Pioneer Science and the Great Plagues

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led to the development of a test for antibodies in horse sera and a program to destroy affected horses with indemnity paid to owners. The cause was identified as a protozoan parasite, *Trypanosoma equiperdum*. It took a half-century, but dourine was eliminated from the U.S. in the 1940s.

### 14. BACTERIOLOGY IN THE HEARTLAND

The catalog from Iowa Agricultural College that came in the mail listed the requirements for the two-year veterinary course; they were simple: “Candidates for admission must be at least sixteen years of age. Before entering the classes, they must pass an examination in reading, orthography, geography, grammar, and arithmetic.” William Benjamin Niles, a teacher in a country school, applied. He had finished grade school in the one-room country schoolhouse in Edenville and began work on the farm. In the winter of 1882–1883,
a country school in Eden Township had employed him as a teacher. The next year, he took the morning train to Ames and enrolled in veterinary school.46

Niles graduated from veterinary school as an honor student in the Class of 1885. His senior thesis had been on lumpy jaw, a chronic tumorlike growth on the jaw of cows. He had isolated the fungus causing the lesion—now called actinomycosis. After graduating, Niles was hired as house surgeon in the veterinary clinic and continued working in bacteriology with Professor Halsted in botany. Starting a private practice in Webster City during the fall of 1886, he continued until July 1887, when he was offered a position in South Carolina.

John M. McBryde, a native South Carolinian and professor of agriculture and horticulture at the University of South Carolina in Columbia, hired Niles as professor of veterinary science and veterinarian for the State Agricultural Experiment Station. McBryde had developed a strong program in agriculture, one of the first to teach bacteriology, and had been appointed president of the University of South Carolina that year. South Carolina was to offer the DVM degree, like the PhD, as a graduate degree. The program ran headlong into politics and was short-lived; there was only one graduate who began his practice in rural South Carolina.

Niles had stepped into a bitter battle in higher education. President McBryde and the university in Columbia were taking flak over what was perceived as ignoring the needs of the state’s “white trash poor and colored.” Governor Ben Tillman led the battle, saying the university was catering to the upper social crust and “not to the poor farmer and the common man who needed it most of all.” 47 He was promising to build a new agriculture school in honor of Thomas G. Clemson, superintendent of agricultural affairs at the U.S. Patent Office, who was a strong promoter of agricultural education in South Carolina. President McBryde was soon forced out at the university and moved to Blacksburg, Virginia, to be the fifth president of Virginia Polytechnic Institute, where he successfully developed another outstanding agricultural college.

The new Clemson Agricultural and Mechanical College was built, much of it with convict labor, in the country on the site of an abandoned Cherokee Indian settlement on the banks of the Seneca River. It opened for students in July 1893. Not wanting to move to the isolated village created as Clemson College, Niles accepted Stalker’s open position in Iowa. South Carolina’s bacteriologist, Meade Bolton, left for Washington to work for the Bureau of Animal Industry. Charles McBryde, former president McBryde’s son, who had earned the MD degree, moved in the next decade to Ames to work with Niles on hog cholera.
The new veterinary department at Clemson College was headed by W. E. A. Wyman, a successful equine specialist whose alma mater was the New York College of Veterinary Surgeons and School of Comparative Medicine. In 1893 Wyman published *The Clinical Diagnosis of Lameness in the Horse*, a marvelous book with elegant woodcuts of lame horses in action. The professorship of veterinary science at Clemson seemed to be a rotating chair. Wyman left after five years and was replaced by George Nesom, an Iowa State classmate of Niles, who had some success in expanding the department. Quitting in 1903, Nesom was replaced in turn by Louis Amos Klein from the faculty at Iowa State College. Klein left after six years to be dean at the University of Pennsylvania; he retired in 1930 and was replaced at Penn by Harold E. Bemis from Iowa State.

**William Niles’s Schoolmates Were Seeding the Faculties of Land Grant Colleges.** Niles’s classmates in 1885 were astonishingly successful: Sesco Stewart, a Canadian who entered veterinary school with an MD degree from Wooster University in Ohio and medical practice experience in Oakland, Iowa, ended as the dean of the Kansas City Veterinary College and the force behind the Missouri Valley Veterinary Association; George Glover, after inspecting cattle on the National Cattle Trail and working in Montana, was the first dean of the Division of Veterinary Medicine at Colorado State Agricultural College; C. A. Carey was state veterinarian of Alabama for many years and the founding dean of the Veterinary Division of the Alabama Polytechnic Institute (now Auburn University). All were national leaders who increased the geographic diversity of the veterinary profession as presidents of the American Veterinary Medical Association: Sesco in the 1902–1903 meeting in Minneapolis; Glover in 1910–1911 in San Francisco; and Carey in 1919–1920 in New Orleans. Carey, through his appointment as chairman of the USDA’s Committee on Eradication of Texas Cattle Fever, had a major role in the elimination of that disease.

Edwin Preston Niles, five years younger than William, left Edenville for veterinary school and graduated in the Iowa State Class of 1886, one year after his brother. He was hired by President John McBryde to be professor of veterinary science at Virginia Polytechnic College in Blacksburg. S. B. Nelson, a graduate of the Iowa State College Class of 1889, was the founding dean of the veterinary school at Washington State College. As new centers of veterinary medicine were created, the influence of Stalker and Fairchild spread throughout the Midwest, South, and West. R. A. Craig, Class of 1897, took a position at Purdue University, taking house surgeon Harry Titus with him the next year.
The new building for the veterinary hospital at Iowa Agricultural College was a two-story brick building constructed for the “Veterinary Department” on a hill south of the campus; described as “the best infirmary in the United States,” it opened for business on June 1, 1885. Field investigations, headed by Dean Stalker, were done in the Iowa Agriculture Experiment Station. But, there was little time to seriously study animal disease. When the Hatch Act of 1887 dedicated federal money for research at land grant colleges, Stalker requested that “a well-trained veterinarian should be added to the present corps of instructors”; the request was approved. Mandating the field investigations combined with duties of teaching surgery, $1,600 was appropriated for the position. William Niles, then at the University of South Carolina, accepted an assistant professorship in Ames to begin on March 1, 1891.

The position gave him travel experience and time for his investigations on the use of tuberculin as a test for tuberculosis in cattle and mallein in the diagnosis of glanders in horses. Niles’s senior thesis at Iowa Agricultural College had been on actinomycosis. In Iowa he was back into the new discipline of bacteriology, using his experience he had gained from Meade Bolton in South Carolina.

Veterinary bacteriology was being added to departments of agriculture in the land grant colleges. In 1897, Kansas State College hired Paul Fischer as professor of veterinary science and college veterinarian. Fischer developed and taught bacteriology in the Department of Veterinary Science for three years before leaving for The Ohio State University.

In 1893, William Fairchild, the professor for basic sciences since the veterinary school opened, resigned and was replaced by another physician, Irving W. Smith, MD. Smith had graduated from Iowa Agricultural College in 1872 and attended medical classes at the University of Iowa; probably on advice from Fairchild, Smith went east for a better medical education, an MD degree from Jefferson Medical College in Philadelphia. Smith had married Sally Stalker, Dean Stalker’s sister. Entering medical practice in his hometown of Charles City, he left for Ames in 1893 when he was appointed college physician and professor of pathology in the Division of Veterinary Medicine.

Smith also followed Fairchild as dean of the Drake University Medical School. In his history of that school, Smith wrote that “in the year 1879 there was in operation at the Iowa Agricultural College at Ames a College of Veterinary Medicine with stiffer entrance requirements and a longer and fuller course of
instruction than any college of human medicine in this country.” Smith was only in the Iowa Agricultural College veterinary school for two years. A reticent and inward man, he was, as L. H. Pammel remembers, resented by some, “perhaps because he was the brother-in-law of Dean Stalker.” Developing tuberculosis, he moved to California, where he died in the next decade.

At the university-affiliated veterinary schools, student enrollment was low. Iowa State College had only fifty students studying veterinary medicine. For the 1894–1895 academic year the veterinary school budget was lean: Dean Stalker, $1,600; Dr. W. E. Harriman, professor of pathology, $1,500; Dr. Niles, assistant professor of surgery and obstetrics, $1,700; and A. R. Wake, house surgeon, $0. In 1894, Iowa State College graduated 8 men with the DVM degree; Penn had 22 graduates receiving the VMD. The numbers were dwarfed by those of the Ontario Veterinary College, where 139 graduated with a VS degree (6 from Iowa) and the Chicago Veterinary College, granting the MDC to 65 graduates (4 from Iowa).  

The veterinary hospital at Iowa State College, 1905. The hospital opened June 1, 1885, and closed in 1912 when the Veterinary Quadrangle opened. Senior veterinary students (Class of 1905) stand in front. R. R. Dykstra, the dean at Kansas State College for three decades, is the tall man, fourth from right.
Physician Wilbert E. Harriman replaced Smith to teach basic sciences. After completing his junior year at Iowa State College in November 1892, Harriman had enrolled in the medical school at the State University of Iowa and at the close of his year’s work won the prize offered for the best examination in histology. Returning to Ames in the spring, he completed his science course, graduating in November 1893. In May 1894 he had passed the examination of the State Board of Medical Examiners and, without a medical degree, began the practice of medicine at Gilbert, Iowa. In October 1894, Harriman, like Smith before him, went east to enroll in Jefferson Medical College in Philadelphia. Awarded the MD degree in May 1895, Harriman returned to practice medicine in Ames and was hired by Iowa State as college physician and surgeon and professor of pathology for the School of Veterinary Medicine.

Harriman taught histology to the first-year veterinary students, pathology in junior and senior years, and general surgical therapeutics in the senior year. He also taught a physiology class that included freshman veterinary students and juniors and seniors in the general science course. A popular professor on campus, Harriman also taught seniors in the ladies’ domestic science course.

The veterinary hospital on the hill rapidly became inadequate. The daily care of inpatients and surgical procedures where an operating table was not advised had to be done outside. In cold months all this created a spectacle on the hill, where passersby were aghast at veterinary students standing in snow and mud with gooseflesh on their bare arms. The veterinary hospital also contained the anatomy dissecting rooms. Dissections were not begun in the fall semester until cold weather set in because fresh animal carcasses were used and would not “keep fresh” in warm weather.

On the Iowa State campus in those days there was “a feeling that the veterinary students were a ‘different kind of animal’ from the rest of the student body, that they did not care for the same things, that their ideals were at variance, and that for these reasons they did not need the same accommodations and comforts as other students.” Why veterinary students were not so refined was raised in a faculty meeting, and Stalker replied that it must be the influence of the head of the department.

L. H. Pammel was an internationally renowned botanist and a major influence on the development of veterinary medicine in the 1890s. Born in LaCrosse, Wisconsin, of German immigrant farmers, he had graduated from the University of Wisconsin and Washington University and came to Iowa Agricultural College in 1889 as head of the Department of Botany. His interests
and research papers were on poisonous plants and he edited that section in the *American Journal of Veterinary Medicine*. His large textbook on poisonous plants was used by every veterinary college in North America.57

Plant toxins were a serious threat to midwestern livestock in the nineteenth century. By 1899 Pammel taught botany courses each year in the three-year veterinary program: general botany, first year; pharmaceutical botany, second year; and in the third year, bacteriology—it was the first course in bacteriology for veterinary students in this country. Two decades later, Pammel produced a comparative study on the curricula of veterinary schools that stressed the importance of rigorous science in the curriculum.

In the early 1890s, Pammel was making a unique social contribution to science at Iowa State College by mentoring and promoting two extraordinarily gifted graduate students: George Washington Carver, the first black graduate student, and Ada Hayden, the first woman (and only the fourth person) to be granted the PhD degree. Carver finished his BS degree with a thesis titled *Plants as Modified by Man*. Under Pammel’s direction he completed the master’s, and in 1896 was hired by Booker T. Washington, the first president of Tuskegee Institute, to head the agriculture department there. Searching for a black American with a graduate degree, Washington had found only one; George Washington Carver would be the first in an impressive line of black American Iowa State graduate students who would help create modern science at Tuskegee.

Funds for Iowa State Experiment Station work were directed to rabies of cattle, finding the toxic agent of cornstalk disease in cattle, contagious abortion in mares and cows, and tuberculosis in cattle. At the time, tuberculosis was a major problem in dairy cattle and bovine tuberculosis, transmitted to humans through milk, was a widespread cause of disease and death. Reporting on the veterinary section of the Iowa Agricultural Experiment Station in 1895, Dean Stalker and Professor Niles found tuberculosis to be more prevalent in cattle than was supposed and stated: “During the past two years the work has consisted principally of investigations concerning bovine tuberculosis. Tuberculin as an aid in diagnosis has proven of great value.”58 The first report published by Stalker was *An Investigation of Bovine Tuberculosis in Which Special Reference Is Made to Its Existence in Iowa*.

Nationwide, departments of veterinary science were testing cattle with tuberculin. Nelson S. Mayo, heading the Department of Physiology and Veterinary Science, used the new tuberculin test at Kansas Agricultural College; his
disclosure of tuberculosis in the college dairy herd caused an intense, partisan discussion. The Board of Regents terminated Mayo in 1897 and ordered a retest by the college veterinarian, Paul Fischer, who called in Bureau of Animal Industry veterinarian T. A. Geddes and James Law from Cornell to assist in testing. Vindicating Mayo, the animals he had declared reactors were positive on retest and were slaughtered and the carcasses burned.

Bacteriology laboratories were being added in most agricultural colleges. In November of 1895, an additional $100 was added to the Iowa State College budget when a request was made for laboratory facilities to teach bacteriology. Struggling for another three years and frustrated with his low salary and the little money budgeted for research, William Niles resigned to accept an offer to work for the BAI. A consistent supporter and contributor to the Iowa Veterinary Medical Association, Niles had been particularly popular among veterinarians in the state.

James Wilson, professor of agriculture and director of the Experiment Station at Iowa State College, was a friend of Niles. He had become secretary of agriculture in President McKinley’s cabinet in 1897 and was instrumental in getting Niles into the BAI. Born in Scotland, Wilson was secretary of agriculture longer than any cabinet officer in history. The BAI moved Niles to a new position in western Iowa, where he was assigned to investigate the effectiveness of an antiserum against the hog cholera bacillus in a seriously spreading outbreak of hog cholera in southwest Iowa.

Dean Stalker asked the Board of Trustees for $75,000 for new facilities for the veterinary school. An editorial by the new associate editor of the American Veterinary Review in 1899 noted that Iowa State College “under the wise guidance of Professor Stalker, has made a national reputation . . .”

15. THE 1890s: HORSE MARKETS AND ENROLLMENTS DROP

James Paget, a first-year medical student at St. Bartholomew’s Hospital in London, discovered larvae of the roundworm *Trichinella spiralis*. Dissecting a human cadaver, he noted small white specks in muscle that when examined microscopically proved to be cysts with tiny worms inside. The worm larvae were connected to disease when a German girl, preparing meat for Christmas,