Pioneer Science and the Great Plagues

Cheville, Norman F

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in 1935. During the war years of the early 1940s he worked tirelessly to create educational opportunities for black youth. In 1942, the Tuskegee Institute Board of Trustees approved a program of cooperation with the State of Alabama to create a school of veterinary medicine at Tuskegee. Patterson opened the School of Veterinary Medicine in 1944, the same year he established the United Negro College Fund that today awards scholarship for students in thirty-seven private black colleges and universities. The first dean, Edward B. Evans, had been Patterson’s mentor at Prairie View Normal School. Three department heads at Tuskegee were Kansas State College graduates: Lloyd B. Mobiley (Anatomy), Thomas G. Perry (Small Animal Medicine), and Theodore S. Williams (Pathology). When Evans resigned in 1946, Williams transformed Tuskegee into a competitive veterinary college with demanding courses and graduate programs. Williams earned his MS degree in veterinary pathology under E. A. Benbrook in Iowa.

27. VETERINARY CORPS AND BIOTERROR

After Pearl Harbor had been bombed and the United States entered World War II, Secretary of War Henry Stimson wrote to Frank Jewett, president of the National Academy of Sciences, requesting a study on biological warfare. The academy chose Dr. Edwin Fred of the University of Wisconsin to organize the group under the clandestine name War Bureau of Consultants. It included twelve scientists, with members from the Army Chemical Corps, Surgeon General’s Office, Department of Agriculture, Public Health Service, and the Army’s Ordnance unit.

The report of the War Bureau of Consultants’ study on biological warfare that was submitted to Secretary Stimson recommended that a biowarfare research program be started. Stimson obtained President Roosevelt’s approval, telling him in a memorandum of April 1942 that “the matter must be handled with great secrecy as well as great vigor.” Proceeding from Roosevelt’s approval, the U.S. Army quickly established a research facility for biowarfare, using as its base the tiny Chemical Warfare Service at Camp Detrick, a small outpost on the edges of Frederick, Maryland. It would become a posting with a big impact on veterinarians in the U.S. Army.
To advise the commanding officer at the newly expanded and renamed Fort Detrick, a germ warfare advisory group of eight civilians headed by George W. Merck, president of the pharmaceutical giant Merck and Co., was established in mid-1942. It operated during the war as a faux New Deal welfare agency called the War Research Service. It was felt that a civilian advisory group would prevent the public from concluding that offensive bioweapons were under consideration. The tasks were complex; they included staffing with research scientists with expertise in human, animal, and plant diseases, as well as specialists in ordnance for delivery of microbes and entomologists to breed mosquitoes and ticks that could spread disease.

Physicians specialized in infectious diseases, already in demand by the Medical Corps, were scarce and badly needed at Camp Detrick. Also in demand were Veterinary Corps officers, highly trained in microbiology, chemistry, and food safety. Nearly all biological agents considered to be potential warfare agents caused zoonoses—diseases transmissible from animals to humans. Among the most dangerous microbes with high bioweapon potential that were selected for study at Camp Detrick were those that caused brucellosis, anthrax, glanders, plague, and tularemia, and several viruses that caused encephalitis. They were all killers of both livestock and humans. The first disease to be studied was brucellosis, but so many workers became infected that the disease was abandoned in favor of anthrax.

Once the scientists were assembled, the task of selecting and acquiring the most dangerous disease agents was begun. By January 1943, the War Research Service had contracted William A. Hagan of the Cornell School of Veterinary Medicine to explore offensive uses of botulism and J. Howard Mueller of the Harvard Medical School to study anthrax—both agents that remained the focus of biowarfare research during the war. Strains and isolates of anthrax and other bacteria were requested from veterinary schools. Samples of *Bacillus anthracis* were sent to Camp Detrick by Professor Allen Packer from Iowa State College.

The Camp Detrick director initiated secret work in about twenty-eight U.S. universities, including Harvard, Columbia, Cornell, Northwestern, Ohio State, Notre Dame, Wisconsin, Stanford, and California. Some urgency had been given to the project by the powerful new German V-1 buzz bombs, which could be loaded with biowarfare agents and directed against soldiers. Other small military research and development laboratories dedicated to biological and
chemical warfare were tucked away in rural communities. As the Roosevelt administration pushed warfare readiness in 1941, the Army established facilities for research and testing of chemical and biological weapons: Pine Bluff Arsenal in Arkansas, Rocky Mountain Arsenal in Colorado, the Dugway Proving Ground in Utah, and laboratories at Plum Island, New York, Camp Sibert, Alabama, and Camp Beale, California. Stocks of anthrax were sent from Camp Detrick to the United Kingdom prior to D-Day as a retaliatory possibility. The War Disease Control Station in Grosse Île, Canada, was a cooperative venture of the Canadian Ministry of National Defense and the U.S. Secretary of State that involved the U.S. Public Health Service, the U.S. Army (Raymond A. Kelser), and the U.S. Department of Agriculture (Harry W. Schoening). Their contribution was the development and production of a vaccine against rinderpest. At the end of the war, the excess stock of remaining rinderpest vaccine was sent to be used in China.

The Commission of Epidemiologic Survey was established by the secretary of the Army, with oversight responsibility for the Walter Reed biowarfare defense program at Fort Detrick. It was to collect data important for the medical program. Richard Shope, the first director, from 1941 to 1945, was succeeded by Theodore E. Woodward and William Tigges.9

The mission of Fort Detrick was separated into two programs: the defensive biowarfare protection program to develop vaccines was a subsidiary of Walter Reed Army Medical Center in Washington, D.C., so that physicians and veterinarians assigned to this program were delegated to the Medical Corps, and the offensive biowarfare attack program run by the Chemical Corps, to which veterinarians were assigned for duty. It seems that a large number of Veterinary Corps officers were assigned to Chemical Corps duty because it might appear inappropriate to the public that the Army Medical Corps would work in offensive bioweapons.

New veterinary officers assigned to Fort Detrick were not allowed to enter the hot zones where research was done until they had been immunized. There was a three-month waiting period, during which they were vaccinated for all diseases being investigated in their assigned area and to undergo testing to see that immunity had developed. An assignment to the virology-rickettsiology unit required vaccines for smallpox, yellow fever, Rift Valley fever, Rocky Mountain spotted fever, and measles, as well as three kinds of hemorrhagic fever and three kinds of equine encephalitis—eastern, western, and Venezuelan. Everyone
received new experimental vaccines against anthrax, brucellosis, and plague. They were to work in a dangerous environment, one in which several laboratory workers had died of viruses and bacteria.

Much of the research on animals involved aerosols of microbes. The aerobiology unit had become internationally recognized for its expertise on particle size, airflow rates, and lung penetration. In all labs, animals on study with infectious agents were held in special cage banks with air that was filtered during entry and exit. The filters, known as HEPA filters, were the current state of ventilation technology. When a young employee at Fort Detrick died of anthrax, the gossip around the post was that he was a safety engineer who had entered the bacteriology building codes indicating that he had been immunized for anthrax but had not been, and while he was changing fluorescent light bulbs, dust trickled down on him that contained anthrax spores. But no veterinary officers actually knew what the details were. In 1960, a report to the Armed Forces Epidemiological Board recorded a young military volunteer who had died of inhalation anthrax in 1958 after receiving a series of inoculations of killed and live vaccines, including one against anthrax. It was all very mysterious, and still is (see appendix V).

All biowarfare labs had large insectariums and test sites to support studies on vectors to carry dangerous microorganisms. The Pine Bluff Arsenal in Arkansas developed the first weaponized agent, a cluster bomblet, based on the British M114, to deliver *Brucella suis*, a cause of brucellosis in humans and pigs. In Utah, the Dugway Proving Ground was the field test site for the Chemical Corps.

The U.S. anticrop research was directed to wheat and rice. This program stockpiled more than thirty thousand kilograms of spores of the fungus that causes stem rust of wheat, *Puccinia graminis tritici*. Weapons systems to deliver anticrop agents were modified from military bomblets developed to drop propaganda leaflets. The bombs were loaded with spore-bearing turkey feathers, an effective means to deliver these agents over a wide area.

Field studies with biowarfare agents had notorious unintended consequences (and sometimes for screwups). Operation Big Itch was an entomological field test to determine coverage and survivability of uninfected fleas as vectors for biological agents. Guinea pigs, placed on the ground as monitors, were to be bombarded with fleas from the air. During one test, one of the bomblets malfunctioned, releasing fleas into the aircraft that then bit the pilot, navigator, and one observer.
One of the Veterinary Corps’s major responsibilities was the care of military dogs. As World War II had gotten underway, the secretary of war authorized the quartermaster general to establish war dog training centers; the Veterinary Corps was to care medically for the dogs and would have to become expert in tropical diseases. The first training center start-up was in August 1942 at the Front Royal Virginia Quartermaster Remount Depot, a permanent cavalry horse remount facility. Three others were opened later in 1942: Camp Rimini, Montana, San Carlos, California, and Fort Robinson, Nebraska, which had been the largest remount station in the U.S. Intended to supply the Army, trained dogs were quickly taken up by the Marines and then by the Navy and Coast Guard.

Basic training for dogs lasted twelve weeks. Dogs were taught to obey verbal commands and gestures, to work under gunfire, and to adapt to wearing gas masks. The dogs were trained for specialized duty; sentry duty and sled dogs were the big fields, but then there were dogs specialized for courier duty, for mine detection, and as scouts. Selection of dogs was important. Most uses demanded dogs that were big, strong, and agile, but the scouting dogs, which had to operate silently and with stealth, had to be of medium size. There were seven preferred breeds: German shepherd, Belgian sheepdog, Doberman pinscher, Siberian husky, malamute, Eskimo dog, and farm collie. Some dogs were unsatisfactory even for sentry duty—the Great Danes were too big and the hunting breeds were too distracted by scents. In battle zones, dogs were used to detect mines and other explosive devices, especially in the South Pacific. In the jungles, they were also used in exploring cave systems, detection of land mines, and guarding sleeping marines.¹⁰ For the Medical Corps, dogs carried first aid to wounded soldiers on the battlefield. For the Signal Corps, dogs were trained to carry reels of telephone wire on their back that played out the wire as the dog moved forward. Crossing a battle zone with speed spared the lives of signal wire operators.

Military dogs were especially effective on Guam, an island territory of the United States since 1898. Guam had been captured by the Japanese three days after Pearl Harbor. The Marines landed to retake the island in July of 1944, accompanied by the 2nd and 3rd Dog Platoons. Mostly Doberman pinschers, the dogs were used as sentries and scouts on nearly five hundred patrols. The National War Dog Cemetery, a memorial to war dogs at Naval Base Guam, honors dogs that were killed in service with the U.S. Marine Corps during the Second Battle of Guam.
Dobermans were the preferred breed for sentry duty. (W. Eugene Smith/The LIFE Picture Collection via Getty Images.)

In World War II, military war dogs were returned home after the war and given to their former owner or the new adopted owner. Sadly, dogs used in Vietnam were euthanized prior to the U.S.’s departure from the country. In 2000, President Bill Clinton signed a law that allowed dogs to be adopted by their handler, and that has been the case since then.

28. POSTWAR INVESTIGATIONS OF ENEMY BIOLOGICAL WARFARE

In August 1942, a Japanese plane had flown out of the western sky and circled low over the rice paddies that surrounded the village of Congshan in the eastern Zhejiang Province of China. Villagers noticed a trail of smoky dust coming from its tail. Two weeks later, village rats started dying en masse — the first signs