Wiley’s first target was the dairy industry. Several crooked dairies in large cities were diluting milk with water and adulterating it with plaster of Paris (to make spoiled milk look white) and pureed animal brains (to give the appearance of a heavy cream layer). Wiley spent over twenty years concentrating on safe milk, butter, and canned meats, promoting accurate labeling and removal of dangerous preservatives—formaldehyde, borax, and copper sulfate were common additives to prevent putrefaction. His political acumen and flair for publicity helped him survive blistering attacks by trade groups, but his campaign was often blocked by powerful industry titans.

New U.S. president Teddy Roosevelt was a major proponent of legislation for food safety. His distrust of the meatpacking industry came from the putrid meat sold to the Army that he was forced to serve his troops during the Spanish-American War. Fortified with formaldehyde to prevent decay, canned meat earned the name “embalmed beef” from the press. Roosevelt also knew that the U.S. was the only industrialized nation without strict laws forbidding the sale of contaminated and adulterated food. Then came unexpected support from an extraordinary book.

_The Jungle_, published serially by Upton Sinclair in 1905, was an exposé of unsanitary conditions and deception in the meatpacking industry. The book contributed to the passage of the Pure Food and Drug Act of 1906. Exaggerated in many areas, the crude prose established Sinclair as a muckraker. In _The Jungle_, Sinclair wrote of ethnic groups showing how unrestrained capitalism had created destructive forces that suppressed culture and family morals. The publicity led to systematized meat inspection by veterinarians within the USDA Bureau of Animal Industry.¹¹

17. PUBLIC VETERINARY SCHOOLS: THE SECOND-GENERATION PIONEERS

At Iowa State College, Dean Stalker was asked to step down and President Beardshear took the reins, acting as dean of the Division of Veterinary Medicine. His first goal was to build a faculty. From the University of Pennsylvania, Beardshear hired J. H. McNeil (for anatomy and surgery) and L. A. Klein (for medicine and sanitary science) to begin in September 1900. With them came the latest German-based methods of teaching, the science of
Robert Koch and Julius Cohnheim, and the influence of Leonard Pearson’s new Germanic curriculum at Penn.

L. A. Klein taught medicine and sanitary science, published *Principles and Practice of Milk Science*, and translated Fröhner’s *Allgemeine Therapie für Tierärzte* into the English *General Therapy for Veterinarians*. Klein had spent one year with the Bureau of Animal Industry before coming to Ames and left in 1902 for Clemson Agricultural College. Seven years later he was appointed dean of the veterinary school at the University of Pennsylvania.

Plans for the Veterinary Division, like all else at Iowa State College, were put on hold by two disasters in 1902: President Beardshear died on August 5 in his campus home, the Knoll, and Old Main burned to the ground on August 14. For eight months the Division of Veterinary Medicine was without a dean.

On April 7, 1903, McNeil was appointed dean. McNeil had graduated from the University of Pennsylvania in 1899 and had remained one year there as house surgeon. Arriving at Iowa State, he proved to be an inspirational teacher and an outstanding academic veterinarian. A close friend of President Beardshear, his extraordinary intelligence and capacity for work put “new life and energy into the Division after its reorganization.” According to Charles Stange, he had “never known a truer friend.”

J. H. McNeil would be an extraordinary dean, attuned to student needs and an “enemy of misrepresentation.” McNeil put in place the first four-year course in veterinary medicine in any college in the U.S. Interested in the breeding of livestock, he was active in attempts to help the livestock breeder and was one of the first to urge systematic control of tuberculosis in cattle. McNeil made heroic but unsuccessful pleas to the Board of Trustees for badly needed new buildings for the Veterinary Division; money was tight and budgets grim.

There was an economic panic in 1907. A run on Knickerbocker Trust Company deposits on October 22 set in motion events that led to severe monetary contraction, and the fallout led Congress to create the Federal Reserve System. Astonishingly, student enrollments were slowly rising in both rural Iowa State and urban Pennsylvania, and both needed new buildings. But at Iowa State there was no relief from the cramped quarters and overworked faculty.

At the end of the 1907 term at Iowa State College, two young faculty members resigned. The faculty now was McNeil and three recent graduates: R. R. Dykstra, Stange, and W. E. Madson. Unable to convince the state legislature of the pressing need for new facilities, Dean McNeil resigned in protest.
on September 30, 1908, and moved to Ohio State as professor of surgery. Later he would spend five years with the Brazil Land and Cattle Company and, after returning, serve as chief of the BAI of New Jersey.

After Beardshear’s death, President Storms had acted as dean of the veterinary college, and he was again acting dean after McNeil resigned. Storms fully supported the construction of new veterinary buildings and made the case in strong terms to the Board of Trustees. Finally, the board members concurred. Their report of 1908 stated that “more adequate provision must speedily be made for this division of our college. We should either frankly abandon the veterinary department or provide for creditable work.” The report gave great credit to McNeil, stating: “Such men can not be secured for the salaries we are paying.”

In March the Iowa State Board of Trustees reported that Charles H. Stange had been selected as dean of the Veterinary Division effective February 4, 1909. In July the state legislature abolished the old system of government by boards of trustees and a new State Board of Education was appointed. The next year building plans were perfected and funding was secured for the new Veterinary Quadrangle.

An impressive editorial in the *American Veterinary Review* of 1907 by botanist L. H. Pammel pushed for science in the veterinary curriculum and compared course requirements of the University of Pennsylvania, Cornell University, and Iowa State College. All three schools had demanding science curricula at the time but differed in their emphasis on the horse: Iowa required twenty-one units of animal husbandry, whereas Cornell required three and Penn none. Iowa and Penn had an additional two units on horseshoeing, but Cornell had none. Pammel’s plea for scientific rigor was timed well. Dean McNeil had resigned at Iowa State over lack of facilities, Law was one year away from retiring at Cornell, and Pearson had two years remaining at Penn. Those were big shoes to step into.

AT THE UNIVERSITY OF PENNSYLVANIA in Philadelphia, the veterinary department was struggling. It was in temporary quarters from 1901 to 1907 in a remodeled car barn. The original building had been needed as a site for the expanding medical school. In August 1905 a fire broke out on the second floor that killed nineteen dogs and destroyed valuable school records and exhibits, including a collection of horseshoes belonging to the Master Horseshoers’ National Protective Association of America that had won medals at the Paris Exhibition in 1900.
Veterinary science at Penn had improved, not declined, during its time in the temporary car barn, largely due to the quality of its faculty. Dean Marshall retired and was replaced in 1897 with an Indiana native, Leonard Pearson. A Penn veterinary school graduate, Pearson had a pre-veterinary BS degree in agriculture from Cornell and had done postgraduate study in Berlin and Dresden. In his teaching, Pearson emphasized diseases of cattle, sheep, swine, and chickens over horses and changed Huidekoper’s French-based teaching program to one of German methods using the English translations of *Physical Diagnosis* by Malkmus in Hannover and *Special Pathology and Therapeutics of the Domestic Animals* by Friedberger and Fröhner in Berlin. Pearson’s changes predicated the future in veterinary education. The appointment of Pearson as state veterinarian and secretary of the State Livestock Sanitary Board made the school the center of veterinary field investigations in Pennsylvania. The period gave Penn a worldwide reputation in science, and when the school moved into its marvelous new building in the fall of 1913, enrollment spiked immediately.

At The Ohio State University, enrollment spiked in 1904. In the first two decades since the founding of the school in Columbus, the School of Veterinary Medicine had struggled; the number of graduates in each class had varied from
none to five (in two years there were none and in three years only one). David S. White, who took the reins from H. J. Detmers, began as dean in 1896 with the comment that the “struggle for existence of (the veterinary department) is too pathetic to relate.” Detmers’s four-year curriculum plan had been reduced to three but still was too demanding to compete with the two years offered by most.

White had graduated from the school in 1890 and spent three years of study in European veterinary schools. For thirty-three years (until he retired in 1929), White was successful in popularizing the school in Ohio. He secured funds for a veterinary laboratory building in 1903 and a veterinary clinic in 1909—billed as the “finest and largest veterinary building west of the Alleghenies.” Six years later, a small animal hospital and a cattle clinic were added. White hired the finest faculty, including anatomist Septimus Sisson from Kansas State College, whose textbook *The Anatomy of Domestic Animals* was the standard for fifty years.

Enrollment had also spiked at Cornell University: the freshman class in 1907 was thirty-five in the “entire attendance” of seventy-seven students. Among them was Florence Kimball, the first woman in the nation to graduate with the DVM degree. When Dean James Law retired in 1908, there were other signs of progress. In the next five years under the new dean, Viranus Moore, BS, MD—physician turned veterinarian—the veterinary college at Cornell opened an ambulatory clinic, established an outstanding quarterly, the *Cornell Veterinarian*, and initiated plans for new clinics that were completed in 1913 and included a four-story building for large animals and two three-story buildings for small animals and farrier duties.

Walter L. Williams, professor of surgery, had gained fame in obstetrics. Educated at Illinois Technical University—now the University of Illinois—he had been a student at the Montreal Veterinary College from 1878 to 1879, where he was taught pathology and physiology by William Osler (he did not have an academic degree). Licensed to practice in Illinois, he later joined the faculty at Purdue University and then at Montana State College. Williams was a careful scientist and prolific writer who published on a range of diseases, from the pathology of glands to colic in horses arising from arterial blockage caused by invasion of the mesenteric arteries by nematodes. At Cornell he was renowned for his expertise in breeding diseases and ethics; his textbooks on these subjects remained the standard for fifty years. His most celebrated student was William Hagan, legendary next generation dean at Cornell.
In New York City, a circular letter dated December 16, 1907, was received by veterinarians from the Cornell University Medical College announcing the establishment of an animal hospital and dispensary at 408 East 26th Street. It was an appeal to veterinarians in the City to send them animals—“horses and cattle excepted”—for purposes of teaching surgery to medical students. All branches of surgery would be available: ophthalmology, otology, laryngology, gynecology, genitourinary, and general. A disclaimer was included in the letter: there would be no experimental work on the animals.¹⁰

THE ADAMS ACT PASSED BY CONGRESS the previous year became operational in 1907; it provided an increase of $3,000 each year to state experiment stations for research on diseases of livestock. The money was a capstone for a
highly successful year for many fledgling veterinary colleges. It was the year Colorado and Alabama established veterinary schools, Michigan authorized one, and Kansas, established two years previously, received a state appropriation of $70,000 for a veterinary school building. Pennsylvania approved $100,000 for the school in Philadelphia, which acquired another $150,000 from private sources to construct the most complete veterinary school building in the country.

Funds from the Adams Act were not available to private veterinary colleges, and they missed the stimulus for research. In the coming decade, deprived of science, they would be at a serious disadvantage in the dilemma that awaited them. In 1900, statistician Karl Pearson published his chi-square test of goodness of fit, a formula for measuring how well a scientific hypothesis fits observation. In theory, a die will fall equally often on each of its six faces. But when rolled a hundred times, one number often comes up more frequently, for in practice there is chance and the ratios are almost always different. How well does the hypothesis that the die is fair fit the data? The chi-square test was important to pioneer scientists; it provided a measure of how well their hypothesis and data corresponded. Statistics and chi-square began to change how scientists worked and how national leaders accepted new scientific information.

In 1908 few politicians knew or cared about chi-square. The country was still seriously vulnerable to livestock plagues and to human disease from unsafe food. State laws were lax and sanitary commissions were in the hands of the agricultural producers. Few had veterinarians as members on the sanitary commission, and West Virginia and Tennessee, as well as Utah, Idaho, and New Mexico in the West, were particularly backward. Of the six New England states, only Massachusetts had a state veterinarian, Austin Peters, as head of the state sanitary commission—Peters had helped save the livestock industry during the recent foot-and-mouth disease outbreak. Agricultural states in the Midwest and South had good scientists and effective programs.

Many states without veterinary schools had outstanding professors in departments of veterinary science in schools of agriculture: veterinarians Cary and Giltner in Alabama, Craig in Indiana, Connaway in Missouri, Van Es in North Dakota, and Lewis in Oklahoma made great progress in promoting sanitation and control of zoonotic diseases. Institutional reports to the USDA on research done with experiment state funds revealed that most schools had none or listed simply “work in progress.” Exceptions were Alabama, which reported investigations of contagious epithelioma of chickens, cottonseed meal poisoning, bovine
mastitis, and milk bacteriology. Minnesota reported studies on hemorrhagic septicemia and swamp fever, and Michigan on hog cholera.

In the first two decades of the twentieth century, six new state land grant schools of veterinary medicine were established in agricultural regions: four to serve farming and ranching areas of the Midwest/Great Plains, one in the South, and one to cover the wheat farms of the Palouse prairies. The founding deans of four schools were graduates of Iowa State College. The College of Veterinary Medicine at the State College of Washington graduated its first class in 1902; enrollments were few—the number of graduates from 1902 to 1908 were two, zero, two, four, two, three, and five.

At Alabama Agricultural and Mechanical College in Auburn, the Department of Physiology and Veterinary Science became the School of Veterinary Medicine, with professor Charles Allen Cary as dean; its first class graduated two years later. Cary, often listed as the father of veterinary medicine in the South, was Alabama’s first state veterinarian; he was, like his mentor Stalker, an expert in poisonous plants and the force for elimination of the ticks of Texas cattle fever, the use of antiserum for hog cholera, and tuberculosis testing in cattle for safe milk. A socially conscious Presbyterian (and superintendent of their Sunday school in Auburn), Carey was supportive of efforts in Tuskegee to teach veterinary science. Realizing its social risk, Cary invited George Washington Carver to speak at the 1903 Alabama Live Stock Association state meeting in Birmingham—both Cary and Carver were alumni of Iowa Agricultural College.

Kansas State College had developed a solid academic program in veterinary science and graduated its first veterinarian in the winter term of 1907. The next year it completed an impressive building for the new Division of Veterinary Medicine, led by Professor Schoenleber. In August 1911, R. R. Dykstra resigned as professor of anatomy at Iowa State College to become professor of veterinary science at Kansas State College. Born in Groningen, Holland, he had graduated from high school in Orange City, Iowa. At Iowa State he had advanced to the rank of full professor in six years. Dykstra Hall at Kansas State College was named for his extraordinary leadership as dean from 1919 to 1948, nearly three decades in the formative years of growth in the Kansas State Division of Veterinary Medicine. Stange too would be dean at Iowa State for three decades. The two were colleagues and friends, and their two veterinary schools were rural-based, struggling to build modern facilities in an agricultural economy, and heavily influenced by farm and ranch practices.
EMERGING COMPLEXITIES OF SCIENCE and access to it for the university-affiliated veterinary schools provided a big advantage. As the private veterinary schools closed one by one, the ten state-supported schools survived. Despite World War I and the agricultural depressions that followed, all would prosper and provide the faculties, curriculum, and inspiration for today’s thirty-five modern colleges of veterinary medicine in North America.

Some progressive state-supported veterinary schools folded during the agricultural depressions (see appendix III). The University of Georgia had a fine program but lost state support during the Depression. Others were destined never to succeed. Advertisements for the College of Veterinary Science at the University of West Virginia described a suspicious out-of-state arrangement: the first year was at Morgantown, the second and third years at 132 Washington Street.
in Pittsburgh—but there was no information on facilities or faculty. Equally
dubious was the California Veterinary College in downtown San Francisco; it
had affiliated with the University of California San Francisco but was unable
to attract students, dedicated academic faculty, or funds to continue operating.

18. THE BUREAU OF ANIMAL
INDUSTRY AND HOG CHOLERA

As the new century began, the Bureau of Animal Industry under director
Daniel Salmon was proving its worth many times over in protecting the
livestock industry. An unexpected calamity had begun in November 1902 when
the local chief of the Massachusetts BAI telegraphed headquarters that a disease
he had examined in Rhode Island dairy cows appeared to be foot-and-mouth
disease. Cows were standing in their stanchions without eating, drooling saliva
into the feed bunk. They had painful ulcers of the mouth and feet and swollen
udderks with ulcers and abscesses. The weight loss of affected cows was striking.
Calves failed to nurse, and the loss of milk production was catastrophic. The
diagnosis of foot-and-mouth disease was confirmed and the work of eradiating
the disease began, including the hurried summons of BAI veterinarians from
throughout the country to New England. The disease had existed since August
and had spread rapidly into neighboring states. The massive effort to find, test,
and slaughter infected animals was effective, and the disease was eliminated
from New England by the end of 1903.

Foot-and-mouth disease continued to require constant vigilance; it again
appeared on a hog farm outside of Niles, Michigan, in August of 1914, and
by the next February, twenty states were affected. The BAI went into action,
imposing quarantines throughout the Midwest. This time, the national public-
ity began to have an impact and there was renewed interest in the veterinary
profession, with effects as diverse as education and sanitary laws. One of the
benefits that resulted from this plague was the introduction of short courses
to educate veterinary practitioners by veterinary colleges.

BAI director Salmon assigned hog cholera work to his best scientist,
the chemist Emil A. De Schweinitz. In the 1890s, De Schweinitz did a variety
of animal injection studies using Salmon’s hog cholera bacillus and produced an