Chapter Four

Tuberculosis in World War I

Although Europe went to war in the summer of 1914, the United States escaped the cauldron until April 1917. But after years of trying to maintain neutrality, President Woodrow Wilson's administration mobilized the nation to fight in the most deadly enterprise the world had ever seen. Modern industrialized warfare would kill millions of soldiers, sailors, and civilians and unleash disease and famine across the globe. Typhus flourished in Eastern Europe and a lethal strain of influenza exploded out of the Western Front in 1918, producing one of the worst pandemics in history. Although eclipsed by such fierce epidemics, tuberculosis also fed on the war.

As the United States entered the war, it rushed to build a mass industrial army. In eighteen months the Selective Service registered twenty-five million men for the draft, examined ten million for military service, and enlisted more than four million soldiers, sailors, and Marines.[1] To the dismay of many people, medical screening boards across the nation soon discovered that American men were not as strong and healthy as they had assumed. Of those eligible for military service, 30 percent were physically unfit; a number of them deemed ineligible to serve had tuberculosis.[2] Therefore, in 1917 Surgeon General William Gorgas called George Bushnell to Washington, DC, to establish the Office of Tuberculosis in the Division of Internal Medicine, leaving Bushnell's protégé, Earl Bruns, in charge of Fort Bayard. Given the Medical Department's mission to maintain a strong and healthy fighting force, Bushnell's new job was to minimize the incidence of tuberculosis among active-duty soldiers and avoid the high cost of disability pensions for men who incurred the disease during military service. It was a tall order.

Wartime tuberculosis had already received attention in 1916, when reports circulated that the French army had sent home 86,000 men with the disease, raising the specter that life in the trenches would generate hundreds of thousands of cases. One investigator found that tuberculosis rates in the British army were double those in peacetime, reversing the prewar downward trend. The head of the New York City Public Health Department, Hermann Biggs, declared that "tuberculosis

offers a problem of stupendous magnitude in France."[3] Subsequent studies revealed that only 20 percent or less of the French soldiers sent home with tuberculosis actually had the disease; others were either misdiagnosed or had had tuberculosis prior to entering the military and therefore had not contracted it in the trenches.[4] The reports nevertheless galvanized public health officials to address the tuberculosis problem. The Rockefeller Foundation, for example, in cooperation with the American Red Cross, established a Commission for the Prevention of Tuberculosis in France to help the French and protect any Americans from contracting tuberculosis "over there."[5]

Bushnell established four "tuberculosis screens" by (1) examining all volunteers and draftees before enlistment, (2) checking recruits again in the training camps, (3) examining soldiers already in the Army for tuberculosis, and (4) screening military personnel at discharge to ensure they returned to civil life in sound condition. To implement these activities, Bushnell developed a protocol under which physicians could quickly examine men for tuberculosis as part of the larger physical examination process. He standardized the procedures for examinations throughout the Army, and crafted a narrow definition of what constituted a tuberculosis diagnosis to enable the Army to enlist as many young men as possible. Despite these efforts, soldiers developed active cases of tuberculosis throughout the war.

Like the rest of the Army, the Medical Department had to play catch up to meet the demands of a ballooning army. It coordinated with the American Medical Association and the American Red Cross to recruit thousands of civilian physicians and nurses for military service, many of whom were unfamiliar with the military, tuberculosis, or both. Bushnell's office also created eight more tuberculosis hospitals in the United States and designated three hospitals with the American Expeditionary Forces (AEF) in France to care for soldiers who developed active tuberculosis in the camps and trenches. Short of resources and knowledge, however, the Army Medical Department at times struggled just to provide beds for tuberculosis patients, let alone deliver the individual care Bushnell and his staff had provided at Fort Bayard before the war.

This chapter examines the power of disease in wartime—specifically tuberculosis—to challenge the American medical establishment. Patients at one tuberculosis hospital even conflated disease and war, depicting the fight against tuberculosis as going "over the top" in the trenches on the Western Front, braving bureaucratic red tape and intransigent doctors (Figure 4-1). Wartime stretched the limits of competent personnel and adequate supplies. Untrained medical officers incorrectly diagnosed soldiers with tuberculosis who actually had some other chest ailment, shuffling them from one Army hospital to another, increasing expenses, generating paperwork, and distressing the soldiers and their families. Overburdened medical personnel worked long hours, in often poor conditions. Thousands of tuberculosis patients resented the diagnosis and protested the conditions in which at times they were virtually warehoused. The draft, which brought millions of young men into government control and responsibility, also exposed the Army Medical Department to public scrutiny. Some wartime tuberculosis hospitals met the crisis well, but others were so widely criticized that the U.S.

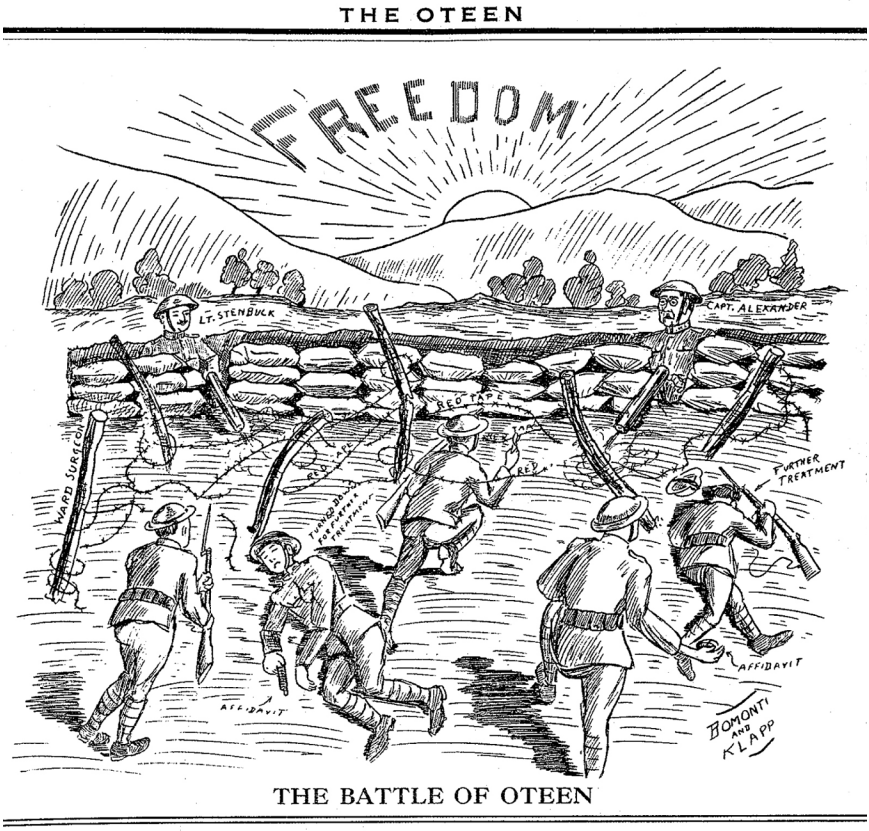

Figure 4-1. The Battle of Oteen," cartoon in *The Oteen*, patient newspaper at General Hospital, No. 19, Oteen, North Carolina, portraying the struggle men with tuberculosis faced getting discharged from the hospital.
Photograph courtesy of the National Library of Medicine, Bethesda, Maryland.

Congress launched an investigation in 1919. World War I, which so dramatically changed the world, profoundly altered the Army's tuberculosis program as well. It also challenged George Bushnell's expertise. The Army's tuberculosis expert had founded his policies on assumptions that, although widely held at the time, proved to be inaccurate and costly in lives and treasure. Wartime tuberculosis, therefore, shows the power of disease to overwhelm both knowledge and institutions.

Keeping Tuberculosis out of the Army

Bushnell based the Army Medical Department's tuberculosis program on four assumptions. The first was that most adults in the United States were already infected with tuberculosis and that this "tubercularization" provided them with

a certain degree of immunity from the disease. "According to recent teachings," he wrote, "we all have a little tuberculosis."[6] Bushnell and his contemporaries were familiar with the concept of immunity and the power of vaccination, and the Army Medical Department vaccinated soldiers for smallpox and typhoid. Extending this concept of immunity to tuberculosis, medical officers differentiated between primary infection in childhood and secondary infection later in life. Observing that tuberculosis was often fatal for infants and young children, they reasoned that for survivors, an early infection of tuberculosis bacilli immunized a person against the disease later in life.[7] (This was accurate to some degree because children who did not develop or die of tuberculosis were more resistant than those who sucumbed.) A "primary infection," wrote Bushnell, gave a person some immunity, which "while not sufficient in many cases to prevent extension of disease [within the body]…is sufficient to counteract new infections from without."[8] In an article on "The Tuberculous Soldier," the revered physician William Osler agreed. For years autopsies had uncovered healed tuberculosis lesions in people who had died in accidents or of other diseases. Although it was not known how many men between the ages of eighteen and forty harbored the tubercle bacillus, Osler wrote, "We do know that it is exceptional not to find a few [lesions] in the bodies of men between these ages dead of other diseases." Thus, he argued, "In a majority of cases the germ enlists with the soldier. A few, very few, catch the disease in infected billets or barracks."[9] Bushnell reasoned if adults developed tuberculosis, "they do it on account of failure of their resistance."[10] Accordingly, the Medical Department often noted the cause of tuberculosis as "failure of immunity." If a primary tuberculosis infection could render one immune to the disease, soldiers with "a little tuberculosis" might even benefit the Army.

Bushnell's second assumption was that tuberculosis was not very contagious, and that a person already infected could be reinfected, "only by large amounts of tuberculosis virus [*sic*]."[11] At one point Bushnell told the chief surgeon of the AEF, "Personally I have no fear of the contagion of tuberculosis between adults and see no reason why patients of this kind should not be treated in the ordinary hospital."[12] He asserted that the "really cruel persecution of the consumptive… through the fear that he will infect others, is based on what I must characterize as highly exaggerated notions of the danger of such infection."[13] This, too, was the prevailing view. Boston bacteriologist Edward O. Otis, who served as a medical officer during the war, wrote that "Undue fear of the communicability of pulmonary tuberculosis from one adult to another is unwarranted in the present state of our knowledge."[14] A civilian nurse similarly wrote, "It is a popular belief that a tuberculous person is a constant source of infection to his associates. This is not true." If a person followed the hygienic rules of covering the mouth and nose while coughing and sneezing, she explained, "an advanced case whose sputum is full of bacilli, need not be isolated from the family except to have a separate bed."[15]

The third assumption informing Bushnell's tuberculosis program was that military life would not increase tuberculosis incidence. He recognized that epidemics of measles or influenza in Army camps and barracks could reactivate latent

tuberculosis, but argued that, in general, military life made men stronger, increasing the body's immunity. He reasoned that if men infected with tuberculosis could indeed easily spread it to others, there would be much more tuberculosis in the Army than there was.[16] After the scare concerning the 86,000 French soldiers with the disease, tuberculosis specialists debated the increased risks and benefits of military service. British physician Leslie Murry, for example, reasoned that although the crowded and damp conditions of trench warfare would have unfavorable effects on soldiers' health, living outside with plenty of fresh air and good food and hygienic practices would improve their resistance to tuberculosis.[17] New York physician Maurice Fishberg suggested in a *Journal of the American Medical Association* editorial that although some people experienced the reactivation of dormant tuberculosis lesions in civil life, "it is doubtful whether it is more likely to occur in military life."[18] Not everyone agreed. Public health specialist George Thomas Palmer countered that although reactivation may not be higher in the military than in civil life, the United States had enough men without tuberculosis to bar anyone suspected of it from the military and thereby avoid an "added financial burden to the nation."[19]

Bushnell's final assumption was that what are now called "false positives" were harmful to the war effort, the Army, and the individual. "There is no reason why the possibly tuberculous alone should be excluded from the risks," he wrote. "He who in time of war excuses men for trifling or doubtful deviation from the normal does not properly conceive his duty toward his country."[20] The challenge, therefore, was to keep tuberculosis out of the Army and tuberculars off the disability rolls, but not to exclude so many men as to impair the nation's ability to amass an army.

Bushnell's views of tuberculosis immunity, contagion, interaction with military life, and the risk of overdiagnosis shaped the Army Medical Department programs for screening recruits. He knew he could not guarantee that all tuberculosis could be eliminated from the Army, but asserted that, "a sufficiently rigid selection of promising material in itself practically excludes tuberculosis."[21] In addition to enlisting the strongest men, Bushnell believed that a massive screening program would pay for itself by eliminating those who would later cost the government in medical services and disability benefits. He calculated that tuberculous soldiers in the United States cost an average $1,000, and that each patient returned from Europe would cost the government about $5,000.[22]

But the nation at war did not have the time or resources for the meticulous one-hour examination practiced at Fort Bayard, so Bushnell developed a protocol for civilian and military physicians to examine volunteers, draftees, trainees, and soldiers for tuberculosis in a matter of minutes. *Circular No. 20* detailed how physicians should examine recruits, and became the single most important Army tuberculosis document during the war.[23] The six-page circular began by cautioning examiners not to base a tuberculosis diagnosis on a man's word because he might be motivated to mislead. Some men may be anxious to enlist despite having tuberculosis so they could fight in the war or become eligible for treatment in Army hospitals; others might feign tuberculosis symptoms to avoid service or to

get a discharge on disability. Examiners, therefore, must base their diagnosis on physical signs. The circular explained that the apices, or the tops of lungs, were the most common location for tuberculosis lesions, and that "the only trustworthy sign of activity in apical tuberculosis is the presence of persistent moist rales." It also outlined ten lung sounds that were *not* signs of tuberculosis but rather indications of bronchitis, pneumonia, or other lung ailments.

The next section described the various kinds of tuberculosis lesions examiners might encounter—acute, arrested chronic, active chronic, and disseminated—noting that arrested chronic tuberculosis was the most common. *Circular No. 20* directed that "the presence of tubercle bacilli in the sputum is a cause for rejection," and that "no examination for tuberculosis is complete without auscultation following a cough." It recommended that a sputum sample "be coughed up in [the examiner's] presence," to ensure that it was actually from the examinee.[24] The last one-third of the document detailed X-ray examinations, summarizing eight different kinds of conditions that may appear and that would be grounds for rejection, and which conditions would not. *Circular No. 20* ultimately counseled examiners to reject anyone with a lesion of considerable size. But as Bushnell told a gathering of tuberculosis specialists, "'Considerable' is not a good term, but we couldn't think of anything better."[25] The circular prescribed no time frames for the examination, but the Medical Department imposed speed by requiring examiners to see at least fifty men a day. Some physicians objected to this pace, while others got into the spirit. One team of three reported seeing 1,763, 1,854, and 1,944 men in three successive days, which raises the question of how thoroughly they conducted their examinations.[26]

The X-ray provisions of *Circular No. 20* generated controversy. Bushnell later wrote that, "considerable pressure was exercised…by a number of prominent physicians and radiologists to induce the Surgeon General to make the radiograph the decisive factor in the diagnosis of pulmonary tuberculosis."[27] The Medical Department had acquired X-ray equipment soon after it was developed in 1895 and immediately found it useful for locating bone fractures and bullets in wounds.[28] By 1915, a Fort Bayard medical officer stated that X-ray technology "has become one of the most valued procedures in the diagnosis of pulmonary tuberculosis," but stressed that it had to be employed by a skilled physician in conjunction with a careful physical examination.[29] During the war mobilization, some physicians wanted to rely primarily on X-rays, claiming that they could be made rapidly and accurately, and that the stored X-ray plates provided a medical record and an excellent resource for research. Medical officers F. E. Diemer and R. D. MacRae at Camp Lewis, Washington, carried this issue to the pages of the *Journal of the American Medical Association,* arguing that X-rays should be the primary diagnostic tool, not an "adjunct." A few months later one of their senior colleagues, Ralph C. Matson, countered that X-rays should be only one of several tools, because Diemer and MacRae "claim more for roentgenology [radiology] than it should be expected to yield."[30]

Bushnell took the Matson view and the Medical Department's tuberculosis program employed X-ray technology only in the quarter or third of cases where the

physical examination was ambiguous. Bushnell believed that X-rays were unreliable because they could not catch early lesions or distinguish between active and healed lesions. He was also concerned that the nation's X-ray schools did not have the technical expertise to train the numbers of skilled radiologists the Army required. Nor did the Army have the equipment to X-ray all recruits, "not to mention the enormous costs of photographing the entire new Army and the impossibility of obtaining a sufficient number of plates within a reasonable time."[31] World War I ultimately, however, did encourage X-ray technology by revealing its power to thousands of physicians, stimulating the search for technical advances, and demonstrating the importance of specialization in reading X-rays. By the end of the war, the Army Medical Department had shipped to France hundreds of X-ray machines for use in Army hospitals and at the bedside, and developed various modes of X-ray equipment, including X-ray ambulances.[32]

The most sensitive tuberculosis controversy was whether to enlist men who had previously been diagnosed with the disease. Medical officers such as Clarence L. Wheaton at Camp Grant, Illinois, believed that soldiers with tuberculosis infection were a "liability" in the training camps.[33] Physicians in other armies agreed. For example, Thomas McCrae, Canadian medical officer and poet ("In Flanders fields the poppies blow"), argued that, "If you accept men who have had tuberculosis you are harming them and adding to the burden after the war."[34] Bushnell took a different view. When an American physician suggested rejecting all men who had any sign of tuberculosis, even old, apparently healed cases, Bushnell replied, "That is impossible," because "if we should say that all signs of tuberculosis should lead to rejection we would have no army at all."[35] Others would have gone further. Army officer J. F. Hammond wrote to Bushnell that he was dismayed that a disability board at his post recommended only five of fifty-three men for duty. Given the wartime emergency, he suggested that men with very slight tuberculosis or no symptoms be given special or light duty. Bushnell may have agreed with him, but responded diplomatically that employing such men "was not deemed advisable" because they were not fit for battlefield work. "In all events," he told Hammond, "this is the view of the War Department."[36]

The War Department took a more lenient position regarding tubercular medical officers than enlisted men. As Bushnell pointed out, "The men especially interested in tuberculosis work had themselves the disease, a fact which under ordinary conditions would debar them from admission into the Army."[37] The War Department assented, but did not issue a general waiver, rather allowing physicians with tuberculosis to serve on a case-by-case basis. Some of these were Fort Bayard "alumni" from the ranks of patients as well as medical officers. In addition to Bushnell, Earl Bruns joined the Office of The Surgeon General and traveled to Europe to evaluate the AEF program after the war. Former patients/medical officers such as Paul Hutton served as a Medical Department inspector; Conrad E. Koerper examined trainees at Camp Gordon, Georgia; Carl Holmberg commanded a tuberculosis hospital at Whipple Barracks in Arizona; and W. H. Tefft and Carl Bloombergh commanded evacuation hospitals in France.

Not everyone favored employing tubercular medical officers. In a letter marked "Personal," one officer touring the hospitals in the West to encourage reconstruction programs—education and rehabilitation programs for tuberculosis patients—wrote to a colleague that at Fort Bayard and Whipple Barracks, Arizona, he found, "the entire staff, commissioned and enlisted…are ex or active T.B.'s." He did not think such men had the energy or enthusiasm to administer reconstruction programs. "Everyone knows that the T.B. man is subject to mental and nervous crises and depressions and [that] unfits him much of the time for such functions as reconstruction which require inexhaustible energy, enthusiasm and 'Pep.'" He believed that "the Commanding Officer [C.O.] should always be a perfectly sound man physically," and then "the rest of the staff might be all ex-T.B.'s if necessary but it would be far better were all of the same physical class of the C.O." Taking direct aim at Bushnell, he wrote, "I fear for your program under the present administrative conditions in these hospitals which seems to be run more for the T.B. medical officers than for the good of the service."[38]

Throughout the war, however, Bushnell's views, correct or incorrect, prevailed. After testing the *Circular No. 20* protocol at Camp Dodge, Kansas, in October 1917, the Medical Department decided to proceed.[39] Calculating that it would require 600 examiners for the screening process, the Medical Department turned to training general practitioners from civil life who knew little about tuberculosis. Bushnell's office established a six-week tuberculosis course to prepare physicians. The first course at the Army Medical School in Washington, DC, was so popular that instructors offered it at several other training camps in the country. General Hospital No. 16, operating in conjunction with Yale Medical School, also offered a course on hospital administration to train medical officers to run tuberculosis hospitals.

Once prepared, these new medical officers participated in the massive physical examination of the nation's young men, taking part in a modern bureaucracy of impersonal queues and myriad forms.[40] Enlistees passed through a series of exam rooms (Figure 4-2) to undergo their physicals, including the "TB (tuberculosis) room." At Camp Lewis, Washington, X-ray specialists viewed 200 to 250 men daily, and reported chest examination findings for each man on "Form 1." If the examiner had concerns, "Form 2" summoned the recruit back for another examination. "Form 3" instructed men how to expectorate sputum and "Form 4" requested yet another X-ray exam. "Silence is maintained in the tuberculosis examining room," reported one medical officer—punctuated, no doubt, by the sounds of supervised expectoration.[41] The physicians filled out more forms if they suspected a man had other physical problems, referring him to various specialists, each with his own forms and procedures. The Army Medical Department also referred those with sexually transmitted diseases to treatment, but sent home men with other diseases such as trachoma, a potentially blinding eye infection, or carriers of the typhoid bacillus.

Despite *Circular No. 20* and Bushnell's efforts, tuberculosis inevitably slipped through the Army's screen. Warning his wife to not tell a soul, a tuberculosis specialist at Camp Russell, Wyoming, confided that "Everyone is very kind but

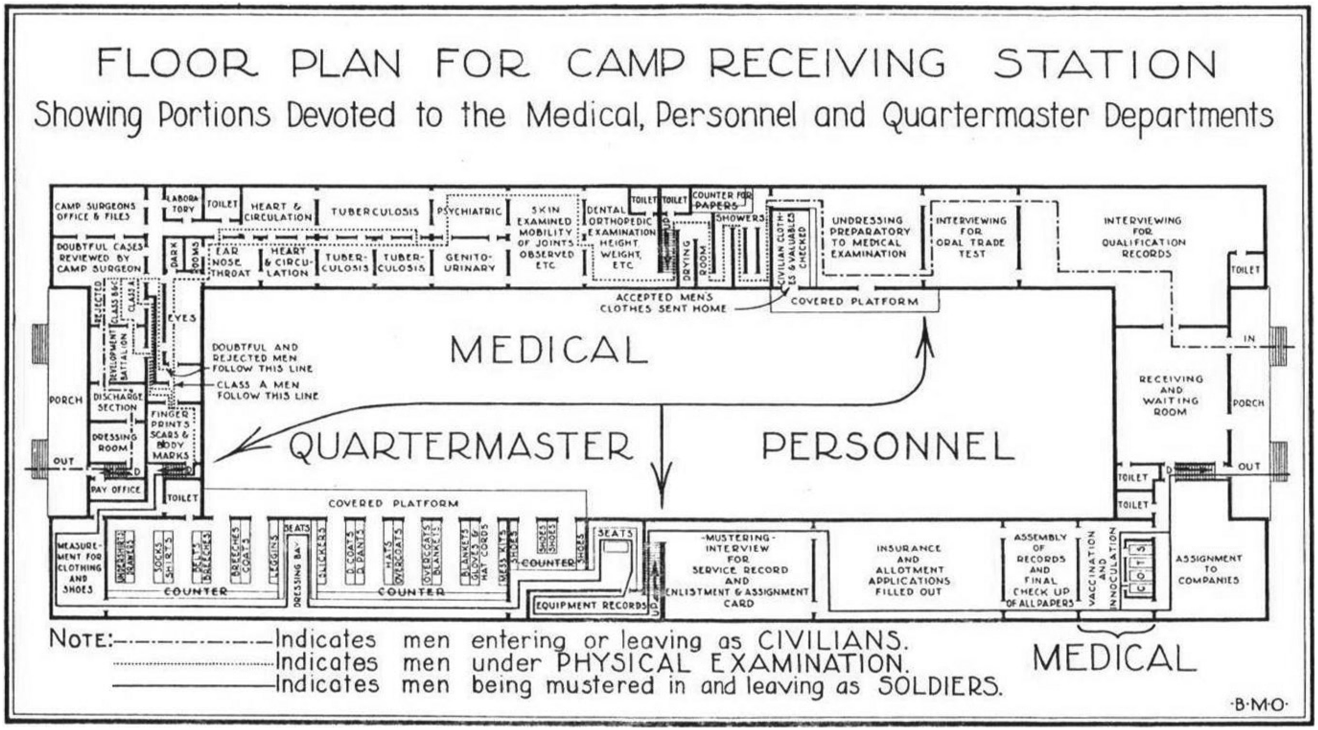

Figure 4-2. Diagram of medical screening facility plan for training camps. Source: The Medical Department in the World War, U.S. Army, Office of the Army Surgeon General, Washington, DC, vol. 6, p. 458.

efficiency is not supreme here."[42] Another physician noted that, "There is a gross misconception on the part of men here as elsewhere as to what shall constitute tuberculosis sufficient for rejection."[43] Earl Bruns noted that examiners seeing more than one hundred recruits in a day became fatigued, and "very often the examiner was not to blame[,] for at times examinations were conducted amid noisy surroundings and without sufficient time to make an examination even according to the rapid Bushnell method."[44]

If examiners diagnosed a recruit or soldier with tuberculosis, the question became whether he should be immediately discharged or kept on the military rolls and treated, and whether he was eligible for disability benefits. The War Department initially ordered that a diagnosis of tuberculosis within the first three months of service *not* be considered in line of duty, unless it was an acute case or the product of extraordinary exposure to the elements.[45] This policy, issued in September 1917, was an attempt to achieve a balance between building up the disability roles at great cost to the government and taxpayers, or sending men back home sick to be cared for by their families.[46] In the following months medical officers determined that although 349 trainees diagnosed with tuberculosis had contracted it in the line of duty, 3,327 had not.[47] When the Army discharged sick draftees or trainees without treatment or benefits, however, people began to protest. Public health officials and the National Tuberculosis Association asked to be informed of any tuberculous individuals being sent to their communities, including the name and address of the "party assuming responsibility for such continued treatment and care."[48] The journal *American Medicine* published an article by British tuberculosis specialist Halliday Sutherland, who expressed concern that if men declined treatment and returned home they could spread tuberculosis to their families. He suggested that the U.S. Army retain men diagnosed with tuberculosis so that the government could provide treatment and discipline them if they resisted.[49]

Members of Congress also opposed simply discharging men with tuberculosis. Representative Carl Hayden of Arizona argued that such men had given up their civilian lives upon induction into the Army, only to discover "that they were afflicted with a dread disease which prevents them from earning a livelihood." He suggested that "some provision should be made for the care of such men until they are able to provide for themselves."[50] In response to such criticism, the Medical Department changed the policy in May 1918 so that "any soldier who shall have been accepted on his first physical examination…shall be considered to have contracted any subsequently determined physical disability in the line of duty."[51] Men therefore found to have tuberculosis were sent to hospitals until "maximum cure" had been achieved.[52] This policy further increased the pressure on Bushnell to keep tuberculosis out of the rank and file.

Medical officers in the training camps lectured soldiers on how to avoid tuberculosis. For example, George Brewer at Camp Ethan Allen, Vermont, spoke on "What the American Soldier can do to lessen his chances of becoming infected with Tuberculosis (Consumption)," noting that "a sick soldier is a double burden because of the extra men who must care for him." To avoid infection, he said, a

soldier should maintain good physical condition; spend time in the fresh air and live in well-ventilated places; avoid sneezing and spitting on others; keep his tent or dugout clean; breathe deeply and hold the pure air in his lungs; and if "any of your comrades" violate these regulations, report him, "so he will not endanger your health by his carelessness."[53]

While Bushnell's policies succeeded in suppressing tuberculosis rates in the Army, the narrow definition of a tuberculosis diagnosis explicitly allowed men with healed lesions in their lungs to serve, and the rapid screening system caused some examiners to miss cases of active disease. For example, George W. Troutman, a brick mason from North Carolina, twenty-two years of age, enlisted with the 118th Infantry in July 1917, but not until the following February did medical officers at Camp Sevier, South Carolina, learn that he had been spitting up blood about twice a week for several months.[54] New York City public health officials also advised the Medical Department that Edward Waring, a soldier with the Signal Corps, had been diagnosed with tuberculosis, but "is reported to be in France." Surgeons at the AEF Base Hospital (BH) No. 20 had to amputate the right leg of Private (Pvt.) Walter P. Keating, 102nd Infantry, for tuberculosis of the bone.[55]

Bushnell recognized that "a standard, though imperfect, is believed to be an indispensable adjunct in Army tuberculosis work not only to support the examiner but also to secure the necessary uniformity of practice in the matter of discharge for tuberculosis."[56] Nationwide, local draft boards and training camps rejected more than 88,000 men for tuberculosis, about 2.3 percent of the 3.8 million men examined. Essentially all soldiers who traveled to France were examined two or three times for tuberculosis before crossing the Atlantic. Postwar assessments calculated that of the more than two million soldiers who went to France to serve in the AEF, only 8,717 were evacuated with a diagnosis of tuberculosis, an incidence of only 0.4 percent; Army-wide only 1,607 American soldiers died of the disease during the war.[57]

Tuberculosis in the American Expeditionary Forces

Bushnell recognized that some men with tuberculosis would emerge among the troops, but he was less tolerant of medical officers who generated "false positive" tuberculosis diagnoses. He became alarmed in early 1918 when a strep infection in the training camps in the United States caused medical officers to send hundreds of trainees to Army hospitals misdiagnosed with tuberculosis, crowding hospitals and generating paperwork and confusion. For a time, therefore, the Office of The Surgeon General ordered that no one should be discharged for tuberculosis from the training camps unless he had bacilli in his sputum—meaning the very severe cases.[58] Bushnell was even more disturbed to learn that more than 50 percent of the patients being sent back to the United States from France with a diagnosis of tuberculosis did not actually have the disease.[59] He viewed such overdiagnoses as "evil," because it took men out of the AEF and overburdened tuberculosis hospitals and naval transports, which had to segregate suspected tuberculosis cases in isolation rooms or on open decks.[60]

Faced with what he called "leaking" of soldiers from the AEF due to erroneous tuberculosis diagnoses, Bushnell turned to a specialist for assistance, Gerald B. Webb (Figure 4-3), from Colorado Springs.[61] An Englishman by birth, Webb had married an American, and when she developed tuberculosis the couple traveled to Colorado Springs, Colorado, for treatment. His wife struggled with the disease for ten years until her death in 1903, and afterward Webb stayed on in Colorado Springs, remarrying and building a medical practice specializing in tuberculosis.[62] In addition to his medical practice, Webb pioneered research into the body's

Figure 4-3. Gerald B. Webb, World War I, Gerald B. Webb Papers.
Photograph courtesy of Special Collections, Tutt Library, Colorado College, Colorado Springs, Colorado.

immune function, searched for a tuberculosis vaccine, and was a founder of the American Association of Immunologists (1913). Still somewhat bored in Colorado Springs, Webb volunteered for the Medical Corps soon after the United States declared war and helped organize and run tuberculosis screening boards at Camp Russell, Wyoming, and Camp Bowie, Texas. While in Wyoming, he published a research paper on the incidence of tuberculosis among draftees who smoked cigarettes, and wrote an editorial supporting Bushnell's tuberculosis program.[63] Bushnell noticed these articles, and after Webb brought order to a chaotic tuberculosis screening program at Camp Custer, Michigan, appointed him senior tuberculosis consultant for the AEF. After meeting with Bushnell in Washington and attending the Army War Course for senior officers at Columbia University, Webb sailed to France in March 1918.

Webb was one of a number of medical consultants who provided expertise to the AEF medical services in fields such as cardiology, urology, skin diseases, and neurological disorders. Johns Hopkins physician William Thayer commanded the medical consultants, who met once a month in Paris. One of Webb's colleagues suggested the importance of his job when he said Webb had to be "the Col. Bushnell on this side of the tuberculosis work."[64] Webb instituted a screening process similar to that in the United States, distributing *Circular No. 20*, and preparing an illustrated version for medical officers in the field.[65] He established a policy similar to that of the training camps, directing that only patients with sputum positive for tuberculosis should be sent back to the United States. Others would be tagged "tuberculosis observation" and sent to one of three hospitals designated as tuberculosis observation centers. There, specialists—Bushnell's "good tuberculosis men"—would distinguish tuberculosis signs from other lung problems such as bronchitis and pneumonia, test a patient's sputum ten to fifteen times before determining that he was free of disease, and thereby send only patients who were indeed positive for tuberculosis back to the homeland. In one of his daily letters to his wife, Varina, Webb described his work as "tactfully putting a cork into the bottle from which so much T.B. leaked."[66]

Headquartered in Neufchateau in the Vosges, Webb traveled to field and base hospitals throughout France. He would typically spend three days at a hospital, examining patients, leading conferences, giving lectures, and, according to his biographer, Helen Clapesattle, "preaching his gospel of fresh air and absolute rest."[67] He recruited a radiologist to teach the proper reading of X-ray plates, and advocated the early detection of tuberculosis, explaining, "Just as the wounded do better if they are got to the surgeons quickly, so the tuberculosis-wounded are more likely to recover if they are spotted and sent to the doctors early."[68] After the Armistice in November 1918, Webb based himself at port hospitals, where he worked to ensure that only properly diagnosed demobilizing soldiers were sent to tuberculosis hospitals in the United States.

Webb designated three large AEF hospitals as tuberculosis centers. BH No. 3, at Vauclaire (Figure 4-4), organized by Mount Sinai Hospital in New York City, operated in an old Trappist monastery, and during its service from May 1918 to January 1919, cared for 9,127 patients, 222 of whom were suspected of having

Figure 4-4. Base Hospital No. 3, Vauclaire, one of the hospitals designated to receive patients suspected of having tuberculosis.
Source: The Medical Department in the World War, in U.S. Army, Office of the Army Surgeon General, Washington, DC, vol. 2. Available at http://history.amedd.army.mil/booksdocs/wwi/adminamerexp/ch24fig125.jpg.

tuberculosis.[69] BH No. 8, organized at the Post-Graduate Hospital in New York City, got off to a slow start when its transport ship *Saratoga* was accidentally rammed by another ship, dumping hospital equipment into the New York Harbor. After finally arriving in France, BH No. 8 set up in Savenay and ultimately saw more than 35,000 sick and wounded during its war service, taking 12,000 X-rays, a large percentage of them for suspected tuberculosis.[70] BH No. 20, organized by the University of Pennsylvania in Philadelphia, was located at a French health resort at Chatel Guyon and operated from May 1918 to January 1919. At first it cared for only a few suspected cases, but as the AEF grew, so did its tuberculosis load, averaging seventy-five tuberculosis patients in its care by the end of the war.[71]

Webb loved the work. He wrote enthusiastic letters to Thayer and Bushnell, detailing his activities and observations, and asking for "any criticisms or suggestions you will have." Webb told Bushnell that he was widely distributing Bushnell's *Military Surgeon* article on tuberculosis screening, and that "it gave me great pleasure to introduce your name to my audiences and to tell of the Army's preparedness for the situation thanks to your years of work and research at Fort Bayard."[72] But when he said he admired many of the physicians he was encountering in the AEF, Bushnell cautioned, "I am well aware that many very excellent internists were sent over with the early base hospitals.…That is not, however, exactly equivalent to having a lot of tuberculosis men." They had not been trained in "our

methods," he pointed out, so that Webb would have to work with them. Bushnell added, however, that given the shortage in the United States, he was "glad that you have not made a call for a considerable number of tuberculosis specialists."[73] Webb also told Thayer, "This work has been one of the greatest pleasures of my life, and I am daily thankful that I can do my small share." His superiors responded with praise. Webb was delighted to report to Varina, "Col Bushnell wrote me I had cut the 60% leak home to 15%!"[74]

The war, therefore, provided once-in-a-lifetime experiences for participants behind the lines as well as in the trenches. The carnage of World War I, like most wars, offered physicians opportunities for medical and surgical research unimagineable in peacetime. The advent of poison gas in 1915, for example, raised the question of chemical weapons' effects on tuberculosis incidence. Physicians speculated that exposure to poison gas could cause tuberculosis or reactivate quiescent cases. Some conducted animal experiments to test their hypotheses and found that gassed rabbits did not develop tuberculosis more easily than those not gassed, and that gassing rabbits with tuberculosis did not accelerate the tuberculous process in their bodies.[75] After the war, the Surgeon General's Office surveyed tuberculosis hospitals to determine the number of tuberculosis patients who had been gassed, and whether, in the medical officers' judgment, the disease had been caused by gas. Although a few medical officers saw a correlation, the majority responded that chemical weapons had little impact on tuberculosis.[76] The Medical Department concluded that "gassing, even in fairly high concentration, cannot initiate a tuberculosis process, the extent to which it may be operative in relighting a quiescent lesion has not been determined."[77] Research continued on the effect of war gases on tuberculosis until 1927, when the *Journal of the American Medical Association* concluded that after a decade of clinical observations, "A man is no more liable to tuberculosis as a result of gassing than is a man who has never been gassed."[78]

An issue of greater consequence was the impact of military life on tuberculosis, and this question would test Bushnell's assumption that most soldiers had gained some immunity against the disease by being previously exposed, or "tubercularized." Although most medical scientists understood that immunity to tuberculosis was not binary—as it was with smallpox, or yellow fever, where survivors, or those who had been vaccinated, acquired immunity for life—they did theorize that childhood tuberculosis infections increased one's immunity to the disease and would to some degree protect soldiers from developing active tuberculosis in the barracks or trenches. One way to test this theory would be through postmortem examinations of soldiers killed in combat or by other diseases to see if they had healed tuberculosis lesions. The Medical Department had the legal authority to perform autopsies on its soldier-patients; Fort Bayard medical officers conducted autopsies on most patients who died there (cattle, too), often holding seminars on the findings. But the lack of Army pathologists and the wartime conditions in France made such a systematic autopsy program difficult in the early months of the AEF. By the fall of 1918, however, AEF pathologists were performing autopsies on 95 percent of all patients who died in a hospital, and the Office of The

Surgeon General had requested special autopsy studies for deaths from gunshot injuries, chemical weapons, and influenza and pneumonia.[79]

To pursue the question of tubercularization, Gerald Webb persuaded several Army pathologists to search specifically at autopsy for healed tubercular lesions, indicated by walled-up tubercles. Having devoted years of research to tuberculosis immunology, Webb had written as late as December 1917 that "practically every post-mortem examination of those who had escaped [tuberculosis] shows such a spot [healed tuberculosis lesion], and it is now known that through having this spot their bodies have been protected against tuberculosis."[80] He therefore did not question the theory that childhood infection gave a person some immunity to tuberculosis, but was seeking data on the actual rate of infection. After gathering approximately 2,000 autopsy reports of soldiers who had died of something other than tuberculosis, though, Webb was surprised to find that only 25 percent of the bodies examined had healed tubercular lesions. This suggested that three-fourths of American soldiers had never been infected with tuberculosis bacilli and therefore lacked the theorized immunity.[81] The fact that some 300 AEF soldiers died of miliary tuberculosis, an acute and lethal form of the disease that most often struck children who had never been exposed to the disease, also ran counter to the immunity theory.

Such results challenged Bushnell's assumption of infection and immunity because they suggested that 75 percent of U.S. soldiers had not been "tuberculized" and could develop active disease if they were exposed to the bacteria in the Army. Troubled by the criticism, Bushnell and Bruns responded vigorously. When Bruns arrived in France after the Armistice to evaluate the Army's tuberculosis program, his May 1919 report generally praised Webb's work, but took sharp exception to the autopsy findings. These and the miliary tuberculosis cases, wrote Bruns, had been "interpreted as meaning that a large percentage of our soldiers have not been 'vaccinated to tubercule,'" and that this "establishes a heresy which should be corrected."[82] Bruns requested a retroactive study of all AEF autopsies to get a larger sample, and contended, with some reason, that Webb's sample was incomplete, even faulty. He noted that it took great care to detect small lesions deep within the lungs, and cited a British study that found calcified tubercle deposits in 70 percent of British soldiers autopsied. He also argued that the tuberculosis rate was twice as high for noncombatant troops as those at the front because troops on the front lines "lived an out-of-door life, were free from dissipation and had plenty of good nourishing food which more than offset the fatigue and exposure." He concluded that "the suggestion that deaths from tuberculosis among the American Expeditionary Forces…[were] due to infections acquired in [F]rance [i.e., from other soldiers] is contrary to the modern theory of tuberculosis and has not been borne out by facts."[83]

This issue erupted during the 1919 National Tuberculosis Association conference when Webb summarized the AEF pathology data. He reported that although H. E. Robertson found that 70 percent of the German soldiers he autopsied had lesions, D. J. Glomsett had found tuberculosis lesions in only 14 percent (44 of 308) of the autopsies he performed on Americans, and Webb himself had "been unable

to detect deposits of tubercle in even as much as 25 percent of the [American] cases."[84] Bushnell rose to respond that, "I do not believe that the situation is as bad as Colonel Webb thinks." Deaths from miliary tuberculosis were "not a proof that the case is one of primary tuberculosis," that is, the results of a soldier's first exposure to tuberculosis bacteria. Following Bruns' line of argument, Bushnell cited other armies' studies of high infection rates among soldiers, and pointed out that some of the pathologists had not used microscopes and were therefore unlikely to find the small, deep lesions other researchers had.[85] The issue remained unresolved and Bushnell pursued it after the war, writing a book on his theory of the tubercularization of the "civilized" races.[86] At an international conference in London in 1921, he asserted that, "It has been established beyond the shadow of a doubt that the large majority of civilized mankind are infected with tuberculosis." Therefore, he could conclude, "That they do not die of it is the best of proofs that tuberculosis is not necessarily evil."[87] Bushnell must have felt compelled to reject the implication that his wartime tuberculosis policies could have exposed soldiers to fatal tuberculosis infections. He may also have been resisting the implication that soldiers and officers who had ever had tuberculosis—such as himself—did not belong in the Army.

But Webb was on to something. The issue would see resolution only in the 1930s, when scientists came to recognize that early tuberculosis infections did not provide protection and that adults could be reinfected with tuberculosis and develop active disease.[88] In the meantime, with his AEF work done, in January 1919 Webb returned to his family and medical practice in Colorado Springs. The National Tuberculosis Association recognized Webb's war work by electing him president in 1920, and Webb set the Association on a course of tuberculosis research on the immunity question and the standardization of X-ray diagnostics. He did not return to military service, but was a mentor for young physicians Esmond Long and James Waring, who would be leaders in the Army Medical Department's tuberculosis program during the next war. Unlike so many of his colleagues, Webb never developed tuberculosis. He died of a heart attack in 1948.

Overwhelmed

As Gerald Webb worked to standardize and strengthen the AEF tuberculosis program in Europe, conditions deteriorated in the United States. When Medical Department inspector Col. Jere B. Clayton visited Fort Bayard in late February 1919, several months after the end of World War I, he did not like what he found. The wartime emergency had exploded admissions but stripped the facility of its best personnel and equipment.The patient population had increased fivefold from some 300 patients in February 1917 to 1,533 in December 1918, and despite the recent transfer of 500 to another hospital, Fort Bayard still had twenty more patients than beds. The physical plant was crowded and rundown. Fifty-five officers lived in thirteen sets of quarters, and most of the motor pool had been shipped to France for the war, leaving one mule ambulance and three motor ambulances, one of which was "unserviceable."[89] Clayton also found the medical staff wanting.

The commander, Lieutenant Colonel (Lt. Col.) Edward P. Rockhill, had been called out of retirement to run the post, and although he had been a patient at Fort Bayard and was therefore knowledgeable in the treatment of tuberculosis, he was "not familiar with the best base hospital procedure" as established by the wartime Medical Department. Clayton judged the chief of medical service to be an "unknown quantity" and the dental service so understaffed it "could do little more than emergency work." He rated ward conditions as "fair only" because some areas of the post were dirty or in ill repair. Clayton reported that the nurses were generally efficient, but that the chief nurse, Samantha C. Plummer, was a "poor executive for a large hospital," and could not provide proper supervision because she was cooking meals for the ninety-six nurses in her charge. He was particularly critical of the Fort Bayard kitchens: "This is probably the richest hospital fund in the country and the patients are not being well fed." The food was too heavy for bed patients, served cold on cracked dishes, and more patients had complained to him about the food than at any other hospital around the country. Patients even had to *purchase* extra milk from the hospital.

Clayton concluded that "as a whole the patients were not receiving the care and consideration that they get in a first class base hospital." He fired off thirty-eight recommendations, including the relief of the Fort Bayard commander, the chief of medical service, the chief nurse, and the head of the Hospital Corps, and a reduction in the number of patients to the authorized capacity of 1,046.[90] The Army Surgeon General, Merritte Ireland, adopted many of the inspector's recommendations, but did not relieve Rockhill—he had no one to replace him. Instead he sent Rockhill a stern memo outlining twenty-three steps he should take to remedy the deficiencies at Fort Bayard. Ireland was particularly disturbed by the sale of milk to patients, stating that "milk should not be sold to a patient in a hospital by the hospital or an agency of it."[91]

This inspection revealed a hospital in crisis. Fort Bayard was one of several Army hospitals that, overwhelmed by patients and bereft of competent staff, struggled to meets its responsibilities during and after World War I. Before the war, Fort Bayard's 300 beds were sufficient to care for an army of 175,000. But what of an army that had grown to four million by late 1918? There was no way Fort Bayard could carry the load.

The Medical Department ultimately faced more than 22,000 cases of tuberculosis, about 18,500 from training camps in the United States and 3,500 from Europe.[92] Tuberculosis patients required treatment for longer periods than many other sick and wounded, thus they consumed a disproportionate amount of Medical Department resources. The Department calculated that during 1918 alone, tuberculosis stood third in loss of days for officers (50,341 days) and seventh for enlisted men (1,255,009 days).[93] Fort Bayard scrambled to meet these needs (Figure 4-5). Although the local economy was booming as the Burro Mountain Copper Company in Grant County increased its copper production tenfold in 1918, Fort Bayard's boom was less profitable.[94] In eighteen months the patient population increased fivefold, but medical officers only tripled, from fourteen to thirty-nine, and nurses and enlisted staff quadrupled, from twenty-three to eighty-six, and from 145 to

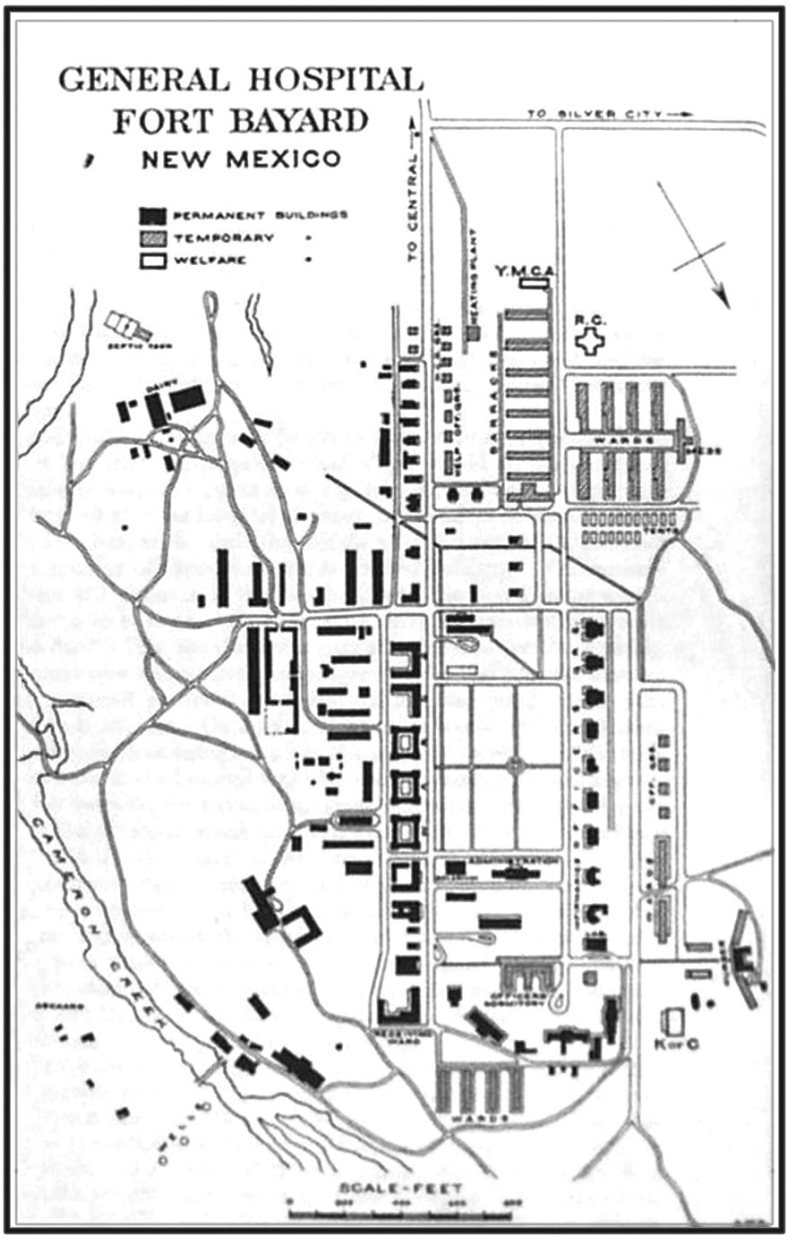

Figure 4-5. Map of Fort Bayard, New Mexico, during World War I, showing the extensive temporary structures (shaded gray) erected to accommodate patients and staff during the wartime emergency. Source: The Medical Department in the World War, in U.S. Army, Office of the Army Surgeon General, Washington, DC, vol. 5. Available at http://history.amedd.army.mil/booksdocs/wwi/MilitaryHospitalsintheUS/chapter25figure166.jpg.

604, respectively. Patients and staff lived in tents and once-condemned buildings.[95] Food stocks and budgets were stretched to the point that the hospital laboratory, which raised Belgian hares for experiments, handed them over to the kitchen for food.[96] And as the AEF claimed able-bodied medical officers, the Medical Department turned to retirees and disabled medical officers to operate its hospitals.

When Bushnell called Bruns to Washington to assist him in the fall of 1917, he appointed Rockhill to command the Army's tuberculosis hospital. Rockhill, forty-five years old, had been invalided out of the Philippines and sent to Fort Bayard in 1907 for tuberculosis of the bladder. Retired for disability in 1909, he returned to active duty in 1916 first as a medical officer at Fort Bayard before he assumed command.[97] As crowded conditions and staff shortages generated myriad problems, Rockhill kept up a prodigious correspondence with Bushnell and Bruns, seeking guidance, support, and an opportunity to complain. "You and Colonel Bushnell are the only two men in Washington," he told Bruns, "who have any connection with and any interest in Fort Bayard."[98] Discipline deteriorated, and while Rockhill issued orders prescribing proper uniform attire and prohibiting the use of "profane or vulgar language," he was at his "wits' end" because many of the men in the hospital had no sense of military order—they were going "hog-wild," Rockhill wrote.[99] Compounding his problems, Rockhill did not always display good judgment. Despite a shortage of thirty medical officers, he advised the Office of The Surgeon General that "the services of a woman anesthetist are not desired at this Hospital."[100] And when a congressman sought admission for his son to the crowded hospital, Rockhill suggested that if the congressman could get an appropriation for a new wing, there might be enough room. To this idea, Bushnell responded curtly that the War Department did not ask for special appropriations during wartime.[101] By mid-1918, recognizing his own limitations and under tremendous stress, Rockhill asked to be replaced, explaining that "the relief of responsibility would be more than a compensation for the loss of prestige."[102]

The nursing staff at Fort Bayard was also in an uproar. When nursing inspector Anna C. Jamme came to Fort Bayard in early 1919, nurses complained about their living conditions, and some of them signed a letter alleging that several coworkers were entertaining men in their quarters.[103] Jamme told Annie Goodrich, the head of the Army School of Nursing, "I cannot begin to tell you how very deeply I was disturbed by the serious and undignified conditions which I found at Ft. Bayard." Although the patients appeared to be well-cared for, she observed a laxness of discipline throughout the hospital, and the chaplain was "filled with anxiety" about the "absence of supervision of the nurses in their social relations." She added that "every one smokes at Ft. Bayard." Jamme blamed the chief nurse. "I believe the whole difficulty lies with Miss Plummer." Samantha C. Plummer had been in the Army Nurse Corps since its inception in 1901, and had spent ten years at Fort Bayard. In peacetime, Jamme explained, the unit "maintained more of a family than a military life," but Plummer could not cope with the wartime expansion.[104] She was not aware of the problems in nurses' quarters because she went to bed early. Jamme did the rounds, though, and at 1:30 a.m. found lights on. Within days of receiving Jamme's report, the Army Nurse Corps dismissed the women accused of

misbehavior, relocated Plummer to a small Army hospital in California, and transferred the nurses who signed the letter of complaint.[105] At about the same time, Jere Clayton issued his disastrous inspection report. With Fort Bayard's leadership in disarray, the Office of The Surgeon General began to ponder the future of its first tuberculosis hospital, now twenty years old and struggling.

To relieve pressure on Fort Bayard and as part of the nationwide effort to increase military hospitalization capacity, Bushnell surveyed the Medical Department's needs and options for expansion. When he asked Canadian officials how many tuberculosis beds he would need, they told him that 3,500 to 4,000 beds per million soldiers should be sufficient. That translated into 14,000 to 16,000 beds for an army that by the fall of 1918 numbered four million.[106] The Secretary of War ultimately approved eight additional tuberculosis hospitals, providing a peak capacity of 8,000 patients in January 1919. Some of these facilities were new construction, and others were conversions of existing facilities. These were General Hospital (GH) No. 8, at Otisville, New York; GH No. 16, in association with Yale University, in New Haven, Connecticut; GH No. 17, in Markelton, Pennsylvania; GH No. 18, in a converted hotel in Waynesville, North Carolina; GH No. 19, newly constructed in Oteen, North Carolina, and later named O'Reilly General Hospital; GH No. 20, at the former Army fort at Whipple Barracks, Arizona; GH No. 21, also newly constructed near Denver, Colorado; and, after the war had ended, GH No. 42 in Spartansburg, South Carolina, taking over the hospital of a former training camp.[107]

In the rush to accommodate thousands of patients, it was difficult, if not impossible, to reproduce the cloistered environment of Fort Bayard. New hospitals faced construction delays and shortages of competent and experienced medical officers and often received patients before they could care for them properly. The Surgeon General had to advise the new tuberculosis hospitals on such rudimentary matters as keeping tuberculosis patients in bed and ordered that "moribund or extremely advanced cases of tuberculosis should not be evacuated to other hospitals or sanatoria."[108] The new medical officers, or "emergency men," most of them civilian physicians, had little knowledge of tuberculosis or the military, and lacked the time to develop relationships such as those that medical officers had with many patients at Fort Bayard. For some hospitals, just providing good, nourishing food was a challenge. This was not a trivial problem because many people considered weight gain a key measurement of recovery, and tuberculosis patients often had tricky appetites due to their feverishness, or because the disease had spread to their gastrointestinal tract. Meals were even less palatable because the AEF had claimed most trained mess personnel, and many hospital kitchens lacked steam tables and carts, which meant they served hot food cold.

Two Troubled Hospitals

An examination of two wartime tuberculosis hospitals—GH No. 8 and GH No. 18—illustrates how the Medical Department struggled to meet the needs of tuberculosis patients. One of the first new hospitals was GH No. 8, in Otisville, New York. Although this facility was well funded and constructed to order, it suffered from

poor management. In the fall of 1917, the Medical Department leased land owned by New York City and began construction in February 1918 on a 1,000-bed hospital (500 of the beds in tent wards), with a final cost of $1.5 million, or $1,500 per bed.[109] Patients began to arrive in June, several weeks before construction was completed. One of the first Medical Department inspectors to tour GH No. 8 declared it "an excellently constructed hospital." But there were warning signs that it would not be well administered, because the commanding officer, William J. Hammer, a civilian tuberculosis specialist who had joined the Medical Corps for the war, was absent. The inspector deemed him "a comparatively new officer, but should prove to be efficient," but by the fall, patients were complaining of poor treatment and bad food in insufficient quantities.[110]

When Bushnell visited the hospital in December, he gave Hammer the benefit of the doubt because of his extensive professional experience in tuberculosis hospitals, and because he was "more of a medical man than military executive and has had a difficult proposition organizing and equipping this hospital." Hammer also had to work with "officers of mediocre ability on his staff not of his own choosing but who were the best obtainable under the exigencies of war time service."[111] Soon, however, thirty patients signed a petition charging that they were not getting enough food, and a Medical Department inspector confirmed that the mess "did not meet the nutritional requirements of tuberculosis patients."[112] Inquiries by members of the U.S. Congress spurred the Army Inspector General to investigate and his inspectors were less sympathetic than Bushnell. They found conditions at GH No. 8 "unsatisfactory" due to the "lack of administrative ability of Major William J. Hammer," and recommended replacing him with a "field officer of the Medical Corps of suitable service, ability and experience."[113] Bushnell and the Surgeon General, perhaps preferring a poor administrator who knew tuberculosis to a good administrator who did not, initially rejected this recommendation.[114] But by late spring of 1919, with more medical officers returning from Europe, the Medical Department replaced Hammer with another "emergency man" from the civilian sector, Allen M. Smith, who proved to be an equally poor administrator. Food complaints persisted and inspectors declared that although the kitchen at GH No. 8 was well constructed and equipped, the "mess officer is manifestly unable to properly feed the patients at this hospital."[115] Surgeon General Ireland had to admit as much to a congressman and promised that he would take action.[116]

In late July 1919, the Army Inspector General, still on the case, took the unusual step of calling for the relief of Smith as commander, for "inefficiency and neglect of duty," and recommended disciplinary action against him for violating Army regulations regarding the purchase of meat and the use of Army transportation.[117] The Surgeon General's own inspector, Paul C. Hutton, who had been a patient and medical officer at Fort Bayard, was also appalled by conditions there. He called for disciplinary action against one of the hospital's medical officers, Edward W. Granger, "who failed to render adequate professional treatment to patients in #9 ward Sunday, August 17th."[118] The short-staffed Surgeon General still did not relieve the commander until the Army Adjutant General ordered him to do so.[119]

After eighteen difficult months, the Department finally closed the shiny new hospital and transferred the patients from GH No. 8 to other facilities.

Other hospitals contended with more competent staff, but problem facilities. The Medical Department established two hospitals near Asheville, North Carolina, home to some twenty private sanatoria and Charles Minor, Bushnell's mentor and a leading tuberculosis physician. The hospital at Oteen (GH No. 19) was constructed from the ground up and performed well, but the effort at GH No. 18, in Waynesville, was fraught with problems. Due to the "acute necessity" of the war, the Medical Department leased an old hotel and the surrounding buildings for conversion into a tuberculosis hospital.[120] Built in 1882, the hotel had three stories of brick construction, 80 rooms, and porches extending along the front and sides of the building. After several weeks of conversion work, the hospital opened in April 1918 with 250 beds inside, and 350 beds in tents. Members of Congress, such as Representative Zebulon Weaver of North Carolina, lauded the "splendid work" at GH No. 18, and welcomed the federal funds that came with the post.[121] The hospital, however, turned out to be a fire trap.

When Bruns visited in June, before the conversion was completed, he found littered grounds, buildings in need of paint, inadequate lavatories, and a poorly equipped kitchen attended by flies. He was so dismayed that the commanding officer, Charles E. Davis, felt it necessary to send him a long, explanatory letter. "The conditions you found distressed me more than you know," Davis wrote.[122] He attributed the deficiencies to lack of personnel and told Bruns that "I trust it will not be forgotten that when this Hospital opened and for a long period of time thereafter, there was not a single officer here who had had any previous military service whatever."[123] Coming from civilian life, Davis was also learning the art of command.

With additional personnel Davis was able to impose some order on the hospital, but in November the patient population exceeded capacity with 643 patients for 600 beds, and an inspector objected to tent wards on low ground that did not have suitable drainage. He recommended moving all of the patients in the tents to another hospital. On 5 December, however, Bushnell, mindful of the hospital bed shortage and the "exigencies of war," directed that the tents be moved to higher ground and provided more heat. The next day, however, the ubiquitous inspector Jere Clayton telegraphed the Surgeon General a dire warning: "Fire risk ominous" at GH No. 18. He described the main hospital building as "inadequate [and] dilapidated," and "tents so close together that if one takes fire all will burn." He ordered the immediate removal of every other row of tents to reduce fire danger, and required fire drills "in case of conflagration." Concluding that it was "not possible [to] adequately care for sick or their attendants [in] this institution," he recommended that "no more patients or enlisted men [from the] medical department be sent here and that the hospital be closed as soon as possible."[124] He confided to a colleague that the buildings and kitchens were "on a par with a dilapidated 'poor house' in a back woods county."[125]

When advised of this assessment the Surgeon General told Bushnell that "if loss of life should result there from after this recommendation has been made,

the Medical Department might be justly blamed." The Surgeon General did not, however—perhaps could not—close the hospital, but instead approved Bushnell's plan to maintain the 600-bed capacity. Bushnell told Davis that "In view of the fact that the crest of the wave of tuberculosis patients is probably not yet reached…it would be inadvisable to give up this institution." Davis needed to make enough improvements to get the hospital through the winter.[126] With the press of patients, the hospital was forced to keep some on the second floor of the hotel, but added fire escapes and assigned only ambulatory individuals "who would be able to get up and leave the hospital without assistance."[127] Bushnell, acting more the military officer than physician, said that Waynesville had disadvantages but "they should not be magnified."[128] GH No. 18 avoided a conflagration, but in May 1919, when the training camp at Spartansburg, South Carolina, was no longer needed, the Medical Department closed the old hotel and transferred patients to a newly designated hospital at Spartansburg.

Not all of the tuberculosis hospitals were unsatisfactory. The Medical Department had a better situation at GH No. 20—Whipple Barracks, Arizona—perhaps because it was small and commanded by one of Bushnell's former medical officers, Major (Maj.) Carl Holmberg, who had been a patient and medical officer at Fort Bayard. The hospital opened in June 1918 with 150 beds, and for the next eighteen months it operated at capacity.[129] Holmberg established a standard of care for patients similar to that at Fort Bayard, instructed the medical officers in tuberculosis, and even held weekly medical seminars. Inspection reports were uniformly positive, ordering such minor changes as providing a sufficient number of fly swatters and providing lockers for enlisted men on duty.[130] However, even Whipple Barracks could not escape complaints about the food. But when a member of Congress forwarded such a complaint to the Surgeon General, the office responded with a petition signed by more than half of the Whipple Barracks patients stating that "this place is ideal in every respect for the care of tubercular patients."[131]

Even the ideal care of tuberculosis patients, however, could not ensure their survival. When Bushnell had told Rockhill of his plans to send Holmberg to Whipple Barracks, Rockhill informed him that Holmberg, who had been a patient at Fort Bayard two years earlier in 1916, still had "activity of the lungs." Bushnell replied, "I do not know how much to think of this." Holmberg, he noted, "has had rales for a long time. I do not think they amount to very much in his case. If that is the only ground on which the diagnosis is based, I should not pay any attention to it."[132] Carl Holmberg survived the war, but barely. Across the top of his efficiency report someone wrote in red ink, "Died 1-1-19." He was thirty-nine-years old.[133]

Race Relations

One of the ironic developments in the "War to Save Democracy" was that the increase in Army tuberculosis patients enabled the Medical Department to resegregate hospital wards by race. Before the war, as former Buffalo Soldier Charles Tyler had pointed out, social functions at Fort Bayard were often segregated or

barred to African Americans. But medical services and benefits were not, in part because it was not practical in a hospital of only a few hundred patients already separated by rank and the severity of illness. In addition, the Buffalo Soldiers had shared duties with white soldiers in the West, and this tradition continued in the frontier environment of Fort Bayard. But with the wartime expansion the War Department renewed racial divides, which put it more in step with mainstream race discrimination. In March 1918, responding to complaints about integrated hospital wards, Surgeon General Gorgas circulated a memo to all Army hospitals stating that "it appears that it would be a better procedure, and for the best interest of all concerned, to arrange for the care of white and colored patients in separate wards or separate rooms, so far as possible." The memo added that, "It is appreciated that at times this might be difficult, if not impossible, as in the time of epidemic."[134]

Racial segregation and racism played out in several ways in the tuberculosis hospitals. One wonders, for example, about Gerald Webb's bedside manner with African American patients when he included racist jokes in letters to family and friends, even his son Gerry, age twelve.[135] GH No. 8, in Otisville, New York, ran segregated education and rehabilitation courses. The officer in charge, Matthew R. McCann, wrote that "from the beginning the presence of the two races has proved a source of embarrassment." When rehabilitation aides instructed black patients in English and arithmetic, they went to their segregated wards rather than teach them in the classroom because, McCann explained, "it was felt desirable to keep the races separate." Black and white patients also took separate daily walks, starting at different times "in order that colored men should not be at the rest house with white men." With no puzzlement or sense of irony, he concluded that the rehabilitation results for the black patients were unsatisfactory. "With the exception of two bright men who took up work in typewriting and bookkeeping classes with the white men," McCann wrote, "there was a general lack of interest and the classes were abandoned after eight weeks."[136] Jim Crow segregation was not conducive to a good rehabilitation program.

Most camps segregated social activities, too. While welfare organizations such as the Young Men's Christian Association (YMCA), Knights of Columbus, and the Red Cross provided recreational club facilities for patients at Army hospitals, African Americans at Fort Bayard did not get a club room until July 1919, and then representatives from the various organizations staffed the club "in rotation."[137] Black soldiers resented the second-class status at the hospitals, especially men who had served in the AEF in Europe and had risked their lives for their country. A hospital newspaper, *The Oteen*, of GH No. 19 at Waynesville, provides a glimpse of resistance to racism. When the newspaper began in 1918, it included a column called "A Dash O'Color," with a Sambo-stereotype cartoon as a header and contents including racist jokes and stories, perhaps written by white patients. By May 1919, however, a "Colored Americans" column replaced "Dash O'Color" with a drawing of a dignified, black Doughboy in salute (Figure 4-6). Instead of racist jokes, the column contained information of interest to the hospital's African American patients. One noted, for example,

Dec. 1918

July 1919

Figure 4-6. Cartoons show African American patients asserting themselves at GH No. 19, at Oteen, North Carolina. The racist "Sambo" figure from December 1918 was replaced by the patriotic Doughboy in May 1919, in the hospital newspaper, *The Oteen*.
Courtesy of the National Library of Medicine, Bethesda, Maryland.

that "The Boys of [ward] E-9 wish to thank the Lt. Colonel for the carton of cigarettes which he gave them for the cleanliness of their ward."[138] Another column reported on entertainment that the Knights of Columbus offered African Americans. "This evening fills a long felt need and if we are to hope for further recognition of this sort, all should combine to shake the hand held out to us."[139]

The Influenza Epidemic

Unlike American society, tuberculosis recognized no color line. Nor did the influenza epidemic of 1918–19. In September 1918 the Army tuberculosis hospitals were hit by one of the worst pandemics in human history.[140] The first wave of influenza emerged in Army training camps in the spring of 1918 and traveled to Europe with the troops. There it flourished and mutated into a highly virulent second wave that exploded in early September in port cities in France, India, and the United States, and then swept the globe. Within months influenza sickened at least one-quarter of the world's population and killed an estimated 40 to 50 million people. Military and civilian physicians alike were appalled and helpless as the disease killed hundreds before their eyes. Normally, influenza is lethal only to the very old and very young, but this strain targeted young adults, ages 20 to 40, and could cause healthy immune systems to overreact, flooding victims' lungs with fluid and drowning them. It induced a deadly pneumonia against which medical treatment was impotent. Ultimately, influenza and related pneumonia killed more American soldiers and trainees during the war than did enemy weapons.

As influenza struck Army posts across the country, some institutions fared better than others. At Fort Bayard, Edward Rockhill identified Pvt. Cornie Gil as the hospital's first influenza patient. Gil had arrived from the military hospital at Ellis Island on 20 September and the next day had a temperature of 104.2 degrees, with the "typical symptoms" of vomiting, headache, backache, and

sensitivity to light.[141] Within three days, six other patients fell ill and by the time the epidemic had passed, almost one-quarter of Fort Bayard patients (287 of 1,200) and one-fifth of the staff (115 of 595) had influenza.[142] To the west, at Whipple Barracks, about 27 percent (97 of 348) of tuberculosis patients got the flu, along with a staggering 42 percent (107 of 251) of staff.[143] Hospital commander Holmberg tried to quarantine the facility, but the war made that almost impossible. Whipple Barracks had to admit forty-seven patients and receive fifty-six new staff during the height of the epidemic, from 1 October 1918 to 14 November 1918.[144] "Of the fifty men who were sent here….during the quarantine," Holmberg told Bushnell, "nearly all developed the disease and six have died from pneumonia." And, he added, "so many of our nurses came down [with] the disease during the past week that we were obliged to go into the open market for temporary assistants."[145]

Some physicians expected the flu epidemic to be especially deadly for tuberculosis patients whose diseased lungs made them vulnerable, but Holmberg and others speculated that patients with tuberculosis in their lungs had "a sort of immunity against these strains" of influenza. The fact that medical staff was sometimes hit harder than patients seemed to support this view. At GH No. 16, in New Haven, medical officers observed that although 16 percent of the tuberculosis patients developed influenza, the rate among the corps men was twice as high.[146] The same was true at GH No. 17 at Markelton, Pennsylvania, where "almost no T.B. patients came down with influenza, whereas the healthy personnel of the same hospitals had many cases."[147] At GH No. 18 at Waynesville, North Carolina, only 5 percent (38 of 643) of tuberculosis patients had the flu, while 25 percent (72 of 263) of the healthy staff fell ill.[148]

Given the comparative isolation of many tuberculosis hospitals, some could keep their influenza rates down by prohibiting people from entering and leaving the posts. The chief medical officer at GH No. 21 in Denver explained that "during the height and severest intensity of the Influenza epidemic in this region, [November and December 1918] this reservation was kept under strict quarantine."[149] Incredibly, the hospital recorded zero cases of influenza among its more than 500 patients, and only six cases among the staff of some 400.

After the war, the Office of The Surgeon General studied the relation between influenza and tuberculosis, canvassing tuberculosis hospitals to learn whether influenza reactivated dormant tuberculosis or if tuberculosis patients were more liable to develop influenza than nontuberculous people. They found that less than 0.1 percent of influenza patients developed tuberculosis following their recovery from the flu.[150] A civilian physician reviewing studies from various sanatoriums reached a similar conclusion.[151] Some observers even speculated that influenza accelerated the decline in U.S. tuberculosis rates. In an editorial in the *American Review of Tuberculosis*, author Alfred Knopf noted that the tuberculosis rate declined 25 percent from 1900 to 1918, but that in the seven years following the epidemic the rate fell 41 percent. He attributed the reduction to improved standards of living and antituberculosis measures, but also he asked whether the influenza epidemic might have killed people quickly "who later might have developed [tuberculosis] and died of it."[152]

1919—More Trouble and Investigations

The warring nations signed an armistice as the influenza epidemic crested in the United States. With millions of fresh, well-fed American soldiers joining the Allied Army, the Central Powers of Germany and Austria knew they could not keep up the fight. The war ended on the 11th of November 1918. But despite the peace in Europe, the year 1919 would be one of the most chaotic in the United States' and world history.[153] As peace negotiators in Paris sought to remake the world, millions of people struggled with hunger, disease, and the wreckage of destroyed empires. A third wave of influenza swept much of the globe and typhus ravaged Eastern Europe. The major powers vied for control of colonies in Asia and Africa, and citizens sought to build new nations in the Baltic region, the Balkans, Eastern Europe, and the Middle East. Some regions fell into civil war, and after the 1917 overthrow of Russia's tsar, socialist revolution swept Russia, Hungary, and Germany, and threatened elsewhere.

The United States, relatively unscathed by the war, was not immune to the chaos. Antiforeigner hysteria and fear of Bolshevism fueled the first American "Red Scare." A newly elected Republican Congress refused to ratify the Treaty of Versailles or sanction President Wilson's beloved League of Nations. In September 1919, during a rail tour of the country to make his case for the League, the president collapsed in Pueblo, Colorado, and suffered a debilitating stroke that would incapacitate him for the remainder of his term as president. The economy staggered as the government cancelled war contracts and hundreds of thousands of soldiers returned home to reclaim their jobs. When corporations sought to roll back labor concessions won during the war emergency, workers resisted. Pressed by a tight labor market and wartime inflation that had outstripped wage increases, an unprecedented 20 percent of American workers—steel workers, miners, and transit workers, to name a few—struck in 1919 against increased hours and pay cuts. In addition to labor unrest, race riots wracked at least twenty-five cities and lynchings doubled between 1918 and 1919, to seventy-eight. Crowds murdered at least ten black veterans in their Army uniforms.[154]

In this time of anger and turmoil the Army opened its newest tuberculosis hospital in Denver, Colorado. During mobilization many cities had wanted military installations near them so they could benefit from the flow of federal funds. Community leaders in Denver believed that although posts, like training camps, might be temporary, a hospital for tubercular soldiers would be permanent.[155] The city therefore sent a delegation to Washington to make its case, and businessmen with the Denver Civic and Commercial Association raised $150,000 to purchase land east of Denver on which to build a hospital. When George Bushnell weighed locations for new tuberculosis hospitals, Colorado was a logical choice. For decades it had been a destination for health seekers and home to scores of tuberculosis sanatoriums, including the Navy's tuberculosis hospital at Fort Lyon. Some of the nation's best-known sanatoriums were in Denver, where Bushnell himself had sought treatment as a young officer. Before the war, some Coloradans had resisted the influx of tuberculosis patients into their state, worried about contagion

and that the indigent sick could become dependent on local communities.[156] But patients in an Army hospital would be supported by federal benefits and the post could provide jobs to local residents. Denver had a climate comparable to Fort Bayard's, but located on national rail lines, it was less isolated. Given this, and the support of the local community, Bushnell chose Denver. In April 1918 the War Department signed a ninety-nine year lease with the Denver Civic and Commercial Association, and construction began in May. The Medical Department assigned Boulder physician William P. Harlow as commander to oversee construction and run the hospital.

Despite this goodwill, the new hospital, GH No. 21, got off to a rocky start. The hospital complex cost $3.2 million and soon comprised eighty-six stucco structures, with capacity for 1,400 patients. Buildings included approximately twenty open-air wards and infirmaries for officers and enlisted men, an isolation ward, quarters and barracks for medical personnel, and service structures such as kitchens, laundries, and the power plant. After the Armistice, the rapid demobilization reduced the military forces from more than four million to a little more than 200,000 by the end of 1919, generating a stream of tuberculosis patients found during discharge examinations. Patients began to arrive in October 1918, months before construction was completed.

In December 1918, inspector W. F. Lewis found fault with almost everything at the new hospital. He deemed "inadequate" the officers' quarters, the enlisted men's barracks, fire protection, the ambulance service, the laboratory equipment, the medical and surgical supplies, and the number and quality of the commissioned medical personnel. He also noted that the mess had been "inefficiently managed," and instructed the commander to "assure himself, by frequent inspections, that the meals served to patients …in wards are properly prepared and served in satisfactory condition."[157] In addition to material problems, morale had deteriorated across military hospitals because after the Armistice many patients and staff wanted to go home regardless of their illness or responsibility to care for the ill. Patient cartoonists at GH No. 42 in Spartansburg portrayed their frustration at having to pass numerous sputum tests before they could be discharged (Figure 4-7). Even Gerald Webb, who loved his job, told his wife in December 1918, "All I want is to get home and out now the war is over. I have no ambitions for promotion or anything else but to get back to you so quickly."[158] The morale problem among staff was so bad that in February 1919 Surgeon General Ireland advised all Army medical facilities that as far as the Medical Department was concerned, "the emergency is not yet over." He recognized that many medical personnel were anxious to be discharged from service and return home, but "you, who are not so fortunate as to have seen service overseas, have a deep obligation to those who fought and became casualties." He noted that "They have made their sacrifices; and yours is to be retention in the service until they have been made as fit as possible for return to civil life."[159] To drive home the point, Harlow, the GH No. 21 commander, began discharging "emergency men" according to their length of service and punishing poor behavior or neglect of duty with additional days in service. "This policy," the Army Medical Department observed, "notably improved the character of the services rendered."[160]

Figure 4-7. Cartoon portraying the frustration of sputum tests for tuberculosis at General Hospital No. 42 at Spartanburg, South Carolina, signed, I. W. Chapman, *Biand-Foryu*, 5 June 1919.
Image courtesy of the National Library of Medicine.

In even the best-run hospitals, tuberculosis patients had morale problems, resenting the rest treatment and confinement. But postwar military patients and their families were especially eager to get out of the hospital and vigorously asserted their rights and claim to benefits. The draft transformed the Army from a professional, volunteer organization to a conscripted army of "citizen soldiers," wherein men from all walks of life entered government service and demanded in return their rights and federal benefits.[161] Gone was the deference that patients and families had shown George Bushnell. Patients now argued with their physicians, challenged the chain of command, complained about the food, and demanded more access to their families. Some of the disgruntled went absent without leave, but others appealed to the media and elected officials for help.

To manage recalcitrant patients, GH No. 21 established a "disciplinary ward" for men sentenced to detention by court-martial or awaiting court-martial hearings. These wards posted guards to enforce rules of silence and bed rest. When several patients escaped or created a ruckus, medical officers resorted to putting them into straightjackets for twelve hours or more as punishment. Between December and February, medical officers put seven patients in the disciplinary ward into straightjackets.[162] Roy Parks, a mule driver in a coal mine before the war, arrived at GH No. 21 with tuberculosis in November and went absent without leave in December. He

returned after a week with influenza and worsened tuberculosis symptoms. Sent to the disciplinary ward, Parks refused to use a throat spray and when a medical officer insisted, Parks cursed him and kicked his meal tray off the bed. The officer, Neill MacArtan, ordered Parks into a straightjacket. Patient John Evanka received the same treatment after escaping from the disciplinary ward and getting drunk with another patient. When a guard, Demet C. Sims, refused to put the jacket on Evanka, Harlow (the hospital commander) referred him to a court-martial for failure to obey an order. Staff also straightjacketed Joseph Willing for smuggling tobacco into the ward, Harold Bassett for having cigarettes in his possession, Charles Wilson for insubordination, William Morrisette for insubordination and refusing to take his medicine, and John Macon for assaulting a guard with a knife.[163] When an inspector—again, Jere B. Clayton—discovered this practice in February 1919, he stopped it immediately, but the matter soon became a public scandal that reverberated for months.

Patient Roy Parks was one of the first to go public. He reported the straightjacket incident to the hospital commander and inspector Clayton, and sent a six-page letter to his wife charging that his punishment had caused a pulmonary hemorrhage. She forwarded the letter to officials in Washington.[164] Several former patients, including E. R. McKee, collected letters from men who had witnessed the use of straightjackets and sent them to Senator George E. Chamberlain of Oregon, chairman of the Senate Committee on Military Affairs. Patients also complained about the food. McKee was particularly descriptive—the meat they served sometimes, he said, "had a kind of green tint, that looked like changeable silk: you looked at it sideways and it looked green and red, or all kinds of colors.… They also gave us milk that was blue and transparent: it had no appearance of milk that you would get any place else."[165] Another patient said, "We had stew all the time, and some of it was very poor; you could not eat it," while another told Harlow that "the coffee was bitter, and the milk was blue, and the eggs were not right."[166] The *Denver Times* began an investigative series on GH No. 21 in late May with headlines such as "Cruelty to Soldiers is Charged at Hospital 21" and "Yanks Say Bad Food is Served at Hospital 21."[167] Harlow responded clumsily to the criticism by putting guards at the hospital door to prevent outsiders from entering.[168]

Where once disgruntled tuberculosis patients were isolated on a remote plateau in New Mexico, now when they complained, they were heard. Just weeks after GH No. 21 received its first patients, at least six U.S. Senators and several members of the House of Representatives complained to the Medical Department about conditions at the hospital. A senator from North Dakota enclosed a letter from a Denver woman stating that, "The disciplinary ward of Hospital 21 under Col. Harlow's administration is a disgrace to the civilized world, no place on earth except in Siberia or Germany are such methods resorted to."[169] Other petitioners included Mrs. George Peabody of Petoskey, Michigan, who relayed her son's complaints about the food at the hospital to the Surgeon General, and William E. Hause, an infantry captain and patient at GH No. 21, who appealed to the Adjutant General of the Army for an investigation into conditions. Denver investment banker E. F. Powers sent *Denver Times* clippings about the poor hospital food to Secretary of War Newton Baker, demanding action "to the credit of the Government and the salvation of the boys."[170]

In response to the uproar, the Army Medical Department sent an investigator to GH No. 21 who confirmed so many of the problems at the hospital that the *Denver Times* claimed victory with the headline, "Charges at Hospital 21 are Upheld by Colonel."[171] But the inspector, E. R. Shreiner, minimized the problems in his memo to the Medical Department, believing that the food service was improving and that the use of straightjackets was "humane" and had been verbally approved by officials in Washington. He attributed much of the trouble to "sensationalism of the local press," and concluded that there was no reason to discipline any of the hospital officers.[172] The Medical Department, however, recognized that action was required and replaced Harlow with a career medical officer, Colonel Howard H. Johnson. This, and a transit workers' strike in Denver, seemed to take the wind from the scandal's sails. By 4 July 1919, the *Denver Times* reported: "Patients at Army Hospital Happy Now; New Commander Rooting out Abuses."[173]

But not everyone was satisfied. On 18 August 1919, Rep. William N. Vaile of Denver, to whom citizens and patients had sent their complaints, introduced House Resolution 245 calling for an investigation of conditions at GH No. 21. The resolution charged that the food served in the hospital "is insufficient in quantity, inferior in quality, and not properly adapted for the nourishment and sustenance of sick men," and that the treatment of patients was "inhumane, unnecessarily harsh, and of such nature as to retard recovery from disease."[174] Vaile asked the Select Committee on Expenditures in the War Department, which Congress had established to investigate war profiteering, to include this issue in its brief. The next month, Rep. Clarence Lea (D-CA), a member of the committee, and committee secretary B. A. Stuberg, while traveling to the West Coast to conduct committee hearings, stopped in Denver to hear testimony related to Rep. Vaile's resolution.[175] On 25 and 26 September, in proceedings at the hospital and the Brown Palace Hotel in Denver, they took testimony from more than thirty-five witnesses, including patients, medical staff, and several citizens about conditions at GH No. 21.

The hearings were anticlimactic. Most witnesses agreed that conditions had improved with the replacement of Harlow. The most contentious issue was whether the straightjacket had caused Roy Parks to hemorrhage. One of Parks' nurses, Margueritte Cunningham, testified that a straightjacket "would bring it [a hemorrhage] on."[176] But medical officer MacArtan testified that Parks had willfully punctured his nose with a pencil to induce bleeding, and two other physicians corroborated his assessment, one of them describing in detail for Rep. Lea the difference between bloody discharges from the lungs and the nose. This testimony, and the fact that a corpsman had seen Parks with a nosebleed, defused the argument that the use of straightjackets damaged patients' health. Some witnesses praised the hospital. Marine officer Kenneth Turner testified that he had been a patient in six American military hospitals and GH No. 21 "was the best institution I had come to"; and an American Legion investigating committee stated that "conditions in the hospital are ideal."[177] Witnesses also were unanimous that the food had improved with better-equipped kitchens and the employment of civilian cooks. Even Roy Parks said, "I have no kick on the food now."[178]

Patients did say that they left the hospital to eat when they did not like the meals. Stanley Ginther told the committee that he went out three or four times a week, as did Howard F. Kearns, who had been a tuberculosis patient in the hospital for ten months.[179] An astounding aspect of this hearing is that no one expressed concern that tuberculosis patients on leave or absent without leave could be a danger to others. Hospital commander Johnson did say that Army regulations required patients to stay in the hospital as long as they could benefit from treatment because of the National Tuberculosis Association's concern that patients who went home without proper care would result "in danger to the men and the community." The Secretary of War, he explained, approved the regulation "in order to cut down the spread of tuberculosis in the country."[180] But Johnson did not specify any medical criteria, nor did the congressman follow up on that point. The "tubercularization" theory of some tuberculosis infection providing immunity apparently informed the policy, eclipsing concerns about contagion. Not all patients, of course, would be infectious, but no one in the hearing discussed medical or scientific criteria—like a patient being sputum positive—as grounds for confinement to the hospital. The hospital approved passes in light of a patient's finances and his health. GH No. 21 medical director Thomas G. Clement said that leaves of absence "are all approved where the soldier has sufficient funds to pay his expenses while he is at home," and that a patient was generally allowed to go to the city "unless there is something in his [the patient's] physical condition or conduct as a patient which the ward surgeon states it might be detrimental for him to have a pass to go down town." Many patients, he said, had monthly passes.[181]

In the hospital's defense, Johnson pointed out that the problems at GH No. 21 were larger than the hospital itself, "the result of the lack of preparation for the war in the furnishing of proper hospital equipment and trained personnel."[182] The hospital survived the intense scrutiny and criticism of 1919, in part because many people recognized that the war emergency created conditions that would challenge even the best medical services. Congress took no action in the wake of these hearings, and the Republicans' eighteen-month investigation of the conduct of the war ended when Warren G. Harding became President in March 1921, and Republican control of the White House made criticism of the administration less attractive. As the Army decreased in size, public attention to conditions within the military diminished. The Medical Department was now committed to its new hospital in Denver.

End of an Era: Closing Fort Bayard and the Death of Bushnell

The tuberculosis hospital in Denver presented an alternative tuberculosis facility to Fort Bayard, which would soon become competition for the Army's first tuberculosis hospital. The Medical Department had greatly expanded Fort Bayard's patient capacity for the war emergency, but now had to consider the Army's long-term needs. In February 1919, Fort Bayard requested $900,000 to renovate existing buildings, increase the water supply, and improve utilities.[183] The Office of The

Surgeon General approved the improvements, but rumors of closure circulated. Col. E. M. Welles Jr., who had taken over command from Rockhill, sent a plaintive memo to the Surgeon General on 6 January 1919. "I have been informed by certain civilians in Silver City," he wrote, "that Fort Bayard is soon to be abandoned." If so, he needed to know ahead of time so he could sell the livestock "far enough in advance of the closing of the Hospital to get a good price."[184]

Like many rumors, this one had a kernel of truth. In 1919 the War Department assessed its postwar hospitalization needs. As the Army shrunk to prewar size it needed fewer hospital beds for soldiers, and more for the thousands of sick, wounded, and disabled veterans who would require hospitalization for months or years. The government therefore arranged to transfer some military hospitals to the Public Health Service for the continued care of veterans, abandoning other hospitals or returning them to the previous owners. In early 1919 the War Department operated fifty-five hospitals with about 64,000 beds.[185] Over the next year and a half it transferred twenty-five hospitals with about 23,500 beds to the Public Health Service, abandoned twenty-five more with 33,000 beds, and retained five hospitals with 3,700 to 7,000 beds. The Medical Department determined that the postwar Army needed only two tuberculosis hospitals, one in the East and one in the West. The choice for the East was one of the most successful tuberculosis hospitals, GH No. 19, at Oteen, North Carolina, "A city in itself," as described by one medical officer. "One year ago it was part corn field and part primeval forest. Today it has miles of cement roads, spacious lawns, flower gardens, a total of 97 buildings, its own power plant, laundry, garage, barber shop, post exchange, and houses 2,600 men."[186] But what about the western hospital?

In 1919, Fort Bayard lost its most powerful advocate, George Bushnell. His health deteriorated during his war service, and he experienced several lung hemorrhages in July 1919 and was forced to step down as head of the tuberculosis program in September.[187] After Jere Clayton's critical inspection of Fort Bayard in February 1919, Col. Roger Brooke, who would be Bushnell's successor, wrote, "I am strongly of the opinion that there are many reasons why the general hospital at Fort Bayard should not be continued or looked upon from this time on as a permanent hospital."[188] Although Brooke assured Welles that it would be "many moons" before the Medical Department abandoned Fort Bayard, the tide was turning.[189] At the end of the year, Brooke laid out for the Surgeon General the case for abandoning Fort Bayard. He argued: (*a*) the government had invested $3.3 million in the Denver location and only $1 million at Fort Bayard; (*b*) many of the buildings in Denver were "reasonably modern and well-constructed," whereas those at Fort Bayard were old and in poor condition; (*c*) Denver was "centrally located" near railroads that connected it to much of the country, while many of the staff and patients at Fort Bayard "object seriously" to the remoteness of its location; (*d*) labor and food supplies in Denver were "cheaper and more abundant" than at Fort Bayard; and (*e*) the Colorado climate had a "world wide reputation for promoting the cure of tuberculosis." Brooke concluded, "It is to the interest of the Government and of our personnel and patients to give up Fort Bayard as a hospital as soon as our patients are reduced sufficiently to be cared for at Denver or Oteen."[190]

A few months later, another senior medical officer, J. L. Chamberlain, went to Fort Bayard to evaluate the abandonment proposal and came back with a spirited defense. He noted that plans for a rail spur and a paved road from Silver City would ease the transportation problems. The hospital was growing its own food, and while the buildings needed repair, an investment of just $75,000 would modernize the site. Chamberlain stated that patient complaints had subsided and some of the earlier problems had been due to a "large number of emergency men who were continually clamoring to get out of the service." As for the isolation, he wrote, "[I]t is believed that removal from the temptations and attractions of a city constitutes a most valuable asset." Chamberlain reported that officers, enlisted men, and civilians "pleaded with tears in their eyes, that I would do everything possible to prevent a change, many of them stating that if they left there they would feel that they were going to their death." He recommended "urgently and unconditionally, that Fort Bayard as a tuberculosis sanatarium, be not abandoned."[191] Although Surgeon General Ireland was persuaded by Brooke's initial recommendation to abandon, Secretary of War Baker kept his options open, telling a congressional committee on 15 April 1920 that he was opposed to the recommendation, but "still studying it."[192]

In addition to the loss of Bushnell as an advocate, the War Department no longer considered Fort Bayard's isolation an asset. Bushnell had believed that proximity of family annoyed the staff and could excite the patient, slowing his recovery. As late as October 1917 he drafted a policy to prohibit patients from bringing their families with them to the hospital.[193] Surgeon General Ireland observed, however, that "great separation of a soldier from his family, particularly where prolonged treatment is required, as in tuberculosis, not infrequently depressed the patient—may even retard his recovery," and, he added, "frequently gives rise to complaints on the part of the family."[194] He therefore directed that the tubercular soldiers be transferred to Army tuberculosis hospitals near their homes.

Despite dissent within the Medical Department and opposition in New Mexico to the Army's abandonment of Fort Bayard, Secretary Baker acceded to the recommendation and the War Department transferred the hospital to the Public Health Service effective 15 June 1920.[195] The Office of The Surgeon General ordered Fort Bayard to transfer all enlisted patients and beneficiaries of the Soldier's Home to GH No. 21 in Denver, and convey responsibility for veteran patients at Fort Bayard to the Public Health Service. Army personnel began to pull out in May and on the 28th Fort Bayard threw a good-bye party that the *Silver City Enterprise* called "the most magnificent ever seen in the southwest."[196] As many as 5,000 people attended festivities that included band concerts, athletic events, a vaudeville program for bedridden patients, a banquet of roast turkey and young pig (most likely from Fort Bayard's stock), and dancing. The dinner program noted that the hospital had cared for more than 18,000 patients during its twenty years of service, and bade farewell with lines from a nineteenth-century poem, "You may break, you may shatter the vase if you will, But the scent of roses will cling round it still."[197]

The next month, on 26 June 1920, the Secretary of the Army issued an order renaming General Hospital No. 21, "Fitzsimons General Hospital," for Lt. William

Thomas Fitzsimons, a civilian surgeon serving as an Army medical officer and the first U.S. Army officer killed in the World War during an air raid at Dannes-Camiers, France, on 4 September 1917. The order noted that the name "also fittingly commemorates the eminent service rendered by the civil medical profession of America as members of the Medical Corps of the Army during the World War."[198] With its new name, Fitzsimons now joined the ranks of named Army hospitals in the country, along with Walter Reed in Washington, DC, Army and Navy Hospital at Hot Springs, Arkansas, Beaumont Hospital in El Paso, Texas, and Letterman in San Francisco.[199] With the transfer of Oteen hospital in North Carolina to the Public Health Service for veterans with tuberculosis in October 1920, Fitzsimons became the Army's sole tuberculosis hospital.

George Bushnell was not among the honored guests at Fort Bayard's closing ceremony. According to Earl Bruns, given the stress of war service, "he was in very poor health during most of the time."[200] Bushnell (Figure 4-8) had already reached the customary retirement age of sixty-four in September 1917, but Surgeon General Gorgas had immediately rehired him to continue running the

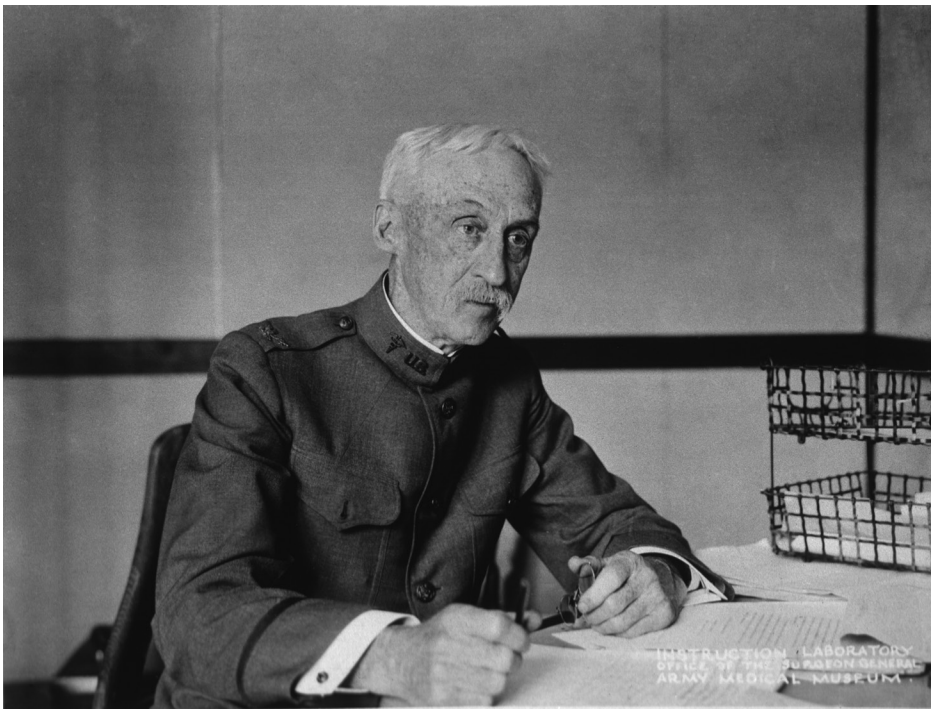

Figure 4-8. Colonel George Bushnell in his office while serving as head of the surgeon general's Office of Tuberculosis, showing the strain of war work and tuberculosis infection.
Photograph courtesy of the National Library of Medicine, Image #B03220.

tuberculosis program. When his health faltered, Bushnell stepped down from the post in January 1919, and retired on 15 October 1919. He returned to his home on a small farm in Bedford, Massachusetts, and wrote two books, *A Study of the Epidemiology of Tuberculosis* and *Physical Diagnosis of Diseases of the Chest*.[201] In July 1921, he traveled to London, appointed by Gerald Webb as the National Tuberculosis Association's representative to the "First International Union against Tuberculosis," and the next year lectured as Professor of Military Science and Tactics at Harvard University. In the summer of 1923, he and his wife Ethel moved to the more benign climate of Pasadena, California. The next spring, Bruns and other Fort Bayard alumni at Fitzsimons in Denver were looking forward to a visit by Bushnell when they received a wire that he was too ill to travel. Bushnell said he would visit when he felt stronger, but he did not recover from this tuberculosis breakdown. After several pulmonary hemorrhages, he died on 19 July 1924 at the age of 70 and was buried in Pasadena.[202]

Army Chief of Staff John L. Hines commemorated Bushnell and his tuberculosis work, noting, "His death removed one to whom many are indebted for their recovery from that dread malady in the past, and whose influence will be distinctly present in the future, wherever efforts are being made to overcome its ravages."[203] The Medical Department also honored Bushnell by naming roads, auditoriums, and an Army hospital after him. But the closure of Fort Bayard and the death of George Bushnell signaled the end of an era in treatment of tuberculosis. Instead of the isolation, rest, and the personalized care of Fort Bayard, medical officers contended with a modern, larger, more urban, and more bureaucratic institution, shaped by the demands of World War veterans and their advocates, and dedicated to more aggressive and invasive medical treatments. It was a new world of Army tuberculosis treatment, one where Bushnell's "good tuberculosis men"—some of whom who suffered from the disease themselves—would soon no longer be welcome.

Notes

1. On mobilization for the war see Robert H. Zieger, *America's Great War: World War I and the American Experience* (Lanham, MD: Rowman and Littlefield Publishers, 2000); Carol R. Byerly, *Fever of War: The Influenza Epidemic in the U.S. Army during World War I* (New York, NY: New York University Press, 2005); Jennifer D. Keene, *Doughboys, the Great War, and the Remaking of America* (Baltimore, MD: Johns Hopkins University Press, 2001 [hereafter cited as Keene, *The Doughboys*]); and Sanders Marble, "Professional Doctors but Amateur Soldiers: The US Army's Affiliated Hospitals Program, 1915–1955," *War & Society* 27 (May 2008): 39–58.

2. Charles B. Davenport and Albert G. Love, U.S. Army Medical Department Historical Unit, and U.S. Department of the Army, Office of The Surgeon General, *Statistics, Medical Department of the United States Army in the World War,* vol. 15 (Washington, DC: U.S. Government Printing Office, 1919, 1925 [hereafter cited as Davenport and Love, *Statistics*]); and Albert G. Love and Charles B. Davenport, *Defects Found in Drafted Men* (Washington, DC: Government Printing Office, 1920).

3. "Tuberculosis in France," *American Journal of Public Health* 7 (1917): 606–11; and "Tuberculosis in War," *New York Times* (28 April 1917). See also Halliday G. Sutherland, "Tuberculosis in the Fighting Forces of America," *American Medicine* 23 (1917): 305–7; Arthur Newsholme, "The Relations of Tuberculosis to War Conditions," *The Lancet* (20 October 1917): 591–95; Leslie R. Murry, "Tuberculosis and the War," *The British Journal of Tuberculosis* 2 (April 1915): 71–77; and R. Y. Keers, *Pulmonary Tuberculosis: A Journey down the Centuries* (London, UK: Bailliere Tindall, Cassell Ltd, 1978), 142–51.

4. For lower figures on tuberculosis among allied armies see James Alexander Miller, "Tuberculosis among European Nations at War," *Transactions of the National Tuberculosis Association* (1919): 179–96.

5. Editorial, "The Campaign against Tuberculosis in France," *American Medicine* 23 (1917): 287–88; on Rockefeller Foundation activities, see the annual reports on its website, http://www.rockefellerfoundation.org/about-us/annual-reports, accessed 24 August 2012; and Roy Porter, *The Greatest Benefit to Mankind: A Medical History of Humanity* (New York, NY: W. W. Norton and Company, 1997).

6. George E. Bushnell, "The Army in Relation to the Tuberculosis Problem," *Journal of the American Medical Association* 70 (15 June 1918): 1821–26. On tubercularization theory see Michael Worboys, "Before McKeown: Explaining the Decline of Tuberculosis

in Britain, 1880–1930," in Flurin Condrau and Michael Worboys, eds., *Tuberculosis Then and Now: Perspectives on the History of an Infectious Disease* (Montreal and Kingston: McGill-Queens University Press, 2010).

7. Arthur J. Myers, *Tuberculosis: A Half Century of Study and Conquest* (St. Louis, MO: Warren H. Green, Inc., 1970), 22.

8. George E. Bushnell, "Tuberculosis Bacteriemia and Massive Exogenous Tuberculosis Infection in Man," *Medical Record* 15 March 1919; Katherine Ott, *Fevered Lives*, 137–38; also George E. Bushnell, "Experimental Evidence as to Immunity from Tuberculosis Infection," *Medical Record* 18 January 1919. For similar views see William C. Pollock and James Hedges Forsee, "Tuberculosis among Doctors and Nurses at Fitzsimons General Hospital," *Military Surgeon* 75 (July 1934): 17–21.

9. William Osler, "The Tuberculous Soldier," *The Lancet* 2 (5 August 1916): 220.

10. G. E. Bushnell to Martha G. Ripley, 8 October 1910, Record Group112, Records of the Surgeon General of the Army [hereafter cited as RG 112], Entry 386, National Archives and Records Administration [hereafter cited as NARA]; and Andrew Anders to Chief Surgeon, American Expeditionary Forces, 31 December 1918, RG 120, Records of the American Expeditionary Forces, [hereafter cited as RG 120], Entry 2065, Box 5159, NARA.

11. Joseph F. Siler, U.S. Army Medical Department Historical Unit, and U.S. Department of the Army, Office of The Surgeon General, *Communicable and Other Diseases*, *Medical Department of the United States Army in the World War,* vol. 9 (Washington, DC: U.S. Government Printing Office, 1928 [hereafter cited as Siler, *Communicable and Other Diseases*]), 173. Before the development of virology in the 1920s and 1930s, medical scientists used the term virus to refer to a pathogen or disease agent.

12. G. E. Bushnell to A. E. Bradley, 5 November 1917, RG 120, Entry 2065, Box 5159, NARA.

13. Bushnell, "The Army in Relation to the Tuberculosis Problem," 1823.

14. Edward O. Otis, "Some Misleading Beliefs Regarding Pulmonary Tuberculosis," *Military Surgeon* 48 (February 1921): 164. See also Edward O. Otis, "The Soldier and Tuberculosis," *Transactions of the American Climatological Association* (1918): 160–67.

15. M.P., "The Nurse and Her Relation to Pulmonary Tuberculosis," *American Journal of Nursing* 20 (1919–20): 463.

16. See Siler, *Communicable and Other Diseases,* 191.

17. Leslie R. Murry, "Tuberculosis and the War," *The British Journal of Tuberculosis* 2 (April 1915): 71–77.

18. Maurice Fishberg, "Tuberculosis and War," *Journal of the American Medical Association* 68 (1917): 1796.

19. George Thomas Palmer, "Tuberculosis and War," *Journal of the American Medical Association* 69 (1917): 60.

20. Siler, *Communicable and Other Diseases,* 182.

21. Siler, *Communicable and Other Diseases,* 178.

22. G. E. Bushnell, "Lessons from the War as to Tuberculosis," *Journal of the American Medical Association* 70 (9 March 1918): 663.

23. Text of the circular may be found in Charles Lynch, F. W. Weed, and Loy McAfee, U.S. Army Medical Department Historical Unit, and U.S. Department of the Army, Office of The Surgeon General, *Surgeon General's Office*, *Medical Department of the United States Army in the World War,* vol. 1 (Washington, DC: U.S. Government Printing Office, 1923 [hereafter cited as Lynch, Weed, and McAfee, *Surgeon General's Office*]), 931–35; and Siler, *Communicable and Other Diseases,* 173–78. Bushnell describes the procedure in "The Diagnosis of Tuberculosis in the Military Service," *Military Surgeon* 40 (1917): 620–44, also published as "The Diagnosis of Tuberculosis in Military Service," *American*

Review of Tuberculosis 1 (1917): 325–52. For related correspondence on the article, see Commanding Officer, Fort Bayard to the Surgeon General, 5 May 1917, RG 112, Entry 23, NARA; and George Bushnell to Surgeon General, 5 May 1917, "Paper on the Diagnosis of Tuberculosis Camps in Military Service," RG 112, Entry 23, Box 466, NARA.

24. Unlike the technical preparations today, sputum tests involved simply looking at a stained sample through a microscope for tubercle bacilli.

25. Discussion regarding Jay Perkins, "What Shall be Done with Tuberculous Soldiers, Discovered in the Draft, in the Cantonments, Overseas?" *Transactions of the American Climatological Association* (1918): 176 [hereafter cited as Perkins, "What Shall be Done?"].

26. Lawrason Brown and Joseph H. Pratt, "Tuberculosis as an Army Problem," *Military Surgeon* 43 (August 1918): 157–59; and Siler, *Communicable and Other Diseases,* 179.

27. Siler, *Communicable and Other Diseases,* 193. On the history of X-ray technology see Bettyann Holtzmann Kevles, *Naked to the Bone: Medical Imaging in the Twentieth Century*, *Sloan Technology Series* (New Brunswick, NJ: Rutgers University Press, 1997); Joel Howell, *Technology in the Hospital: Transforming Patient Care in the Early Twentieth Century* (Baltimore, MD: Johns Hopkins University Press, 1995); and Barron H. Lerner, "The Perils of 'X-ray Vision': How Radiographic Images Have Historically Influenced Perception," *Perspectives in Biology and Medicine* 35 (1992): 382–97.

28. Mary C. Gillett, *The Army Medical Department, 1865–1917* (Washington, DC: Center of Military History, 1995), 99; and Vincent Cirillo, *Bullets and Bacilli: The Spanish-American War and Military Medicine* (New Brunswick, NJ: Rutgers University Press, 2004).

29. George R. Callender, "Roentegen Ray in Pulmonary Tuberculosis," *Interstate Medical Journal* June (1915): 598–603. See also Perkins, "What Shall Be Done?" 169.

30. F. E. Diemer and R. G. MacRae, "The Value of Chest Fluoroscopy," *Journal of the American Medical Association* 72 (18 January 1919): 172–74; and Ralph C. Matson, "The Value of Chest Fluoroscopy," *Journal of the American Medical Association* 72 (28 June 1919): 1893.

31. Siler, *Communicable and Other Diseases,* 194. In preparation for World War II, one medical officer supported the Bushnell policy because of the lack of resources and personnel trained in the use of X-rays. See William C. Pollack, "Tuberculosis in the Army," *American Review of Tuberculosis* 44 (1941): 659.

Chest X-rays are still considered but one of several means to diagnose tuberculosis, and the reliability of the analysis depends on the skill of the radiologist. See Michael D. Iseman, *A Clinician's Guide to Tuberculosis* (Philadelphia, PA: Lippincott Williams & Wilkins, 2000), 137–39.

32. Lynch, Weed, and McAfee, *Surgeon General's Office*, 468.

33. Clarence L. Wheaton, "Tuberculosis Control in Army Cantonment," *American Review of Tuberculosis* 3 (1919): 39–43.

34. Thomas McCrae, "Tuberculosis in the Soldier," *American Review of Tuberculosis* 2 (1918): 373, 375.

35. Discussion regarding Perkins, "Tuberculous Soldiers Discovered, What Shall be Done?" 177.

36. Hammond and Bushnell correspondence, January and February 1918, RG 112, Entry 31-J, Box 19, NARA.

37. Siler, *Communicable and Other Diseases*, 172.

38. John M. McDilly to Frank Billings, 15 January 1919, RG 112, Entry 31-J, Box 250, NARA.

39. Lynch, Weed, and McAfee, *Surgeon General's Office*, 950.

40. W. P. Chamberlain and various authors, U.S. Army Medical Department Historical Unit, and U.S. Department of the Army, Office of The Surgeon General, *Sanitation in the United States and Sanitation in the American Expeditionary Forces*, *Medical Department of the United States Army in the World War,* vol. 6 (Washington, DC: U.S. Government Printing Office, 1926 [hereafter cited as Chamberlain, *Sanitation*]), 431–73. See Siler, *Communicable and Other Diseases*, 182–85 for tuberculosis rates in each of the training camps. On the screening process at various training camps, see Francis E. Trudeau, "Special Tuberculosis Examinations in the Military Service," *Journal of the American Medical Association* 71 (7 September 1918): 818–22; Ralph C. Matson, "Examination of Recruits for Tuberculosis," *New York Medical Journal* 108 (1918): 199–203; and Lawrason Brown and Joseph H. Pratt, "Tuberculosis as an Army Problem," *Military Surgeon* 43 (August 1918): 139–59.

41. Matson, "Examination of Recruits for Tuberculosis," 201.

42. Gerald B. Webb to Varina Webb, 27 July 1917, Box 5, Gerald B. Webb Papers, Special Collections and Archives, Tutt Library, Colorado College, Colorado Springs, CO [hereafter cited as Webb Papers, Tutt Library].

43. Alexander Josewick to Gerald B. Webb, 28 December 1918, Box 5, Webb Papers, Tutt Library.

44. Earl H. Bruns, "The Tuberculosis Situation in the American Expeditionary Forces." Trier, Germany: Office of Civil Governor, American Area, Department of Sanitation and Public Health, 1919, RG 112, Entry 1011, Box 7, NARA [hereafter cited as Bruns, "Tuberculosis Situation in the American Expeditionary Forces"].

45. Siler, *Communicable and Other Diseases*, 198; and for a discussion of this process, see Siler, *Communicable and Other Diseases*, 587–609.

46. W. C. Gorgas, *Circular No. 24*, "Line of Duty," 11 September 1917, RG 112, Entry 10, Box 4614, NARA. See William S. Pollock, "Tuberculosis in the Army," *American Review of Tuberculosis* 44 (1941): 658–74, for a discussion of this matter.

47. J. H. Ford, U.S. Army Medical Department Historical Unit and U.S. Department of the Army, Office of The Surgeon General, *Administration: American Expeditionary Forces*, *Medical Department of the United States Army in the World War,* vol. 2 (Washington, DC: U.S. Government Printing Office, 1927 [hereafter cited as Ford, *Administration: AEF*]), 200, and Siler, *Communicable and Other Diseases*, 200.

48. Chamberlain, *Sanitation,* 515; and William H. Baldwin, "The Present Status of Soldiers and Draft Rejects with Tuberculosis," *American Review of Tuberculosis* 3 (1919): 322. See, for example, E. H. Bruns to H. M. Bracken, 5 July 1918, RG 112, Entry 31-J, Box 396, NARA.

49. Halliday G. Sutherland, "Tuberculosis in the Fighting Forces of America," *American Medicine* 23 (1917): 305–7.

50. Rep. Carl Hayden to W. C. Gorgas, 7 February 1918, RG 112, Entry 31-J, Box 20, NARA.

51. Siler, *Communicable and Other Diseases*, 199.

52. Chamberlain, *Sanitation,* 514.

53. Surgeon, Fort Ethan Allen to Surgeon General, 11 July 1917, RG 112, Entry 26, Box 91, NARA. On health in the training camps, see Nancy Bristow, *Making Men Moral: Social Engineering during the Great War* (New York, NY: New York University Press, 1996); Jennifer D. Keene, *World War I: The American Soldier Experience* (Lincoln, NE: University of Nebraska Press, 2011); and Allan M. Brandt, *No Magic Bullet: A Social History of Venereal Disease in the United States since 1880* (Oxford, UK: Oxford University Press, 1985, 1995).

54. Correspondence regarding George W. Troutman, RG 120, Entry 2065, Box 5159, NARA.

55. Louis Harris to Surgeon General, 14 January 1918, RG 120, Entry 2065, Box 5159, NARA; and "Disposition of Class D Patients," 24 June 1918, RG 1120, Entry 2130, Box 272, NARA.

56. Siler, *Communicable and Other Diseases*, 182.

57. Lynch, Weed, and McAfee, *Surgeon General's Office*, 376–77; Medical Department, U.S. Army, *Internal Medicine in World War II:* vol. 2*, Infectious Diseases* (Washington, DC: Office of The Surgeon General, Department of the Army, 1963), 331; and William H. Baldwin, "The Present Status of Soldiers and Draft Rejects with Tuberculosis," 323.

58. Memorandum, Office of The Surgeon General, "Discharge of Pulmonary Tuberculosis Patients," 15 April 1918, RG 112, Misc. Letters, Memos, etc., Box 18, NARA; and Siler, *Communicable and Other Diseases*, 193.

59. William C. Pollack, "Tuberculosis in the Army," *American Review of Tuberculosis* 44 (1941): 659; and Ford, *Administration: AEF,* 377.

60. Ford, *Administration: AEF,* 376 and 804.

61. See Siler, *Communicable and Other Diseases*, 185–90.

62. For more information on Webb, see Helen Clapesattle, *Dr. Webb of Colorado Springs* (Boulder, CO: Colorado Associated University Press, 1984); and Douglas R. McKay, *Asylum of the Gilded Pill: The Story of Cragmore Sanatorium* (Denver, CO: State Historical Society of Colorado, 1983), 58–64.

63. Gerald B. Webb, "The Effect of the Inhalation of Cigarette Smoke on the Lungs," *American Review of Tuberculosis* (March 1918): 25–27; and G. B. Webb, "Tuberculosis in the Army," *Journal of Laboratory and Clinical Medicine* 3 (1918): 137–39.

64. Gerald B. Webb to Varina Webb, 17 April 1918, Box 5, Webb Papers, Tutt Library.

65. Ford, *Administration: AEF,* 377; and Bruns, "Tuberculosis Situation in the American Expeditionary Forces."

66. Gerald B. Webb to Varina Webb, 2 May 1918, Box 5, Webb Papers, Tutt Library.

67. Clapesattle, *Dr. Webb of Colorado Springs,* 301. For a discussion of Webb's activities in the American Expeditionary Forces see pages 300–23.

68. Quoted in Clapesattle, *Dr. Webb of Colorado Springs*, 303–5.

69. Ford, *Administration: AEF,* 630–31.

70. R. J. Estill, "History of Base Hospital No. 8, U.S.A., July 17, 1917–March 6, 1919," RG 112, Entry 2130, Box 226, NARA.

71. Ford, *Administration: AEF,* 646–47; Morris Piersol, "History of U.S. Army Base Hospital #20," unpublished report, RG 120, Entry 2130, Box 270, NARA; and George Morris Piersol, "Internal Medicine as Observed at a Base Hospital in France," *Transactions of the American Climatological Association* (1919): 152–64. Several other hospitals had significant tuberculosis patient populations, including BH No. 86 at Mesves, BH No. 106 at Beau Desert, and BH No. 118 at Savenay.

72. Gerald B. Webb to George Bushnell, 20 July 1918, RG 112, Entry 31-J, Box 396, NARA.

73. George Bushnell to Gerald B. Webb, 7 August 1918, RG 112, Entry 31-J, Box 396, NARA.

74. Gerald B. Webb to William S. Thayer, 19 July 1918, RG 112, Entry 31-J, Box 396, NARA; and Gerald B. Webb to Varina Webb, 4 November 1918, Box 5, Webb Papers, Tutt Library.

75. A. R. Koontz, "War Gases and Tuberculosis: An Experimental Study," *Archives of Internal Medicine* 39 (1927): 832–64.

76. See, for example, Fort Bayard responses to Surgeon General inquiry, May 1919, RG 112, Entry 31-J, Box 20, NARA; and John L. Hankins and Walter C. Klotz, "Permanent Effects of Gas in Warfare," *Transactions of the National Tuberculosis Association* 18 (1922): 258–269.

77. Surgeon General memorandum, "Relation of Gassing to Tuberculosis," 14 May 1919, RG 112, Entry 31-J, Box 252, NARA. See also Hermann Harrison Cole, "A Clinical Study of Gassed Soldiers, with Special Reference to Pulmonary Tuberculosis," *American Review of Tuberculosis* 7 (1923): 230–55.

78. Editorial, "War Gases and Tuberculosis," *Journal of the American Medical Association* 89 (16 July 1927): 206.

79. Ford, *Administration: AEF,* 201; George R. Callender and James F. Coupal, U.S. Army Medical Department Historical Unit and U.S. Department of the Army, Office of The Surgeon General, *Pathology of Acute Respiratory Disease and of Gas Gangrene Following War Wounds*, *Medical Department of the United States Army in the World War,* vol. 12 (Washington, DC: U.S. Government Printing Office, 1929 [hereafter cited as Callender and Coupal, *Acute Respiratory Disease*]), 187–95. For more on pathology in World War I, see Cay-Rüdiger Prüll, "Pathology at War, 1914–1918," in Roger Cooter, Mark Harrison, and Steve Sturdy, eds. *Medicine and Modern Warfare* (Amsterdam: Rodopi, 1999).

80. Gerald B. Webb, "The Problem of Immunity to Tuberculosis," 25 December 1917, Webb Papers, Box 5, Tutt Library.

81. Gerald B. Webb, "Some Lessons of the War in Pulmonary Tuberculosis," *Transactions of the American Climatological Association* (1919): 114–28 [hereafter cited as Webb, "Some Lessons"]; and Clapesattle, *Dr. Webb of Colorado Springs*, 304.

82. E. H. Bruns to Henry A. Shaw, "Tuberculosis Immunity Investigation," 24 February 1919, RG 120, Entry 2065, Box 5159, NARA. Evidence suggests that a systematic review was never completed. See also G. E. Bushnell, "The Epidemiology of Tuberculosis in the Military Service," *Transactions of the National Tuberculosis Association* 15 (1919): 155–73.

83. Bruns, "The Tuberculosis Situation in the American Expeditionary Forces."

84. D. J. Glomsett et al., "What Can We Learn Regarding Pulmonary Tuberculosis from the Opportunity Afforded by the General Postmortem?" *War Medicine* 11 (1919): 993–94; and Webb, "Some Lessons."

85. Bushnell in discussion of Webb, "Some Lessons," 127.

86. G. E. Bushnell, *A Study of the Epidemiology of Tuberculosis, with Special Reference to Tuberculosis of the Tropics and of the Negro Race* (New York, NY: William Wood, 1920). See also a review by Edward O. Otis, *Military Surgeon* 48 (May 1921): 365–67.

87. G. E. Bushnell, "The Role of the International Union in Combating Tuberculosis," *American Review of Tuberculosis* 7 (September 1921): 602–10.

88. Edward R. Baldwin and Leroy U. Gardiner, "Reinfections in Tuberculosis: Experimental Arrested Tuberculosis and Subsequent Infections," *American Review of Tuberculosis* (1921): 510–13; and Edward Baldwin, *Tuberculosis, Bacteriology, Pathology and Laboratory Diagnosis with Sections on Immunology, Epidemiology, Prophylaxis and Experimental Therapy* (Philadelphia, PA: Lea & Febiger, 1927). For current discussion on immunity and tuberculosis, see Michael D. Iseman, *A Clinician's Guide to Tuberculosis* (Philadelphia, PA: Lippincott Williams & Wilkins, 2000), 63–96.

89. The following discussion is drawn from Jere B. Clayton, "Report of Sanitary Inspection of General Hospital, Fort Bayard, New Mexico, on February 19th, 20th, and 21st," RG 112, Entry 31-J, Box 20, NARA.

90. Clayton, "Report of Sanitary Inspection of General Hospital, Fort Bayard."

91. Surgeon General to Commanding Officer, Fort Bayard, 11 March 1919, "Recommendations made by Representative of Inspection Division, Surgeon General's Office," RG 112, Entry 31-J, Box 20, NARA.

92. Siler, *Communicable and Other Diseases*, 68.

93. *War Department Annual Report*, 1919, vol. 1, pt. 2, 2328. Syphilis also had high rates for days lost.

94. Christopher J. Juggard, "Copper Mining in Grant County, 1900–1945," in Judith Boyce DeMark, ed., *Essays in Twentieth-Century New Mexico History* (Albuquerque, NM: University of New Mexico Press, 1994), 47.

95. F. W. Weed, U.S. Army Medical Department Historical Unit and U.S. Department of the Army, Office of The Surgeon General, *Military Hospitals in the United States*, *Medical Department of the United States Army in the World War,* vol. 5 (Washington, DC: U.S. Government Printing Office, 1923 [hereafter cited as Weed, *Military Hospitals*]), 488–90; and "History of U.S.A. General Hospital, Fort Bayard, N. M., During World War," NARA, RG 112, Entry 31-J, Box 16.

96. Earl Bruns to George Bushnell, 4 July 1917, RG 112, Entry 31-J, Box 16, NARA.

97. Biographical information on Edward P. Rockhill from U.S. Army Surgeon General's Office Biographical Sketches of Medical Officers, Manuscript Collection 44, History of Medicine Division, National Library of Medicine.

98. Rockhill to Bruns, 10 June 1918, RG 112, Entry 31-J, Box 16, NARA.

99. General Orders No. 35, 19 October 1917, RG 112, Entry 31-J, Box 16, NARA; and Edward Rockhill to Bruns, 5 July 1918, RG 112, Entry 31-J, Box 16, NARA.

100. Surgeon General memo, "Women Physicians as Anesthetists," 12 March 1918, RG 112, Entry 31, Box 16, NARA.

101. G. E. Bushnell and Rockhill correspondence, June and July 1918, RG 112, Entry 31-J, Box 16. NARA. This could have been U.S. Representative Byron Patton Harrison (D-MS) or U.S. Representative Thomas Walter Harrison (D-VA).

102. Bruns and Rockhill correspondence, June 1918, RG 112, Entry 31-J, Box 16. NARA.

103. Correspondence regarding Anna Jamme inspection of Fort Bayard nursing personnel, February 1919, RG 112, Entry 31-J, Box 16, NARA.

104. Anna C. Jamme to Annie W. Goodrich, 15 February 1919 and Anna C. Jamme to the Surgeon General, 15 February 1919, RG 112, Entry 31-J, Box 16, NARA.

105. Dora Thompson memo, 7 March 1919, RG 112, Entry 31-J, Box 16, NARA. The Army Medical Department did not, however, take any action against the men—a captain and two sergeants—named in the complaint.

106. Correspondence between George E. Bushnell and the Department of Militia and Defense, Ottawa, July–August 1918, RG 112, Entry 31-J, Box 396, NARA.

107. For information on these hospitals see Weed, *Military Hospitals*; and for GH No. 16, see RG 112, Entry 31-J, Box 239; and *History and Roster of U.S. Army General Hospital No. 16, New Haven, Connecticut,* (New Haven, CT: Yale University Press, 1919); on GH No. 17, see RG 112, Entry 31-J, Box 244, NARA; and *The Star Shell* (1918–19) Markelton, PA, in the National Library of Medicine; on GH No. 42, see the *Biand-Foryu*, (1918–19), Spartanburg, SC, in the National Library of Medicine.

108. Surgeon General to Base Hospital, Camp Jackson, 1 February 1918, RG 112, Entry 10, Box 4614, NARA.

109. Weed, *Military Hospitals,* 516.

110. F. W. Weed, "Special Sanitary Inspection," 27 June 1918, RG 112, Entry 31-J, Box 208, NARA.

111. Memorandum, "Conditions at Army General Hospital No. 8, Otisville, N.Y. (Tuberculosis)," 6 January 1918, RG 112, Entry 31-J, Box 209, NARA [hereafter cited as Memorandum, "Conditions Otisville (Tuberculosis)"].

112. Memorandum, "Conditions Otisville (Tuberculosis)." Charles Eugene Perry also describes patient complaints at GH No. 8 in "The Rehabilitation of the Tuberculous Soldier," *Boston Medical and Surgical Journal* 181 (28 August 1919): 261–62.

113. Synopsis of Memorandum, "Conditions Otisville (Tuberculosis)," 11 January 1918, RG 112, Entry 31-J, Box 209, NARA.

114. 3rd Endorsement to Memorandum, "Conditions Otisville (Tuberculosis)," 16 January 1918, RG 112, Entry 31-J, Box 209, NARA.

115. J. B. Clayton, "Report of Sanitary Inspection of General Hospital No. 8 at Otisville, New York," 27 June 1919, RG 112, Entry 31-J, Box 209, NARA.

116. Merritte Ireland to Edmund Platt, 11 July 1919, RG 112, Entry 31-J, Box 209, NARA.

117. "Report of investigation concerning food and other conditions at U.S.A. General Hospital No. 8, at Otisville, N.Y.," 2 August 1919, RG 112, Entry 31-J, Box 209, NARA.

118. Paul C. Hutton, "Report of Sanitary Inspection of General Hospital No. 8 at Otisville, N.Y.," 16–19 August 1919, RG 112, Entry 31-J, Box 209, NARA.

119. Correspondence concerning GH No. 8, Otisville, August 1919, RG 112, Entry 31-J, Box 209, NARA.

120. Weed, *Military Hospitals,* 544-46.

121. Zebulon Weaver to Surgeon General Gorgas, 14 July 1918, RG 112, Entry 31-J, Box 247, NARA.

122. Charles E. Davis to E. H. Bruns, 2 July 1918, RG 112, Entry 31-J, Box 247, NARA.

123. Charles E. Davis to E. H. Bruns, 2 October 1918, RG 112, Entry 31-J, Box 247, NARA.

124. J. B. Clayton, "Report of Sanitary Inspector of General Hospital No. 18, Waynesville, North Carolina," 6 December 1918, RG 112, Entry 31-J, Box 247, NARA [hereafter cited as Clayton, "Sanitary Inspection Waynesville," 6 December 1918].

125. Correspondence concerning Clayton, "Sanitary Inspection Waynesville," 7 December 1918.

126. G. E. Bushnell to Davis, 16 December 1918, RG 112, Entry 31-J, Box 247, NARA.

127. Correspondence concerning Clayton, "Sanitary Inspection Waynesville," 6 December 1918.

128. G. E. Bushnell to Commanding Office, GH No. 18, 19 December 1918, RG 112, Entry 31-J, Box 247, NARA.

129. Weed, *Military Hospitals,* 556.

130. Inspection reports for August and December 1918, GH No. 20, Whipple Barracks, RG 112, Entry 31-J, Box 251, NARA.

131. Congressman William L. Nelson to Surgeon General, concerning complaint of L. E. DeVinna, September 1919, RG 112, Entry 31-J, Box 249, NARA.

132. George Bushnel to Edward P. Rockhill, 21 March 1918, RG 112, Entry 31-J, Box 19, NARA.

133. Efficiency Report of Carl Holmberg, RG 94, AGO, Box 5772, NARA.

134. Surgeon General, "Separation of White and Colored Patients," 22 March 1918, RG 112, Box 18, NARA. For more on segregation in the Army during World War I, see Gerald Astor, *The Right to Fight: A History of African Americans in the Military* (Novato, CA: Presidio, 1998); Arthur E. Barbeau and Lorette Henri, *The Unknown Soldiers: Black American Troops in World War I* (Philadelphia, PA: Temple University Press, 1974); and Mark Ellis, *Race, War, and Surveillance: African Americans and the United States Government during World War I* (Bloomington, IN: Indiana University Press, 2001).

135. Gerald B. Webb to Gerald B. Webb Jr., 5 May 1918, Box 5, Webb Papers, Tutt Library. For another example, see Gerald B. Webb to Benjamin C. Allen, 26 December 1917, Webb Papers, Tutt Library.

136. Matthew R. McCann, "Historical Sketch of Reconstruction Services, U.S.A. Gen. Hosp. #8, Otisville, N.Y.," April 1919, RG 112, Entry 31-J, Box 209, NARA.

137. "Colored Soldiers Get Club Room," *Silver City Independent*, 8 July 1919.

138. *The Oteen*, 9 November 1918, 16, National Library of Medicine.

139. *The Oteen*, 51 May 1919, 7, National Library of Medicine.

140. On the influenza epidemic, see Carol R. Byerly, *Fever of War*; Alexandra Minna Stern, Marin S. Cetron, and Howard Markel, guest eds., and David Rosner, contributing ed., "The 1918–1919 Influenza Pandemic in the United States: Lessons Learned and Challenges Exposed," *Public Health Reports* 125, suppl. 3 (April 2010); Nancy K. Bristow, *American Pandemic: The Lost Worlds of the 1918 Influenza Epidemic* (New York, NY: Oxford University Press, 2012); Alfred Crosby, *America's Forgotten Pandemic: The Influenza of 1918* (Cambridge, MA: Cambridge University Press, 1989; first published as *Epidemic and Peace, 1918*, Westport, CT: Greenwood Press, 1976) and John M. Barry, *The Great Influenza: The Epic Story of the Deadliest Plague in History* (New York, NY: Viking, 2004).

141. Edward Rockhill to Surgeon General, 27 September 1918, RG 112, Entry 31-J, Box 20, NARA.

142. Edward Rockhill, "Influenza," 17 April 1919, RG 112, Entry 31-J, Box 20, NARA.

143. Leopold Shumacker, "Influenza Report," 23 February 1919, RG 112, Entry 31-J, Box 252, NARA [hereafter cited as Shumacker, "Influenza Report"].

144. Shumacker, "Influenza Report."

145. Charles Holmberg to George Bushnell, 9 November 1918, RG 112, Entry 31-J, Box 251, NARA.

146. *History and Roster of the U.S. Army General Hospital No. 16, New Haven, CT* (New Haven, CT: Yale University Press, 1919), 17. See also H. J. Corper and E. D. Downing, "Laboratory Observations on the Influenza Epidemic in a Government Tuberculosis Hospital," *American Review of Tuberculosis* 3 (1919–20): 10–24 [hereafter cited as Corper and Downing, "Laboratory Observations"].

147. Roger Brooke, "Influenza," 15 February 1919, RG 112, Entry 31-J, Box 252, NARA [hereafter cited as Brooke, "Influenza"].

148. Walter Watterson to Surgeon General, 18 February 1919, RG 112, Entry 31-J, Box 247, NARA.

149. W. H. Bergtold, "Influenza," 14 March 1919, RG 112, Entry 31-J, Box 33, NARA. For a discussion of the impact of quarantine of a tuberculosis hospital see Howard Markel, et al., "Nonpharmaceutical Influenza Mitigation Strategies, US Communities, 1918–1920 Pandemic," *Emerging Infectious Disease* 12 (2006). Available at http://www.cdc.gov/ncidod/EID/vol12no12/06-0506.htm, accessed 24 August 2012.

150. Corper and Downing, "Laboratory Observations"; Siler, *Communicable and Other Diseases*, 162; and Brooke, "Influenza."

151. Maurice Fishberg, "Influenza and Tuberculosis," *American Review of Tuberculosis* 3 (1919–20): 543.

152. Editorial, "The Decline of Tuberculosis Mortality in the United States and the Influence of the Influenza Epidemic of 1918," *American Review of Tuberculosis* 13 (1926): 389. See also Roll H. Britten and Edgar Sydenstricker, "Mortality from Pulmonary Tuberculosis in Recent Years," *Public Health Reports* 37 (17 November 1922): 2843–58; and George Rosen, *Preventive Medicine in the U.S., 1900–1975: Trends and Interpretations* (New York, NY: Science History Publications, 1975), 32. The question of the impact of influenza on tuberculosis rates is still under examination today. See Andrew Noymer, "The

1918 Influenza Pandemic Hastened the Decline of Tuberculosis in the United States: An Age, Period, Cohort Analysis." *Vaccine* 29 (2011, Suppl. 2): B38–B41.

153. On the chaos of 1919, see Zieger, *America's Great War*; Cameron McWhirter, *Red Summer: The Summer of 1919 and the Awakening of Black America* (New York, NY: Henry Holt and Company, 2011); and Phyllis Lee Levin, *Edith and Woodrow: The Wilson White House* (New York, NY: Scribner, 2001).

154. On the events of 1919 see Joseph A. McCurtain, *Labor's Great War: The Struggle for Industrial Democracy and the Origins of Modern American Labor Relations, 1912–1921* (Chapel Hill, NC: University of North Carolina Press, 1997); Alan Dawley, *Changing the World: American Progressivism in War and Revolution* (Princeton, NJ: Princeton University Press, 2003); and Adriane Lentz-Smith, *Freedom Struggle: African Americans and World War I* (Cambridge, MA: Harvard University Press, 2009).

155. On the establishment of the new tuberculosis hospital at Denver, see Stephen J. Leonard, Thomas J. Noel, and Donald L. Walker Jr., "Honest John Shafroth: A Colorado Reformer," *Colorado History* 8 (2003); "Fitzsimons—The Story of a Hospital," *Military Surgeon* 65 (September 1929): 442–46; J. A. Wier, "The History of Fitzsimons Army Medical Center," *Denver Western Roundup* 36 (1980): 3–14; and Lyle W. Dorsett and Michael McCarthy, *The Queen City: A History of Denver*, 2d ed. (Boulder, CO: Pruett Publishing, 1986), 127.

The first official history of GH No. 21, Weed, *Military Hospitals,* 363, says it was located near Camp Miles, but there is no record of a Camp Miles in Colorado.

156. On resistance to tuberculosis patients, see Thomas A. Krainz, *Delivering Aid: Implementing Progressive Era Welfare in the American West* (Albuquerque, NM: University of New Mexico Press, 2005), 93–101; and a series of Public Health Service reports on "Interstate Migration of Tuberculous Persons," 1915, vols. 11–20.

157. W. F. Lewis, "Report of Sanitary Inspection of the Army General Hospital No. 21, Denver, Colorado," 22 December 1918, RG 112, Entry 31-J, Box 54, NARA.

158. Gerald B. Webb to Varina Webb, 9 December 1918, Box 5, Webb Papers, Tutt Library.

159. Memorandum, 11 February 1919, RG 112, Entry 31-J, Box 21, NARA.

160. Weed, *Military Hospitals,* 373.

161. Keene, *The Doughboys*.

162. Details on the use of straightjackets in GH No. 21 are found in U.S. Congress, *Hearings on H. R. 4474,* 68th Cong., 1st sess.; U.S. Congress, House Select Committee on Expenditures in the War Department, *War Expenditures*, 66th Cong., 1st sess. [hereafter cited as U.S. Congress, *War Expenditures*]; and E. R. Schreiner, "Special Report Relative to Complaint Submitted through Senator George E. Chamberlain," 3 June 1919, RG 112, Entry 31-J, Box 43, NARA [hereafter cited as Schreiner, "Complaint through Senator Chamberlain"].

163. U.S. Congress, *War Expenditures*, 189–90.

164. Schreiner, "Complaint through Senator Chamberlain."

165. U.S. Congress, *War Expenditures*, 743.

166. U.S. Congress, *War Expenditures*, 819 and 823.

167. "Cruelty to Soldiers is Charged at Hospital 21," *Denver Times*, 28 May 1919; and "Yanks Say Bad Food is Served at Hospital 21," *Denver Times,* 30 May 1919.

168. "Public Now Allowed in Hospital is New Order," *Denver Times*, 3 June 1919.

169. Letter forwarded to Senator Porter James McCumber (R-ND), "Dear Brother Elva," from "lovingly your sister, Edith," 11 June 1919; in RG 112, Entry 31-J, Box 43, NARA. Additional correspondence regarding problems at GH No. 21 can be found in RG 112, Entry 31-J, Box 43, NARA.

170. E. F. Powers to Newton D. Baker, 2 June 1919, RG 112, Entry 31-J, Box 43, NARA.

171. "Charges at Hospital 21 are Upheld by Colonel," *Denver Times*, 23 June 1919.

172. E. R. Schreiner, "Special Report Relative to Complaint Submitted through Senator George E. Chamberlain," 3 June 1919, RG 112, Entry 31-J, Box 43, NARA.

173. "Patients at Army Hospital Happy Now: New Command Rooting Out Abuses," *Denver Times* 4 July 1919.

174. U.S. Congress, *War Expenditures*, 4 September 1919, 177.

175. The Select Committee on War Expenditures also investigated complaints about conditions and the treatment of patients at Walter Reed, but these did not include tuberculosis patients.

176. U.S. Congress, *War Expenditures*, 721.

177. U.S. Congress, *War Expenditures*, 844 and 846.

178. U.S. Congress, *War Expenditures*, 819 and 698.

179. U.S. Congress, *War Expenditures*, 833 and 838.

180. U.S. Congress, *War Expenditures*, 858.

181. U.S. Congress, *War Expenditures*, 766–68.

182. U.S. Congress, *War Expenditures*, 857.

183. "U.S.A. General Hospital, Ft. Bayard, N.M., 1918," RG 112, Entry 31-J, Box 16, NARA.

184. E. M. Welles to Surgeon General, 6 January 1919, RG 112, Entry 31-J, Box 16, NARA.

185. The number of Army hospitals and beds changed almost every week because the Medical Department established additional hospitals during mobilization and the war, and then dismantled those hospitals during demobilization. These figures are drawn from Floyd Kramer, "The Year's Work in Military Hospitals and a Prospectus of the Future," *Military Surgeon* 47 (1920): 681–94; and "Memorandum for the Secretary of War," 14 April 1920, RG 112, Entry 29, Box 173, NARA.

186. Henry W. Hoagland, "The Treatment of Tuberculosis in the Army Hospitals," *Transactions of the American Climatological Association* (1919): 22.

187. Roger Brooke to Warfield T. Longcope, 14 August 1919, RG 112, Entry 29, 1917–27, Box 396, NARA; and "Obituary, George Ensign Bushnell," *Military Surgeon* 55 (September 1924): 423–24.

188. Roger Brooke, "Reply to Report of Sanitary Inspection of General Hospital, Fort Bayard, N.M., on February 19, 20, and 21, 1919, by Col. J. B. Clayton," RG 112, Entry 31-J, Box 20, NARA.

189. "Medical Department to Retain Hospital at Fort Bayard," *Silver City Independent*, 29 April 1919. See also "War Department to Retain Fort Bayard," *Deming Headlight* 7 May 1920.

190. Roger Brooke, "Memorandum for the Secretary of War," 11 December 1919, RG 112, Entry 31-J, Box 16, NARA.

191. Chamberlain memo for Chief of Staff, 13 April 1920, RG 112, Entry 31-J, Box 16, NARA.

192. Roger Brooke to Commander, Fort Bayard, 14 April 1920, RG 112, Entry 31-J, Box 20, NARA; and Congress, House Committee on Public Buildings and Grounds, "Public Buildings and Grounds," 15 April 1920, 66th Cong., 2nd sess., 4.

193. G. E. Bushnell to the Surgeon General, 22 October 1917, RG 112, Entry 31-J, Box 20, NARA. On the distribution of overseas patients to hospitals in the United States see Siler, *Communicable and Other Diseases*, 175–78.

194. Surgeon General to Adjutant General, 20 April 1920, RG 112, Entry 31-J, Box 16, NARA.

195. Under provision of Public Act 326, Section III, dated 3 March 1919. See congressional inquiries in RG 112, Entry 31-J, Box 16, NARA; and Carter Glass to Secretary of War, 5 April 1919, RG 112, Entry 31-J, Box 16, NARA; and Adjutant General memos, 12 May 1920, RG 112, Old Entry, 399, NARA.

196. "500 People at Bayard Farewell," *Silver City Enterprise,* 28 May 1920. See also *Silver City Independent*, "Military Stages Huge Celebration at Fort Bayard," 1 June 1920.

197. Program for the occasion of the Army's departure from Fort Bayard, May 1920, Silver City Museum. Poem may come from "Notes and Queries: A Medium of Inter-Communication for Literary Men, Artists, Antiquaries, Genealogists, Etc.," 17 November 1849, Gutenberg E-books.

In 1965, the Fort Bayard facility, comprising over 480 acres, was transferred to the State of New Mexico, which continues to operate the facility for various medical treatment programs.

198. General Order No. 40, War Department, 26 June 1920. For a biography on Fitzsimons, see Carol Byerly, "William T. Fitzsimons," in Sanders Marble, ed., *Builders of Trust: Biographical Profiles from the Medical Corps Coin* (Fort Detrick, MD: Borden Institute, 2011), 86–98.

199. Earl H. Bruns, "Colonel Bushnell: An Estimate of His Character and Work," *American Review of Tuberculosis* 11 (1925): 289 [hereafter cited as Bruns, "Colonel Bushnell"].

200. Bruns, "Colonel Bushnell," 289.

201. George E. Bushnell, *A Study of the Epidemiology of Tuberculosis with Especial Reference to Tuberculosis of the Tropics and of the Negro Race* (New York, NY: William Wood and Company, 1920); and Joseph H. Pratt and George E. Bushnell, *Physical Diagnosis of Diseases of the Chest* (Philadelphia, PA: Saunders, 1925).

202. Gerald B. Webb, "Colonel E. Bushnell, M.C., U.S.A.: An Appreciation," *Journal of the Outdoor Life* 21 (September 1924): 521–22.

203. Bruns, "Colonel Bushnell," 289.