Pioneer Science and the Great Plagues

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for another fifty years because of the nature of the disease to remain hidden in between waves of disease. Its reappearance was often tied to foibles of those involved: failures to vaccinate, fly-by-night serum producers selling unstable or diluted antiserum, and delays in the laboratory diagnosis to confirm the disease—an event that made it too late to prevent spread of hog cholera.

19. VETERINARY EDUCATION, CHARLES STANGE, AND THE FLEXNER REPORT

The Committee on Intelligence and Education of the American Veterinary Medical Association issued its annual report in 1904. Ignoring Kansas City Veterinary College dean Sesco Stewart’s critique of the previous year, it included a list of colleges to be accredited by the AVMA but had used only information supplied by the school. The report was favorable to a number of “colleges” of dubious credentials. A favorable report was made for the Collins Veterinary College in Nashville, Tennessee, but an investigation the next year revealed that the college had been “chartered by the State of Tennessee but owned and run by a non-graduate. There was not a qualified veterinarian connected with the faculty. Diplomas were issued at random—no faculty, no course, no college.”

After three years of ignoring the problem, a committee was appointed by the U.S. secretary of agriculture to investigate veterinary schools. The committee’s report released in 1908 was a “bombshell.” It placed the veterinary colleges into three classes: A (those colleges whose graduates would qualify to sit for the U.S. Department of Agriculture civil service examination for employment in the USDA); B and C (those whose graduates who would not). The report was not accepted by the Education Committee of the AVMA.

In 1908 the American Medical Association directed its new Council on Medical Education to investigate medical schools in North America. The intent was simple. Medical school curricula should be standardized, with a minimum of two years of basic sciences and two years of clinical training in a teaching hospital. To provide data on the state of medical education, the AMA’s new Council asked the Carnegie Foundation for the Advancement of Teaching to survey medical education in the U.S. and Canada and propose changes. The Carnegie Foundation appointed Abraham Flexner, neither scientist nor physician, to
direct the survey, and for two years Flexner’s committee toured medical schools in North America.

The Flexner Report was released in 1910. It recommended that physicians be trained in a scientific manner, state licensure procedures be strengthened, and medical schools be given control of their teaching hospital. The Report gave high marks to only a few medical schools: the Universities of Michigan, Western Reserve, and Wake Forest in the U.S. and McGill and Toronto in Canada. Highest praise was given to the new medical school at Johns Hopkins University, which was recommended as a model in North America.

The Flexner Report damned the status of most medical education in the U.S. In the end, it would cause the number of MD-granting institutions in the U.S. to go from 160 in 1904 to only 66 in 1935. It called Chicago’s 14 medical schools a “disgrace to the state” and declared that Chicago was “the plague spot of the nation.” In Canada, only the school at Western University was deemed inadequate by the Report, and none closed.

The hospital of the University of Iowa Medical School was called a “well-intentioned but feeble institution” and it was recommended that the school either reform substantially or close. It had opened in 1898, the first university teaching hospital west of the Mississippi River, but its meager funding by the state legislature was reflected in patient care. In the end Iowa responded, creating a functional and beautiful hospital that opened in 1928 and progressed to the great institution it is today.

The Flexner Report also forced nationwide closure of schools of osteopathy, chiropractic medicine, electrotherapy, homeopathy, naturopathy, and eclectic medicine (which based therapy on botanical remedies). Only the American Osteopathic Association was able to bring some osteopathic medical schools into compliance with the Report. Early lack of leadership and vision for medicine in Iowa led to quasi-medical businesses: the Palmer Chiropractic operation in Davenport, the Still Osteopathic School in Des Moines, and the Iowa Homeopathic College of Medicine in Iowa City. For a period, the University of Iowa had two medical schools operating simultaneously: the allopathic medical school (the college that survived) and the Iowa Homeopathic College of Medicine, started in 1876 as the Homeopathic Medical Department. The Board of Regents allocated funds for a homeopathic school building and hospital, which opened at the corner of Jefferson and Dubuque Streets in Iowa City in 1895. Homeopathy had been contradicted by a wide range of scientific studies across chemistry, biology, medicine, and psychology, and the positive results
shown by a few studies were found to be due to chance, flawed research, or reporting bias. The lack of science caught up to homeopathy and the school and homeopathic hospital closed in 1919.

For the susceptible boys who hadn’t finished high school, scalawags were still offering veterinary diplomas by mail order for a reasonable fee. In August 1910, young farm boys in Eden Township read a two-line advertisement for college by mail order in the local newspaper, the *State Centre Enterprise*. It offered a great deal: “AMERICAN INSTITUTE OF VETERINARY SCIENCE, Chicago, IL. Complete Course in Veterinary Medicine with examination and diploma in 3 months.” No one applied and the scam vanished.

When the Flexner Report was released, several veterinary schools had better facilities and more rigorous curricula than many of the poorer medical schools. Yet the Report also swept through veterinary education. At Iowa State College, a young and receptive Dean Charles H. Stange was attentive to demands for medical reform and reorganized the Division of Veterinary Medicine to meet the new standards. Stange, the third veterinarian to be dean, was fluent in German and attentive to German science, often translating articles and books for U.S. consumption. Pursuing graduate studies at the University of Chicago, he returned in 1908 to accept a position with Iowa State.

During his tenure from 1909 to 1937, Stange’s extraordinary contribution was to insert rigorous science into veterinary education. His predecessor, Dean McNeil, had made Iowa State the first to require a four-year curriculum for the DVM degree (in 1906). Stange would add to that by leading Iowa State to be the first to require high school graduation for matriculation (1911) and one year of pre-veterinary college work (1931). J. F. Smithcors, in his book *The American Veterinary Profession*, stated that Dean Stange “had a greater influence on veterinary education in this country during the past two decades than did any other member of the veterinary profession.”

In his first speech at the AVMA annual meeting of 1911 in Toronto, Stange promoted higher standards with more science in the curriculum and cautioned that “live stock interests are demanding not more, but better men — men capable of solving the many and complex problems incident to modern veterinary science.” Attendees from state schools applauded him for having “the nerve” to speak out; those from private schools called it “lack of judgement.”
In North America at the time there was great controversy and debate among veterinarians over raising entrance requirements and increasing the time of study for educating veterinarians. In Canada, the Ontario Veterinary College had no educational requirement for matriculation, shifting attendance records, and short terms yet attracted many students; in contrast, Montreal, with stiff matriculation exams, strict requirements for attendance, and long courses, attracted few students and folded. In the U.S., Harvard, with high entrance requirements and long courses, failed to attract enough students to perpetuate itself; an editorial in the American Veterinary Review exhorted its members to advise potential veterinary students to avoid Harvard due to its “meagre clinical facilities, attitude of its faculty, and high cost of tuition.” Salmon’s National Veterinary College, with minimum standards, also disappeared in a few years. There seemed to be other factors at work.

In the Midwest, veterinary schools were increasing standards and having increasing enrollments. Perhaps it was a midwestern phenomenon. In discussing the history of the debate, the historian Louis Merillat wrote that “no one seems to have been influenced by the fact that each time Iowa raised its entrance requirement and lengthened its course, its enrollment increased.” The Kansas City Veterinary College, after increasing its requirement and putting up new buildings, soon forced two other veterinary schools in the city to close. Then again, the success in Kansas City may have been based on music—the Kansas City Veterinary College had an outstanding school band and a glee club that performed regularly in the city.

Stange would lead the Iowa State College veterinary school through its most striking period of growth—beginning with the construction of the new complex of buildings, the Veterinary Quadrangle, the State Biological Laboratory north of the Quadrangle, and a new veterinary teaching hospital. To design the new Veterinary Quadrangle, Stange had visited the new buildings at Penn and had traveled to Europe, returning home with the concept of multiple departmental units connected by elegant covered walkways. The result was practical and architecturally pleasing. When it opened in 1912 after being decorated with gargoyles and landscaped with ivy and evergreen, the new building had a beauty unmatched by any veterinary school in the country.

Iowa State College had the leading veterinary faculty and physical plant in the country. A letter to Stange from Walter Crocker at the University of Pennsylvania, at the time America’s best-known veterinary pathologist and most
outspoken critic, stated: “Penn is the only school in this country at this time that gives a thorough course in pathology and it does not have the facilities that Ames has. . . . To my mind you are in the lead in every subject but pathology and with Dr. Benbrook at the head of that department veterinary supremacy is absolutely yours.” In the dean’s report to the president, Stange writes that “in order to facilitate the work of this division and increase its proficiency, it has been divided into departments.”

The Association of State and Provincial Veterinary Colleges met for its annual meeting at Hotel Astor in New York City on September 2, 1913. F. S. Schoenleber of Kansas State College was president and L. A. Klein of Penn, vice president. Reports were that there were twenty-four hundred students enrolled in all veterinary schools in the U.S. and three hundred in Canada. The
list of veterinary colleges accredited by the USDA Bureau of Animal Industry included eight state-supported and eight private schools.

THE DIVISION OF VETERINARY MEDICINE at Iowa State College needed a pathologist to replace Professor Dimock, who had moved to chair the Department of Veterinary Science at the University of Kentucky in 1918. William W. Dimock was known internationally; he had been chief veterinarian of the National Board of Health in Cuba, and his move was a serious loss to the faculty. The new faculty person would have to be a competent pathologist and have the capacity to deal with diagnostic pathology at a national level. Iowa State had started a diagnostic laboratory in 1912 that had been opened to help veterinarians and farmers with difficult problems in animal disease. The operation, working in the basement of the Veterinary Pathology Building, had expanded considerably and more help was needed. Swine influenza was a new viral disease appearing throughout the Midwest, and there was no virologist and no technology to identify or grow a virus.

Stange’s letters of inquiry in March about outstanding candidates revealed a paucity of experienced pathologists. Dean Oscar Brumley at Ohio State had no one. Professors from departments of veterinary science—Roderick from North Dakota and Robert Graham at Illinois—were contacted but proved to be blind leads. V. A. Moore, the dean at Cornell, “regrets that we do not have anyone available” and recommends that Stange contact A. R. Ward at the BAI and Walter Crocker, the feisty veterinary pathologist at the School of Veterinary Medicine at the University of Pennsylvania. Crocker was the author of the only book on veterinary pathology and autopsy techniques in English.

Stange receives a response from Walter Crocker, who lays out his salary and technical requirements for the position. But Penn quickly responds with a 25 percent increase in salary and an appointment at the Wistar Institute, and Crocker will stay at Philadelphia. He sends an extraordinary letter to Stange recommending his former assistant, Benbrook. Writing that there was no one else, he tells Stange of the incompetence in veterinary pathology in eastern institutions: “Fitch could not do an autopsy or discuss lesions to save his life. He came down from Cornell and spent three days with me to pick up enough postmortem pathology to write a book on. His trouble is he can’t tell postmortem
decomposition from antemortem change. Look at the new chief of the pathological division at Washington. He was out to see me last August with Fitch and he wouldn’t risk looking into a microscope at a tumor Fitch could not diagnose. He would not take a chance.” Crocker ends his letter: “If you will have Dr. Benbrook do one complete autopsy on a horse or cow as a demonstration . . . you will admit it to be the first time you ever saw an autopsy.”

Edward A. Benbrook accepted Stange’s offer to join the research department at Iowa State College and to be responsible for the Veterinary Diagnostic Laboratory, and moved to Ames in 1918. Appointed head of the Department of Veterinary Pathology a year later, he held that position until 1955 and was a leader of the College of Veterinary Medicine longer than any other faculty member. Exploiting the technology he had learned at Penn, he applied microscopy and photography to work.

20. WORLD WAR I: BIOWARFARE, PREJUDICE, AND THE U.S. ARMY VETERINARY CORPS

On a cold November night in 1915, a stevedore walked silently through the darkened dockside corrals at the Breeze Point wharf off the shipyards in Newport News, Virginia. Awaiting the trip to European remount depots, mules and horses purchased by British and French agents crowded the corrals. Dockworker John Grant carried a brown paper package containing rubber gloves and two needle-backed syringes filled with brownish fluid. Jabbing the syringes into the rumps of as many animals as he could, Grant dumped the remaining fluid into the watering troughs. The brown fluids were cultures of the glanders bacillus and the horses would sicken and die within the next four weeks—the carcasses thrown overboard at sea—or, better from Grant’s view, arrive alive to spread glanders to European remount depots.

The possibility that Germany might resort to biological warfare against the neutral America’s livestock industry was a persistent worry since the European War started. The U.S. was shipping horses and mules to the Allies—animals that were being used to expand their transport and cavalry. In 1915 Germany began a clandestine program of sabotage along the eastern U.S. coast. Attempts to bomb or derail trains headed for British remount depots in Canada and Newport News, Virginia, did not succeed, and biological attacks failed because