to San José, two hundred and fifty miles. Forty head of them died in a short time. He says that the spleen and liver were greatly enlarged, contents of stomach dry and hard, flesh next to hide very red, all had high fever, and, although all the doctors in the neighborhood were called in council, not a sick animal was saved.

“Many more cases like those above given might be recorded, but these convey an idea of the situation. It is proper, in this connection, to give the following: In the latter part of June, 1886, W. M. Plaster, of Texas, shipped a herd of Texas cattle into Arizona, unloading into the pens at Benson. He claimed the cattle were from Presidio County, and non-in-

fected. Hence, his herd was not quarantined, but permitted to move at once on to his range. In reaching their new range they were driven through the San Pedro Valley, where many native cattle were grazing. A few weeks after the arrival of the Plaster cattle at Benson, the Barbocomari Cattle Company drove in between five hundred and six hundred head of beef steers from the range, and shipped out of the same pens into which Plaster had unloaded his Texas cattle. This lot was shipped to California and put in pasture at Kings River. In about fifteen days after their arrival, splenic fever developed among them, and twenty-five per cent of them died. This was called 'big melt,' and those familiar with the local disease could distinguish no difference between the symptoms or the *post mortem* appearances. After the disease had run its length in this herd of Arizona cattle, Mr. Miller, who was acquainted with the disease, purchased the balance of the cattle, and the shipper returned to his ranch. On his way down the San Pedro Valley he saw many dead and dying cattle among the native herds that had grazed over the trail of the Plaster cattle, and all of the symptoms were the same as those manifested by his cattle that had died in California. There is every reason to believe that Plaster's cattle were infected, and that they scattered the germs in the shipping pens and along their trail, and that the disease on Kings River, California, and on the San Pedro, Arizona, were the same and from the same source. All this was undoubtedly the true Southern splenic fever. The exact resemblance of this Kings River disease, in symptoms and *post mortem* appearances, so far as the most practical men could determine, and the local disease of 'big melt' strongly confirms the opinion that they are the same disease, changed, perhaps, a little, by local causes."

In 1888 Mr. Mercer was commissioned to make a further investigation concerning the diseases of animals in California. In his report, dated October 9, 1888, he says:

"In accordance with your telegraphic order of September 28, 1888, I employed Dr. Thomas Bowhill, M.R.C.V.S., and at once took the field to investigate the causes of the great mortality among the cattle in Monterey County, this State.

"Arriving at Cholone, a station on the Southern Pacific Railroad, we visited the herd of E. J. Breen, and found that during the month of September he had lost over nine hundred out of a band of twelve hundred cattle, and nearly one hundred others were suffering from the disease. Two cows were killed that were in the last stages of the disease, and autopsies made. These are hereto attached and made a part of this report. Texas fever was the trouble.

"Proceeding to Coburn's ranch, we found thirteen cases of actinomycosis, and some tuberculosis. Two animals were killed, autopsies made, and the results herewith submitted.

"At Soledad we examined one cow, and pronounced it splenic fever. Around this village nearly all the cattle are infected, and hundreds have died. While we found no anthrax, there is no doubt, in my mind, but that the disease exists here, and probably more than half of the deaths have occurred from this cause.

"Visiting Gonzales, we found the whole region round about rotten with anthrax. One herd of eight hundred cattle placed in a stubble-

field July 15th had suffered a loss of one hundred head, and the autopsies showed anthrax clearly, in the general condition of the organs, and under the microscope the anthrax germ. Autopsies herewith inclosed. Two horses were examined, and anthrax found. Autopsies also inclosed. At this place the Spanish residents are in the habit of eating the meat of the dead animals after 'jerking' it, and the local physician reports fourteen deaths among their children from putrid sore throat; caused, he says, by eating this diseased meat. Quantities of it are being shipped to San Francisco, and this fact I have reported to the Board of Health there. Proper action will be taken.

"Diligent search was made for the history of the causes leading to these outbreaks, but the shortness of the time given for investigation rendered it impossible to gather reliable data. From all the facts attainable, I am of the opinion that there is a considerable area in this State that is permanently infected with the germs of splenic fever. The Salinas Valley, where this outbreak occurred, was visited last winter by cold sufficient to freeze the ground to the depth of an inch. Certainly this would kill the fever germs. Many cattle have been brought in this year from the San Joaquin Valley and other parts of the State, to feed on the stubble, but none can be found that came from Texas or other southern points east of the Rockies. I am not prepared to say definitely that the Texas fever originated here, but there is much to induce the belief.

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"I send you specimens of the work done in the field, from which you can verify our work. The situation here is so serious that it seems to me you would be fully justified in detailing some one for a term of months to ascertain *all* the facts in regard to the various diseases among the domestic animals of the State, and, if possible, to locate the line of Texas-fever infection."

The results of Dr. Bowhill's investigations, so far as they relate to Texas fever, are found in the following paragraphs from his report:

"In accordance with instructions by telegraph, dated November 10, 1888, I proceeded to San Diego County, in this State, to investigate the cattle disease there predominating. The result of my investigations I herewith respectfully submit:

"On my arrival at San Diego, finding that my written instructions had not yet arrived, I thought it the better plan to inform myself on the following points: (1) The direction in which the said diseases were supposed to exist; (2) The ranches on which said cattle were dying; (3) The health and condition of the cattle in San Diego County and its surroundings. In the course of my inquiries I came in contact with the following named gentlemen, from whom I elicited the appended information:

"The first gentleman I interviewed was Mr. George Sellwyn, of the firm of Sellwyn & Allison, wholesale butchers. He said: 'I have been twenty-three years in this county, and have known of the existence of the disease for the past sixteen years. In the neighborhood of San Diego it has been worse during the last three or four years. Some seasons the disease predominates in one locality more than in another. This year

(1888) it has manifested itself principally at Warner's Ranch, which is owned by ex-Governor Downey, of California.'

"Mr. Sellwyn also stated that cattle brought from the mountains during the dry season of the year to San Diego County, or any part of the coast, are, in about fifteen days after arrival, subject to disease. The disease is of frequent occurrence, and the cattle are slaughtered and used for consumption. He describes the symptoms and the *post mortem* lesions, and they correspond to those of Southern fever and splenic apoplexy.

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"The next gentleman I interviewed was Mr. Hardy, wholesale butcher of San Diego. He informed me that he shipped cattle in April and May, 1888, to San Diego, and pastured them in El Cajon Valley. They appeared healthy until the month of August, 1888, when about two per cent died. He stated that Mr. Shutton's cattle, also in El Cajon, began to die, when he sold the remainder to him (Mr. Hardy), who found on slaughtering them that two were diseased, the spleens being three times their natural size, and one section of a dark, black color. The livers were spotted and covered with yellow streaks, like straws laid across. The kidneys were also diseased. The flesh when dressed was of a light yellowish-red color. Mr. Hardy further stated that fifty per cent of the cattle within from ten to thirty miles from the coast in San Diego County take this sickness, and about twenty per cent of the sick animals die, and it appears to be worse between the 1st of July and the 1st of December.

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"The next gentleman was Thomas Alvarado, of Rancho Monserrate. He first noticed disease on his ranch about ten years ago, and it was, in his opinion, brought in by cattle from Lower California and Mexico. Last year he lost about sixty head, and his neighbor, H. H. Gunn, lost over one hundred head. The cause was, in his opinion, Southern fever. He first noticed this disease in the county about eighteen years ago, directly after Judge Weatherby brought in two hundred cows from Arizona.

"His brother, D. Alvarado, of Cuervo, lost over sixty head last year, and considered his losses due to Southern fever.

"I now left for Warner's Ranch, and on my way I passed through El Cajon Valley, and was informed there was at present no sickness or deaths among the cattle, nor could I discover signs of any. On passing the Santa Marie ranch I was informed that they had lost ten or twelve head, but attributed the loss to black leg. I interviewed a Mr. Johnson, who lives seven miles above this ranch, and he informed me that in 1883 he lost twenty head of cattle out of a total of sixty head, and attributed his loss to Southern fever.

"In the evening I arrived at Ballena, and next morning drove to the Warner ranch, where I found that the manager, Mr. Linton, was not at home, having gone to Julian, intending to continue his journey to San Diego. I had a conversation with one of his men, who informed me that they had lost over one hundred head of cattle; that the cattle ceased dying a few days before my arrival, and a short time after the first frost, and I therefore could not make an autopsy. I decided to go on to Julian and personally interview Mr. Linton. This gentleman confirmed the state-

ments made by the man I had seen in the morning. He also added that he purchased and brought some cattle from the San Felipe ranch, which adjoins the Warner ranch. A little later, ex-Governor Downey, owner of the ranch, bought four hundred Chihuahua steers, shipped from Mexico to Colton by a man called Strausenbach; that said cattle were delivered by Strausenbach on the Warner ranch, and a short time after their arrival the natives began to die. Mr. Linton ascribed the cause of these deaths to the arrival of the San Felipe cattle. I found, however, that the other half of the San Felipe cattle, purchased by Joseph Marks, merchant at Julian, and removed by him to San Bernardino, remained perfectly healthy and as yet have caused no disease among the other cattle at that point. On the contrary, some of the San Felipe cattle on the Warner ranch died soon after the advent of the four hundred steers from Chihuahua, of which none died. Mr. Linton described the symptoms of the disease in the following manner: They hung their heads, had a staring coat, and eyes somewhat sunken and staring, and voided in most cases bloody urine. The fattest and best were first to die; others lingered for days, and some eventually recovered. On opening some of the dead cattle, he found the spleens enormously enlarged, the liver of a brick-red color, and the gall-bladder full of dark-green bile. There was absence of any dark stain to the flesh, which was, if anything, brighter than usual. The Indians and half-breeds devoured the flesh of most of those that died without as yet having experienced any bad effects, which could scarcely have been possible had it been anthrax. Mr. Linton owned to having lost one hundred head, but I am inclined to think that he underestimated his loss, as his nephew informed Mr. Bishop, his neighbor, and one of his men, who informed me, that they had sold one hundred and fifty hides, and that others were missing which they did not find, placing the loss, in his opinion, between one hundred and eighty and one hundred and ninety head.

“From Julian I went to Governor Waterman’s ranch, at Cuyamaca, and on arrival was informed that a valuable Herford bull had died that morning after a short illness, and had been buried but a few hours. I had it disinterred and made an autopsy, with the following results: Spleen enormously enlarged, being three times its natural size; capsule hypertrophied, and covered with white spots. On section, the splenic pulp was disintegrated, but still held its consistency, unless pressure was used; then it oozed out. The liver was considerably enlarged and of a brick-red color, its surface being covered with yellow streaks. The gall-bladder was enormously distended and full of dark-green, inspissated gall. The kidneys were somewhat fatty, with more or less parenchymatous degeneration, and in the pelvis a yellow, viscid fluid was present, somewhat adherent to the mucosa. The mucous membrane of the bladder I did not see, as it was too much covered up, but the lungs were somewhat congested. The flesh was of a bright yellowish red, and the blood was of a bright color and coagulable. Coverglass specimens from the spleen and liver, stained with methyl-violet blue and with Johnis-fuchsin, revealed nothing, and I gave as my diagnosis, Southern fever.

“At this ranch I interviewed the foreman, Mr. B. W. Carey, who said: ‘We have lost, in all, twenty-one head. We shipped cattle from the Penasquitos, on the coast, to San Bernardino by car, in April, 1888. These cattle remained there three months. In July, 1888, we re-shipped

them, with others, back to the Penasquitos ranch, and in about two weeks after their arrival two deaths occurred, and we started the cattle next day for the Cuyamaca ranch, driving them by way of Poway and El Cajon, and on arrival at Cuyamaca three died the same night. We then had no deaths for a few days, when two more died. They all exhibited the same symptoms. Mr. Shutton's cattle commenced to die after Governor Waterman's passed through. Mr. Shutton then shipped the remainder to San Diego, and they were slaughtered.

"I must here refer you back to my interview with Mr. Hardy, at San Diego. Mr. Hardy shipped cattle to El Cajon in April and May, 1888, and they began to die in August, 1888. Governor Waterman's cattle, having gone through at the end of July or beginning of August, on their way to Cuyamaca, it would appear that the Governor's cattle may have infected both these herds, as the two cattle which Mr. Hardy slaughtered at San Diego, and which he believed to be affected with Southern fever, were taken from the remainder of Mr. Shutton's herd, which Mr. Hardy purchased from Mr. Shutton. In connection with Governor Waterman's cattle, I must state that, yearly, deaths take place at the Penasquitos ranch. It is, however, a curious fact that none of the cattle shipped to San Bernardino from Penasquitos died, but that the deaths took place two weeks after their return, with other cattle, to Penasquitos, which, the Governor's son informed me, came from their San Bernardino dairy. It is a well-known fact that deaths have occurred close to Colton (which is two miles from San Bernardino) from Southern fever, and it may be that Governor Waterman's cattle crossed a trail and became infected, or became infected from the cars on their return to Penasquitos; but these, being native cattle, could not infect Hardy's and Shutton's herds, unless some Southern cattle were mixed in the herd. It is also a fact, that the bull that died at the Cuyamaca ranch was raised on that ranch, and that there were no deaths there until the arrival of the herd from Penasquitos. I am informed that the original stock of these two ranches was brought in by Colonel Taylor, from Springer (New Mexico), Iowa, and Kansas.

"I left Cuyamaca to trace up the infection on Warner ranch, and, on my way, passed through the San Felipe ranch, which adjoins the Warner, and I found they had lost three head, and attributed their loss to black leg. During one year, they informed me, they had lost a considerable number with black leg; in fact, it was of annual occurrence. I now crossed the Warner ranch for the second time. I passed through the center of the Chihuahua steers, all of which, as well as the natives, seemed in splendid condition, no deaths having occurred since my first visit. In following the trail of those cattle, the first place I reached was Oak Grove, owned by Mr. Studebaker, who informed me that the Warner steers passed through his place, and up to the present no deaths have occurred, but that one of his cows was sick and passing bloody urine. He said, also, that one of the Warner steers had mixed with the herd. From here I proceeded to Temecula, and found that a great number of cattle had died around this place. Here I interviewed the following named gentlemen:

"Mr. E. J. Talan stated that he had lost one heifer three weeks after the Warner Ranch cattle passed, and that two years ago he lost thirteen head on the same trail. Mr. Nickels, I was informed, lost ten or twelve, and Mr. Philip Cases lost five head. I went to Mr. Hutchinson's dairy

farm, and he informed me that he had lost about twenty head of dairy cows, and that most of his herd had been sick. He opened some of those that died, and found the gall-bladders enormously distended and full of dark-green, inspissated gall, and the spleen enormously enlarged. All those he opened presented similar appearances. The first animal that died was his best and fattest cow, which occurred, as near as he could remember, in the middle of July. Previous to that, some long-horned steers were seen on the adjoining hills, and two of them came down and mixed with his herd, and were with them for several days. Mr. Linton, manager of the Warner ranch, informed Mr. Hutchinson that those Chihuahua steers were scattered from Colton to his ranch, some thirty or forty being missing.

“Mr. Gibson, at Niger Cañon, five miles above Temecula, lost ten head, some of those roving steers also having appeared around his place. Mr. Brady, three miles from Temecula, lost fifteen head, and he also said that the Warner steers came through in August, and that his cattle began to die before they came through, and a Mr. Hutchinson informed me that long-horned steers were seen on the hills around Temecula as early as the 6th of July. They could not have been stragglers from those that went through in August.

“Having gained all the information I could at Temecula, and the evidence being somewhat conflicting, I now proceeded to the Santa Margarita ranch, leaving the Warner trail, as I was informed other trails came through Temecula, some of the cattle going to Santa Margarita and others to the coast ranches around San Juan de Capistrano and Santa Ana. Mr. O’Neil, of the Santa Margarita ranch, informed me that when the Chihuahua steers, sold to Governor Downey, were pastured on the Castile ranch, fifteen miles from Colton, he went to see them, but declined to purchase.

“On the 12th day of July, 1888, I delivered cattle to Hardy, of San Diego, and he informed me that he had seen long-horned stragglers at Temecula.”

“This seems to coincide with the date of the death of Mr. Hutchinson’s cattle. He also said that Colonel Taylor brought cattle from Texas to Cuyamaca and Penasquitos, some of which were of a high grade, and that two years ago they died. The Texans, in his opinion, infected the high grades, which, undoubtedly, were those mentioned by Governor Waterman’s foreman as coming from Kansas and Iowa. Mr. O’Neil also informed me that they are constantly killing Texas and New Mexico cattle in San Bernardino City. His own losses had been about ten to fifteen head this fall, which he attributed to cinabar ore or mercurial poisoning, the mercury having been washed down by the rains into the drinking-places, and other deaths he attributed to ticks; but I am not inclined to believe either of those theories, because it is well known if an animal is sick and seeks solitude in the scrub, that is the time that the ticks will attack him, and as a cause of death they may assist, indirectly helping to weaken an already emaciated animal. From what I heard from Mr. O’Neil’s neighbor, Mr. Foster, I am inclined to think that the poison on his place is Southern fever.

“From here I went to San Juan de Capistrano and interviewed Mr. Marcus Foster. He said that Mr. O’Neil brought cattle on to the Santa Margarita ranch, which adjoins his, and that they broke down the fence and mixed with his, and he lost one hundred head. Next year the

same thing occurred, and the animals mixed with his, as well as others which he brought from Arizona, and he lost from eight hundred to one thousand head. This year (1888) he lost about one hundred head. He further remarked that all the ranches below had been affected in a similar manner, and as they never had this disease before, it must have been brought in. I made an autopsy on this ranch, and found the lesions those of Southern fever.

"I now started back on the trail of the Warner steers, and went to Colton. I here interviewed Mr. Castile, owner of the Castile ranch, and he informed me that Mr. Strumbaker brought four hundred steers from Chihuahua, unshipped at Colton, and drove them to his ranch, fifteen miles from Colton, about June 6, 1888, and pastured them there two months. He then sold them to ex-Governor Downey, and his son helped to deliver them on the Warner ranch. He denied losing any on the way. He further said that a year ago, in September, 1887, he lost fifty-six dairy cows, which he valued at \$3,000, and ascribed the cause to cattle being driven across the ranch. This year he had lost none.

"I now proceeded to the Southern Pacific office at Colton, and found the shipments to this point as follows: (1) From Benson, Ariz., for Mr. Marcus Foster, San Juan de Capistrano, unloaded May 4, 1888; (2) From Tucson, Ariz., for Mr. Marcus Foster, San Juan de Capistrano, unloaded April 6, 1888; (3) On March 13, Mr. Strumbaker shipped in one hundred and thirteen head, which I found were slaughtered at Colton and San Bernardino.

"At the Santa Fé office, in Colton, I found that Mr. Strumbaker shipped four hundred head of cattle from Chihuahua, which arrived June 5, where they were unloaded and sent down to the Castile ranch, as already stated.

"I had the greatest difficulty in getting my questions answered, and in a good many instances, instead of trying to assist, they tried to mislead and perplex me.

"Having now obtained all the evidence I could concerning the outbreak of disease in San Diego County, and with due regard to conflicting statements, no doubt purposely made in a great many cases, I draw the following conclusions:

"That Texan, Arizona, and Mexican cattle have been shipped into Colton, and from there traveled by the trail going to Warner's Ranch and that going to Capistrano; also, by O'Neil's trail from San Geronimo to Rancho Santa Margarita, and that the cattle infected these trails and the individual ranches, and by that means caused the death of so many native cattle in San Diego County. The only objection I can see to these conclusions is: Can permanent infection exist, as Mr. Mercer was inclined to think during our inspection in the Salinas Valley of Monterey County? To prove this would require further and special examination of the various ranches in California at a time when the disease is at its height.

"In Los Angeles City, Dr. Whittlesey, V.S., drew my attention to the fact that some cows had died within the city limits, from what he supposed was Southern fever. The cows belonged to Mr. W. W. Cate, who said that his cows died from red-water, and were treated for the disease by an empiric, without any of them recovering. The animals were in the habit of grazing in the river bottoms, along which river-bed Scanton



Bros., owners of the Orleans Market, were in the habit of driving their cattle in order to reach their slaughter-house, ten miles from the city. In this way, Dr. Whittlesey considered that Mr. Cate's cattle were infected.

"Leaving Los Angeles, I went to Hanford, at the request of the State Board of Health. On arrival I met J. A. Davidson, M.D., who informed me that at the request of the Board of Supervisors he went out and examined some three hundred and sixteen head of cattle brought from the Salinas Valley, and pastured on alfalfa. After being there three weeks, they commenced to die. He quarantined them. Mr. Motheral informed me that the cattle, in coming to Hanford, passed through the Poly-Heilbron ranch, where cattle have been dying in great numbers. The mortality ceased soon after their arrival. Mr. Motheral, who used to farm in Mississippi and Florida, said he had had experience with Southern fever, considered the symptoms and *post mortem* lesions of these cattle those of Southern fever, and laid particular emphasis on the fact that after the frost came they ceased dying.

"Mr. J. E. Tilton, who lives four and one half miles from Hanford, informed me that he had lost nineteen head this year, and sixteen head last year. He usually carried about forty head of cattle. This year they began to die about the 1st of September. In August some cattle came in from the Coast Range of mountains. He cut some of the dead cattle open, and found the omasum hard and dry. The spleen was three times its normal size, and was black. Some of the animals before death voided bloody urine. Some died quickly, while others lingered for days. The fattest died first. I went to Mr. Sanford's ranch, four miles from Hanford, who informed me that he sold his hay to Poly, Heilbron & Co., to feed to cattle on their ranch. They brought in about one thousand four hundred head of cattle, and two or three days after arrival they commenced to die. About four hundred and fifty died on the Poly-Heilbron ranch before they left. I made two *post mortems* here. The first was a cow that got down and was killed the same day I arrived. I found the following lesions: Spleen slightly enlarged, but the pulp was normal. The liver was enlarged, and of brick-red color, and the gall-bladder immensely distended, and full of dark-green, inspissated bile. The kidneys I found congested. The stomach and intestines were in a normal condition, as were also the heart, great vessels, and the blood. The lungs were both affected with broncho-pneumonia, being variegated, brown and red lobuli, alternately. I split open the bronchial tubes, and found them full of the *Strongylus micrurus*, causing parasitic bronchitis. Microscopical examination failed to reveal anything. Numerous other animals were coughing, so I recommended for each affected animal the following:

"Spirits of turpentine,  $1\frac{1}{2}$  ounces; linseed oil, 1 pint. Mix and make one drench; give immediately.

"I considered this the safest thing to give them, as it would be impossible to give inhalations, and I had no inter-tracheal syringe with me.

"The next autopsy was a calf that died two days before I arrived. The weather was cold, and there was not much decomposition. The spleen was enormously enlarged, being at least three times its natural size, and on section was black, but not entirely disintegrated. The liver was enlarged, fatty, and of a brick-red color; the gall-bladder was distended to a great size, and full of gall. I did not examine the other

organs, as there was so much *post mortem* staining. The flesh was, if anything, brighter than normal, with a yellowish-red color. Microscopical examination failed to reveal any germ, except a few putrefactive bacteria, and, as the animal had been dead so long, I could not give a definite opinion, but considered the lesions almost identical with those of Texas or Southern fever.

“It would seem, in this case, that the infectious principle came from the Poly-Heilbron ranch, and that the other deaths reported by Dr. Davidson were due to infection in passing over the Poly-Heilbron ranch, or they were infected before leaving the Salinas Valley; but the former, in my opinion, is the more likely, as the number of deaths at the Poly-Heilbron ranch during the past few months would indicate considerable infection in that locality.

“Finding the death-rate at a minimum, and no other places to visit, I returned to San Francisco.”

In February, 1889, Governor Waterman, of California, telegraphed that the disease was still prevalent among cattle in San Diego County, and asked that a competent veterinarian be directed to make a further investigation, and give such directions as might prevent its extension and ultimately result in its suppression. In compliance with this request, Dr. A. J. Chandler, veterinary surgeon for the Territory of Arizona, was directed to visit the locality. The results of his investigation will be found embodied in the following report:

“Upon receipt of your telegram I at once started for Southern California, and while in Los Angeles accidentally learned of the district in San Diego County in which the disease existed, which proved to be on the Los Penasquitos ranch, about fifteen miles north of San Diego, five miles back from the coast, and leased by Governor Waterman. Upon investigation I found that about one hundred head of cattle had been affected with the disease, some thirty of which had died. Among the latter were some very valuable Hereford bulls. A number were on a fair way to recovery, while a few were beyond hope. The disease is undoubtedly Southern fever. I made two *post mortem* examinations, one upon an animal which had died just before my arrival, and the other upon an animal I had slaughtered. In both instances the spleen was enlarged, the liver yellowish-brown and increased in weight; the gall-bladders were enormously distended and filled in one case with yellowish fluid bile, and in the other with a dark brown and very thick fluid. The urinary bladders were filled with dark, bloody urine. The kidneys were congested and enlarged, and the cortical substance softened; the subcutaneous alveolar tissue and the mucous membranes of a yellowish tinge. The blood fluid was of a bright red color. The symptoms are high temperature, rapid pulse, staggering gait, and in some instances delirium. The following history of the outbreak is thus given:

“In April, 1888, eighty-four head of cattle were driven across country from the Penasquitos ranch to San Bernardino. In July, part of the same herd, and cattle from the dairy ranch at San Bernardino—seventy-three head in all—were driven to the Penasquitos ranch. Two weeks after they reached the ranch they commenced dying. Those coming

from the dairy ranch became affected, while those from the Penasquitos ranch remained healthy. Three died at Penasquitos ranch. The remainder were started to a mountain range—the Cuyamaca; seven head died on the way, and the remainder within three weeks. Three hundred and five head of cattle were driven from the Cuyamaca range, which has an elevation of between 4,000 and 5,000 feet, starting on the 5th of January, 1889, reaching the Penasquitos ranch on the 8th of that month. The cattle began to die on the 24th, and at the time of my visit to the ranch some thirty had been lost. Running with these cattle were seventy head belonging to Mr. Taylor, and raised on the ranch. Up to this time they had remained perfectly healthy.

“From San Diego I went on to Kern County, examined many of the large ranges, and made inquiries of the inhabitants and of the County Physician. I saw many herds of cattle, but could not find or hear of any disease among them. During the early part of the fall several hundred head died, and from the description of the disease, as given by the cattlemen, I think it was anthrax.”

While Mr. Mercer was in California in 1888, the question of the infection of the State with Texas fever was discussed in the newspapers, and also at meetings of the San Francisco Board of Health. Articles on the subject will be found in the “Morning Call” of October 9th and 10th. The following interesting extract is taken from an interview with Mr. Mercer, which appeared in the “Chronicle” of about that time, the exact date not being noted:

“Texas fever has been known to exist in the southern portions of the United States for upwards of a century. There is no known remedy for the disease. The Colony of Virginia, previous to its State organization, passed laws prohibiting the bringing of cattle from the south into the Colony. For nearly one hundred years subsequently, but little was heard of this fatal disease. Early in the fifties, however, as Texas began to fill up with cattle, and cut for them a northern outlet, large numbers of native cattle along the trail in Missouri, Illinois, and other States began to die of a strange, and in that region, an unheard-of disease. Hundreds of thousands of dollars’ worth of cattle perished annually for a number of years previous to the breaking out of the war, and after careful investigation by drovers and scientific men, the origin of the disease was traced to Texas cattle. An autopsy of the diseased animal exhibits a greatly enlarged spleen—in some instances its length amounts to thirty inches. The splenic pulp consists of a disintegrated mass, which has lost all consistency, the contents resembling black currant jelly. The liver is also enlarged, and changed from its normal color to a bright brick-red. The third compartment of the stomach, or manyplies, is found impacted, and has the appearance of a charred black mass.

“The disease may be known from the red color of the blood and its ready coagulation. It is only imparted by cattle coming from below the line of permanent infection; where that line is located, west of the Rockies, is a matter for future determination. In the Eastern States, after years of investigation by the Government, this line has been determined. It extends from a point on the Atlantic coast near the

boundary of North Carolina, in a general westerly direction to the northeast corner of the Indian Territory; thence westerly for two thirds of the way across the Territory, where it turns abruptly to the southwest, continuing in the same general westerly direction to the Rio Grande River, a little below El Paso, thus leaving one third of the northern portion of Texas free from infection.

“Cattle from south of this line, when moved north, have the peculiar facility of infecting the trail over which they pass, and rendering it deadly ground for the conveyance of poison to the native cattle. Since the first herds of Southern cattle have been driven and shipped north, over \$3,000,000 worth of native cattle of Kansas, Colorado, Wyoming, New Mexico, Nebraska, Illinois, and Missouri have died from this infection; hence, the people of these States and Territories have made Splenic fever a special study.

“By way of giving a more definite idea to readers of your paper, I may say that a herd of Southern cattle driven along a dusty road, or across the prairie, leaves so much poison that native cattle crossing the road or the trail are infected in the varying percentages of twenty to sixty. This percentage, just as in diseases which are of epidemic or endemic form, such as measles, etc., which assail the human family, varies in accordance with the virulency of the germ, which, during some particular years, assumes a very virulent type. Those of the Northern cattle, which take on the disease and die of it, have not the power of transmitting it. More definitely speaking, Texas fever, in its primary condition, is transmissible; in its secondary condition, not transmissible. There is no known remedy, safety depending upon quarantine regulations alone.

“Another striking peculiarity of the disease, is its lessened intensity when frost comes, as the germs are then destroyed. Taking this fact into consideration, all the Eastern and Western States quarantine against Southern cattle, from the time of the last spring frosts, until cold weather in the fall. No restrictions are placed upon their movements during the winter months. Observations thus far taken justify the opinion that there is a large section of country on the Pacific Coast south of this line of permanent infection. Where that line is located, is a question worthy of the most careful research on the part of the Bureau of Animal Industry and the State of California.”

The question of cattle disease in California was not again brought to the attention of the Department until 1894. During that year it was alleged that outbreaks of Texas fever had occurred in Nevada, Kansas, and Missouri, from California cattle taken to those States. The following is from a report of Mr. Albert Dean, who is stationed at the Kansas City Stock Yards, and has charge of the inspection of cattle from the Texas fever district:

“From February 1 to November 20, 1894, 127,388 cattle were shipped from the native divisions of the Kansas City Stock Yards to points in the State of Kansas, for grazing and feeding, and during the same period of time 116,691 head of feed and stock cattle were shipped from the same yards to points in the State of Missouri. From this movement, aggregating 244,079 cattle, an outbreak of Southern cattle fever occurred

on the farm of J. R. Blackwell, Lees Summit, Jackson County, Missouri, and also the same disease developed on the farm of O'Donnell & Son, Gridley, Coffee County, Kansas. Both of the above-named parties, on June 5, 1894, bought cattle in the Kansas City Stock Yards that had been received that day from Ventura, California, and took them to their farms."

On account of these outbreaks of disease, apparently caused by California cattle, Mr. W. E. Hill, an Inspector of this Bureau, was directed to proceed to California and make an investigation as to the extent of territory in that State which is permanently infected with the Texas fever contagion. In the years intervening between 1886 and 1894 the investigations of this Bureau had done very much to clear up the mysteries surrounding this disease. It was shown that the contagion was disseminated by the cattle-tick known as the *Boophilus bovis*, and that the distribution of this tick in the eastern part of the United States corresponded with the district permanently infected with Texas fever. In other words, cattle coming from sections where this tick existed would spread Texas fever, and those coming from sections where the tick did not exist were found to be harmless. Mr. Hill's reports, from which I shall quote extensively, are, therefore, largely given up to a determination of the districts in California in which the cattle-tick, *Boophilus bovis*, is found, although he has also presented evidence to show that the cattle in these districts disseminate Texas fever in exactly the same manner as do the cattle from the tick districts of the States bordering on the Atlantic and Gulf coasts.

On December 20, 1894, Mr. Hill wrote from Capistrano:

"I send you by this mail a sample of cattle-ticks, taken from cattle this morning on the Boca La Plalla ranch, near this place, the cattle belonging to Marcus Foster, who resides here. I regard them as the genuine *Boophilus bovis* tick. This whole country along the ocean, on the low, hilly, brushy land, seems to be infested with this tick. It is said they were first brought to this country by Mr. O'Neil, of the Santa Margarita ranch, six or eight years ago, on cattle that he brought from Texas. I go to-day to Los Flores, on the O'Neil ranch, where the two hundred and ninety head came from that arrived at Hymer Station, about June 8th, and remained in the Berry pasture about two weeks. There can be no doubt but that they were ticky when they left here, and could have infected the Berry pasture in time to cause the outbreak that killed the Jackson cattle. They were shipped by J. L. Heath."

December 21st, he wrote from San Diego, California, as follows:

"Have just arrived here, and by this mail I send you some more ticks, obtained from cattle at Los Flores, on the Richard O'Neil ranch (Santa Margarita). Having obtained more ticks at this point than I needed to send you, I send one case of about one hundred and twenty-five to the Secretary of Agriculture, Washington, D. C. The ticks I send

you to-day were obtained from cattle at the same station from which J. L. Heath shipped the two hundred and ninety head of cattle that were unloaded at Hymer about June 8th, where they were put into the Berry pasture, and remained about two weeks. Mr. Hugh McGee, the foreman of this ranch at Los Flores, tells me that there were ticks on these cattle when unloaded."

December 22, 1894, Mr. Hill wrote:

"I send, under wooden cover, a sample of ticks gathered from cattle on the Santa Margarita ranch, controlled by Richard O'Neil, who lives near Oceanside, California. I hope they will arrive at their destination in fairly good condition. This country, all along the coast, in the mountain foothills, covered with small brush, is infested with these ticks. Cattle are covered with them, and about twice a year the ranch people clean these ticks from their cattle with currycombs, and then use crude petroleum on the cattle. I have also sent samples to Albert Dean, Kansas City, Missouri. I think all the cattle ranches between Los Angeles and San Diego are infested with these ticks. North of Los Angeles I will investigate a little later. If any cattle are brought from high altitudes to the coast, a large per cent of them die."

The ticks sent by Mr. Hill were carefully examined at the laboratory of this Bureau, and identified as the *Boophilus boris*, or Texas fever ticks.

On December 25, Mr. Hill made the following statement:

"When I wrote you the 23d, I thought that I would not send you any more ticks gathered in this section; but yesterday I went out on the Cuyamaca Railroad to Lakeside Station, in El Cajon Valley, twenty-two miles from the ocean, and in the interior among the small mountains and foothills. Here I found plenty of ticks, and gathered another supply. I know of no way to dispose of them but to send them to you. I never saw as many ticks on Texas cattle as I have seen on the cattle here. It seems to me that I have sent you enough to satisfy any reasonable man that the cattle here are all infectious, and are capable (through the tick) of giving the Texas fever to susceptible cattle. One thing the cattlemen of this section have learned by experience, viz.: that when they bring cattle from the high ranges down to the ocean ranges, or take those from the low to the high ranges, the high-range cattle take sick, and a large per cent of them die, while the low-range cattle remain healthy. They do not understand why this is so, or what the tick has to do with it, further than to drain the system of blood. They have quit making such transfers, and therefore the cattle have had no contagious disease among them this season.

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"This one thing all cattlemen agree upon: that when cattle from Arizona or other high altitudes (having no ticks) are brought to the coast ranges at a low altitude, and are put with cattle having ticks, the high-altitude cattle invariably take sick and die. They explain their appearance, when sick, as follows: Ears lopped down, hair rough, eyes having a staring look, flanks drawn up, head drooping, animals move slowly when aroused, and void bloody urine, and when examined after

death the spleen is found to be greatly enlarged. The liver is enlarged and of a darker color than in the normal condition. All of these things, with the presence of ticks on the body, indicate clearly, to my mind, the nature of disease that causes death under the above conditions."

January 27, 1895, Mr. Hill wrote from Stockton, California:

"Have just arrived here, and will likely stay here to-morrow, when I expect to go eastward up the San Joaquin Valley, and will arrive in Los Angeles about February 2d or 3d. One thing you can take to be true, unless all the people in this part of California lie, and that is not probable, to wit: that the country along the Pacific coast from the Mexican line as far north as the Bay of San Francisco, and from the foot of the Tehachapi Pass down the San Joaquin Valley to the Sacramento River, is infested with ticks."

Mr. Hill wrote from Ventura, California, to Colonel Dean, December 29, 1894, as follows:

"Last night I stayed with Mr. L. J. Rose, Jr., at his home eight miles from this place. He gave me the following history concerning his cattle transactions during the years 1893 and 1894. I will give it in his own language as repeated to me, to wit: In the spring of 1893, he and William Hobson, a butcher of Ventura, California, leased what is known as the Broome ranch, consisting of twenty-three thousand acres, located seventeen miles southeast of Ventura. They also bought the cattle on the ranch, seven hundred and fifty-five head. These cattle had been raised on this ranch and there was an abundance of ticks upon them, the ranch having been infested with ticks for years. This ranch borders on the ocean, some of it not many feet above the sea level, other parts high, rocky, and largely covered with small, bushy trees and brush. Some of the peaks are from three thousand to five thousand feet above the sea level.

"Mr. Rose also had another smaller ranch, on which he had had more or less cattle for three or four years. This ranch was also infested with ticks. It is called the Tapo ranch, and is situated in the low mountains south of Newhall and about thirty miles from the Broome ranch. The lowest part of this ranch is about two hundred and fifty feet above the ocean. This ranch is also rough, stony, and covered with underbrush, etc., and much of it is from five to ten hundred feet above the ocean, having many peaks much higher. To properly stock these two ranches they first bought, May 15, 1893, five hundred head of cattle from Mr. Hardison, who lives at Santa Paula, California, and they soon moved two hundred of these to the Broome ranch and placed them with the cattle already there. Within three weeks one hundred and seventy of the Hardison cattle had died, and none of the cattle which were previously on the Broome ranch had been sick. About November 1, 1893, they removed the remaining three hundred from the Hardison ranch to the Broome ranch, and in three weeks one hundred head had died. The Hardison ranch is near Santa Paula, about twenty miles from the Broome ranch. Its elevation at its lowest places is from two hundred to three hundred feet above the lowest elevations on the Broome ranch. Mr. Rose assured me there were not, and never had been, any ticks on the Hardison ranch, and others told me the same thing.

“Their second and last purchase was one thousand eight hundred head at Tehachapi, on the Mojave desert, elevation four to five thousand feet above the sea level. These cattle were moved in two drives, the first drive about June 1, 1893, and the second about June 15, 1893. About six hundred of the one thousand eight hundred were taken to the Tapo ranch, where one hundred of them died. The other twelve hundred were placed on the Broome ranch, and in a month six hundred of these had died, and yet none of the cattle which were on the ranches previous to the purchases above made had died or been sick. The total loss was nine hundred and seventy head. It seems clear to me that the two thousand three hundred head bought and placed on these ranches were susceptible cattle, and those which were previously on the two ranches were infectious and gave the disease to those which had been purchased elsewhere and moved onto these ranches. I call it Texas fever. Mr. Rose further said that when the fall rains came and the weather became colder, the cattle quit dying, and he has had no further trouble in that direction. In the spring of 1894, owing to the limited amount of rainfall the previous winter, and the probability of the coming season being dry, with a scarcity of feed on the ranges, he and Mr. Hobson concluded to wind up their cattle business; and to better accomplish this, they divided the cattle. From the portion taken by Mr. Rose, three hundred and forty-one head were driven across the country to Los Angeles, where he shipped them, via the Santa Fe Railroad, to Barse Commission Company, Kansas City, Missouri; one heifer died en route, leaving three hundred and forty head, which he says were sold to a Kansas man by the name of Pitney. He further said that it was quite likely these cattle had some ticks on them when shipped; that he did not especially recollect about it, but that the remaining cattle left at home had an abundance of ticks during the summer, and he therefore took it for granted that the cattle shipped must have had ticks. This is the only shipment made by Mr. Rose to points outside of California.

“Now, Mr. Dean, I think a careful perusal of the above will convince you, as it has me, as to how the Berry pasture became infected. I have traced two shipments of infectious cattle from California to this pasture, either of which could have infected it. One by J. L. Heath, shipped from Los Flores, California, about June 1st, arriving at Hymer June 8, 1894, and the other by L. J. Rose, from Los Angeles, about May 21st, and arriving at Hymer May 27, 1894. Each of these shipments of cattle remained in the Berry pasture about two weeks. Mr. Rose also said that his cattle, when sick, voided bloody urine, and a *post mortem* examination showed an enlarged spleen—symptoms of Texas fever.

“Mr. Rose gave me the following history of the Willoughby shipment of cattle last summer, to wit: He made two shipments; the first was from his own ranch, which all say is not infested with ticks of any kind. Mr. Dunn, of this place, went with this shipment. For Mr. Willoughby's second shipment, he bought one hundred and fifty-four head from William Hobson, they being part of the Rose and Hobson cattle from the Broome and Tapo ranches (infected ranches). The balance came from the Conejo and Casitas ranches. The Conejo adjoins the Broome ranch, and is said to be infested with ticks. The Casitas is some miles distant, and said to be free from ticks. Mr. Willoughby's boys went with this last shipment, which was consigned to the Kansas



City Live Stock Commission Company. From this shipment came the cattle bought by Mr. Blackwell, of Lees Summit, and Mr. O'Donald, of Gridley, Kans., which arrived in Kansas City, June 5, 1894. In this shipment were one hundred and fifty-four cattle from the Broome and Tapo ranches, which I consider were infected, and would give disease to susceptible cattle. The same is probably true about the cattle from the Conejo ranch. It is clear to my mind that the fever outbreak in the Blackwell and O'Donald pastures came from the Rose and Hobson cattle, aided somewhat by those from the Conejo ranch. It is said, by the cattlemen of this county, that only a part of the cattle ranches of California are infested with the cattle-ticks, and, from the information I have obtained from various sources, I think this may be true. I am firmly of the opinion that for the safety and protection of other States and Territories, California should be quarantined against, and no cattle allowed to be driven or shipped out of the State, except as provided by the Bureau of Animal Industry in its regulations."

The following extracts are made from a report submitted by Mr. Hill, February 9, 1895:

"After gaining what information I could in Los Angeles, I started down the coast for the purpose of visiting some of the ranches and obtaining ticks from the cattle. The first ranch visited was the San Joaquin, below Santa Ana, managed by Mr. George Irvine. On account of a severe rainstorm that prevailed at the time, and the cattle being from five to ten miles away in the Coast Range hills, I was unable to obtain ticks at this ranch. Mr. Irvine said that if I had been present about November 1st, when they removed the ticks from the cattle with a currycomb and saturated their bodies with crude petroleum, I could have obtained a bushel of ticks. Mr. Irvine also informed me that of late years they had brought no cattle, except bulls, from other ranches; that in the spring of 1893 he brought from Puente ranch, elevation 1,200 to 1,500 feet, nineteen bulls, all of which died during the following summer. On a later occasion they brought to their ranch a number of yearling bulls, about one half of which died.

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"Mr. Manuel Lucero, a Mexican, said that he at one time lived near the Santa Cruz Mountains, south of San Francisco, and that he had seen plenty of the same kind of ticks in that section of the country.

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"Mr. Gates, of the firm of Vail & Gates, also informed me that eight or nine years ago he was engaged in the cattle business in the Salinas Valley, between Soledad and Monterey, California, and at that time there were plenty of ticks in the valley, and that his cattle were infested.

\* \* \* \* \*

"I did not see Mr. H. C. Hooker, he having disposed of all his cattle and returned to his ranch in Arizona. At Ventura and Santa Barbara I obtained what information was possible from other persons concerning his cattle shipments from California to Kansas during the summer of 1894, as follows:

"He sent three trains, two of them from the Foxon, or Bell ranch, near Los Olivos, California; the third or last train was from the Santa Anita, or Hollister, ranch, near the Santa Ynez Mountain, bordering on

the coast. These shipments were made the last of May, 1894. So far as known, no harm resulted from the first two shipments, although Mr. Bell informed me that his ranch near Los Oligos was infested with some kind of ticks that got onto cattle, horses, deer, and rabbits. It is supposed that from the other shipment (Santa Anita ranch) Texas fever developed near Bazaar, Kansas, which resulted in considerable loss. A portion of the cattle in this shipment came from the Foxon or Bell to the Santa Anita or Hollister ranch, about February 1, 1894. The remainder came from Tucson, Arizona, to the Santa Anita ranch in March, 1894. Up to the time of the shipment of this trainload to Kansas about one hundred head of cattle thus introduced had died, but none of the original herd on this ranch had been sick. From the symptoms of those that were sick, and *post mortem* examinations of those that died, as explained by Mr. Hollister, no doubt remains in my mind that the disease was Texas fever, and that those that were shipped to Kansas infected the country in and around Bazaar.

"The ticks sent you, inclosed in a redwood box, came from the Santa Anita or Hollister ranch, where the cattle in the last Hooker shipment came from. I regret exceedingly that, owing to the lateness of the season and the cold, rainy weather, I was unable, after leaving Santa Barbara on my trip up the coast to Niles, then across to Stockton and up the San Joaquin to Bakersfield and Los Angeles, California, to obtain or see any cattle-ticks. Had I been two months earlier I could have known to a certainty if cattle-ticks existed in the several localities visited, and would not have been dependent upon the testimony of others. Seeing is believing, and far more convincing than being otherwise informed, but I was assured by many persons (whom I have no reason to doubt) at the different places which I visited, and by parties met on the train, that the whole coast as far north as San Francisco was infested with ticks during the warm weather of summer. Two of these persons told me that the coast far above San Francisco was infested with ticks; one of them, J. H. Flickinger, of San José, California, declared that to his personal knowledge they could be found at least as far north as the northern limit of California, likewise along the foothills of the mountains on both sides of the San Joaquin Valley, and in many of its alfalfa pastures. At Hanford, California, Dr. William Carmichele, V.S., informed me that in the summer of 1894 a herd of cattle was brought from Cholame, on the west side of the San Rafael Mountains, near the head of the Salinas Valley, to the Barber pasture, near Hanford. They remained there two or three weeks, after which they were slaughtered. Within three or four weeks thereafter a dairy herd of thirty cows was put in the same pasture, and seventeen of them died in about three weeks. Dr. Carmichele was called to see these cattle. The symptoms of the disease, as he described them, were glassy, staring eyes; drooping head with ears lopped; the urine a dark, bloody color. Two of the sick animals were slaughtered. A *post mortem* of these and also of those that died from sickness showed enlarged spleen, liver somewhat enlarged and of a mahogany color, gall-bladder full of dark bile, and the contents of the third stomach, or manfolds, were impacted and very dry. The doctor having recently emigrated from Canada, and having had but little experience with diseases among cattle in this country, was unable to designate the disease. He did not recollect having seen any ticks on the cattle, and never having heard of the cattle-tick, he did not make an examination in search of them. There

is no doubt in my mind that the Barber pasture was infected, and that the loss of seventeen cows of the dairy herd was caused by the introduction of ticks by the herd brought from near Cholame.

“It is a conceded fact in that section that the Salinas Valley has been infested with cattle-ticks for many years. I learned, while at Hanford and other towns near by, that at different times and places, in 1893 and previously, there were quite a number of similar attacks of sickness among the cattle of the valley. Bakersfield is the headquarters for the Kern Cattle Company, and the Miller & Lux Cattle Company, both firms having large interests in the San Joaquin Valley. The Kern Cattle Company claims to have about seventy-five thousand acres of alfalfa pastures and grain fields, all, or nearly all, under irrigation. Owing to the rain and impassable roads, I was unable to visit the several cattle pastures. I was informed that there had been no unusual losses among cattle in that section for about two years, but that for several years previous to that time a disease unknown to the people, which had baffled the skill of all, had appeared among cattle in different localities at various times during warm weather, and that hundreds had died, while cattle in other pastures near by would seem perfectly healthy. I exhibited some ticks I had in a box, and asked persons if the cattle in their pastures were infested with ticks like those. The reply was that ticks were on the cattle in some of the pastures, and in others, not. Mr. C. L. Conner, Superintendent of the Greenfield cattle ranch, said that in his vicinity, during the summer, there were plenty of such ticks on the cattle. The people of California have never suspected that the tick, in any way, was the cause of the disease, or even an injury to the cattle, except by the loss of blood which ensued, thus producing a weakness of the system. I was told at Bakersfield and many other places that the losses generally occurred among cattle brought during the latter part of winter, spring, and summer, from Arizona, New Mexico, and other high elevations, to the low elevations along the coast to the San Joaquin Valley, and that if they were brought in during the fall and early winter, the mortality was far less during the following summer.”

On October 28, 1895, Mr. Hill reported as follows:

“As Mr. J. F. Warren had, at one time, in a communication to the ‘Texas Live Stock Journal,’ stated that there were no cattle-ticks in the San Joaquin Valley, I thought it advisable to obtain some and take with me. This was done at a dairy ranch a few miles from Los Angeles, Cal.

“Armed with a box of ticks (*Boophilus boris*), I left for Firebaugh, Cal. Mr. Warren met me on the arrival of the train and took me to a ranch-house on the west side of the San Joaquin River, about three miles from the depot. Here we met a Mr. Smith, who has for twenty-five years presided over this ranch of forty thousand acres, largely in alfalfa and barley fields, belonging to Miller & Lux, of San Francisco, Cal., and on which there is said to be about twenty thousand head of cattle at the present time.

“While we were talking, a wagon arrived from one of the feed lots, on which were two dead steers on the way to the rendering tanks. On these carcasses, between the hind legs, and on the bodies, I found about a dozen half-grown ticks (*Boophilus boris*), to the surprise of both Messrs. Warren and Smith, who said they were the first ticks they ever

saw on cattle in that valley. On the same carcasses, small ticks were quite plenty. Afterwards, I found full-grown ticks on other cattle that died while I was there; also, on cattle that were put into a chute for examination.

“I convinced Mr. Warren that ticks do exist in the San Joaquin Valley, and in his locality.

“I am of the opinion that they do not become very numerous, at least on those ranches in that section, for reasons which will be explained further on. The cattle themselves showed that no great numbers had been on their bodies; some animals examined, no ticks could be found, or signs that there had been any, and in most cases I could only find from one to three on an animal, some full-grown and others small. On this ranch they have lost by death about one hundred cattle during the summer. Some of them were large, fat cattle, but in the main were scalawags, *i. e.*, have been ailing for some time.”

The information which is given above is certainly sufficient to show that a large area of territory in California is permanently infected with Texas fever. Many cattle have undoubtedly died from the disease in that State. The cattle-tick, which disseminates the contagion, is found in abundance there, and outbreaks of the disease have been caused in other States by California cattle. The limits of the infected area in that State have not been accurately determined, and further investigation will be required to enable any one to make a line separating the infected from the non-infected territory. With a large movement of cattle from California to other States, it is necessary to have regulations which will prevent the dissemination of disease with certainty, and the Department can only consistently make the same regulations apply in the same manner to California as they apply to other States for a like purpose.

Very respectfully,

D. E. SALMON,  
Chief of Bureau.





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