

**Not on My Farm!: Resistance to Bovine Tuberculosis Eradication
in the United States**

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Not on My Farm!: Resistance to Bovine Tuberculosis Eradication in the United States

A recurrent theme in the economic and technological history literatures is the importance of active opposition to technical change. This paper examines the concrete example of widespread resistance during the early twentieth century to government-led campaigns to use new tuberculin testing technologies to eradicate bovine tuberculosis in the US. Drawing on newspapers and archival records, we explore three issues: the political economy of opposition; the role of earlier scientific controversies in the discourse; and the techniques, including the radio and litigation, used by the opponents. Over time, the protests shifted from challenging the scientific merits of the testing technology to more nuts and bolts issues such as the program's administration and the distribution of the costs.

A recurrent theme in the economic and technological history literatures is the importance of active opposition to technical change. In his recent book *Gifts of Athena*, Joel Mokyr notes that throughout the past “technological progress has run into an even more powerful foe: the purposeful self-interested resistance to new technology. Outright resistance is a widely observed historical phenomenon.”¹ Societies that achieved modern economic growth were often those that developed institutional structures limiting the power of opponents to new technologies. While such opposition is often discussed in the abstract, the serious and systematic analysis of concrete historical examples, especially for the United States, is relatively rare.² As a result, it has been hard to place recent examples, such as opposition to biotechnology, in their proper long-run context.

This paper examines farmer resistance during the early twentieth century to government-led campaigns to use new tuberculin testing technologies to control bovine tuberculosis [BTB] in the United States. Based on the new Germ Theory of Disease and more specifically the new diagnostic tool, tuberculin, animal health officials realized by the mid-1890s that bovine tuberculosis (caused by the bacteria *M. bovis*) was a serious and growing threat to both human and livestock health. The contagious disease was spreading steadily through the nation's dairies and breeding cattle, creating symptoms similar to those experienced by humans afflicted with *M. tuberculosis*. *M. bovis* also infected humans through contaminated milk, meat, and direct contact with tubercular animals, killing thousands of Americans every year.

Armed with this new knowledge and diagnostic technologies, health authorities began to urge comprehensive testing and eradication of the disease in the animal population. The campaign against BTB advanced in two phases. From 1893 to 1917, many northern states, enacted a programs to test cattle and slaughter the reactors with compensation ranging from nothing to complete coverage. In addition, most major cities passed legislation requiring tuberculin testing of the dairy herds providing their milk supplies and in many cases also mandated pasteurization. From 1917 on, the federal government initiated a vast cooperative effort with state and local governments to eradicate the disease. As we argue in a companion paper, this campaign was a canonical example of a disease eradication program, involving the unprecedented peacetime use of the state's police power as federal and state authorities sent testers to every dairy and cattle operation in the nation. Officials ordered the destruction of 3.8 million TB reactors, with only partial compensation to the owners. This campaign brought the disease under control by 1941, generating returns to the livestock sector in excess of ten times the total program costs and saving tens of thousands of human lives.³

Although most dairymen and cattle breeders eventually cooperated with the program, significant segments of the farm population fought the eradication campaign over its entire history. Early municipal efforts to impose tuberculin testing in Chicago, Milwaukee, and Washington, D.C. met with widespread protests and milk strikes. During the 1920s, the federal campaign provoked the organized opposition of the American Farmers Union and the American Medical Liberty League as well as vigorous attacks from a powerful U.S. Senator. More spectacularly, as the testing campaign progressed during the Great Depression, antagonism from Iowa farmers led to riots and the declaration of martial law in 1931. The Iowa Cow War attracted national attention and encouraged the spread of organized opposition to other states including South Dakota and California. Indeed, the Golden State emerged as the center of resistance against compulsory testing as Central Valley dairymen of Portuguese descent waged a legal and direct action struggle until the end of the 1930s. Contrary to its well-cultivated image as a pioneer of progressive change, California was the last state in the nation to be declared "free" of the disease.

The broader goal of this paper is to better understand the opposition to the new tuberculin testing program, and in doing so, to shed light on resistance to technological change more generally.⁴ In particular we are interested in precursors to the recent debates over genetically modified organisms (GMOs). Based on newspaper accounts, court cases, and the archival records of the U.S. Bureau of Animal Industry (BAI), the Federal Radio Commission, the American Medical Association, and of U.S. Senator Carter Glass and other leading participants, we analyze the political economy motivating the many forces opposing and supporting the tuberculin testing effort. In addition, we explore how the early scientific debates over the danger of *M. bovis* shaped the discourse and effectiveness of the resistance movement. Finally, we examine the range of techniques used to oppose the testing campaign and their parallels to modern efforts to oppose new technologies.

Resistance to the test-and-slaughter programs based on the tuberculin diagnostic technology should not be viewed as knee-jerk Ludditism.⁵ The science underlying the testing technology was the new, controversial, and in many ways counterintuitive. The proposed program against the contagious disease, moreover, had the nature of Rousseau's stag hunt—success depended on the active participation of all cattle owners. Effective use of the new technology required collective action, which placed the adoption decision in the political arena. The public and increasingly compulsory nature of the resulting program made organized resistance all but inevitable.

The opposition centered around three main sets of issues. The first set dealt with the efficacy and science of the new technology. Opponents argued that the underlying concepts were flawed and that it was premature to slaughter valuable animals on the basis of “a mere theory;” that injecting tuberculin violated Nature's order and carried considerable risks for animal and human health; that even if the test-and-slaughter approach were scientifically sound, it was infeasible on a national scale; and finally that superior, less Draconian alternatives such as vaccines and isolation were available. In economic terms, this set of debates was related to efficiency questions—that is, whether the net benefits were positive and greater than the alternatives. Those who believed the costs outweighed the benefits argued that the program was in reality a rent-seeking

scheme benefiting medical professionals, drug companies, politicians, and meatpackers, sold in the guise of a public health measure.

The second set of issues concerned the distribution of the costs and benefits. As is often true of new technologies involving spillover effects, the benefits of adoption were spread across a large and dispersed population, which included consumers, meat packers, and many farmers, and the costs were concentrated among a well-organized minority. The objectors were often owners of valuable cattle that would be destroyed if diseased. Such owners complained that they risked major financial losses for the sake of unproven public health concerns. An interesting aspect of the tuberculin testing controversy is that it represents an early case a technology's proponents devising indemnity programs to partially compensate the "losers" for the cost they bore. A recurring theme was the struggle over how to share the burden. While arguments about Pareto improvements often discuss such compensation schemes hypothetically, designing institutional mechanisms that work in practice involved substantial innovation and experimentation.

The third set of objections involved the implementation of the program and focused on issues of process. Many farmers were deeply concerned that outside experts were gaining too much control over farming operations by dictating the timing and management of the tests. In addition, farmers were outraged that they could not appeal what many thought were the arbitrary judgments of the test administrators. These concerns were often voiced as individualistic or libertarian-grounded complaints about the heavy-handed actions of government bureaucrats who threatened an individual's liberty, property, and (if the science were wrong) even their lives. Often the objections to the test-and-slaughter program were part of a larger agenda of grievance and dissent. Indeed, the most vigorous resistance occurred when pre-existing organizations or communities took up the "anti" campaign as part of their broader cause. It is notable that such opponents were rarely content with the status quo but rather disapproved of the direction that change was taking. The opposition reflected the fact that there were many farmers who stood to suffer significant losses as a result of an intrusive government program to fight a disease which, at least at the beginning, was poorly understood. As the program progressed, the emphases of the protesters shifted from disputing the

scientific merits of the testing technology to challenging more nuts and bolts issues such as the program's administration and the distribution of the costs.

Bovine Tuberculosis, Tuberculin Testing, and the Scientific Debate

Bovine tuberculosis was an especially dangerous disease because it could take years for infected and highly contagious animals to manifest visible symptoms. In advanced stages, cows lost weight and suffered up to a 25 percent reduction in milk production. Eventually the cattle might show external signs of lesions, have coughing attacks, and die prematurely. The microorganism *M. bovis* spread among cattle (and other animals) by contact with infected animals or with contaminated materials. Rates of infection were higher among closely confined cattle than in free-range animals. As a result, bovine TB was far more common in the dairy herds dotting the northern states. Early tuberculin test results (see below for a discussion of tuberculin) often shocked public health officials when over one-half of the animals in prized herds reacted. Circa 1917, the best estimate is that 5 percent of U.S. cattle were infected, including 10 percent of dairy animals and 1-2 percent of range cattle. This represented a roughly 50 percent increase from the infection rates prevailing a decade earlier. Without vigorous countermeasures, infection rates would likely reach those found in northern European regions where well over 50 percent of cattle were diseased.⁶

The impact of bovine tuberculosis was not limited to cattle. Humans could also contract the disease and, indeed, it was possible to transmit the disease directly from animals to humans, humans to animals, and from humans to humans. The primary form of transmission to humans was through contaminated milk with children proving the most vulnerable. Elsewhere we estimate that circa 1900 nearly 15,000 Americans were dying each year from BTB and many more suffered pain and disfigurement.⁷

The scientific understanding of tuberculosis was rapidly advancing by the end of the nineteenth century. Most notable was Robert Koch's discovery of the tubercle bacillus, *M. tuberculosis*, in 1882. This breakthrough proved that tuberculosis was not hereditary, but rather a contagious disease caused by a microorganism. But with progress came controversy. In 1898 Theobald Smith identified small differences in cultures drawn

from bovine and human sources. At first Koch denied that there was a difference between the human and bovine forms of the bacteria. At the 1901 International Congress on Tuberculosis held in London, Koch did an about-face, proclaiming that *M. bovis* was indeed a distinct organism, but that it posed little threat to humans. He noted that “if such a susceptibility really exists, the infection of human beings is but a very rare occurrence. I should estimate the extent of infection by the milk and flesh of tubercular cattle... as hardly greater than that of hereditary transmission, and I therefore do not deem it advisable to take any measures against it.”⁸ Tragically, Koch even speculated that children exposed to *M. bovis* might benefit by gaining immunity against *M. tuberculosis*.⁹

Koch’s declarations helped galvanize the opposition to eradication efforts. An editorial in the highly respected *Breeder’s Gazette* offers a sense of the rage evoked by anti-BTB campaign:

For years the noble army of tuberculin squirt gun manipulators has been marching up the hill, beating tom-toms and brandishing the pole-axe, crying ‘Kill, Kill.’ This fierce and bloodthirsty campaign against our herds has been waged on the disputed assumption that tuberculosis in cattle is a menace to the public health.... Servile worshippers of asserted authority, the half-baked scientists and zealots of the squirt gun brigade have pushed their work of destruction until it has mounted to millions of dollars.... [But following Koch’s assertion that the human and bovine diseases were distinct] watch the noble army of matadors march down the hill.¹⁰

The controversy remained front-page news in the world’s leading newspapers. In December 1905, Koch used the prestigious stage of his Nobel laureate address to reassert his stance that “Bovine tuberculosis is not transmissible to man....”¹¹ Despite growing evidence to the contrary, Koch was slow to recant, thereby lending “expert” support to dairy interests opposed to the wholesale elimination of suspect cattle. Long after the scientific arguments were settled, Koch’s views continued to sway public policy debates about BTB.

Control of bovine tuberculosis was impossible as long as the disease could escape detection during its early but contagious stages. In 1890, Robert Koch developed tuberculin, which soon proved to be an important diagnostic tool, making it possible to detect TB in animals without visible symptoms. The early forms of the tuberculin test involved injecting the animal with the substance and later checking for signs of a fever or swelling. Detecting a “reaction” was clearly a judgment call. Both false positives and

false negatives occurred, with some of the false negatives due to recent exposure to tuberculin that “produces a tolerance...lasting for about six weeks.”¹²

The tuberculin technology was based the Germ Theory of Disease, which as noted above was new, controversial, and for many counterintuitive. The underlying scientific claims were that apparently healthy cows could be diseased; that this bovine disease could pass to humans; that a serum (which was originally derived from the disease organism harvested from infected guinea pigs and mixed into a broth containing ox bile) would produce a fever or swelling in an infected animal when injected; and that the same serum would cause no reaction and do absolutely no harm to a healthy animal or its products. Disbelieving these claims, many farmers held that tuberculin was “filth” which would infect healthy animals with tuberculosis or activate the disease in animals with latent cases. They further believed that the injections induced abortion in cows, reduced milk output, and otherwise harmed their health. In addition to complaints that any animal could be made to “react,” farmers contended that reactors often showed no visible lesions in post-mortem inspections. Questions about the reliability of the test, as well as the scientific controversy among high-profile experts about the dangers that BTB posed to humans, inspired much of the resistance movement.¹³

The extended immunity that tuberculin provided against further reactions complicated matters by making the operation of markets worse. Tuberculin widened the asymmetries inherent in the livestock market by providing sellers even more private information about their animals. Using privately administered tests, livestock owners could detect the disease in their cattle and then sell the reactors to buyers who could not accurately retest the animals for two to three months. By this time just one sick animal could have infected an entire herd. In many instances, owners of diseased cattle first “plugged” their animals with tuberculin and then submitted them to unwitting state officials for testing and certification. Thus, the invention of tuberculin represented a double-edged sword. This advance was necessary to bring the disease under control, but the new technology could also be misused in ways that spread the contagion.¹⁴

Governmental Control Efforts

The response of U.S. states and cities to the growing knowledge about BTB represents a prime example of what Jonathan R.T. Hughes has called the “Governmental Habit.”¹⁵ Over the 1890s and 1900s, many states and large municipalities enacted regulatory measures to slow the spread of the deadly disease. These programs testify to the farsighted nature of the veterinary and public health establishments as they grappled with educating farmers and elected officials, building political consensus, and administering a wide range of control measures. In many states, programs were up and running within a few years of the introduction of tuberculin to the United States. Indeed, visionaries saw the possibility of eradicating BTB by eliminating its infected carriers. But in the words of D. E. Salmon, head of the U.S. Bureau of Animal Industry, unfortunately: “the first attempts to control this disease... were so radical and harsh that they aroused the antagonism of the cattle owners, the men who above all others should have been aided and benefited....”¹⁶

The most vigorous early campaign began in Massachusetts. In 1894, the state enacted a strict compulsory anti-BTB program with quarantines and comprehensive testing. The coercive nature of the program and the provision of only partial compensation induced loud protests from cattle and dairy interests. In 1895 the state responded by fully compensating cattle owners for their reactors, thereby generating predictable moral hazard consequences as many farmers took advantage of the “opportunity to get rid of sick or unproductive cows at public expense.”¹⁷ Due to the resulting high expenses and continued opposition from cattle and dairy interests, the state shifted in 1898 to a voluntary program emphasizing visual inspections as opposed to tuberculin testing. Pennsylvania had also adopted a largely voluntary plan beginning in 1896. The state provided free voluntary tuberculin testing. Visibly ill animals were destroyed with the owner receiving the salvage value and a partial indemnity. This approach proved far more popular with dairymen than the 1894 Massachusetts program.¹⁸

By 1900, many other states, especially in the Northeast and Midwest, also had programs. In Wisconsin, the University engaged in a highly publicized campaign to encourage testing and train testers. Illinois provided voluntary testing of herds but no compensation for reactors. In New Jersey, the State Tuberculosis Commission offered testing of individual animals (rather than herds) and paid full compensation for reactors

slaughtered. The State Board of Health bore the responsibility for TB control in New York, providing partial compensation for condemned reactors. In Michigan, reactors were either slaughtered without state compensation or kept isolated. Delaware, Maine, Maryland, Minnesota, New Hampshire, Rhode Island, and Vermont also enacted legislation falling within this range of policy options.¹⁹ Everywhere these efforts met with some farmer resistance and in many cases, most notably in Massachusetts and Wisconsin, the initial programs were scaled back due to farmer complaints. At the city level, Chicago and Milwaukee led the way with ordinances in 1907/08 requiring testing of cows supplying milk to their citizens. These varied state and local experiments taught public health officials that a successful campaign had to have the buy in of most farmers. This realization made authorities very sensitive to organized opposition.

Active federal involvement began in 1906 with a voluntary testing campaign in Washington, D.C. In 1909, tuberculin testing became mandatory in the District. The government also experimented with a relatively generous compensation scheme to reimburse owners of slaughtered reactors. These efforts led to a decline in the fraction of tested animals reacting from about 18 percent in 1906 to less than one percent in 1919. This experience, along with those of several states, convinced BAI officials that a more ambitious national program might work.²⁰ Success was far from certain and there was no precedent in the United States or elsewhere for such an ambitious undertaking.

The cooperative state-federal program dates back to 1917/18 when Congress appropriated money to eradicate TB from the nation's dairy herds and authorized the payment of indemnities. As the program evolved the federal government matched state indemnities, up to one-third of the difference between the animal's appraised value and salvage value, with a cap on the federal payments initially set at \$50 per head for registered purebreds and \$25 per head for grade cattle.²¹ The voluntary program with indemnities proved highly popular with most farmers. By 1922, all but 6 states were participating. By this time about two million tests had been administered and almost 65,000 farmers, with 500,000 cattle, were on the waiting list.²² With incentives provided by federal money, state spending increased from about \$2 million in 1918 to \$13 million by 1927. Until financial pressures associated with the Great Depression curtailed non-federal spending, state and local governments were spending more than twice the federal

appropriation of about \$6 million. The mechanics of the program differed across states. In general, the program began locally (typically encompassing a county) when a set fraction (ranging from a majority up) of dairy cattle owners in the area agreed to participate. (This is much like the procedure used to form special assessment irrigation and drainage districts in the United States or to initiate enclosures in England.) The tests were then compulsory for all cattle operators in that area and the slaughter of reactors mandatory. Owners could not appeal the test results, but they could contest the reactor's appraised value, which in turn effected the indemnity payment. To hurry the laggards, states often made testing compulsory later in the process.

A sense of the national and regional patterns of adoption of the program can be gained from Figure 1. It shows the percentage of counties in each census region and in the country as a whole that had achieved the status of modified accredited area (which meant the reaction rate was below 0.5 percent and the area was free to export breeding and dairy cattle.) The series display the standard S-shaped curve we have come to expect from diffusion processes. The East North Central region, which was the center of many of the early local efforts and a hotbed of early opposition, was the leader in completing the federal program. This regional picture hides significant state-level variation that is important for the story of opposition. Figure 2 fills in the detail by graphing the percentage of counties achieving control in three states, North Carolina, Iowa, and California. North Carolina, despite its reputation for backwardness, was the first state to achieve accredited status; California was the last.

By 1940 government agents had administered roughly 323 million tests. The national infection rate had fallen from about 5 percent of all cattle in 1917 to below 0.5 percent by the late 1930s.²³ We estimate elsewhere that the financial benefits to the agricultural sector (farmers, packers, shippers) exceeded the cost by a ratio of at least ten to one. This was just part of the story because circa 1940, in the absence of the anti-bovine TB program and the allied milk pasteurization movement, there would have been about 25,000 human deaths from bovine TB in the United States per year. In fact, what had been a major scourge, particularly for young children, had become a rarity.

Early Opposition to the Eradication Program

The campaigns to eradicate bovine TB generally had support from the veterinary community, meat packers, and an assortment of public health officials. But the enthusiasm among farmers was far from universal and did much to delay early efforts. In 1908 Chicago passed an ordinance requiring pasteurization of all milk sold in the city as well as tuberculin testing of the cows that produced it. This incited a storm of protest among dairy operators and milk dealers that lasted for years.²⁴ These early conflicts between the metropolitan health departments and the neighboring dairies were part of a larger ongoing collective bargaining negotiation over the milk supply. Dairymen, who were often organized into unions that regularly went on strike, saw tuberculin testing and pasteurization regulations as unilateral mandates from urban-based consumer interests. Such mandates raised their production costs without providing compensation and were seen as unwarranted in light of existing medical knowledge.

In response to the Chicago ordinance, the highly organized dairymen in the surrounding milkshed rallied the downstate representatives in the Illinois legislature to the fight against the city interests. The Speaker of the House, Edward Shurteff, convened a special investigating committee which assembled a two thousand page report containing testimony largely slanted against tuberculin testing and pasteurization. Repeating the qualms of Koch and others, this 1911 document became a mainstay for the opposition for years to come. The legislature also passed a law overturning existing municipal pure milk ordinances and prohibiting Illinois cities from enacting future testing and pasteurization regulations. This rollback remained in effect until a new governor, Chicago-based reformer Edward Dunne, took office in 1913.²⁵

The legislative reversal of the Chicago ordinance was one of the first of a long line of injunctions that local farmers obtained, but in almost all cases, the courts eventually ruled on behalf of the government. Cases concerning the testing and destruction of tuberculous cattle reached the Supreme Courts of Minnesota (1925), Iowa (1926, 1927, 1928, 1930, 1932), Nebraska (1927, 1928, 1930, 1931), Michigan (1929), Ohio (1929, 1930, 1931), Washington State (1932), Illinois (1934), California (1937) and the Court of Appeals of New York (1928), among others. In every case the laws, apart

from minor technicalities, were upheld. The underlying reasoning was that the laws protected against disease and, under the common law, cattle infected with contagious diseases were public nuisances and could be summarily destroyed by public officials without compensation to their owners. The courts held that the killing of diseased cattle was not a taking of private property for public use (as requisitioning cattle for military use would be), but an abatement of a public nuisance (akin to destroying a burning building to put out a fire).²⁶

The country's leading farm journals and national agricultural organizations split on the issue of bovine TB eradication. *Hoard's Dairyman* was an early and strong advocate of the effort whereas *Breeder's Gazette* and the *Rural New Yorker* adopted hostile or, at a minimum, skeptical stances. The American Farm Bureau and its state and county chapters along with the National Grange lobbied for the program while the American Farmers Union and the American Medical Liberty League (AMLL) often mounted stiff opposition that retarded acceptance in many states. As another example, while officials of the American Meat Packing Institute, headed by Oscar Meyer, lobbied Congress in support of the program, the Farmers' Protective Association of Pennsylvania, led by Joseph Cope, leveled sharp criticism in the 1928 hearings on the Department of Agriculture Appropriation for 1929. One apparent consequence of the debate was that Congress, at the behest of Calvin Coolidge, increased the indemnity limits in the following year.²⁷ This represents one of many instances when opponents succeeded in gaining concessions as supporters fine-tuned the program to buy off potential opposition.

The American Medical Liberty League, a small but vocal group established in Chicago in 1918, proved harder to convince.²⁸ Opposing the tuberculin testing of cattle was part of the AMLL's broader agenda to "refuse and resist" compulsory vaccination and to fight against the influence of organized medicine, especially the American Medical Association. The AMLL generally rejected the Germ Theory of Disease, with its literature characterizing vaccines as poisons. This argument again played on a counterintuitive aspect of the theory—namely, that exposure to a disease organism in a weakened form helped develop resistance in the healthy body's immune system. There was reason for concern because the level of exposure that left the normal person protected might infect exceptional persons with the disease and, moreover, the injected

substances might accidentally be contaminated. As an example, one of the worse epidemics of foot-and-mouth disease in U.S. history was apparently due to the use of impure hog cholera serums in 1914. Even more serious was a tragic and widely publicized scandal that occurred in Lübeck, Germany in 1930 when over 200 infants vaccinated against TB died from tainted doses.²⁹ The League's literature also argued that the use of polluted materials contributed to spread of the Great Influenza in 1918-19.

The League's anti-TB testing efforts were spearheaded by the organization's Secretary and driving force, Lora C. Little of Chicago, by left-wing attorney Joseph W. Sharts of Dayton, Ohio, and by Dr. Eugene Underhill of Philadelphia. In the early 1920s, the League raised the hackles of animal health authorities by flooding the midwestern counties that were considering county-wide testing programs with anti-tuberculin pamphlets. This literature generated "a great deal of dissention and ill feeling among the farmers" to testing.³⁰ By the mid-1920s, the organization was assisting the newly formed Farmers' Protective Associations to rally local opposition to compulsory testing—in one case, the AMLL's magazine reports attracting a gathering of 2,500 farmers near Dayton, Ohio in favor of the cause—and to challenge the program in both legislatures and courts.³¹ Lawyers allied with the League were especially active in court cases in Ohio and Iowa in the late 1920s.

The most prominent critic of the national eradication program was Carter Glass. When the Senator from Virginia was not gearing up to revamp America's financial institutions, he fancied himself a Jeffersonian Democrat, gentleman farmer, and a defender of the common man. In January 1922 a veterinarian representing the State of Virginia tested Glass's prized herd of Jerseys and proclaimed that two heifers were positive and had to be destroyed. By Glass's account he immediately quarantined the two suspect animals and then respectfully asked for a retest on the grounds that his herd had been declared clean a year earlier, his animals had not had any contact with other animals, and he thought that the state's veterinarian was incompetent.³² When the Virginia State Veterinarian, Dr. Ferneyhough, denied Glass's request for a retest and apparently insulted Glass in the process, the senator embarked on a personal crusade against the program.

In a 16-page tirade published in 1922, Glass recounted how he was stonewalled, how Virginia authorities revoked the license of his private veterinarian for having the audacity to retest Glass's animals, how state officials threatened and tampered with his expert witnesses, how state officials summarily rejected the recommendations for a retest by federal BAI officials and numerous other impartial experts, and how, when one of the condemned heifers was put down after an accident, laboratory tests found no signs of tuberculosis. The conflict escalated and in 1928 Glass used his official position to turn his privately-printed "Tale of Two Heifers" into a 31-page U.S. Senate document. A few of the section headings offer a hint of the extent of the Senator's anger: "Unprofessional Conduct Charged," "Menace to Property Rights," "Wanton Official Obstinacy," "The Bunglers Revealed," "The Conspiracy Broadens," "Arbitrary Bureaucracy Rebuked," "An End to Official Terrorism," and "Deception and Despotism." In 1927 Glass won a court case ordering the retesting of the remaining heifer, which passed. Not satisfied, Glass charged that the entire testing program was built on speculative theories and gathered expert testimony questioning whether humans could contract BTB.³³

The Senate document that Glass crafted clearly hit a nerve. Farmers from throughout the Northeast and Midwest deluged his office in 1928/29 with requests for copies. Many complained of similar treatment by arrogant and abusive public officials. Several Senate colleagues, including Hiram Bingham (CT), William Borah (ID), William Bruce (MD), Duncan Fletcher (FL), William King (UT), George McLean (CT), Lee Overman (NC), T. Walsh (MT), and James Watson (IN), added their voices of praise and promises of support.³⁴ For all of his subsequent lobbying efforts, Glass never persuaded the Congress to gut the program. Nonetheless, his Senate office did become a clearinghouse for the "anti" forces that distributed the "Tale of Two Heifers" at supervisor meetings and local elections where the testing program was under consideration. The AMLL's Lora Little noted with glee that the widely-circulated official Senate document "was enough to make [USDA] Secretary Jardine sick."³⁵ The testing authorities had to redouble their educational efforts to meet the challenge of the powerful and much aggrieved Senator.³⁶

The Iowa Cow War

The most publicized instance of grassroots opposition to the eradication campaign was the infamous Iowa Cow War, a set of civil disturbances that broke out in eastern Iowa in 1931. Tuberculin testing began on a voluntary basis in Iowa in 1919. A 1923 law allowed counties to begin compulsory testing on an area-wide basis if three-quarters of the area's cattle owners petitioned to implement the program. Counties adopting the program paid the non-federal portion of the indemnities. Revisions to the law in 1925 and 1927 shifted the burden to the state and made testing in a county compulsory if 65 percent of cattle owners signed the petition or if a simple majority voted in favor in a special election. Greater changes occurred in 1929 when the Iowa legislature made testing mandatory across the state. The movement from voluntary to compulsory programs was a general pattern in other states. This was a predictable outcome that reflected the changing self-interest of many farmers. As more herds became TB free, their owners had an incentive to urge their political representatives to force slackers to participate in order to prevent the re-infection of clean herds. In addition, as time passed the scientific evidence supporting eradication became firmer, emboldening consumers, government officials, and many farmers to press for a general cleanup.³⁷

In Iowa, opponents of compulsory testing represented a determined minority in several regions, including Cedar County. After brewing for some time, the Iowa Cow War erupted in Tipton, Iowa on 8 March 1931 when about 1,000 farmers confronted the state veterinarians and 20 sheriffs sent to begin testing on the W. C. Butterbrodt and E. C. Mitchell farms.³⁸ On 19 March some 1,500 protesters, egged on by Milo Reno of the Iowa Farmers' Union and Jake W. Lenker of the recently-formed Iowa Farmers' Protective Association, marched on the state capitol in Des Moines. Speakers from the group were allowed into the Iowa House chambers to address members on their demands to end compulsory testing.³⁹ Besides criticizing the expense, mismanagement, and coercive nature of the program, speakers recited a litany of complaints challenging its scientific integrity. They asserted the "impossibility of transmitting tuberculosis from cows to humans," denounced the tuberculin test as "unreliable," and charged that it caused the "cows to abort, become barren, and give unsaleable milk."⁴⁰ The protest leaders saw the public health rhetoric as a mere cloak; asserting the real motives were to

create graft opportunities for politicians and health officials as well as a cheap source of meat supplies for large-scale packers. The public health concerns fell on deaf ears, in part, because the USDA allowed packers to pass the meat of condemned reactors into the human food chain after trimming out the obvious tuberculosis lesions. Many farmers reasoned that this was evidence that the USDA and the large packers were in cahoots—if the animals were so dangerous that they had to be condemned, why was any of the flesh approved for consumption? A bill introduced by Representative Lawrence Davis, making testing optional, failed to gain passage a few weeks (April 14) after the marchers returned home. Given the rural makeup of the legislature this failure suggests that many of the state’s dairymen did not support the protesters. In other incidents that spring, objectors stampeded their cattle to avoid testing and roughed up officials and reporters.

A second series of conflicts broke out when testing resumed in Cedar County during September 1931. On the 21st of that month, several dozen state men went to Lenker’s farm in a high-profile effort to enforce the testing requirements. Several hundred farmers confronted the veterinarians and their phalanx of sheriff’s deputies, violently driving the outsiders away. In response, Governor Daniel Turner imposed martial law in the area, calling out 1,700 well-armed national guardsmen to protect the testers. Two protest leaders, J. W. Lenker and Paul Moore, were arrested and charged with conspiring to interfere with testing.⁴¹ During October and November, hostilities spilled over into Des Moines, Henry, Jefferson, Lee, and Muscatine Counties. The troops remained in southeast Iowa for two months (at a fiscal cost of over \$100 thousand). The Cow War attracted national attention, including coverage in *Colliers* and *The Nation*. The situation began to quiet down in late 1931 after the state assured farmers that they could use accredited veterinarians of their own choosing to administer the tests. Opposition east of the Rockies then shifted from Iowa to South Dakota.⁴²

Agricultural and social historians often treat the Cow War as one of the opening salvos in the Farmers’ Holiday movement headed by Milo Reno. During a series of violent strikes during August 1932, midwestern farmers blocked roads to prevent the shipment of dairy products. They also intimidated court officials in an attempt to halt farm foreclosures. The most notable example was the kidnapping and threat to lynch Judge C. Bradley in April 1933.⁴³ This was serious business.

This literature stresses the role of the agricultural depression in causing the Iowa Cow War. *The Iowa Stater* of May 1996 argues “Farmers, hard pressed by the Great Depression, found the testing and subsequent condemnation of their cattle increasingly alarming.” And John Stover observed that “compulsory tuberculin testing was salt that slung the wound of economic discontent.”⁴⁴ Farmers faced with falling crop prices, bank failures, and increasing foreclosure rates could not stand the losses resulting from the condemnation of reactors. But this argument is not the “slam dunk” that one might initially think. First, it implicitly relies on information about subsequent developments that would not have been available in early 1931 when the anti-testing protests began. The farm economy was bad in March 1931 but not nearly as bad as it would become over the next two years.⁴⁵ Second and more importantly, this argument ignores the unprecedented generosity of the eradication program precisely during this period.

Beginning in 1929, Congress had raised the limits on federal indemnities from \$50 to \$70 per head for registered purebreds and from \$25 to \$35 per head for grade animals to adjust for the higher livestock values of the late 1920s. The crucial point in assessing the economic basis of the Iowa uprising is to realize that these limits were not lowered to reflect depression-era deflation until 1932. The national data in Table 1 compare the average current-dollar values of appraisals, salvage, and payments with the average current-dollar price per head of all cattle, dairy cattle, and purebred cattle.⁴⁶ According to these data, the generosity of the program was never greater than in FY 1931—the average payments remained high while prices per head were falling. Federal indemnity payments reached a peak of \$36 per head in FY 1931 and state payments, which averaged \$38 per head, remained near their 1930 high. Farmers’ losses fell to just over \$11 per head, less than 20 percent of the average value of dairy cattle. By way of comparison, farmers’ losses averaged 30 percent of the value of dairy cattle in the five years after 1931 and 34 percent in the five years before. The loss ratios were much higher during the 1920/21 farm downturn. As events unfolded, farmers typically received more for their reactors in early 1931 than they did for healthy animals in 1932.

One might argue that as farm conditions became increasingly depressed in the early 1930s, farmers were less willing and able to absorb even small losses. Yet for many, the prospect of gaining an indemnity became very attractive. For example, the

Chief of BAI wrote to his agents on 23 March 1933: “During a period such as the present when the value of cattle are low, there seems to be more of a tendency on the part of unscrupulous persons to get possession of cattle, usually of a low grade, at very low prices, and then present them for the tuberculin test with the idea that State and Federal indemnity will be obtained.”⁴⁷ Some Pennsylvania farmers in the early 1930s purportedly went so far as to tamper with the test by applying irritants to create a swelling at the injection site, thereby simulating a reaction in healthy animals. As noted below, this period also witnessed a scandal in Marin County, California, which according to one authority was the most serious violation of the laws governing the control of animal diseases in the state’s history.⁴⁸ Similar allegations arose in New Jersey and Vermont.

Although more generous than that of the typical state, the Iowa program did have design features that help explain some of the opposition. In Iowa, funding was based on local property taxes once state allotments were exhausted. Thus there was the prospect that instituting the program could lead to increases in local property tax rates, which undoubtedly generated opposition in a period of rising tax delinquency. But there are limits to this explanation. At the time of the protests in the southeastern part of Iowa, over one-half of the state’s counties had already been certified and, as Figure 2 reveals, the program was progressing well in many other counties without raising serious objections. Even in Cedar County 75 percent of the cattle had already been tested.⁴⁹

Norman Baker, KTNT, and the Debate over Dissent

Local observers and the BAI’s archival records point to the crucial role of one southeast Iowa radio station, Norman Baker’s KTNT, in catalyzing the local opposition leading to the Cow War. As George Mills, a Tipton newspaperman, observed:

A major reason for [the Cow War]... was the inflammatory broadcasts over Muscatine Radio Station KTNT (The Naked Truth) by station owner Norman Baker.... He was out to raise all the hell he could with the state government, the newspapers, and anyone else who got in his way.... The war was confined to the few counties in the range of KTNT and neighboring areas in eastern Iowa.... It was my belief there might have no Cow War at all without KTNT and Norman Baker even though farmers were not doing all that well. A prominent legislator-farmer [Iowa House Speaker La Mar Foster] expressed that same view to me. [Brackets added, parenthesis in original.]⁵⁰

Starting in 1926, testing proponents across the Midwest began complaining to the BAI that KTNT was engaged in a campaign of lies and distortions against the testing effort.⁵¹ Much like the Internet today, the new medium of radio in the 1920s gave critics such as Norman Baker a powerful tool to reach a vast audience. Such alternative messages no longer needed to be mediated through the filters of the mainstream press and could instead be disseminated far and wide via the airwaves. Early radio shared some of the credibility problems that currently plague information appearing on the Internet. As will be noted below, several features of the new radio technology raised serious questions of accountability. For example the inability to record the transmissions made radio broadcasts even more fleeting than information posted on the Web. The difficulties with translating from text to speech, specifically of discerning and documenting the placement of quotation marks, added to the controversies swirling around Baker's message. Some argued that the fact that the federal government licensed the stations led listeners to give unwarranted credence to the broadcasts. As one Iowa official complained, Baker's propaganda has caused "a lot of misunderstanding... some people feel that were these statements not true this man would not be allowed to make them."⁵² Later in 1930s, Baker moved his operations to Nuevo Laredo, Mexico and established a 150,000 watt station, XENT, which he boasted could "blanket the entire country."⁵³ In describing the intrusion of Baker's unwanted messages, the AMA (one of his main enemies) used language similar to modern complaints about foreign spam e-mails.⁵⁴

Baker was forced to Mexico because in July 1931 the Federal Radio Commission ruled against renewing KTNT's license. The official reason stated that Baker was not serving the "public interest," but instead promoting his private ventures (including his newspaper, chain of stores, and controversial cancer clinic) and attacking his personal enemies. Although the FRC pulled the plug on KTNT in the midst of the Cow War, the process leading to this decision was long in coming. Through his self-promoting actions and penchant for controversy, Baker had acquired a legion of powerful enemies. In addition to attacking proponents of tuberculosis testing, he targeted the American Medical Association, the Iowa Farm Bureau, the State Agricultural Extension Service, the reactionary wing of the Iowa Republican party, the "Radio Monopoly" which wanted

to silence his “Know The Naked Truth” broadcasts, a wide swath of the Muscatine business community, and even the Parent-Teacher Association.⁵⁵

Our focus is on the animus Baker generated among advocates of the eradication campaign, including county extension agents, local veterinarians, members of the anti-tuberculosis association (the predecessor to the American Lung Association), and leaders of the meat packing industries. Baker first came to the notice of those involved in tuberculosis eradication in early September 1926 when his broadcast advanced the American Medical Liberty League arguments that BTB was harmless to humans and that testing poisoned animals. He discouraged farmers from signing county petitions to begin testing and encouraged those who already had signed to remove their names. Finally, he boldly offered \$1,000 to any doctor who could prove that BTB could be transmitted from cows to humans.⁵⁶

His broadcast of 21 February 1927 grabbed the full attention of the Washington BAI office. According to several Iowa veterinarians and extension agents, Baker stated over the air: “Dr. J. R. Mohler Chief of the Bureau of Animal Industry U.S. Dept. of Agriculture says ‘About one sixth of the cattle have been tested and tuberculosis is spreading faster than ever before. This is caused by the tuberculin test.’ He also added ‘You write to Dr. Mohler and see if he did not make this statement.’”⁵⁷ As letters flowed east, Mohler complained to Baker and others that he had been seriously misquoted. Baker replied that he only quoted the BAI Chief regarding the number of animals tested and the statement that “This is caused by the tuberculin test” was outside his quotes. Indeed, this was how the text read in a Farmers Protective Association circular that Baker was purportedly quoting. Mohler countered that the listeners obviously heard something different.⁵⁸

The KTNT broadcasts induced a vigorous debate over free speech on the public airwaves. But this story does not conform to the popular image of Washington bureaucrats flexing their muscles to silence opposition at the grassroots level. Instead, BAI leaders repeatedly championed free speech. On numerous occasions, dignitaries at the local level (including members of the medical professions and chambers of commerce) sent letters to the BAI taking offense to Baker’s criticisms of the testing program and advocating counteractions to silence him. In response BAI officials almost

always recommended letting Baker, the AMLL, and the other critics have their say, lest they gain greater creditability by being martyred. These officials also stressed that the press generally presented the BAI's efforts in a favorable light.⁵⁹

In an early letter to J. A. Kiernan (Chief of the BAI's Tuberculosis Eradication Division), H. R. Smith, the livestock industry's point man, wrote:

As the Federal government has jurisdiction over radios throughout the country, would it be possible for you to call this to the attention of the man in charge in Washington to see what can be done to prevent in the future such misleading information being broadcasted to the people of Iowa by this man Baker. Inasmuch as the Federal government and the states are now spending large sums on the eradication of tuberculosis, such information does a great deal of harm and makes it all the more difficult and more expensive to get the desired results.⁶⁰

Smith's plea was followed a stream of correspondence demanding BAI officials somehow shut Baker up.⁶¹ In a letter to Mohler on 12 April 1927, Charles E. Hearst, President of the Iowa Farm Bureau Federation, wrote:

The influence of the broadcasting done from that station has been most damaging to farm organization work, tuberculosis eradication, and to the right kind of community spirit. Why such an activity should be permitted to impose itself on the public and spread the damning misinformation and distrust and prejudice that has been spread thereabouts, I cannot understand. It certainly seems that some force should be able to cut off any further use of that station for that or any other unfair purposes.⁶²

On the 23rd, Hearst fumed that "it seems to me most distressing that people are permitted to command the use of the air to broadcast misleading, unauthentic, destructive propaganda...."⁶³

The BAI officials responded to this anti-Baker deluge with remarkable care. D. S. Burch, Editor of the Bureau, proposed a course of action in a series of memoranda to Kiernan. In response to Smith's letter, Burch wrote:

There is no feasible way to 'muzzle' a station, and even if there were I think it would be inadvisable. The Bureau would suffer in the end by attempting to limit the free expression of opinion even though inaccurate. The best means of combating the situation ... is... vigorous refutation both by radio and through the press.⁶⁴

Regarding the 1927 Baker-Mohler squabble, Burch stated to Kiernan:

I think it would be unwise to suppress station KTNT by Federal action.... This is a country of free speech and oftentimes the voicing of views, even if unsound or incorrect, affords opportunity for the forcible presentation of true facts. Briefly, the forcible suppression of views is undemocratic and undesirable.... I recommend that no steps be taken to suppress the free expression of opinion, but that vigorous action be taken to prevent misquotations.⁶⁵

Mohler followed a similar line, writing to Iowa radio stations and newspapers in April 1927 in an attempt to set the record straight. He also complained to the FRC, requesting unspecified measures be taken to prevent government officials from being misquoted over the public airwaves. The BAI played no apparent role in the Commission's decision of July 1931 not to renew Baker's license.⁶⁶

Even after the plug was pulled on KTNT, the eradication troops in the field complained about the continued circulation of AMLL-inspired material. As an example, in January 1932 J. C. Exline, Inspector in Charge, Olympia, Washington, asserted that the American Medical Liberty League was "in violation of the Postal laws" for sending "scurrilous and defamatory matter" through the mail. In a similar fashion, Dr. A H. Quinn, Jr., President of the Iowa Veterinary Medical Association, wrote Mohler in September 1932, inquiring if Baker's use of the U.S. mail left him vulnerable to prosecution from the Post Office, ICC, or some other federal agency. Such complaints elicited patient responses from the BAI in Washington, D.C.: "no prosecution could be successfully maintained for violation of the postal laws" and the best that could be done is to educate the public regarding the disease and the tuberculin test.⁶⁷ No response is recorded to the following jaw-dropping suggestion by H. R. Smith that U.S. congressmen somehow be muzzled due to Senator Glass's excesses:

The Glass document has unquestionably done a great injury to the cause. Unfortunately, it has been given wide circulation. Why a United States Senator is privileged under Government expense to send throughout the country thousands and perhaps million of these documents to add perhaps millions to the cost to the Government and the States in the eradication of tuberculosis is something beyond my comprehension. There ought to be some kind of censorship on material sent out by the representatives of Congress.⁶⁸

Glass gave as good as he got when it came to wishing to silence voices opposed to his own. In 1928, Senator George McLean wrote Glass, complaining that proponents of the testing program were traveling his state showing "lantern slides carrying pictures of crippled and emaciated children due to milk from untested cows." Glass replied that such speakers "ought to be in the penitentiary" for engaging in ignorant fear-mongering and the USDA "should be mercilessly condemned for permitting such an outrage."⁶⁹ Such were the passions released in the heat of the testing campaign.

The Last Stand in California

When the BAI certified California's Merced and Kings Counties as accredited areas in late 1940, the last bastions of bovine tuberculosis in the United States were officially conquered. California's position in pulling up the rear of the national anti-BTB campaign stands in stark contrast to the state's well-cultivated image as a pace-setter.⁷⁰ The slow progress of its eradication program was the result of a mix of institutional, financial, and legal forces. These included weak administration, poor leadership, funding pressures, and delays in payment of indemnities created by constitutional problems. All of these problems were amplified by the vigorous and well-organized opposition by Portuguese dairy farmers in the San Joaquin Valley.⁷¹

California's health officials had long recognized that the state suffered from serious problems with bovine tuberculosis. In 1899, the State Veterinarian observed: "tuberculosis exists to an alarming degree among the dairy herds of this State, especially in and around the larger cities where... from 50 to 90 per cent [of the dairy cows]... are affected with the disease."⁷² The State Legislature was slow to address the problem. In 1915, it enacted a "Pure Milk law" prohibiting the sale of raw milk from cows that had not passed the tuberculin test. In 1921, legislation allowed state cooperation with the federal accredited herd and area plans, but given constitutional qualms, provided no state indemnities. The basis for the prohibition was that the police powers of the state included compelling the destruction of diseased animals with no compensation. Indemnities to encourage compliance thus constituted "gifts" of public money and were therefore unconstitutional. Without state indemnities farmers were ineligible for federal matching funds. As a result, relatively few cattle owners volunteered for the test-and-slaughter program. A handful of northern counties, Modoc, Lassen, and Tehama, had taken the initiative by participating in the federal testing effort without providing compensation, but few other counties followed their lead. By the late 1920s, bovine tuberculosis infection rates were falling outside the state but rising locally. California had become a national dumping ground for diseased animals.⁷³ The biennial BAI surveys began to highlight the enormous gap between the eradication efforts in California and most of the rest of the nation, including Oregon and Washington. In 1929 the California passed the

first bovine tuberculosis law allowing state payments. The law allocated only token funds for indemnities because its real intention was to create the basis for a “friendly” case before the California Supreme Court. On 21 April 1930, the California Supreme Court ruled that state indemnities were constitutional. As a further sign of change, the voters in the November 1930 election passed “by the greatest majority of any question” a constitutional amendment explicitly allowing indemnities for condemned animals (for diseases not limited to tuberculosis).⁷⁴

In this contest, the voters also elected a new governor, James “Sunny Jim” Rolph, Jr. Rolph, the popular long-time Republican mayor of San Francisco, filled his administration with spoilsmen. He replaced G. H. Hecke, Director of the State Department of Agriculture under the previous three (Republican!) administrations, with a series of short-termers. In July 1931, Dudley Moulton took the helm. Moulton sacked Dr. John P. Iverson, a highly respected administrator who had headed the Division of Animal Industry since its inception in 1919, and replaced him with Dr. Joseph J. King of San Francisco. At roughly the same time, the Legislature passed the first large (\$450 thousand) appropriation for indemnities, making California the 46th state (out of 48) to join the national program. But depressed conditions undercut state revenues. Charges of mismanagement and suspicions of graft throughout the Rolph administration added to the problems. By late 1932, his appointees at the Agriculture Department had riled the State Grange, Farm Bureau, *Pacific Rural Press*, University of California, and USDA. There was repeated discussion at the Grange and other organizations of launching a recall campaign against Rolph.⁷⁵

The anti-BTB program became a leading issue in the anti-Rolph movement. Funding for the indemnities represented a large, new mandate without an established constituency. As the program was getting off the ground, complaints about delays in indemnity payments and low prices for salvaged carcasses gained wide press in farm circles. A proposal by Director King to make the eradication program self-supporting through a \$1 tax on all dairy animals provoked further opposition. (The “Jo King” proposal included centralizing all milk inspection at the state level and fully indemnifying owners of reactors by having the state pay the portion of the full value not covered by the federal indemnity.) At the same time, rumors began to circulate that some private

veterinarians were failing to brand reactors and dairymen were collecting such animals in a conspiracy with program officials to claim excessive indemnities.⁷⁶

Matters came to a head in 1933. In early February the Grange started a recall petition drive against Rolph and later that month, a State Senate committee began to investigate charges of indemnity fraud in Marin County. Rolph saved himself by firing Moulton, King, and several others in the DAI. By September 1933, the Marin case grew into a major scandal, resulting in federal indictments. Court documents, archival records, and newspaper reports establish the following particulars. In June 1932, two Marin ranchers, Eugene Biggio and Antilio Lertora rented a dairy operation at Inverness, near Point Reyes. They began to assemble a herd of several hundred milk cows, purchased at low prices (about \$15 per head), but conducted no actual dairying. (Ernest N. Tooby apparently engaged in a similar venture.) Biggio and Lertora had the financial backing of Frank J. de Benedetti, an official of the Del Monte Meat Co. of San Francisco and a local politico (who, at a minimum, shared ties with Joseph King.) In October 1932, Moulton placed Marin County in the tuberculosis control program. The Biggio and Lertora animals were tested in December 1932—over eighty percent of the 640 cows reacted. After some wrangling, Harold Gardner, the chief state appraiser, and J. M. Holzer, the federal appraiser, placed values ranging from \$40 to \$120 per head on cattle that R. E. Duckworth, who had conducted the tuberculin tests, asserted were so inferior that they “were not even good for chicken feed.” The total indemnities came to \$15 thousand.⁷⁷

Federal and state authorities refused to pay. The federal grand jury investigation of the “Cow Racket” case, which opened in October 1933, grabbed front-page headlines for about two weeks in the leading California newspapers. Over 30 witnesses testified and in the end, King, Gardner, Holzer, Biggio, Lertora, de Benedetti, and Tooby, were indicted. The trial in April 1934 received less publicity and the judge quickly directed that the public officials be acquitted because the evidence that they had conspired was too flimsy. The jury reached a split verdict on Biggio, Lertora, and de Benedetti, and the case was not retried.⁷⁸

Although no one was found guilty in the “Cow Racket” case, the damage to the program was done. After the replacement of Moulton at the Agriculture Department, the Division of Animal Industry was reorganized, the “Bureau of Tuberculosis Control has

been abolished and the position of chief discontinued.... The chief appraiser and six quarantine guardians were released from service on March 1, 1933, and it is not intended that these positions be refilled.”⁷⁹ The state fiscal crisis also threatened the program. Funding for the 1933/35 biennium was slashed to less than one-half of the 1931/33 level. In light of the budget cuts, officials decided to complete work in existing “cooperative control” counties but to exclude new counties until more resources became available.

In 1934 President Roosevelt signed the Jones-Connally act, which made federal emergency funds available without requiring state matching funds. At the behest of the Farm Bureau and many dairymen, the Boards of Supervisors in several of the excluded counties imposed compulsory testing under this federal program.⁸⁰ Unlike their neighbors in counties operating under the “regular” federal-state cooperative program, owners of reactors in these so-called “voluntary tuberculosis control areas” were eligible for only federal, not state, indemnities (which averaged about \$12 per head). One impetus for the counties outside the “cooperative control area” to participate in the Jones-Connally program in spite of these unequal terms was that markets were increasingly closing to livestock and livestock products from “dirty” areas. Los Angeles, San Francisco and most other California cities were beginning to prohibit dairy products from non-tested cows, and eastern cattle buyers refused animals from non-accredited areas. Nearly everyone agreed that all “California dairymen will eventually be forced to clean up their herds,” the only questions were when and at whose expense.⁸¹ In this environment, the last great episode of resistance erupted.

Beginning in mid-1934, an “organized group of dairymen in certain counties resorted to injunctions and court actions in an endeavor to obstruct and hinder tuberculin testing progress.”⁸² These counties included Fresno, Kings, Madera, Merced, San Luis Obispo, Stanislaus, Tulare, and Yolo; and “the organized group” consisted largely of farmers of Portuguese descent. Immigrants from Portugal, principally from the Azores, had moved into California’s dairy industry in large numbers during the late nineteenth and early twentieth centuries. IPUMS data for the 1920 Census reveal that roughly six-tenths of the dairymen in the San Joaquin Valley and about one-third in the state as a whole reported that their parents spoke Portuguese as their mother tongue. Portuguese dairymen in California were known for keeping larger herds, which given the contagious

nature of the disease, would have yielded higher infection rates. They tended to specialize in the production of milk for manufactured purposes (cheese, butter, and processed products) rather than for the fresh market. In addition, they formed tight-knit communities centered in the counties under the “voluntary” control program.⁸³

Among the leaders of the Portuguese resistance were Fresno attorneys Louis Coehlo and Thomas Lopez, who helped organize the Western Cooperative Dairymen’s Union. (This group assessed members a tax of \$1 per cow to pursue its court challenges against testing.) Frank Correira, a Los Banos area dairymen, also became highly active in the group. These leaders asserted that testing program enforcement would discriminate against political outsiders such as the Portuguese and that high reaction rates (which resisters reckoned would average over 20 percent) would drive many dairymen to bankruptcy. One of their more remarkable arguments used reasoning contrary to that attributed to the Iowa Cow War “antis.” Prices for milk and livestock began rising (and a local drought eased) in 1934/35. As condition improved, Coehlo urged delaying the implement of the eradication program, so San Joaquin Valley farmers “have a chance to recoup some losses of the last few years....”⁸⁴

Among the non- Portuguese leaders of the movement was J. E. Van Sant, a veterinarian who operated a biologics laboratory in Bakersfield. Van Sant began his career at the Cutter laboratories of Berkeley in the late 1910s. He ventured out on his own in the 1920s, producing and marketing a treatment against Bang’s disease (brucellosis). State authorities considered his treatment no better than snake oil and banned its sale circa 1933. At this point, Van Sant began agitating against the tuberculin testing program. Dedicated to stopping “the insidious encroachment and betrayal by government agencies,” he helped organize the “Dairy Protective Association” and had himself elected its president. In 1934, the state attempted to restrict his veterinary practice for failing to brand reactors. Van Sant continued to be a thorn in the side of the program. He successfully lobbied San Luis Obispo County against adopting testing in 1935 and used his influence elsewhere in the San Joaquin Valley.⁸⁵

The opponents relied on the common European argument that BTB was so prevalent “that California could not do without the products of untested cows because a shortage would be created.” But the progress of the campaign nationally was turning the

marketing argument on its head. After Washington, Oregon, and Idaho approached accredited status, proponents could respond that the clean herds of the Pacific Northwest “are able and willing to supply California with all the dairy products it can use.” And “it will be only a matter of time until all clean states forbid the sale of all kinds of dairy products” from untested or unclean cows.⁸⁶ “[C]ompetition and consumer preference,” an Assembly committee noted in 1933, were placing the eradication problem at the California dairyman’s “very doorstep.” They reasoned that “When dairy products imported into the State are labeled as having been obtained from nonreacting tuberculin-tested cows in competition with our own products which may not be so labeled, there can be little doubt as to the consumers’ preference in the matter.”⁸⁷ And in 1939 C. U. Duckworth warned that the livestock sanitary officials in the “remaining states talked very seriously a year ago of asking the federal government to quarantine California because we were not showing enough results.... California can not stand this black eye much longer.... [We] should be ahead rather than lagging behind....”⁸⁸

Iowa did not have a monopoly on extralegal actions and arrests. The most notable California incident occurred in May 1937 when an angry mob of over 500 protesters harried officials and prevented testing on a Crows Landing dairy in Stanislaus County. The subsequent crackdown saw five local farmers arrested and a warrant issued for a “Communist organizer” supposedly associated with the troubles.⁸⁹ Despite such inflammatory episodes the primary avenue of resistance in California was through court challenges. The anti-testing groups repeatedly received temporary injunctions, but the higher courts almost always upheld the legality of the state’s efforts. Even so the opponents scored some temporary successes. For example, a Fresno County court allowed the permanent injunction against the initial testing ordinance, leading the supervisors to revise the law. The legal challenges proved so numerous and persistent through the mid and late 1930s that the State Attorney General appointed a fulltime deputy to handle the bovine tuberculosis cases.⁹⁰

Nationally, the bases of the legal challenges evolved significantly over time. As late as the early 1930s, the cases still focused on the nature of the disease and the scientific merits of the tuberculin test. In the Iowa cases such as *Loftus v. Department of Agriculture of Iowa* (211 Iowa 566, Dec. 1930), opponents argued that the “tuberculin

test in fact is not a test” and that “the serum injures the cattle,... causes abortion, and stringy and unhealthful milk, and even frequently introduces the disease into the bodies of healthy animals, and sometimes even causes their death.” Or again in *Panther v. Department of Agriculture of Iowa* (211 Iowa 868, Jan. 1931), the test “actually injures the animal.” Such scientific arguments do not appear in the California court cases of the mid and late 1930s.⁹¹

California attorneys emphasized other procedural issues. Their legal arguments contested the authority of counties to conduct testing, the arbitrary actions of the testing veterinarians, and the inability of farmers to appeal the results of the test. But the “most serious attack” was the charge of discrimination; owners of reactors in voluntary control areas received no state indemnities whereas their counterparts in neighboring cooperative counties did. One novel channel pursued by the alien (i.e. non-citizen) Portuguese farmers was to contest the state laws through federal courts as a state violation of their due process rights. By the late 1930s, neither the state nor federal courts had much difficulty finding grounds to reject the resisters’ claims.⁹²

The protesters were not entirely mollified when the California legislature passed legislation in July 1937 extending the cooperative program (with state indemnities) to all 58 counties in the state. In addition to creating uniformity, the legislation allocated \$1.5 million for the upcoming biennium for this purpose. C. U. Duckworth did note that “[i]t formerly was the complaint of this group [of organized opponents] that tuberculosis eradication was not uniform through the state.... [The] new law ... apparently has not deterred this organization from continuing attempts to obstruct the work.”⁹³ In November 1938, he added that the same faction “which had opposed the county ordinances also opposed the state law and... has been constantly in one court or another” since the uniform program was implemented in September 1937. The 1937 law actually provided opponents with new opportunities—they had come close to exhausting their grounds for appeals under the old regime. Now they had “a brand new field” for legal challenges against the constitutionality of the tuberculosis eradication campaign.⁹⁴

The California opponents had built up an organization committed to resisting testing. Rather than retreat when one of its demands was met it was emboldened to press harder. By resisting through direct action and court challenges, the opponents had

effectively doubled down on their bets. Several leaders had been charged with failure to cooperate (that is, attempting to prevent testing by keeping their cattle out of barns) and faced trial. Many other dairymen, by not allowing their reactors to be slaughtered, had lost their formal claims to receiving any indemnities. By 1939, the state legislature compromised, passing special appropriations to pay some of the contested indemnities.⁹⁵

As it evolved, the California campaign increasingly differed from the earlier protests. Senator Glass and the participants in the Iowa Cow War had objected chiefly to the science of the enterprise, arguing that the net social benefits were negative. Indeed, they developed conspiracy theories to suggest the campaign was pushed by self-interested veterinarians, meat-packers seeking cheap stock, and politicians desiring greater opportunities for graft. Objectors in California tended to emphasize distributional issues; initially the lack of indemnities and later the discrimination faced by dairymen in voluntary control areas relative to their counterparts in cooperative areas. As an example, the Crows Landing incident mentioned above highlights the greater importance of compensation as opposed to scientific issues in California. The protest leaders explicitly “said they are not objecting to the testing as such, what they want is a delay until a bill [authored by O’Donnell] now in the [California] legislature becomes law, which provides for positive indemnity....”⁹⁶ Thus, the prospect of receiving higher compensation in the future increased farmer resistance and slowed implementation. Replaying the scientific arguments of Koch, who had been dead for a quarter-century, no longer carried much punch.⁹⁷

These contrasts undoubtedly overstate the differences between these movements. Each cluster of opposition parroted Carter Glass, complaining of high-handed treatment by state officials and outside veterinarians, who in their expert status combined the roles of “accusers, prosecutors, judges, and executioners.” (*Panther v. Dept. of Ag. Iowa*). The impossibility of appeal remained a bone of contention. And although we have found little evidence of collaboration between the Iowa and California movements, other similarities are apparent. Both were based on existing social networks in their respective farm communities—membership in the Farmers’ Union in Iowa and the tightly knit groups of Portuguese dairymen in the San Joaquin Valley.⁹⁸ Both were guided by headstrong individuals who had run afoul of the scientific and medical establishments—

Baker and Reno in Iowa and Van Sant in California. Finally, in both cases, the anti-testing campaign, once initiated, acquired a momentum and logic of its own. It has become commonplace to think of modern America as living in a contentious and litigious age, with the rise of dissent and oppositional politics (and the use of lawsuits to attain such ends) beginning in the 1960s and 1970s. But these examples make it clear that such politics and practices were alive and well throughout the early twentieth century.

Conclusion

Writing in 1905, Leonard Pearson, a prominent veterinarian, noted ““There is scarcely a subject related to agriculture or public health that has occasioned as much or as bitter discussion, or has led to the expression of so many divergent views as this one of tuberculosis in cattle.””⁹⁹ As government agents began descending on dairies across the nation to seek out and destroy infected animals, debate turned to active resistance. Opponents successfully delayed implementation in some areas and repeatedly attempted to gut the program in the courts and state legislatures. To counter resistance, the program’s supporters attended farmers’ meetings, lobbied state and local officials, and carried on extensive education campaigns. More than once, proponents relaxed restrictions or increased payments to farmers to buy off potential opposition. Yet the path remained rocky as the governor of Iowa was forced to declare martial law to quell anti-testing riots while, at roughly the same time, scandals in the California program were helping drive an effort to recall that state’s governor. These were the most visible episodes signaling the widespread hostility to the testing effort.

Such hostility should not come as a surprise because opposition to technological change has been a persistent theme in the economic history. It would be useful to compare the anti-testing movements with other celebrated episodes of resistance. The Luddites protested that the new textile machinery and the factory system would cause unemployment and alter the balance of power in the workplace. Critics of many agricultural machines, such as the tractor, cotton picker, and tomato harvester, complained they would hurt “the little guy” who could not afford the fixed costs. Such concerns are of little relevance here because the testing technology was largely scale

neutral and threatened few jobs. Contrasts with recent opposition to biological technologies such as GMOs are also telling. Much of the resistance to GMOs comes from consumers and their representatives who fear the unknown—something yet undiscovered in the new organisms might prove harmful. In the BTB eradication program, consumer groups were generally among the strongest advocates; it was producers who believed that tuberculin might be a time bomb that would harm their stock. Such fears were fuelled by the counterintuitive nature of the science underlying the testing program—how could a serum derived from the disease organism be safe? Disputes within the scientific community added to the uncertainty. Koch’s statements were especially important and well-placed contrarians such as Carter Glass, Norman Baker, and J. Van Sant were able to keep the debate going.

In his analysis of the opposition to new technologies, Mokyr notes that “The political economy of technological change thus predicts that it will be resisted by well-organized lobbies, whereas its defenders will usually be a motley group of consumers and inventors and perhaps a few groups with a direct interest in economic growth. The struggle between the two parties will always take the form of a non-market process....”¹⁰⁰ The battle over BTB eradication represents an exception to Mokyr’s generalization because the opponents were the “motley group.” Even though consumer interests remained scattered and disorganized, members of the medical community and American Tuberculosis Society were able to join with public health officials and producer groups such as meatpackers to lobby hard for the testing program. The terrifying cost of the disease helped galvanize politically effective support. A few photos of disfigured and dying children could offset a large dose of Norman Baker’s rabble rousing. Once indemnities were in place, many dairymen also became ardent supporters. Moreover, unlike the situation in Europe, American consumers did not need to fear BTB eradication would lead to food shortages and price increases.¹⁰¹

Innovations that are true Pareto improvements are rare because most technological changes have winners and losers. The opposition was first and foremost based on the perceived economic interests of the participants. Even a farmer who saw most of his herd condemned as reactors would be unlikely to protest if the indemnities were high enough. But early experiments with indemnities showed that overly generous

payments led to moral hazard problems by encouraging farmers to lower the defenses against the disease and to dispose of low productivity animals at the state's expense. For this reason, zero opposition would not have been an optimal outcome. The challenge for the advocates was to fine tune the incentive structure along with their educational efforts to keep the protests at an acceptable level. In this sense the level of opposition was, in a crude fashion, being orchestrated by the program's supporters as they sought a reasonable balance between protests on one hand and moral hazard problems on the other.

A comparison of BTB eradication in the United States and Europe bears on the early opposition to other biological and medical technologies. Mokyr notes that the realization that puerperal fever was transmitted by doctors was slow to be grasped in Europe and America, but even after the discovery spread in Europe "American physicians fiercely resisted it." The tragic delay probably cost tens of thousands of lives. Mokyr reasons that Europe's leadership was a function of scientific enlightenment: "On the European continent, which was more receptive to the techniques based on the body of useful knowledge we call bacteriology, resistance was weaker."¹⁰² The explanation must be more complex because, while Americans were stamping out BTB based on their understanding of bacteriology, their European counterparts whistled in the wind, dooming hundreds of thousands to the horrible disease. Clearly, the political economy of the relative costs and benefits, the varying strengths of the opposition movements in different countries, and the political savvy, wisdom, and resolve of the new technology's advocates must to be taken into account.

Figure 1: Percentage of Counties Nationally and by Census Region Achieving "Modified Accredited Status," 1923-1941

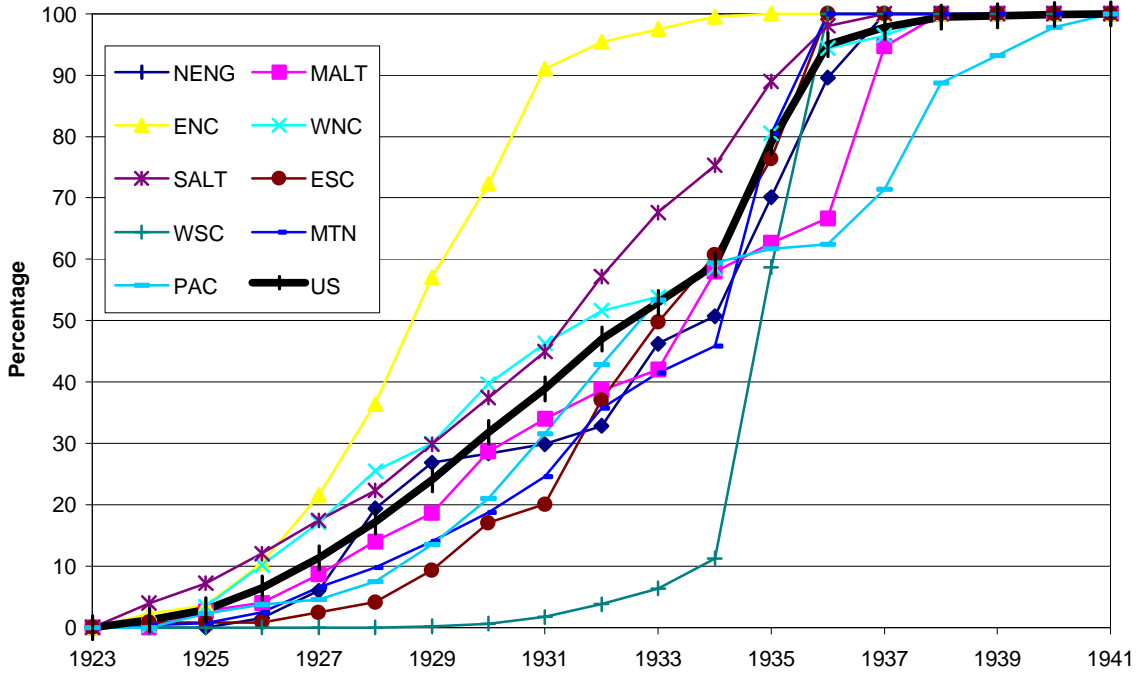


Figure 2: Percentage of Counties in California, Iowa, and North Carolina Achieving "Modified Accredited Status," 1923-1941

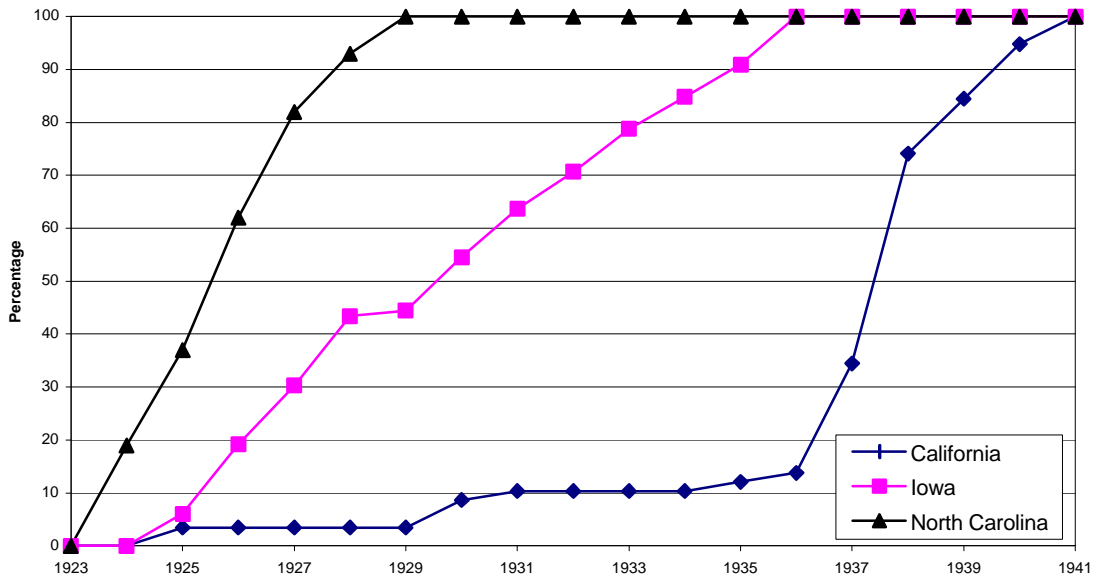


Table 1: Comparing National Cattle Prices with Appraisal Values and Indemnity Payments, 1919-1940

Year	<u>Price in Dollars Per Head, Jan. 1</u>			<u>Average Dollars per Head for Fiscal Year, Ending June 30</u>					<u>Maximum Federal Payment</u>		<u>Price Received by Farmers 1910-14=100</u>
	<u>All Cattle</u>	<u>Dairy Cattle</u>	<u>Purebred Dairy</u>	<u>Appraisal Value</u>	<u>Salvage Value</u>	<u>Indemnities</u>		<u>Farmers' Loss</u>	<u>Purebred</u>	<u>Grade</u>	
	(1)	(2)	(3)	(4)	(5)	State (6)	Federal (7)	(8)	(9)	(10)	(11)
1919	54.7	78.4		131.0	41.4	42.7	22.4	24.6	50	25	211
1920	52.6	81.5		179.1	34.7	51.1	28.9	64.5	50	25	213
1921	39.1	61.2		150.2	22.9	54.2	27.2	45.9	50	25	168
1922	30.4	48.7		109.8	17.7	36.3	23.5	32.4	50	25	128
1923	31.7	48.7	195.6	97.6	18.0	33.2	21.2	25.3	50	25	137
1924	32.1	49.9	127.3	82.9	17.4	27.7	18.4	19.4	50	25	142
1925	31.7	48.3	128.3	76.0	20.3	22.7	17.1	15.9	50	25	148
1926	36.8	54.7	134.7	85.7	24.9	26.0	14.9	19.9	50	25	150
1927	40.0	59.2	149.4	97.0	31.3	27.6	16.7	21.4	50	25	142
1928	50.6	73.4	166.0	111.9	40.4	28.7	18.9	23.9	50	25	143
1929	58.5	83.9	166.0	125.8	46.0	33.8	21.2	24.8	70	35	147
1930	56.4	82.7	153.2	136.2	42.1	40.4	26.2	27.5	70	35	136
1931	39.0	57.0		111.3	25.0	38.6	36.3	11.4	70	35	105
1932	26.4	39.5		75.2	13.7	30.6	19.0	11.9	50	25	76
1933	19.7	29.2		58.4	11.0	24.6	14.9	7.8	50	25	69
1934	17.8	27.0		54.8	11.5	21.4	13.8	8.1	50	25	80
1935	20.2	30.2		57.6	15.2	15.9	18.7	7.8	50	20	99
1936	34.1	49.3		77.7	26.5	10.2	22.4	18.5	50	25	112
1937	34.1	50.5		86.0	28.9	12.2	18.1	26.8	50	25	118
1938	36.6	54.5		86.8	32.2	16.4	16.0	22.2	50	25	109
1939	38.4	55.7		89.0	34.5	19.0	16.2	19.4	50	25	95
1940	40.6	57.3		91.1	37.1	20.4	16.5	17.0	50	25	96

Sources and Notes for Table 1 and Figures 1 and 2.

Table 1:

Farmers' Losses equal Appraisal Value minus Salvage and State and Federal Indemnities. To make the USDA's "Price Received by Farmers" series in Column (11), comparable to the FY data, we averaged the two years centered on January 1; that is, the 1919 figure represents the average for 1918 and 1919. The series has been rebased to 1910-14. Columns (1), (2), and (11) from US Bureau of the Census, *Historical Statistics of the United States* (Washington, DC, GPO, 1976), series K 565, 596, 344, respectively. Column (3) series on purebred dairy prices derived from data in USDA, *Crops and Markets* 2:4 (April 1925): 127, 3:6 (June 1926): 180; 4:4 (April 1927): 140; 5:4 (April 1928): 132; 6:4 (April 1929): 140; 7:4 (April 1930): 130; 8:4 (April 1931): 138; Columns (4)-(10) from US Animal and Plant Health Service, *Cooperative State-Federal Tuberculosis Eradication Program: Statistical Tables Fiscal Year 1971*, (Washington, DC, March 1972): 7.

Figures 1 and 2:

US Bureau of Animal Industry, *Annual Reports*, 1922-1941.

¹ Mokyr, *Gifts*, p. 220. For recent examples, see Bauer and Gaskell, eds., *Biotechnology*.

² Olmstead and Rhode, "Agricultural Mechanization," pp. 35-53 examines the activities of the Horse Association of America. This organization of "buggy whip manufacturers" and the like lobbied against the coming of the horseless age. Although much of their propaganda focused on individual decision-makers, the HAA also raised public policy issues associated with the adoption of the internal combustion engine.

³ See Olmstead and Rhode, "Impossible Undertaking," pp. 734-72 for estimates of the financial and human costs.

⁴ In the process, we also place the Iowa Cow War, which is frequently portrayed as part of the farm protests against the Great Depression, into the context of opposition to tuberculin testing. . Kramer, *Wild Jackasses*, pp. 206-19; Shover, *Cornbelt*, pp. 28-40; White, *Milo Reno*, pp. 20-21, 49-64; Choate, *Disputed Ground*, p. 44.

⁵ As Mokyr, *Gifts*, p. 236 notes, "when major technical choices involve public expenditures, complementary or substitute relations with other technologies, or other types of spillover effects, they will end up being judged by non-market criteria." In such cases, "artificial distinctions between the 'economic sphere' and the 'political sphere' ... are doomed." p. 221.

⁶ See Olmstead and Rhode, "Impossible Undertaking," pp. 737-40 and the sources cited therein.

⁷ *Ibid.*, p. 768

⁸ Koch, "Combating of Tuberculosis," pp. 441-56; Miller, "Tuberculous Cattle," p. 28; Myers, *Man's Greatest Victory*, pp. 106-109.

⁹ Myers and Steele, *Bovine Tuberculosis*, p. 57. On the Koch controversy, see Rosenkrantz, "Trouble," pp. 156-59, 174-75.

¹⁰ "Move to Modify Quarantines," *Breeder's Gazette* (2 Oct. 1901), p. 507; Myers, *Man's Greatest Victory*, pp. 345-46. See also Orland, "Cow's Milk," pp. 179-202.

¹¹ Miller, "Tuberculous Cattle," p. 35; *New York Times* (1 June 1904), p. 1.

¹² U.S. BAI, *Special Report*, pp. 416-18; Smith, *Conquest*, pp. 7-9; Houck, *Bureau*, pp. 364-66; Myers, *Man's Greatest Victory*, pp. 115, 125.

¹³ This represented a case where, as Mokyr, *Gifts*, p. 236 observes, “[r]eliance on technical expertise ... is weakened by disagreements among experts and even disagreements over who is an expert to begin with.” See also Nelkin, *Controversy*, pp. 16-17 and Dormandy, *White Death*, pp. 141-43.

¹⁴ Olmstead and Rhode, “Tuberculous Cattle Trust,” pp. 942-44; McCann, *This Famishing World*, sec. 103; Schlebecker and Hopkins, *History*, p. 201.

¹⁵ Hughes, *Governmental*.

¹⁶ Salmon, “Tuberculosis,” p. 5. Salmon is best known for discovering the *Salmonella* bacteria.

¹⁷ Teller, *Tuberculosis Movement*, p. 19; Peters, “History,” pp. 894-95.

¹⁸ Myers, *Man’s Greatest Victory*, p. 272-74, 283; Teller, *Tuberculosis Movement*, p. 20; Reynolds, “Problem,” pp. 454-58.

¹⁹ Myers, *Man’s Greatest Victory*, pp. 278-79; Salmon, *Legislation*, passim.

²⁰ Area dairymen responded to the testing program with initial alarm. The following *Washington Post* articles provide a sense of the drama: “Dairymen Are Up in Arms: Declare Tuberculin Test May Lead to Milk Famine” (18 April 1907), p. 16; “Plead for Milk Cows” (1 May 1907), p. 16; “Would Oust Dr. Woodward: Milk Dealers to Aid Producers in Fight on Tuberculin test” (10 October 1910), p.3; “Milkmen Going to Court” (11 October 1910), p. 16; “Milkmen Near Clash” (18 October 1910), p. 4; Hickman, “Eradication,” pp. 231-42.

²¹ Myers, *Man’s Greatest Victory*, p. 295. To provide an example, assume that a purebred cow was appraised at \$200 and had a salvage value of \$50. In this case the federal government would match a state’s payment up to the \$50 limit. The state could pay more than \$50 if it chooses.

²² Larson, Davis, Juve, et al., “Dairy Industry,” p. 341.

²³ Wight, Lash, O’Rear, et al., “Tuberculosis,” p. 237.

²⁴ *Breeder’s Gazette* (16 June 1909) related the sentiments of the Committee of the Illinois Legislature established to review the Chicago laws: “Strange as it may seem there is still suggestion of the ‘kill all’ policy – the kill all reacting cows. It would be a sad day if any legislature should so far forego sanity as to enact such a statute. It would mean a

shotgun reception to the poll-tax inspectors—a state of real anarchy. There must be more of fact and less of hypothesis before such a policy can be adopted in the name of public health.” Quoted in Myers, *Bovine Tuberculosis*, p. 261.

²⁵ Olmstead and Rhode, “Tuberculous Cattle,” pp. 940-42, 954.

²⁶ Tobey, *Legal Aspects*, pp. 77-81. In *Lawton v. Steele*, 152 U.S. 136, (1894), the U.S. Supreme Court affirmed that the government police power “is universally conceded to include everything essential to the public safety, health and morals, and to justify the destruction or abatement, by summary proceedings, of whatever may be regarded as a public nuisance (including)... the slaughter of diseased cattle; the destruction of decayed or unwholesome food.”

²⁷ Smith, *Conquest*, pp. 13, 17-19, 29-31; U.S. House. *Agricultural Appropriation Bill, 1929*, pp. 1110-40. See also U.S. Congress, *Congressional Record*, pp. 10343-44.

²⁸ Kaufman, “American Anti-Vaccinationists,” pp. 463-79, esp. p. 466. According to the American Medical Association’s Propaganda Department (which kept the league under close surveillance), the AMLL was allied with the British Anti-Vaccination Society and operated into the 1950s. Although AMA officials often ascribed self-interested motivations to the AMLL’s actions, an ideology opposing “State Medicine” appears the driving idea. The League was not simply a refuge for marginalized faddists and patent medicine peddlers. Among the distinguished speakers at the league’s early conventions was Clarence Darrow, the crusading civil rights advocate. See “American Medical Liberty League,” pp. 395-98, and AMLL materials in file 15, Box 49, files 1-4, Box 50, in “Historical Health Fraud and Alternative Medicine Collection,” American Medical Association Archives, Chicago, IL.

²⁹ Dormandy, *White Death*, pp. 344-45. This episode led *The Rural New Yorker* (31 May 1930), p. 715, to condemn “professional fanatics” who advocated vaccinating humans or animals.

³⁰ Letter from J. S. Sturve, 7 March 1924, file 2, Box 50 “AMLL-Corr, 1913-26,” AMA Health Fraud collection. Files 1-4 contain numerous inquiries and complaints about the AMLL that *JAMA* and the AMA Propaganda Department received from agricultural journalists, farm officials, and health workers.

³¹ *Truth-Teller*, 22 September 1927, p. 7. For an excellent treatment of Lora C. Little's career as an anti-vaccination crusader, see Johnston, *Radical Middle Class*, pp. 197-213.

³² Palmer, *Glass*, pp. 187-91, 257; Smith and Beasley, *Glass*, pp. 264-67; Glass, *Tale*, p. 2. See Box 11, file B. Carter Glass papers, University of Virginia Special Collections, Charlottesville, VA for interchanges between Glass and government authorities over these incidents. A letter on 4 October 1923 from Mosby G. Perrow, Director of Lynchburg's Public Welfare Department indicates, for example, that Glass retained the right to sell milk in the city despite its testing ordinance.

³³ U.S. Senate, *Tubercular Infection*, passim.

³⁴ Glass papers, Box 88, files 1 and 2. Hiram Bingham's support of Glass is noteworthy because before his political career, he had been a noted scholar. After earning a Ph.D. in history at Harvard, he held positions at Princeton and Yale. He is best known for leading the Peruvian expedition that rediscovered Machu Picchu.

³⁵ *Truth-Teller* (22 August 1928), p. 5; Glass papers, Box 88, files 1-3.

³⁶ The U.S. BAI responded by publishing *USDA Miscellaneous Publication, no. 59*, Mohler, *Reliability*, which offered a point-by-point rebuttal to the major charges.

³⁷ Iowa, *Laws*, pp. 2-14. An additional problem, arising from the advent of improved roads and the increased availability of trucks, was the bootlegging of cattle from unclean areas to accredited areas to take advantage of any price premium received on tested stock. Myers, *Man's Greatest Victory*, pp. 363-64.

³⁸ *Davenport Democrat* (9 March, 10 March, 1931), pp. 1-2. These newspaper articles were collected in the scrapbooks of George Ormsby, a participant in the Cow War. George J. Ormsby papers, Box 2, file E, Iowa State University Special Collections, Ames, IA. See also Archie, "Times of Trouble," pp. 28-35, 52-53.

³⁹ Choate, *Disputed Ground*, p. 44. One speaker read a poem that echoes the language of the *Breeder's Gazette's* articles noted above: "Knights once went forth with lances/ Clad in coats of mail/ Now they go with squirt guns/ And shoot cows in the tail." At roughly the same time, Governor Bryan of Nebraska suspended testing in counties in his state where opposition was active. Francis to headquarters, 7 April 1931, BAI Records.

⁴⁰ White, *Milo Reno*, pp. 53-55.

⁴¹ *Des Moines Register* (22 September 1931), p. 1; *Davenport Daily Times* (22 and 24 September 1931), p. 1 each day; *Tipton Advertiser* (24 September 1931), p. 1; and *Midwest Free Press* (22, 23, and 24 September 1931), p. 1 each day. Baker's *Midwest Free Press* gave heavy play to his protest activities. Ormsby papers, Box 2, file F. Lenker and Moore were convicted and sentenced to 3-year prison terms. The Iowa Supreme Court upheld their sentences in 1933, but the new governor pardoned the pair after they served about one month in jail. White, *Milo Reno*, p. 64.

⁴² *New York Times* (1 November 1931), p. 58. A local slogan was "get the boys out of the barnyard before Christmas." "Revolution," *The Nation* (7 October 1931), p. 349; Davenport, "Get Away," pp. 10-12; Myers, *Tuberculosis*, pp. 228-29; Smith, *Conquest*, p. 45; Wiser, Mark, and Purchase, eds., "100 Years," p. 40; Myers, *Man's Greatest Victory*, pp. 360-61, under the subtitle "Opponents Move Westward." But according to a 10 February 1933, p. 6 article in *Farmers' National Weekly*, the leading agricultural paper associated with the U.S. Communist Party, farmers in eastern Pennsylvania also waged an active resistance campaign after the Iowa Cow War. The paper repeatedly expressed sympathy for opponents to anti-BTB and Bang's disease programs. A follow-up article on 3 March 1933, p.1 blamed grafting "bankers and politicians" for the tuberculin testing effort. A 19 October 1934, p. 3 article approvingly quoted a local organizer who charged "the Bangs disease contract robs the farmer of his cows without compensating him for this value" and part of a pretext to benefit the class of rich farmers.

⁴³ Wall, "Iowa Farmer," p. 124.

⁴⁴ "The Cow War" *Iowa Stater Shover, Cornbelt Rebellion*, p. 29; see also DiLeva, "Frantic Farmers," pp. 81-109. The papers of Milo Reno at the University of Iowa are relatively silent about the Cow War, focusing on later developments.

⁴⁵ For example, corn prices in December 1929 were 80 cents a bushel and in 1930 were 60 cents. These are the two harvests directly preceding the Cow War. In December 1931, corn prices stood at 32 cents. Hence, most of the decline in corn (and dairy cattle) prices occurred well after the Cow War's opening shots.

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- ⁴⁶ We are focusing on national data because state level data are only sporadically available. According to 1929 FY data, the eradication program in Iowa was more generous than the median state.
- ⁴⁷ Chief of BAI to his agents, 23 March 1933, BAI Records, Box 375.
- ⁴⁸ Munce, "Tampering," 29 March 1932, BAI Records, Box 375; Arburua, *Narrative*, p. 83.
- ⁴⁹ Myers, *Tuberculosis*, pp. 228-29; Smith, *Conquest*, p. 45. The farmers in this region were not slow to adopt other new technologies. Ryan, "Study," p. 278 finds the "eastern livestock" area was among the earliest adopters of hybrid corn.
- ⁵⁰ Mills, "Comment," p. 129. In 1933, La Mar Foster was the representative from Cedar County and a supporter of the "antis."
- ⁵¹ As an example, J. A. Barger stated that Baker's "radio activities have been largely responsible for much misinformation that has gone out regarding tuberculin testing...." Barger to Chief of Bureau, 8 June 1931, BAI Records, Box 373.
- ⁵² Bromwell, to Barger, 28 February 1927, BAI Records, Box 373.
- ⁵³ Fowler and Crawford, *Border Radio*, pp 67-102.
- ⁵⁴ "Warns Broadcasting by Quacks May Soon Swamp Radio in U.S.," *Chicago Tribune* (12 October 1932).
- ⁵⁵ Wolfe, "Norman Baker," p. 396; Winston, *Throttle*, pp. 159, 172, 179-205.
- ⁵⁶ Barger to Smith, 6 October 1926; and Lake to Lintner, 10 September 1926, BAI Records, Box 373.
- ⁵⁷ Bromwell to Barger, 28 February 1927; Spence to Mohler, 25 February 1927; Munger to Mohler, 24 February 1927, BAI Records, Box 373. There were numerous other letters from Iowa officials and veterinarians.
- ⁵⁸ Baker to Mohler, 25 March 1927; Mohler to Baker, 2 April 1927; Baker to Mohler, 7 April 1927; Baker to Mohler, 11 May 1927; and Mohler to Baker, 24 May 1927, BAI Records, Box 373; Winston, *Throttle*, p. 190. Obviously the truth is lost in the ether.
- ⁵⁹ Baker lobbied as well. In a letter to Carter Glass on 7 June 1928, Norman Baker wrote that as part of his campaign against BTB testing he was reading the Senator's entire "Tale of Two Heifers" on KTNT over a series of nights and "lauding you to the sky." Baker

sought the Senator's aid in reversing the FRC's decision regarding the station's wattage, which "has been cut down ...because I have practiced free speech." Baker singled out the "Radio Monopoly" as wishing to silence him. Glass papers, Box 88, file 1.

⁶⁰ H. R. Smith to Kiernan, 14 September 1926, BAI Records, Box 373.

⁶¹ Secor to Mohler, 18 March 1927; Mahison to Mohler, 27 February 1927; Munger to Mohler, 24 February 1927; and Barger to Chief, 28 March 1927, BAI Records, Box 373.

⁶² Hearst to Moeller [sic], 12 April 1927, BAI Records, Box 373.

⁶³ Hearst to Mohler, 23 April 1927, BAI Records, Box 373.

⁶⁴ Burch to Kiernan, memo, 22 September 1926; a 20 September 1926 memo, Kiernan to Burch, noted "I doubt very much that the Federal Government would take any action in the matter, except to broadcast facts regarding tuberculosis." BAI Records, Box 373.

⁶⁵ Burch to Kiernan, memorandum, 1 April 1927, BAI Records, Box 373.

⁶⁶ Chief of Bureau to Pickard, FRC, 5 April 1927, BAI Records, Box 373, "I strongly recommend that the Federal Radio Commission consider the desirability of taking steps to prevent misquotations of public officials. Without in the slightest degree questioning the right of persons to broadcast what they believe themselves, I feel that no persons should be permitted to misquote or misrepresent the views of others." "Report of Ellis A. Yost," 5 March 1931; and "Statement of Facts," 5 June 1931, and related material in U.S. Federal Communications Commission, Radio Division. Records. KTNT file, RG 173, Entry 3, Box 426, National Archives and Records Administration, College Park, MD.

⁶⁷ Exline to Chief, 30 January 1932; Quinn to Mohler, 10 September 1932; Chief of Bureau to Exline, 8 February 1932; Mohler to Quinn, 16 September 1932; and attached handwritten note of 15 September 1932, BAI Records, Box 373.

⁶⁸ H. R. Smith to Barger, 3 November 1931, BAI Records, Box 373.

⁶⁹ McLean letter, 11 June 1928; Glass reply, 19 June 1928, Glass papers, Box 88, file 1.

⁷⁰ California's troubled experience in controlling BTB calls into question popular generalizations promoted by historians such as Kevin Starr, about the state's preeminent role as a vanguard of progress over the twentieth century. This role is illustrated, for example, by California's early development of an extensive quarantine system to control the introduction of plant diseases and insect pests. See Iranzo, Olmstead, and Rhode,

“Historical Perspectives,” pp. 55-67. But the same efficiency and zeal did not carry over to controlling several animal diseases.

⁷¹ As early as 1929, a BAI inspector observed “California has a very large Portuguese population engaged in dairying [which]...represents an antagonistic element, or at least it assumes a passive attitude towards the eradication program.” Foster to BAI Chief, 21 January 1929, BAI Records, Box 356.

⁷² Boyd, “Review,” p. 510.

⁷³ Jackley, “Report,” p. 661, Iverson, “Report,” pp. 389-91; Iverson, “Division,” pp. 228-29; Duckworth, “Tuberculosis,” p. 227.

⁷⁴ *Patrick v. Riley*, 209 Cal. 350 (1930); Iverson, “Progress,” p. 673; *San Francisco Chronicle* (7 November 1930), p. 2 notes that the Proposition, No. 13, won with 779,696 yes votes to 169,286 no votes.

⁷⁵ Arburua, *Narrative*, pp. 124, 139; McDonald, “Tuberculosis Control,” p. 22; *San Francisco Chronicle* (20, 21, 22 October 1932), each p.1.

⁷⁶ The State Grange was especially concerned about the indemnity fund as well as a general worsening of relations between the State DAI and the USDA. In late 1932, the state Farm Bureau also called for an investigation of the indemnity funds. *San Francisco Chronicle* (2 December 1932), p. 16; *Pacific Rural Press* (8 October 1932), pp. 246, 253, 276; (22 October 1932), p. 278; (29 October 1932), pp. 292, 295; (12 November 1932), p. 342; (26 November 1932), pp. 371, 374; (3 December 1932), p. 388; and (31 December 1932), p. 545. Washington got wind of the scandal by early 1933; see Chief of Bureau to Howe, 10 January and 2 February 1933, BAI Records, Box 375.

⁷⁷ *New York Times* (2 February 1933), p. 13; *Los Angeles Times* (5 February 1933), p. 1; (23 February 1933), p. 5; (24 February 1933), p. 1; (25 October 1933), p. 5; *San Francisco Chronicle* (24 February 1933), p. 1; (3-7 April 1934); *Lertora v. Riley*, 6 Cal. 2d 171 (1936).

⁷⁸ Chief to Howe, 20 February 1933, BAI Records, Box 373, File 9.212.4; *Los Angeles Times* (29, 30 September; 2, 4, 6, 25 October 1933); *San Francisco Chronicle* (29, 30 September; 1-11 October 1933; and 3-7, 13, 17, 19, 20 April 1934); *Sacramento Bee* (5 October 1933); *Western Livestock Journal* (5 October 1933), p. 8; *Pacific Rural Press*

(28 October 1933), p. 331. Later courts ruled against the attempts of Biggio and Lertora to collect on indemnities. *Lertora v. Riley*, 6 Cal. 2d 171 (1936). The state did apparently pass legislation granting indemnities to the pair, although the federal government never paid. Arburua, *Narrative*, p. 109.

⁷⁹ Craig, Schudder, and Robinson, "Report," pp. 3016-18.

⁸⁰ In Tulare County testing became compulsory after a vote of dairymen attending a mass meeting. *Fresno Bee* (9 December 1934), p. C1, (20 December 1934), pp. B1-B2.

⁸¹ *Fresno Bee* (13 December 1934), p. A4; (20 December 1934), pp. B1-B2; (30 December 1934), p. B2; (10 January 1935), p. A2. California indemnities averaged \$11.82 per head in FY 1935. U.S. House, *Agricultural Appropriation, 1937*, p. 173.

⁸² Duckworth, "Bovine," (1935), p. 366. See also U.S. House, *Agricultural Appropriation, 1935*, p. 143; "Here and There with Jack Klein," *California Cultivator* (30 November 1940), p. 644, Smith, *Conquest*, pp. 31, 48.

⁸³ One-percent IPUMS sample for 1920 from Ruggles, Sobek, Alexander, et al., *IPUMS*; Bohme, "Portuguese," pp. 242-43; Graves, *Portuguese Californians*, pp. 69-73.

⁸⁴ *Fresno Bee*, (20 December 1934), pp. B1-B2; (6 January 1935), p. B3; *Los Angeles Times* (9, 12 January 1935; 19 June 1936). Coehlo also argued "the possibility of humans contracting tuberculosis from tuberculin cows is extremely remote." Correira's activities are detailed (and defended) in his daughter's memoir, Stonehill, *Barrelful*, pp. 228-36 and in Graves, *Portuguese Californians*, pp. 86-88. In contrast to the Portuguese community, the Danish Creamery Association refused to take a stand on the issue of testing. *Fresno Bee* (9 December 1934), p. C1

⁸⁵ Arburua, *Narrative*, p. 311, *Los Angeles Times* (15 March 1934), p. 7; *Sacramento Union* (15 March 1934), p. 8; *Pacific Rural Press* (20 April 1935), p. 415; *Tulare Daily Advance-Register* (12 March 1934), p. 4; (14 March 1934), p. 1; (15 March 1934), p. 4; *Fresno Bee* (15 March 1934), p. B1; (4 November 1936), p. B3.

⁸⁶ *California Cultivator* (12 September 1936), p. 670; *Fresno Bee* (20 December 1934), pp. B1-B2.

⁸⁷ Craig, Schudder, and Robinson, "Report," p. 3018.

⁸⁸ Duckworth, "Tuberculosis," (1939), pp. 44, 47.

⁸⁹ Nor did Iowa have a monopoly on mass meetings and demonstrations. In June 1936 a protest meeting held in the Portuguese Hall in the small town of Gustine reportedly attracted over one thousand participants. Stonehill, *Barrelful*, pp. 86-87; *Los Angeles Times* (4 May 1937), p. 5; (5 May 1937), p. 11; (6 May 1937), p. 3; *Modesto Bee* (3 May 1937), pp. 1, 10; (4 May 1937), pp. 1, 12; (5 May 1937), pp. 1-2; (6 May 1937), pp. 1-2; *Hanford Daily Sentinel* (3 May 1937), p. 1; (5 May 1937), p. 1.

⁸⁹ *Los Angeles Times* (1 September 1935), p. 29; (15 February 1936), p. 6; (10 November 1936), p. 8; (2 April 1937), p. 23; (22 April 1937), p. 8; (8 December 1937), p. 8; (16 March 1938), p. 12; *Pacific Rural Press* (18 August 1938), p. 140; (15 October 1938), p. 358; *California Cultivator* (5 August 1937), p. 437. In early 1936, six “bovine disease rebels” were arrested in Kings County for refusing testing. *Fresno Bee* (4 February 1936), p. B6; (6 February 1936), p. B6; (9 February 1936), p. C4.

⁹⁰ Duckworth, “Bovine,” (1935), p. 366; Duckworth, “Bovine,” (1938), p. 488. The Attorney General over much of this period was Earl Warren.

⁹¹ Our investigation found no evidence of direct involvement by the AMLL.

⁹² See State cases: *Coehlo v. Truckell*, 9 Cal. App. 2d 47 (1935); *Stanislaus County Dairymen’s Protective Association v. County of Stanislaus*, 8 Cal. 2d 378 (1937); *Loftus v. Superior Court of Kings County*, 25 Cal. App. 2d 346 (1938); *Affonso Bros. v. Brock*, 29 Cal. App. 2d 26 (1938); *Western Cooperative Dairymen’s Union v. County of Merced*, 30 Cal. App. 2d 722 (1939); *Mattos v. Superior Court of Merced County*, 30 Cal. App. 2d 641 (1939); *Gomes v. Superior Court of Merced County*, 30 Cal. App. 2d 650 (1939); *Thome v. Superior Court of Merced County*, 32 Cal. App. 2d 521 (1939); and Federal cases: *Borges v. Loftus*, 87 Fed. 2d 734 (1937); *Borges v. Loftus* 301 U.S. 714 (1937); and *Aguiar, Bello v. Brock*, 24 Fed. Suppl. 692 (1938). The *Affonso* decision was the most important for undermining the legal basis of the opposition whereas the *Thome* decision saved face for the opponents by specifying their private veterinarians could be monitor the testing.

⁹³ Duckworth, “Bovine,” (1937), p. 362.

⁹⁴ Duckworth, “Bovine,” (1938), p. 488; Duckworth, “Bovine,” (1939), p. 44.

⁹⁵ Duckworth, “Bovine,” (1939b), p. 629.

⁹⁶ *Modesto Bee* (4 May 1937), p.12; See also (3 May 1937), p. 1, 10.

⁹⁷ In a 20 March 1935 letter to “Brother Members” of Farmers Union, George Ormsby, President of the Cedar County unit, wrote that the T.B. test battle in his county “was not started with the intentions of winning, for the law was against us. But it was started with the intention of trying to get the uninformed public to understand the detrimental tactic’s [sic] that were used against the farmer under the law, and also how the consuming public was deceived, by making them believe that they were getting meat that was free from the T. B. germ.” Ormsby papers, Box 2, file I. A 23 September 1931 Associated Press newspaper story posted from Tipton, IA explicitly lists three reasons for the farmers’ “displeasure with the law”: (1) “the value of the tuberculin tests... has never been adequately proven”; (2) the “inadequate return for the reactors...” and (3) “the compulsory nature of the law violates their sense of freedom” especially their inability to “choose their own veterinarians.” Ormsby papers, Box 2, file D, item no. 29.

⁹⁸ The role of ethnicity appears tricky. The population of Cedar County, the center of the Iowa Cow War, was “heavily German.” The farmers’ ethnicity was said to contribute to their resistance to U.S. actions during WWI, but was seldom directly linked to the Cow War. Archie, “Times of Trouble,” p. 30; 19 October 1918 Letter of Paul P. Moore in Grant White Papers, folder 4, University of Iowa Special Collections, Iowa City, IA

⁹⁹ Cited in Myers and Steele, *Bovine Tuberculosis*, p. 91.

¹⁰⁰ Mokyr, *Gifts*, pp. 253-54.

¹⁰¹ Opponents to tuberculin testing in Europe, where BTB was far more widespread, frequently warned of politically unacceptable reductions in the food supply. This contrasts with current opposition to GMOs from European farmers and governments who oppose technologies that threaten what they perceive to be a harmonious (if heavily subsidized) balance in the farm economy. Productivity-enhancing technologies that increased food supply will only lead to pressure for more farm subsidies.

¹⁰² Mokyr, *Gifts*, p. 226.