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**CALIFORNIA'S CATTLE
_RANGE INDUSTRY: DECIMATION OF THE HERDS, 1870-1912**

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The forces detrimental to the range-cattle industry after the 1860's were forces which developed and gathered momentum over a long period of years. To the cattleman with a long-time view of his business they were forces which challenged his initiative and his strength, To every man in the work, however, there were two ever-impending threats to his undertaking: drought and disease, against either of which there was little to do. Drought came, or it did not; disease came, and for long years threatened in all its virulence, to stay.¹ The cattleman could, in large part, only hope. Richard Gird expressed the sentiment of all when he stated, "There is great profit in the business if no untoward event occurs, such as sickness among the cattle or an entire absence of rain."²

The drought of 1862-1865 was not the only such occurrence in California of primary importance to the range-cattle industry. The semi-arid climate which exists over much of the state is yearly faced with the spectre of no rain, and to the range-cattle industry this spectre has many times been very real. The development of irrigated pastures, the utilization of supplementary hay and the feeding of concentrates, the digging of range wells and systems of water canals have alleviated at times the problem in areas, but even with these supplements to grass lands pastures, the failure of rains to appear at their regular times is regarded with apprehension. The cattleman's anxiety over the lack of rain runs like a thread through the literature of the industry. Going back no further than the 1870's we find such items as the following:

Since Monday morning we have been in great glee here on account of rain... I send to the mountains to bring back the cattle sent off.

Our pasture has nearly gone in, and no prospect of rain. We have made a clean sweep from the mountains, and letting them drift.

*It does not seem to be able to rain ... The country is in a state of anxiety.
If it does not rain this year great numbers of sheep and many cattle will die.
A very little rain would assure abundant grass and I think it will come yet.
Pleasant soft rain today which made people rejoice, and myself among them.
I am in hopes that the long agony of waiting for rain is over as tonight it looks as if it
had set in for a good one.
No rain since October 27 ... All the green grass browning down to dust again.
It rained over two inches, which . . . came very opportunely as the young grass that
had sprouted was dying for lack of moisture.*

Accompanying periods of drought were all the attendant afflictions to add to the distress. "Grasshoppers," wrote Richard Gird during a particularly dry season, "are hatching out by the millions and are bound to consume a great deal of grass," adding later, "since the last notes were written the grasshoppers had had a good and multitudinous revel on many parts of the ranch . . . and for a long time have eaten, I think, as much food as the cattle."

Although the rain supply was seldom as much as the cattleman desired, there were several periods in the history of the industry before 1912 when drought materialized into serious calamities. The years 1870 and 1898 stand out as particularly important for the adversity they brought. The rain which Cave Couets heralded "with glee" on February 27, 1870, had been long in coming and was not long lasting, nor was the drought which resulted confined to the districts where ranged Couets' cattle, The United States Commissioner of Agriculture reviewing the situation in California at the close of the drought noted that,

During the three years from 1868 to 1871, south of Monterey neither grass nor grain grew ... Hundreds of farms were abandoned and stockmen were compelled to drive their cattle ... to gulches in the mountains, not only for food but for water. In February, 1870 not a blade of grass was to be seen over the extensive valley of the Santa Clara.

By 1870 stockmen had begun to move their cattle to out-lying, higher ranges and to flood the market with those for which no pasturage could be found, The drought was fairly general throughout the state, no section escaping without some loss of cattle at some point within its borders.

The reports of the State Surveyor-general for the years 1870 and 1872 indicate the loss of cattle as well as the character of herd migration in search of food and water. The Southern California region, San Francisco area, San Joaquin Valley, the North Mountain and Northeastern sections, and the Trans-Sierra area all showed a loss of cattle³. The greatest losses occurred in the San Joaquin Valley and in Southern California, the former section losing nearly one-third its numbers and the latter nearly one-fourth. The counties of San Bernardino, San Diego, Merced and Tulare were especially affected. Cattle in the San Francisco area were reduced from 38,902 to 28,774, most of the loss occurring in Sonoma County. At the same time the south

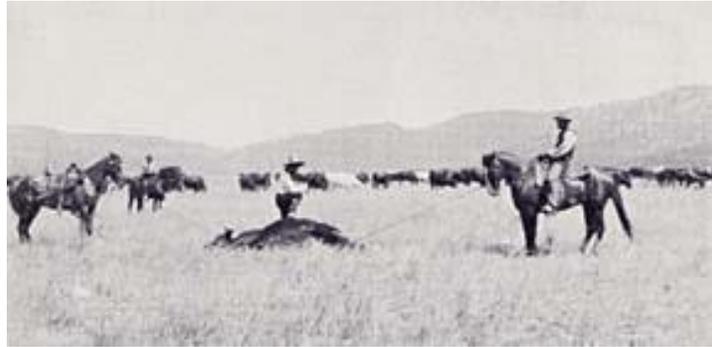
coastal, north coastal, Sacramento valley and Sierra Nevada counties increased in numbers of cattle indicating that some of the losses recorded for other sections had found pasturage on the natural grasses of the highlands sections or on the irrigated fields of the Sacramento valley. Total loss for the state as indicated for these two years was 73,435.

The year 1873 again threatened to be a dry one, and cattle were thrown upon the market in both San Francisco and Los Angeles with the resultant fall in the price of beef.⁴ Drought again struck during the year 1876-1877 when the San Joaquin Valley and the south central coastal area were devastated. It was reported that cattle died in droves on the ranges of Fresno, Tulare and Kern counties, and that hundreds of cattle were slaughtered to save the hides. Lowell M. Hardison, resident of Ventura County at that time, reported that three-fourths of the stock in that county died from loss of forage.

The drought of 1898 was, if possible, more devastating in its effects than previous droughts except that of 1862-1864. The southern half of the state was most severely affected, grasses drying as early as March so that cattlemen were in search of northern ranges early in the year. Lacking grazing facilities or the ability to transfer their herds long distances to better pastures, cattle producers found their stock dying in droves before the end of the summer. Even in the usually humid Pajaro Valley in Monterey County cattlemen resorted to the felling of trees in order to obtain the moss and browse from their branches, Tulare Lake, which had been the succor of thousands of cattle during the drought of 1862-1865, went dry during the summer of 1898.

Reports of county assessors indicate a reduction in number of cattle in the entire state from 487,742 in 1898 to 463,536 the next year. The president of the State Board of Agriculture, however, reported that actual losses were much greater than the assessor's reports revealed, A contemporary remarked that the drought of 1898 was "the means of crippling the cattle business greatly in California."

The havoc wrought among range-cattle herds by drought was rivalled, if not exceeded, by that resulting from disease. Disease among California cattle herds has a peculiar history. There is, in the early literature of the industry prior to about 1868, very little mention of cattle disease. That disease was present in various forms there can hardly be doubt. A. S. Mercer, investigator for the United States Bureau of Animal Industry, suggested that the lack of mention of disease before that date may have been due to the fact that the herds were not valued highly and diseases were not given much consideration. This suggestion, however, is an unlikely explanation in view of the fact that such cattlemen as Abel Stearns kept very minute records as to the management of their ranchos, yet they took very little account of losses attributable to disease and made no mention of epidemics. Pioneers with whom Mercer conversed reported that there had been "very little trouble of this kind," yet from 1870 to 1884 thousands of dollars were lost in California due to cattle diseases. The United States statistician reported that in the latter year alone 2.3 per cent, or 22,659 cattle in the state died from disease.



The greatest scourge of disease among California herds was that of Texas or Southern fever. In 1866 the president of the State Board of Agriculture warned California cattlemen of the possibility that the cattle then arriving from Texas might introduce the disease to California herds. No quarantine was instituted, however. By 1887 losses from the disease had become so great in the state that the United States Department of Agriculture sent a special investigator to determine the nature, and if possible, the cause of the disease. The investigator, Thomas Bowhill, interviewed cattlemen in southern California where the disease was especially prevalent and found that most of them had first noticed the symptoms among their herds during the period from 1868 to 1872. Henry Miller of the firm of Miller and Lux found first traces of Texas fever among their herds on the San Joaquin in 1878, but he had heard that it had been especially fatal to herds in Alameda County in 1877. In 1880 Clarence W. Gordon, investigating livestock conditions in California, found the disease prevalent in Kern County.



Cause of the disease was attributed to various factors, and the stumbling attempts of the cattlemen to relieve their herds was futile. By the 1880's observation and deduction had shown that the contraction of the fever was usually the aftermath of contact with other herds, especially but not necessarily those from Texas, New Mexico, Arizona, and Lower California. Also it was found that not only contact, but mere passage over a pathway recently trod by perfectly healthy cattle, or pasturage where they had lately been, often resulted in contraction of the disease. They found,

too, that grown cattle brought into an infected area contracted the disease, but calves and yearlings did not; and that mountain cattle when brought to the coastal area died, but cattle raised on the coast did well in mountain areas. Cattlemen reported the disease more prevalent from July to December, or the date of the first frost. It was found, too, that very few cases occurred north of the Sacramento area.

Richard Gird in 1881 expressed the bewilderment of the cattlemen when he wrote in his journal:

Cattle still continue dying. It is certainly very hard to get at the cause or a cure. Post-mortem of many show many organs affected . . . We have moved them and taken all measures of precaution we could think of. It would stop or abate, then under precisely similar conditions it would break out again with more virulence than before. Most of the thoroughbreds have died.

Because the disease seemed to be more prevalent among higher grade cattle, it was believed that more exercise designed to remove weight might prove beneficial. Henry Miller suggested removal of the cattle to higher levels where the cattle would be forced to walk longer distances to water. Richard Gird thought he would change the grade of his cattle from his usual Shorthorns to Devons and Angus. When a certain area was known to be dangerous to cattle it became the practice among cattlemen to avoid that particular grazing ground. This method usually proved successful in preventing the disease, and for some unexplainable reason the area sometimes again became usable after a short period of time. Other cattlemen simply sold their herds before the disease was due to strike which, in most cases, meant before prime condition had been reached.

Remedies proving ineffective, the status of Texas fever in California remained unchanged. Unlike other infested states, except Texas, no restrictions as to movement of cattle from one area to another within the state were made. The result was that the disease gradually spread to other sections of the state, striking down herds in one place while leaving untouched the cattle on the adjoining range. The only legislative aid was provided by the act of 1889, amended in 1891, which prohibited the importation of any livestock known to be infected with a contagious or infectious disease. This act was of no aid in alleviating the situation, however, since, as was already well known, apparently healthy cattle were capable of transmitting the disease.

In 1888 the direct cause of the disease was discovered by Dr. Theobald Smith to be an intracorporuscular parasite. During the next year Dr. F. L. Kilbourne's investigations proved that the transmitting agent was the cattle tick, Research soon proved that cattle without infected ticks were incapable of spreading the disease, and that ticks alone, scattered on pathways and pastures later used by healthy cattle invariably resulted in an outbreak of the disease. The bite of the tick was proved to be essential in the transmission of the disease. Thus the mystery of Texas fever was solved.

With the cause of the disease revealed, California took steps to stop the further introduction of the cattle tick into the state. On March 19, 1893, the state legislature provided for the declaration by the State Board of Health of a quarantine against the entry of cattle for purposes of grazing from March to November, from areas known to be infested with the tick, specifically, Texas, New Mexico and Mexico.

The United States Department of Agriculture, however, instituted stronger measures. During the same year, 1893, W. E. Hill, Inspector for the Bureau of Animal Industry, was sent to investigate conditions of infestation in California. He found conditions critical, but did not decide too definitely the actual limits of the disease. The result was that by order of the Department of Agriculture dated February 5, 1895 that part of California south of and including the counties of Contra Costa, San Joaquin, Amador and Alpine were included in the national quarantine area established by acts of 1884 and 1895. Further investigation seemed to warrant more extensive quarantine lines and on January 22, 1896 a second order placed the entire state under federal quarantine. The order stated that no cattle were to be transported from the area thus quarantined to any portion of a state not under quarantine except by rail for immediate slaughter when, it was specified, all necessary precautions were to be taken to prevent enroute the spread of the cattle tick. This order was effective in preventing the spread of cattle ticks from California into Oregon and Nevada, but it did nothing to protect uninfested areas within the state.

Further investigation revealed that the counties of Modoc, Lassen and Plumas were free from ticks, and on January 27, 1897 the order was issued releasing those counties from quarantine. Four months later the line of quarantine was moved south to exclude from quarantine all counties north of the southern boundary of Solano, Colusa, Sutter and Placer counties. On April 1, 1896, the duty of enforcing the quarantine orders was placed upon the County Boards of Supervisors.

Meantime cattlemen had begun to cleanse the ranges by deliberately avoiding areas known to be infested until the ticks, lacking hosts, had died. Eradication of ticks among individual herds was undertaken by means of chemical dips of petroleum and arsenic. So fast did the work of clearing individual ranges progress, several more counties were released from quarantine before the end of the year. On December 16, 1897, Solano, Yolo, Eldorado, Alpine, Mono and Inyo Counties were released from quarantine.

The process of tick eradication had progressed to this point when the drought of 1898-1899 occurred. Wide-spread and intensive as the drought was in the areas lying south of the quarantine line, the restrictions on the movement of cattle worked particular hardship upon the cattlemen of these southern areas. Pastures burned and water holes dried up, but no relief could be obtained if cattle could not be driven north into the cooler mountain areas. On March 25, 1898 the United States Department of Agriculture therefore revoked the previous quarantine orders and released the entire state from quarantine thus making it possible to drive California cattle, after inspection, anywhere in California and into Oregon and Nevada for pasture range.

With the passing of the drought the quarantine line was again reestablished, December 19, 1898, this time at the northern boundary of the state, where, pending inspection, it remained for one year. On December 19, 1899 the quarantine line was placed at the same point where it had been at the time the drought began.

During the next year tick eradication and inspection made extensive progress and on December 14, 1900 the line of quarantine was moved approximately sixty miles south of its former position, clearing the state as far south as the northern limits of Monterey, San Benito, Merced, and Mariposa counties.

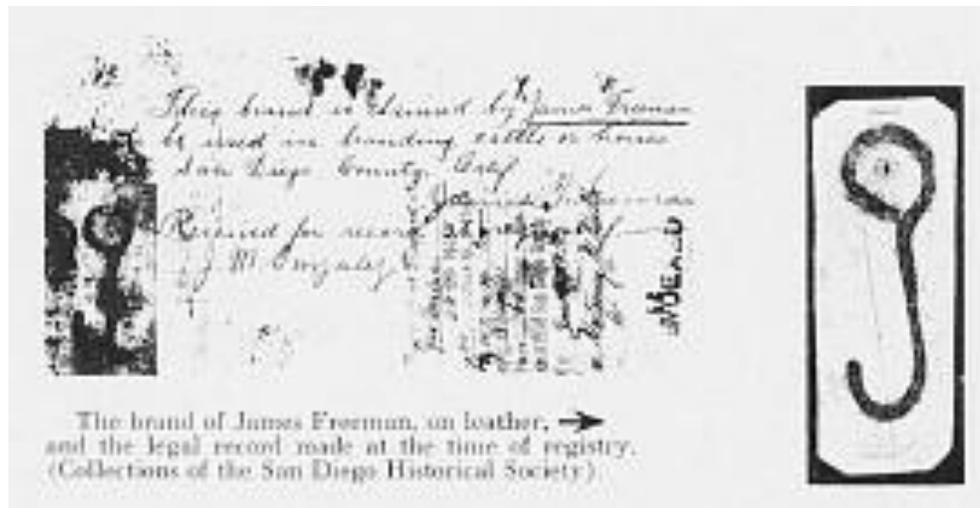
From this point south, tick eradication was more difficult, for the areas of greatest infestation had been reached. During the entire year of 1901 only two counties, San Benito and Mariposa, were cleared. On December 27, 1902 a partial rescinding of the quarantine was applied to Kern, Tulare, Kings, Monterey, Fresno, Madera and Merced counties, in that cattle from those counties were permitted to pass into non-quarantined areas upon being declared free from ticks. Not until 1904 was another change made in the quarantine line, when, on January 15, Monterey County alone was released. For another two and one-half years no other areas were released from quarantine, but on July 2, 1906 the County of Merced and portions of two ranches in Madera County were declared free from tick infestation. Meantime, on March 20, 1905, the State Veterinarian was given the power to regulate passage of stock over the quarantine line after inspection had shown that the cattle were free from ticks and infectious disease.

Progress in tick eradication had been so slow in the heavily infested southern counties of the state that the Bureau of Animal Industry in 1906 undertook, under a grant from Congress, the systematic clearing of the state. During the first year federal inspectors examined 1,015 herds in the eleven counties still under quarantine and found almost half the cattle tick infested, especially the herds in San Luis Obispo, Santa Barbara, Ventura, Fresno, San Diego, and Orange counties.

Meantime, through the efforts of the State Veterinarian, the California Legislature in March, 1907, was induced to pass a much-belated law. The law made it a misdemeanor to move or expose tick-infested cattle in such a manner as to infest other cattle. Previous to the passage of this act the movement of cattle within a county had not been regulated so that infested cattle were given free access to all ranges within the area. The law of 1907 also provided for the disinfection of cattle according to the directions of the State Veterinary, so that cattlemen who had previously been skeptical of the value of the arsenical dips were given no choice as to its use on his herds. William M. MacKellar, Veterinary Inspector in charge of the program, declared that the law was of great benefit in the work of tick eradication.

Under the program thus instituted tick eradication progressed more rapidly. On April 15, 1907, those portions of Madera and Fresno counties east of the Southern Pacific Railroad were declared free from ticks, and in a few months, on August 1, the rest of

Merced and Fresno, together with the counties of Kings, Tulare, and Fern Counties and a portion of San Bernardino were released. This order was a trifle premature, however, for on April 1, 1908, Madera and Fresno counties west of the Southern Pacific Railroad were again placed under control, and on April 1, 1909, all of Tulare County was remanded to quarantine. At the latter date, however, Santa Barbara County and the eastern part of Riverside County were released. Santa Barbara County was again placed under quarantine at the end of the year, and there it remained until November 1, 1911.



Despite these seeming reverses during 1908 and 1909, Dr. C. M. Haring, State Veterinarian, declared before the convention of the American National Livestock Association that more territory had been freed from ticks in California during those two years than in all other states under quarantine.

During the year 1910 the work of tick eradication proceeded rapidly in the southern counties, so that on April 1 of that year only the counties of San Diego, Orange, Santa Barbara and a portion of San Luis Obispo remained under quarantine. At that time the Veterinary Inspector reported that 41,906 cattle were under quarantine, more than half of which were on one large ranch where the owner had refused to cooperate in the process of tick eradication. So complete and thorough had been the work of the officers in charge that, during the years from 1908 to the summer of 1910, all cattle brought to Government-inspected slaughtering houses in Los Angeles, the center of meat distribution in the most heavily infected portion of the state, were found to be free of the disease.

The reason for lack of success in San Diego and Orange counties lay in part in the fact that reinfestation of tick-freed herds occurred repeatedly from the mingling of those herds with those of Lower California. Along the international boundary line there was no fence to separate the cattle, and Lower California, badly tick infected, had instituted no program for tick eradication. Stockmen near the border in California refused to cooperate in the program of eradication, maintaining that until the

government undertook the construction of a fence between the two districts, all efforts were futile. Convinced of the truth of this statement, the Bureau of Animal Industry in 1909 began the construction of such a fence.

The international fence proved of great value in the remainder of the fight for tick eradication. On April 1, 1911 the Bureau of Animal Industry announced that a total of 67,977 square miles of land had been cleared of ticks and that 11,947 square miles remained under quarantine. By June 30, 1912, 3,386 square miles of that tick infested area were cleared, and 1,834 square miles the next year. During the next two years 6,007 square miles were released, and on June 30, 1917 the Bureau of Animal Industry announced the clearing of the remaining 720 square miles.

Thus the scourge of Texas Fever was brought to a close. Loss to California cattlemen, especially those of the southern half of the state, had been high during the half-century of prevalence of the disease.

If the herds of cattle in northern California had escaped the extreme devastation from Texas Fever suffered by those in the southern part of the state, they were not exempt from the ravages of other diseases, particularly blackleg and anthrax. Of them all blackleg took the greatest toll.

The history of blackleg in California dates from the advent of bred cattle. Blackleg, or *Hemorrhagic septicemia*, attacks only fat, young cattle; the lean, lanky cattle of Spanish days had not been susceptible to it. With the crossing of those cattle with more flesh-producing strains that immunity was lost. The degree of prevalence of blackleg and anthrax among cattle in California during the early years, is difficult to determine because of the prevailing confusion between the two diseases. Similar symptoms and somewhat similar modes of infection led cattlemen to believe they were identical diseases, until 1875 when the two were differentiated by Bollinger. Blackleg was confined to no one section of the state, but was, of course, more prevalent in areas of greatest feed, more highly bred, and hence the fattest, cattle. Once initiated, the disease spread rapidly among all herds, taking huge tolls from each. Richard Gird, on his ranch in San Bernardino County, found his losses from the disease in 1886 had been "two a day" from the first of January to the eighteenth of April, and, he added, in his Journal under the latter date, blackleg was "the worst thing" with which he had had to contend that year. Walter L. Vail, president of the Land and Cattle Company which owned several ranchos in San Diego County, reported in 1900 that losses on those ranches often ran as high as ten per cent of the year's increase.

Various remedies had been tried by California cattlemen to control the disease, none of which had been successful partly due to failure of perfection of a single-injection vaccination serum, and partly due to the inability of untrained persons to differentiate between the several cattle murraines, especially anthrax and blackleg. Because of infection from spores dropped on pastures by infected cattle and scattered from cadavers not immediately buried, the disease was particularly difficult to control without loss of a great amount of pasturage. No effective remedy was found until

Victor A. Norgaard, chief of the Pathological Division of the Bureau of Animal Industry, perfected a vaccine which required a single injection in 1896. Free distribution of the vaccine was begun in August, 1897.

The first two year's work of vaccination revealed the prevalence of the disease from Modoc County to the border of Mexico. Not all counties presented stock for vaccination, and in those that did so the proportion of infected cattle so treated was small. In each of the counties of Santa Barbara, San Benito, Fresno, Inyo, Sacramento, Butte and Modoc, only from one to five hundred head of cattle were vaccinated during the period. In San Diego and Lake counties from five to fifteen hundred head of cattle were reported vaccinated. In Los Angeles County, the only other county of the state to take advantage of the program, from fifteen to twenty-five hundred head were so treated. It was evident that a long period of demonstration and education would be necessary before cattlemen would cooperate in the eradication of the disease.

The Bureau of Animal Industry persisted in the work, however, and during the year ending June 30, 1900, it distributed 8,585 doses of vaccine to California cattlemen. At that time the estimated annual loss of cattle in the entire state from blackleg before the vaccine had been administered was set at 21 per cent of all the young cattle; after the program was initiated, the loss was reduced to 3.7 per cent among the unvaccinated cattle. During the year ending June 30, 1903 the Bureau distributed 7,908 doses in California, and the estimated loss among unvaccinated cattle had been reduced to 2.36 per cent. The six years' work had thus served to limit to a marked extent the amount of infection among cattle, although only a small per cent of the cattle of the state had as yet been vaccinated.

The year ending June 30, 1903, saw the first large-scale participation of California cattlemen in the program for elimination of blackleg. That year 76,991 doses of vaccine were distributed to 518 cattlemen who requested its use. Each year thereafter a comparable number of vaccine doses were used in California; each year the estimated losses among both vaccinated and unvaccinated herds decreased. The following table indicates the use of the vaccine during the next few years, with the declining rate of losses from the disease:

THE ELIMINATION OF BLACKLEG AMONG CALIFORNIA CATTLE			
Fiscal Year Ending June, 30	Doses of Vaccine Distributed	Per cent of Loss Among Unvaccinated Cattle	Per cent of Loss Among Vaccinated Cattle
1900	3,010	3.7	.66
1901	7,908	2.36	.46
1902	25,083	3.61	.90
1903	76,991	1.62	.46
1904	61,261	1.32	.50
1905	47,064	1.74	.41
1906	60,021	.93	.38
1907	53,740	.86	.2
1908	53,294	.89	.32

Free distribution of blackleg vaccine was thereafter continued by the Bureau of Animal Industry. By 1910 the percentage of loss had reached so low a point that statistics were no longer published. The program of demonstration of the worth of blackleg vaccine and the gradual elimination of loss of cattle among vaccinated herds, and hence among the unexposed, unvaccinated cattle, had by 1910 practically exterminated the disease among California cattlemen. Following 1910 cattle owners were generally able to maintain their herds fairly clear of the disease.

The course of anthrax among cattle in California was somewhat prolonged and devastating, epidemics of the disease being not unusual. In 1887 it was reported that the entire southern half of the state was badly infected and that an outbreak near Gonzales, in Monterey County, was particularly virulent. The disease was long diagnosed and treated as blackleg, despite the fact that the anthrax bacillus had been isolated as early as 1850. The belief that the germ was adequately destroyed if the carcass of an animal which had died of the disease was allowed to be eaten by buzzards, was accepted by many cattlemen with the result that the carcass was not always carefully and effectively disposed of. Often the carcass was buried in a trench too shallow to prevent the germ from reaching the surface and again infecting animals grazing in the vicinity.

Not until 1881 was Louis Pasteur's vaccine for immunization against anthrax developed, and its use did not adequately supply protection to cattle because of the difficulty of administering it, and because the animal frequently died from the treatment. Continued use of the vaccine, however, and its improvement by the research division of the Bureau of Animal Industry during the early years of the 1900's, produced results in time. Swamp drainage and deep burial of carcasses, urged by the Bureau of Animal Industry, assisted in bringing infection to a minimum. In 1909 it was reported that there remained only a few infected areas in California.

Thus disease, particularly Texas fever, blackleg, and anthrax, through their long history in the annals of the range-cattle industry in California, had added to the uncertainties of the business. To these diseases must be added the less endemic diseases of tuberculosis and pneumonia, and the ever-present threat of stock-poisoning from certain forage plants.⁵ The toll exacted by cattle disease had been great and the fight against it long and constant. By 1912 the three greatest scourges had been brought under control, but until that had been accomplished, losses had mounted into the tens of thousands. The course of the cattle industry in California had been long and difficult but the question of its survival still remained.

NOTES

1. Not until 1888 was the cause of Texas Fever, the greatest scourge, discovered and a remedy effected.
2. July 22, 1881. On November of that year Gird estimated that his ranch held "just about \$60,000 worth of stock . . . , which should at least produce 30 per cent profit . .

. which is”, he wrote, “just about right, I suppose.” In Southern California especially, rain was the controlling element in the range-cattle industry. There, writes L. M. Holt, who lived through the period after 1870 in this area, “cattle ranges were dependent upon the rainfall for their feed . . . After a good wet winter the feed was abundant and the cattleman did well. After a dry season the feed would be short, and the cattle . . . frequently died off by thousands.”

3. The San Diego *Union* on May 5, 1870 carried the notice that several thousand head of cattle belonging to Thomas Fowler had been driven from Tulare County to Kern Island, Bakersfield, which alone, and temporarily, had pasturage. “This will greatly embarrass the stockmen who have already located there,” it was stated, “as the grass will last but a short time.”

4. The San Francisco *Market News*, of June 12, 1873 noted, “beef is plentiful and very cheap, owing to the grass drying up.” A similar notice was carried on December 31 of that year, and in the Los Angeles *Express* of October 11, 1873.

5. St. Johnswort has been the greatest stock-poisoning menace. It is especially prevalent in the northern half of the State and was first noticed about 1900.

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