

Chapter Five

“A Gigantic Task”: Treating and Paying for Tuberculosis in the Interwar Period

In May 1941, as the United States stood on the brink of another world war, Benjamin Goldberg, president of the American College of Chest Physicians, recited some stunning figures at the association’s annual meeting in Cleveland, Ohio. He calculated that from 1919 to 1940 the Veterans Administration had admitted 293,761 tuberculosis patients to its hospitals. These patients had received government care and benefits for a total of 1,085,245 patient-years, at a cost of \$1,185,914,489.56. These figures were “approximate,” he added, because “many more millions of dollars have been utilized in the Army and in the Naval branch of the armed services, before members of those services having tuberculosis were invalided to the Veterans’ Administration.” As the nation faced another national emergency, he declared, tuberculosis specialists must advise the government on how to preserve the health of the nation and prevent a similar cost “in suffering and dollars.”¹

Goldberg’s remarks reveal that although tuberculosis rates in the United States were declining 3 to 4 percent annually during the interwar years, the government’s burden to care for tuberculosis patients remained heavy. The Army was only three-quarters the size it was before World War I (131,000 versus 175,000 strength) and experienced no major epidemics, so that suicide and automobile accidents became the leading causes of death in the peacetime Army. Although hospital admissions of active duty personnel for tuberculosis declined during the decade, tuberculosis admissions at Fitzsimons Hospital in Denver remained constant due to a steady stream of patients who were veterans of the war. Tuberculosis, in fact, became a leading cause of disability discharges from the Army and, with nervous and mental disorders, generated the greatest amount of veterans’ benefits between the wars (Figure 5-1).² This phenomenon was generally the result of three factors. The first was the increasing complexity and cost of modern hospitals and medical and surgical practice. The Medical Department’s tuberculosis program was decidedly bigger, busier, and more expensive at Fitzsimons Hospital than it had been at Fort Bayard. Located near a city rather than the

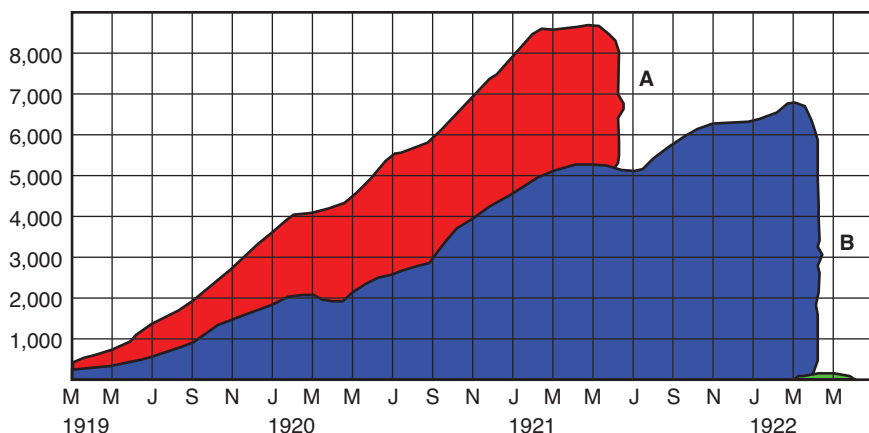


Figure 5-1. Chart showing increase in hospital care for tuberculosis veterans in the years immediately after the war, in Public Health Reports 37 (15 September 1922): 2248. Available at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2000002/pdf/pubhealthrporig02581-0001.pdf>.

mountains, Fitzsimons served as a general hospital for active military and veterans in the local region in addition to being a tuberculosis sanatorium, and it became a center of medical knowledge, skill, and technology. The second factor was a congressionally driven proliferation of veterans' benefits for tuberculosis in the 1920s and the large number of veterans seeking those benefits. Veterans comprised the majority of the patients at both Fort Bayard and Fitzsimons, but those at Fitzsimons faced a much more extensive and complex—indeed bewildering—array of benefits and programs that generated complicated administrative procedures and bureaucracy. The third factor contributing to the increasing cost of government care for tubercular soldiers and veterans was the development of new and more invasive therapies and rehabilitation programs that lengthened the already long hospital stays. The average length of the hospital stay for tuberculosis patients more than doubled from 148 days during the four-year time span of 1914–18, to 343 during 1929–31.³

Between World War I and World War II, the Medical Department also had to contend with tighter budgets. In the 1920s, Congress repeatedly expanded veterans' benefits but kept the War Department on a short rein, appropriating fewer funds than the department requested. These budget cuts made it more difficult for Fitzsimons and other Army hospitals to recruit and retain medical personnel and maintain the hospital plant and supplies. The story of tuberculosis in the Army after World War I, then, is one of increasing demand and decreasing resources, a dynamic that left Fitzsimons financially strapped even before the country entered the Great Depression. An examination of Fitzsimons' postwar environment—the modern hospital and technology, the ever-changing landscape of veterans' benefits, and new, invasive treatments for tuberculosis—illuminates these stresses.

Fitzsimons: A Modern Hospital in a New Environment

An Urban Community

Instead of standing on a remote mesa as did Fort Bayard, the postwar Army's tuberculosis program at Fitzsimons was embedded in American society. Denver at the time was buffeted by the turbulent social, economic, and political winds of the 1920s and after two decades of growth and the wartime economic boom, the city's economy staggered.⁴ Fitzsimons also felt the impact of the tramway strikes in 1919 and 1920, for example, that cut the hospital off from the city until the commander made special arrangements for the transport of medical personnel. As the Ku Klux Klan gained strength across the country, fiercely defending native-born white Protestantism and punishing minorities, the *Denver Post* reported in 1924 that the "Invisible Empire" was the "largest most cohesive and most efficiently organized political force in the state of Colorado today."⁵ It is not clear whether the Klan penetrated the hospital, but the religious life there was diverse. One of Fitzsimons' chaplains was Catholic, the other Protestant, and the post regularly offered Jewish religious services.

Less diverse racially, the War Department had retained few African American personnel during postwar demobilization and downsizing, and the Fitzsimons roster listed no more than one or two black enlisted men and no black nurses at all.⁶ At the same time, however, Fitzsimons averaged about 100 African American male patients.⁷ Unlike Fort Bayard, Fitzsimons maintained racially segregated wards, putting black officers and enlisted men together in the "colored" infirmary and ambulant wards with a separate recreation room, kitchen, dining area, and a sleeping porch. The Veterans' Bureau also established a hospital for black veterans at Tuskegee, Alabama. Despite such discrimination, African American soldiers and veterans had better access to healthcare than most black Americans. One study found that in 1928 in civilian society there was one hospital bed for every 139 white Americans, while 1,941 blacks had to "compete" for each available hospital bed.⁸ This was not the case for black soldiers and veterans, however, because they were eligible for government hospital services, even if they were racially segregated. Fitzsimons did not segregate patients of other ethnicities. Mexicans and Mexican Americans, who worked in the post laundry, construction and maintenance, and on the hospital farm, were sometimes hospital patients and cared for in white enlisted wards.

Fitzsimons joined a host of tuberculosis hospitals in Denver, many established by ethnic and religious groups, including the National Jewish Hospital for Consumptives (1899); Agnes Memorial Sanatorium (1904); the Jewish Consumptives' Relief Society (1904); the National Swedish Hospital (1908); and the Evangelical Lutheran Sanitarium (1905).⁹ This plethora of nearby hospitals allowed for close collaboration between Army physicians and other tuberculosis specialists. A medical officer told the Office of The Surgeon General that "our Fitzsimons pathologic presentations, I can say without exaggeration, attracted the attention of all the specialists throughout this section of the country."¹⁰ Fitzsimons was

certainly one of the most comprehensive sanatoriums in the region in terms of the services and programs it offered. It was the site for one of the first War Mothers' Homes, which offered accommodations to families who were visiting their loved ones in the hospital.¹¹ The American Red Cross was also on site, and showed Hollywood movies—two shows a night (the first for patients and the second for employees)—and set up radios in the wards to broadcast evening programs such as the baseball World Series. Other amenities included stables, a golf course, tennis courts, a baseball team, garage and service station, beauty shop, barbershop, restaurant, and newsstand. The hospital received national and international attention, with visits from President William G. Harding in 1924 and Queen Marie of Romania in 1926.

The Antituberculosis Movement

Very much a part of the bustling city around it, Fitzsimons operated in a world far less riven by tuberculosis than before the war. Although still a leading killer in the United States, the death rate from tuberculosis had halved in just twenty years, from almost 200 deaths per 100,000 people in 1900 to fewer than 100 deaths per 100,000 people in 1920, making the United States one of only three countries (with New Zealand and Canada) with rates below 100 per 100,000, or 0.1 percent.¹² These falling tuberculosis rates inspired redoubled efforts by the antituberculosis movement. Founded in 1904, the National Tuberculosis Association had chapters in every state by 1920 and ran annual Christmas Seal campaigns with the American Red Cross to raise funds and to tell the public that "tuberculosis is preventable and curable."¹³ Governments at all levels promulgated antituberculosis measures, some of which were harsh. Arkansas barred schoolteachers with tuberculosis from the classroom, Alabama required that tuberculosis prisoners be segregated from the others, and Oklahoma refused to grant medical licenses to physicians with tuberculosis. At one point, the states of Washington and North Dakota prohibited people with tuberculosis from marrying.¹⁴

Most states required dairy herds to be tested for *Mycobacterium bovis*, the germ that causes tuberculosis in cattle, and by 1920 many large cities had outlawed unpasteurized milk. In 1925, no fewer than eight federal agencies were involved with tuberculosis control: (1) the Veterans' Bureau, (2) War Department, (3) Public Health Service, and (4) Office of Indian Affairs all managed hospitals for tuberculosis patients; (5) the Immigration Service screened newcomers for the disease; (6) the Department of Agriculture inspected cattle and swine for tuberculosis; (7) the Bureau of Mines investigated tuberculosis among miners; and (8) the Department of Labor and other agencies collected data on tuberculosis prevalence and control.¹⁵ The interwar period was also the heyday of tuberculosis sanatoriums. Although in 1900 the United States had just thirty-four sanatoriums with 4,485 beds, by 1925 there were 536 institutions with 73,715 beds in the country. Many general hospitals ran tuberculosis wards as well.¹⁶ These institutions produced so many journals and newsletters that they gave rise to an organization called Associated Editors of Tuberculosis Publications.¹⁷ Despite the proliferation

of sanatoriums, though, the vast majority of civilian tuberculosis patients (perhaps 90 percent) were treated at home.¹⁸ This was not the case in the military, however, because Navy, Soldiers' Home, and Veterans' Bureau tuberculosis patients had access to hospital treatment, and many of them went to Fitzsimons.

A Modern Hospital

Cleaner and safer than ever before, by the 1920s the modern American hospital had become the preferred place for healthcare. By 1930, 65 percent of all births and 50 percent of all deaths in the United States occurred in hospitals.¹⁹ National medical organizations moved to standardize hospitals in areas such as staffing credentials and levels, laboratory facilities, and operating equipment and procedures. The American College of Surgeons produced its first list of approved hospitals in 1919 and by 1925 had surveyed and accredited all government hospitals.²⁰

The Army's new tuberculosis hospital stood as a center of modern medical expertise, technology, and training, and in the 1920s, was admitting and discharging 300 patients per month—almost the total patient annual capacity of Fort Bayard before the war. A complex of 160 buildings on 595 acres supporting 1,800 beds, Fitzsimons served as the Army's primary tuberculosis hospital and regional general hospital. The facility also offered outpatient services, delivering thirty to forty babies a year.²¹ In addition to rest therapy, Fitzsimons' medical officers now treated tuberculosis patients with an array of new therapies, including physical therapy, surgery, and rehabilitation and vocational education. In 1929 Fitzsimons' laboratories completed 134,384 tests on patient blood, urine, feces, sputum, venereal lesions, and spinal fluid; produced 10,669 chest X-rays; and conducted 134 autopsies. Fitzsimons' surgeons performed 667 tonsillectomies, the dental department filled 1,663 cavities and extracted 2,169 teeth, medical personnel in the outpatient clinic conducted 601 physical examinations, hospital nutritionists prepared twenty different diets for patients, and the laundry washed three million pieces of dirty linen.²² Fitzsimons was a big, modern, bustling facility (Figure 5-2).

Fitzsimons had twenty-three wards, seventeen of them for tuberculosis. Each tuberculosis patient admitted to Fitzsimons had a chest X-ray; a dental examination; an ear, nose, and throat examination; and submitted sputum, urine, blood, and stool samples to be tested for a variety of diseases and conditions.²³ Such procedures produced an increasing number of records and gave rise to new bureaucracy. Annual reports increased fivefold in length and ceased to mention medical personnel by name. Hospital correspondence referred to patients by number rather than name, and hospital management became so arduous that the commanding officer no longer had time to see patients.²⁴

Not everyone welcomed the changes. George Bushnell's protégé Earl Bruns' career tracked the rise of the modern hospital. But as he assumed his mentor's mantle as the Army's tuberculosis specialist in 1921, he worried that large hospitals of more than 200 or 300 beds would be unmanageable and make it difficult for physicians to get to know their patients.²⁵ Born in Indiana in 1879, Bruns graduated from Miami Medical College in Cincinnati, Ohio, in 1903, and became an Army



Figure 5-2. Overview of Fitzsimons General Hospital buildings in Denver, Colorado. 1920. Photograph courtesy of the Denver Public Library, Western Historical Collection, Image #Z-387.

physician in 1905.²⁶ He married Caroline Howard and after serving at several western posts, the couple went to the Philippines in 1906 where Bruns conducted research on tropical medicine until he fell ill in 1908. When Bruns and his wife arrived at Fort Bayard months later they both had tuberculosis. Bruns had active disease in both lungs, but after more than a year of complete rest he returned to light duty. Although his disease was “apparently arrested,” records from 1913 and 1915 indicate that he still had tuberculosis bacilli in his sputum. Bruns eventually resumed full duty caring for patients and serving as Bushnell’s deputy. After war-time service with Bushnell in Washington, the American Expeditionary Forces in Germany, and a course of instruction in tuberculosis in Switzerland, the Army Medical Department named him chief of medical services at Fitzsimons. There, Bruns (Figure 5-3) continued Bushnell’s work, keeping the Medical Department at the forefront of tuberculosis treatment and research. He helped to structure, equip, and staff the Fitzsimons tuberculosis program, instructing medical officers in tuberculosis medicine, developing new therapies, and advocating the rehabilitation of tuberculosis patients to return them to a “productive way of life.”²⁷

Bruns recognized that the larger hospital could support specialists in fields such as orthopedics, urology, or neuropsychiatry, but he also believed that successful tuberculosis treatment depended on “the personality of the doctor in charge and the close personal contact between the physician and the patient.” In 1923, therefore, he organized the Fitzsimons tuberculosis beds into seven 200-bed “units,” each with one infirmary and two ambulant wards—to, in essence, transform a



Figure 5-3. Portrait of Colonel Earl H. Bruns (1879–1933).
Photograph courtesy of the National Library of Medicine, Image #B03796.

large, impersonal institution into a collection of smaller, more intimate hospitals. Each unit operated as a separate sanatorium under the direction of one medical officer who would get to know each patient well and handle most of their tuberculosis treatments with support from specialists in other hospital departments. If, for example, a patient moved to the surgical ward for an appendectomy, or left the hospital and returned at a later date, he would return to his original unit and staff. Medical officers serving a four-year tour of duty would spend the first year assisting a ward officer and then the commander would select the most competent assistant to take over a ward. In 1926 Bruns reported that under the unit system “there is better cooperation and more kindly feeling between patients and doctors,” and that it had succeeded because it was based on “the sound principle of continuity and individualization of treatment.”²⁸ He believed such treatment

afforded patients at Fitzsimons "the best opportunity" to get well compared to civilian patients, who had to contend with considerable "expense and privations" many could ill afford. "The treatment of tuberculosis is expensive," he noted, "because it means the best of food, the best of care, and the best of surroundings."²⁹

Budget Woes in the New Army

Creating community, stability, and good patient care at Fitzsimons during the 1920s was not easy. After having four commanders in its first two years, Fitzsimons acquired more stable management in 1920. Colonel (Col.) William H. Moncrief Sr. (Figure 5-4) served as commander from September 1920 to August 1923, followed by Col. Paul C. Hutton (Figure 5-5), who ran Fitzsimons until September 1929.³⁰ Moncrief was a surgeon rather than a tuberculosis specialist, and never had active tuberculosis, but Hutton was intimately familiar with the disease. He had developed tuberculosis while on duty in the Philippines and went to Fort Bayard for treatment in 1905. Upon recovery, Hutton returned to duty as a medical officer at Fort Bayard. When transferred to Fort Seward in Alaska he investigated tuberculosis among Indian and Inuit peoples, in addition to his other duties. As a hospital in-



Figure 5-4. William H. Moncrief, commanding officer, Fitzsimons General Hospital, 1920–23. Photograph courtesy of the National Library of Medicine, Image #B019314.

spector after the war he visited Fitzsimons General Hospital seven times so that by 1923, according to the *Rocky Mountain News*, he was “perfectly familiar with every detail concerning it.”³¹ Also a student of Bushnell, Hutton carried on Bushnell’s horticulture tradition, building greenhouses to furnish flowers for the hospital wards.

Moncrief and Hutton led Fitzsimons during a time of persistent budget and personnel shortfalls as Congress consistently reduced troop levels and cut War Department funding. The Department had proposed a peacetime Army of 500,000, but Congress—reflecting the nation’s rejection of military and international involvement—was almost hostile to the military and authorized only 280,000 men in the National Defense Act of 1920 and further reduced troop numbers to 175,000 in 1922.³² Army strength reached a low of 119,000 enlisted men and 12,000 officers in 1929 and stayed there for several years. The Medical Department shrank to a low of 11,535 in 1939 and the Surgeon General’s staff fell from 2,100 during the war to only 177 people in 1934.³³ The National Defense Act of 1920 did promote the Surgeon General to the rank of major general, authorize relative military rank for members of the Army Nurse Corps, and create the Medical Administrative Corps to free physicians from paperwork. It also limited the Medical Department to only 5 percent of the strength of the Regular Army, below the 7 percent the Department recommended for peacetime. The Act based promotion on length of service instead of relative seniority, which meant that officers had to serve a certain number of years before promotion, regardless of vacancies in higher ranks.³⁴

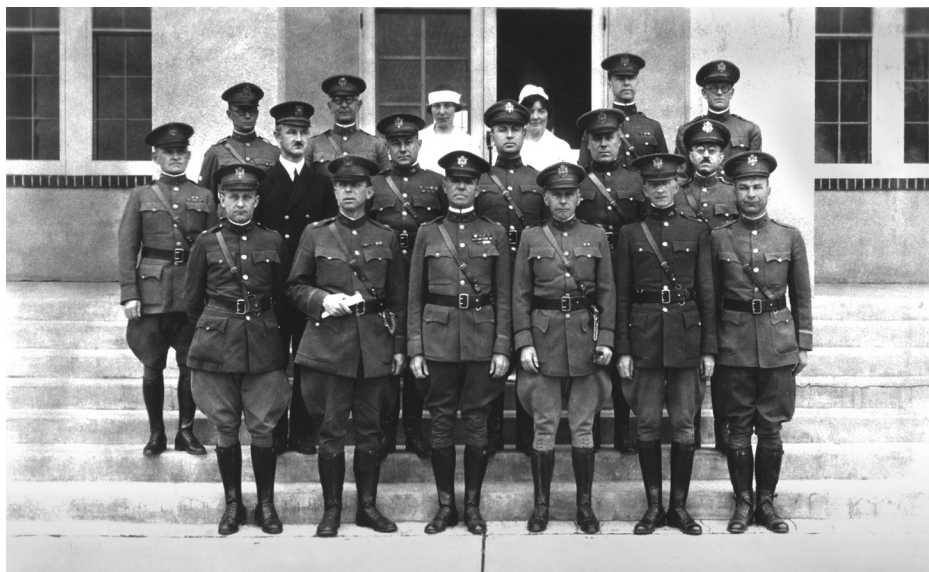


Figure 5-5. U.S. Army, Fitzsimons General Hospital, Denver, Colorado, Commanding Officer Colonel Paul C. Hutton (front row, third from left), and staff in the mid-1920s. Photograph courtesy of the National Library of Medicine, Image # A07785.

As private medical practice became increasingly lucrative during the 1920s, such provisions made it difficult to maintain a robust Medical Corps. Fitzsimons quartermaster Edgar W. Mumford told a Senate committee in 1921 that he had difficulty providing affordable housing to officers, and "I know a great many of these doctors will resign if their pay is reduced; they just can not get by."³⁵ Medical officers testified that they could not stay in the military service because they could not afford to send their children to college, maintain servants, or buy the requisite uniforms. Unmoved, Congress reduced the size of the Medical Corps, Medical Administrative Corps, Dental Corps, and Veterinary Corps to only 1,055, which required the Surgeon General to discharge more than 200 officers in 1922. Others resigned in response to the policy, leaving the department understaffed for years.³⁶ As historian Richard Ginn notes, "The department was held in high esteem by neither the civilian medical establishment nor the Army, and it experienced difficulty in recruiting qualified applicants."³⁷ In 1927 only thirty-five physicians took the entrance exam, and all but seventeen failed. Throughout the 1920s, Surgeon General Ireland struggled to maintain the personnel and resources he believed essential to meet the medical needs of the Army. One year he warned the Secretary of War, "In my opinion the Medical Department is less well prepared for field service than before the war with Germany."³⁸

In 1922 congressionally mandated staff reductions required Fitzsimons to cut six of fifty-six officers. The Office of The Surgeon General told the commander, Moncrief, that fifty medical officers should suffice to meet the "minimum needs" of the hospital, adding superfluously, "we are expecting our officers everywhere to do more work."³⁹ Moncrief already faced a personnel shortage due to the recent arrival of 100 new Naval patients. He had three officers on sick report and others he considered unsatisfactory. In one case the hospital neurologist "is really not a neurologist, but a psychiatrist only, and Bruns tells me that he has not enough confidence in his judgement."⁴⁰ Staff cuts had made it "extremely difficult to maintain the desired morale," Moncrief reported in 1923. Without job security, medical officers "were not as keenly interested in the performance of their duties or in their professional advancement as would normally have been expected."⁴¹ In 1926, laboratory personnel changed so often that they were not properly trained, and three years later Bruns warned Washington that "the shortage of medical officer personnel is interfering materially with the treatment of our patients."⁴² This was compounded by the fact that the patient mix had become so much older and sicker that in 1929 Bruns had to reconfigure Fitzsimons tuberculosis units from one infirmary and two ambulatory wards to two infirmaries and one ambulatory ward. Bruns explained, "Most of the Veterans' Bureau tuberculous patients are far advanced cases who live in this vicinity and only come into the hospital when they have a flareup or an exacerbation of their disease." Consequently, "it is almost impossible for [a Fitzsimons medical officer] to supervise the treatment of all his patients, his time being devoted almost entirely to treating the very sick patients in the infirmary ward."⁴³ Enlisted personnel were lacking as well. In 1924 Fitzsimons was able to employ only 380 of the 450 employees they deemed necessary.⁴⁴ Funds for medical supplies and construction were also limited, though surplus war equipment and supplies lasted through the decade.

Staffing shortages and budget cuts required streamlining operations, adopting corporate management techniques, and cooperating with civilians.⁴⁵ In the medical field, Army hospitals such as Fitzsimons hired nurses from local areas and trained student nurses from three Denver area nursing schools in hopes of recruiting them for the Army Nurse Corps. In 1924 only 20 percent of the nursing staff was from the Army Nurse Corps and 8 percent from the Army Nurse Reserve Corps. The Fitzsimons chief nurse had to hire the remaining 72 percent from the local civilian nurse population and instruct them in military medical policy, procedures, and culture.⁴⁶ In 1929, to supplement its dwindling supply of medical officers, the Medical Department began requiring medical school graduates who held Army internships to remain in the Medical Corps for at least three years.⁴⁷

In the postwar years, therefore, the U.S. Congress squeezed War Department budgets at a time when modern laboratory and surgical medicine made it increasingly expensive for the Army Medical Department to furnish and maintain hospitals. These budget pressures extended throughout the War Department and other branches of government, and when they hit the Veterans' Bureau, they intensified the Medical Department and Fitzsimons' problems.

Structuring Veterans' Benefits

Although Fitzsimons was an Army hospital, of its patients, a majority—74 percent in 1924—was veteran rather than active duty—a much larger percentage than any other Army hospital.⁴⁸ It was increasingly costly to provide tuberculosis care for these veterans, thanks to the legislative expansion of benefits for veterans with tuberculosis and expensive new forms of treatment available. Paying for those treatments, moreover, was complicated not only by the complexities of tuberculosis, but also by a continually changing and confusing government payment system.

Much of the historical attention to veterans' benefits during the interwar period has focused on the Adjusted Compensation Act of 1924, better known as the "Bonus Act" by which Congress awarded a lump sum payment to World War I veterans.⁴⁹ The bonus was in the form of a savings bond due to mature in 1945, but during the Depression economically suffering veterans launched a campaign demanding immediate payment from Washington, which culminated in the dramatic Veterans Bonus March of 1932. Although the bonus ultimately paid out in the 1930s, costing the U.S. Treasury \$3.8 billion, the lesser known story is that the government spent more than two and a half times that (\$10.2 billion) on medical and hospital costs and disability payments to World War I veterans during the interwar period.⁵⁰ In response to complaints and petitions from ailing veterans and their interest groups, Congress amended veterans benefits laws at least nineteen times in the decade following the war, generating a patchwork of benefits. Not surprisingly, much of the debate and legislation concerned tuberculosis, which was the single largest cause of disability payments for disease during the 1920s, claiming almost a quarter of all benefits.⁵¹ The evolution of these tuberculosis

benefits and their administration reveals the difficult if not impossible task of defining and legislating the circumstances under which veterans who developed tuberculosis merited government support.

The Medical Department had long avoided a heavy cost burden by simply discharging enlisted men with tuberculosis from the Army roster to the Soldiers' Home disability rolls so that the Home would assume payments and the patients could continue their hospitalization undisturbed. But by 1928 the Office of The Surgeon General told Hutton that "a great deal of pressure was [being] brought to bear from the Soldiers' Home authorities because of their lack of funds," so that Fitzsimons should retain tuberculosis patients—and the cost of their care—through their enlistment terms.⁵² This practice added to the Medical Department's burden of tuberculosis treatment. At \$4.50 a day, Fitzsimons' costs were comparable to those in other Army general hospitals. But this was about three times the cost of prewar tuberculosis hospital care.⁵³

Administration

When the United States went to war in 1917 many in the Wilson Administration and Congress wanted to avoid a repetition of the late nineteenth-century situation whereby political parties competed for the veterans' vote by repeatedly expanding federal benefits for veterans and their families. By 1890 more than 40 percent of the federal budget went to Civil War veterans, and by 1915 virtually all veterans—93 percent—were receiving a federal pension.⁵⁴ Wishing to avoid similar long-term payments, the Wilson Administration did, however, recognize that a draft to build sufficient troop strength to fight this new war would lead to political expectations that the government would care for soldiers, sailors, Marines, and their families if military personnel were killed, wounded, or became sick in service. "It would be nothing less than a crime," Secretary of the Treasury William McAdoo told the Congress, "for a rich and just Government to treat its fighting men so heartlessly and to subject their dependent wives and children, who are unable to fight, to greater suffering than if they could fight."⁵⁵ The government thus sought to provide benefits based entirely on *compensation* for lost income and injury, and not *gratitude* for service to their country.⁵⁶ The United States would care for sick and injured veterans, but healthy surviving veterans should not expect long-term government support.

Congress began by passing the War Risk Insurance Act of 1917, which provided four kinds of benefits: (1) a family allotment of soldiers' pay to replace the loss of the breadwinner; (2) automatic compensation for death and disability; (3) additional, optional, government-subsidized life insurance of \$10,000 per soldier; and (4) medical care in government hospitals. Army hospitals initially provided this last benefit because Congress failed to authorize or fund additional hospitals for this care. Congress also created the Federal Bureau of Vocational Education to provide rehabilitation training and payments to disabled soldiers. These programs did not include pensions, but, according to one historian, they "established unprecedented health care, disability, vocational rehabilitation, and

survivors' benefits for World War I servicemen and their dependents."⁵⁷ After the war, thousands of these men remained in government hospitals; as of May 1921, the Bureau of War Risk Insurance was supporting 26,266 hospitalized patients, and at least 10,000 of them were suffering from tuberculosis.⁵⁸

As thousands of sick and injured veterans overwhelmed Army and Navy hospitals, Congress turned to the Public Health Service (PHS) in March 1919 "to provide hospital and sanatorium facilities for discharged sick and disabled soldiers, sailors, and marines; Army and Navy nurses, male and female; patients of the War Risk Insurance Bureau; and other legal beneficiaries of the Public Health Service."⁵⁹ Established in 1798 for the care of sick and disabled seamen, the PHS had a long history of caring for sailors and members of the Merchant Marine, but it was not prepared for the scale of damage wrought by industrial warfare. Between March 1919 and June 1922 the PHS admitted 264,000 veterans for more than 14 million hospital days, and at a 1922 medical conference the PHS Surgeon General, Hugh S. Cumming, reported that approximately one-third of the patients in veterans' hospitals had tuberculosis.⁶⁰ Although the PHS operated twenty hospitals, it, too, was soon overwhelmed. Few had foreseen the magnitude of the tuberculosis problem. As two former Army medical officers, George T. Palmer and Henry W. Hoagland, wrote in 1921, "Neither in hospitals, sanatoria, nursing service nor competent medical personnel were we prepared for the great increase in recognized tuberculosis among our soldiers, sailors, marines and nurses." It was, they said, a "gigantic task," and the problem would endure "for perhaps twenty years to come."⁶¹ The proliferation of agencies added to the confusing flood of patients. Because of Congress's patchwork approach to benefits, soldiers and veterans with tuberculosis had to go to the Bureau of War Risk Insurance for disability payments, to the Veterans Rehabilitation Bureau for disability training, and either the PHS or the Army or Navy medical departments for medical and hospitalization benefits. Veterans and their families complained to their government representatives about the bureaucratic nightmare. Veterans' benefits program administration was, one official later noted, "almost indescribably bad."⁶²

Chaos reigned as to which agency was paying for what services for whom. In April 1920, Fitzsimons had about 800 vacant beds, but it could not admit several hundred discharged soldiers with tuberculosis because of bureaucratic red tape among various agencies.⁶³ Twelve hundred tuberculous veterans, in "a common battle against the life-sapping disease," converged on Tucson to compete for 278 tuberculosis beds available at the veterans' hospital there. The local newspaper headline read, "United States Red Tape Leaves Stricken War Vets to Die on the Streets of Tucson."⁶⁴ At the same time, some veterans received duplicate benefits. Fitzsimons commander Moncrief complained that it was unfair that veterans who received both Soldiers' Home and veterans' benefits could "pool their privileges and select the best from both sources," but the War Department avoided confronting that thorny issue.⁶⁵

The Senate responded to the outcry by appointing a committee to investigate the administration of veterans' benefits, and it soon found that "unexplainable delays, confusion, red tape, complications, and intricate, slow-moving machin-

ery have combined to increase the difficulties of the incapacitated ex-servicemen to the highest possible point in securing the compensation or aid to which they are entitled." The committee's July 1921 report described how the Federal Board for Vocational Education and War Risk Insurance conducted separate, duplicative physical examinations that confused veterans, and warned, "It would be unpardonable for Congress to tolerate a further continuation of the cumbersome, overlapping, haphazard methods under which this problem is being handled." The committee also stated, "we are convinced that there are not sufficient hospital facilities for attending to the two special cases of disease resulting from this war, neuropsychiatric and pulmonary tuberculosis."⁶⁶ A presidential committee had come to a similar conclusion, stating that because of the multiple government agencies, "There is no one in control of the whole situation."⁶⁷ Both committees recommended a single agency to handle veterans' benefits.

Congress responded by creating the Veterans' Bureau, and on 29 April 1922, the PHS transferred to the new agency fifty-seven hospitals (including Fort Bayard and several other Army tuberculosis hospitals), with 17,000 beds, 13,000 patients, 1,400 nurses, and 900 physicians and dentists.⁶⁸ The Bureau took over responsibilities of insurance, vocational education, and hospital care. Unfortunately, it began in scandal when the first director, Col. Charles R. Forbes, appointed by President William G. Harding, was convicted of fraud and sent to prison for selling off PHS surplus supplies and skimming funds from Veterans' Bureau accounts.⁶⁹ The appointment of former Army officer Frank Hines as Veterans' Bureau director in 1923 put the agency on more solid footing. In 1930, President Herbert Hoover consolidated all veterans programs, including Civil War pensions and the soldiers' homes, under one agency and renamed it the Veterans Administration, with Hines serving as director until 1945.

Eligibility

A single government agency, however, would not solve the problem of who was eligible for benefits and who was not. Regarding tuberculosis, the challenge was in determining whether soldiers and nurses who developed active disease after they had left military service had contracted it while in the Army—whether it was "service-connected." As with heart disease and some mental disorders, it was difficult, if not impossible, to determine the time and/or cause of onset of the tuberculosis infection.⁷⁰ At first the Medical Department ruled that men who developed tuberculosis in the first three months of service were not eligible for benefits because they most likely did not get the disease in the Army. But when trainees were discharged for tuberculosis without treatment several members of Congress protested this as an unfair denial of aid. The Medical Department reversed the policy and provided hospital and medical benefits to all military personnel diagnosed with tuberculosis, regardless of when they developed the disease, until they had received the maximum benefit of medical treatment. In 1918 Congress stipulated that every member of the Armed Forces should be presumed to be healthy upon entering the service and therefore entitled to compensation for subsequent

illness or injury. During the war, therefore, the government discharged on disability about 20,000 men for tuberculosis and these men crowded the hospitals and depleted Medical Department resources.⁷¹ After the Armistice, medical discharge examinations found several thousand more cases of active tuberculosis among outgoing soldiers who also required government hospitalization.⁷²

But what of former soldiers who developed tuberculosis soon after discharge from the military? When government officials told such veterans that they were not eligible for benefits, some petitioned their congressional representatives for private compensation bills and Congress passed numerous bills awarding benefits to individuals who had been able to convince their senator or congressman of the merit of their particular case.⁷³ But this piecemeal and cumbersome approach lacked fairness, causing powerful interest groups such as the American Legion, Veterans of Foreign Wars, and Disabled American Veterans to take up the issue. The Legion was the largest, richest, and most influential of these groups, with some one million members in the 1920s. Awash in petitions and feeling the pressure, Congress sought a more efficient and equitable solution. In 1921 it stipulated that veterans with active tuberculosis or a neuropsychiatric disease causing a 10 percent disability within two years of service would be considered to have acquired it in the conduct of duty and be eligible for disability benefits. As the two-year time period expired, though, veterans with newly diagnosed tuberculosis or other ailments continued to accumulate, so Congress created a Committee on World War Veterans' Legislation to assess the problem. After holding thirty-one days of hearings and considering 200 amendments to the law, Congress passed the World War Veterans' Act of June 1924, expanding and bringing together into one program the various provisions governing veterans' benefits. As one observer put it, "The bill liberalizes the law in nearly every particular that we could liberalize it."⁷⁴ One key measure was a "presumption of service origin" stating that veterans who developed tuberculosis (or neuropsychiatric diseases, paralysis, encephalitis, or amoebic dysentery) between 6 April 1917, when the United States entered World War I, and 1 January 1925, were presumed to have contracted it during their military service and were eligible for government hospital and disability benefits.⁷⁵ One critic commented that the World War Veterans' Act amounted to "diagnosis by statute."⁷⁶ The measure added about 100,000 additional beneficiaries between 1926 and 1932, bestowing benefits, by one count, on a total of 328,658 veterans, almost 64,000 of them with tuberculosis.⁷⁷

Disability

Determining who was eligible for benefits and which agency would provide them, however, did not solve the problem of how to calculate the degree of disability a veteran suffered or at what rate and for how long he should be compensated.⁷⁸ The World War Veterans' Act of 1924 directed the Veterans' Bureau to establish a table to calculate the extent of disabilities suffered by the nation's veterans, to create a rating system to calculate the degree of disability for various injuries and illnesses, and to award compensation accordingly. This table was

heatedly contested by veterans and the federal government because it set out formulas that many people considered arbitrary. For example, a soldier who lost an arm was deemed 25 percent disabled while one who lost both arms or his sight was 100 percent disabled.⁷⁹

But what about veterans with tuberculosis? Although a man could not recover an amputated arm or leg, some tuberculosis patients could recover their health. As with heart disease, tuberculosis could be mild, moderate, or severe; it could be aggravated by work or stress; and like mental illness, people could repeatedly recover and relapse. But did that mean that benefits should be terminated when a veteran's health improved? No, said Rep. Carroll Reece of Tennessee, who had a large number of tubercular ex-servicemen and a large tuberculosis sanatorium in his district. As he told his colleagues on the House floor, "Experts are agreed that there is no permanent cure for tuberculosis," Reece explained, but rather the disease is either "active or arrested." "By arrested is meant the germ is temporarily inactive, but will become active upon the slightest provocation." He argued therefore that "a system of permanent rating for the tuberculars must be adopted" to enable them to live peacefully with their disease quiescent. Reducing benefits when the tuberculosis was arrested would require the veteran to go back to work to support his family, even though it could shorten his life. "The conditions under which the tubercular patient may live," he said, "together with the resulting mental ease or mental disquietude, largely affect his power of resistance." Such work and worry could reactivate the disease, causing veterans who had been discharged as "arrested" to return to government hospitals as reactivated cases.⁸⁰

Faced with such arguments, in January 1926 the Special Committee on World War Veterans Legislation considered provisions to determine disability payments for tubercular veterans, which included designations such as "temporary total disability" for patients in the hospital who were expected to recover or "permanent partial benefits" for patients who could regain only a portion of their health. The discussion revealed the difficulty of writing laws and setting benefits for such a complex disease.⁸¹ Committee members tried to use analogies to understand tuberculosis, one member stating that "lung tuberculosis...cuts off a piece of that lung as definitely as an amputated limb, the amount depending on where the amputation takes place."⁸² One witness, Dr. William LeRoy Dunn of Asheville, North Carolina, employed a horsepower metaphor, explaining that a healthy man operated at 100 horsepower, but a man who had active tuberculosis, even if he recovered, would never operate at full capacity again. "It may be 50, 70, 80, or 90 horsepower," he said. "He is safe at or under 90 horsepower, but you can not safely work him at 100 or 110...because he would get into trouble and burn out something."⁸³

During one hearing committee members sparred verbally with tuberculosis specialists Dunn and Dr. Kenneth Dunham of the University of Cincinnati, both of whom worked with the American Legion and advised the Veterans' Bureau. The issue was the extent to which tuberculosis disabled an individual. When the physicians insisted that a 10 percent disability rating was too low, the committee tried to get them to recommend a single disability rating. They demurred. Every patient

was different, they said, depending on the man, the extent of his disease, his occupation, and where he lived. Textile workers or miners, for instance, would be more likely to reactivate their disease than men working outdoors.⁸⁴ The witnesses agreed that tuberculosis disability typically exceeded 25 percent, but insisted that “it is almost impossible for the average doctor to exactly evaluate your disability in tuberculosis.”⁸⁵ Members of Congress grappled with the difference between arrested and cured tuberculosis. One representative asked, “A man is never cured of tuberculosis?” to which the physician replied, “In a pathological sense he is never cured, practically speaking.” The congressman therefore concluded, “If he is never cured he must have a handicap.”⁸⁶ Another, Rep. John Rankin of Mississippi, asked, “Do you concede there is any such thing as a cured case of tuberculosis?” to which Dunn replied, “No, sir.” “You never go further, then, than arrested?” asked Rankin. “No,” replied Dunn.⁸⁷ Dunham finally suggested that Congress sidestep “a lot of intricate, difficult medical judgment” and simply to say that if a man had had tuberculosis, he should be given \$50 [50 percent disability] a month.⁸⁸ Veterans’ Bureau Director Hines quickly pointed out that “Now of course, a provision of a flat rate covering any disability is getting close to the pension system which I understand the ex-service men desire to avoid and most certainly we do.”⁸⁹ He did not, however, oppose the proposal.

The spectre of thousands of veterans individually appealing to their elected officials for assistance caused Congress in July 1926 to approve a single standard for a permanent 50 percent disability for ex-servicemen with “arrested tuberculosis.”⁹⁰ This provision, called the “statutory tuberculosis award,” more than tripled the number of veterans covered from 12,019 in 1926 to 38,701 two years later, and increased the average payment to tuberculous veterans from \$16.80 a month to just under \$50.00 a month.⁹¹ Military tuberculosis patients had become a “vast monetary expense” for the government.⁹²

In 1930, twelve years after the end of the war, Congress awarded all disabled World War I veterans a new round of disability benefits in *gratitude* for wartime service. These non-service-connected benefits increased the pension rolls from 229,568 beneficiaries receiving \$29.6 million in 1931 to 407,584 beneficiaries receiving \$75.4 million in 1932.⁹³ Historian Walter Hickel has concluded that “despite the intentions of the War Risk Insurance Act’s framers, compensation had become recompense for military service rather than for disability and its economic effect on veterans.”⁹⁴ Veterans and their advocates were so successful that by the early 1930s more than 90 percent of federal social spending was on veterans’ benefits.

Tuberculosis Rehabilitation

Veterans’ rehabilitation programs also affected Army hospitals and government coffers by adding weeks or months to the time disabled soldiers were hospitalized.⁹⁵ Like many war wounds, tuberculosis robbed its victims of the energy and strength required for physical labor, long workdays, or simply living. Rehabilitation was intended to restore disabled men to productive work. It had nineteenth-century

roots in efforts to educate and train freed slaves after emancipation and in Progressive Era efforts to retrain victims of industrial accidents for new occupations and help immigrants and the poor support themselves.⁹⁶ These programs did not require the labor market to make allowances for the needs of the disabled, but focused instead on helping the freedman, disabled worker, immigrant, or veteran adjust to the economy. Before the war, prevailing views held that disabled men were diminished individuals—but thousands of injured American war veterans (and millions in Europe) who were warriors and heroes challenged that view. Manpower needs did as well. During the war, the Army Medical Department sought to conserve military manpower by establishing convalescent camps in the United States and France to allow men temporarily disabled by illness or injury to recover and then return to active duty. Some medical officers suggested that such men could be employed in a "Limited Service Corps," working in fields such as telegraphy or photography, and thereby free up physically fit men for combat duty.⁹⁷

Wartime rehabilitation programs also represented the government's commitment to help individual soldiers return to civil life as fit and productive as they could be.⁹⁸ To this end the Vocational Rehabilitation Act of 1918 provided rehabilitation training to soldiers eligible for disability compensation. The Act and subsequent amendments authorized up to four years of training and a monthly stipend during training. The program ran until June 1928; 25 percent of the almost 130,000 veterans who completed the training courses suffered from tuberculosis. (About half had orthopedic impairment or medical problems such as injuries to the lungs from chemical weapons, while 25 percent suffered from "shell shock" or other neuropsychiatric problems; only about 5,000 were amputees.)⁹⁹

Earl Bruns was an early advocate of rehabilitation, writing in 1918 that, "the whole plan of reconstruction in tuberculosis, as well as other diseases and injuries, is to guide our disabled soldiers back to health and useful employment, imbued with the idea that they are still serviceable citizens and not candidates for soldiers' homes and an existence spent in idleness."¹⁰⁰ During Bruns' tenure at Fitzsimons, the hospital advocated a "Creed of the Disabled Soldier," which stated, "Once more to be useful—to see pity in the eyes of my friends replaced with commendation—to work, produce, provide, and to feel that I have a place in the world—a MAN among MEN in spite of this physical handicap."¹⁰¹ Tuberculosis patients and other veterans with damaged lungs (generally from chemical weapons or severe pneumonia) needed exercise and physical therapy to help restore their breathing capacity. Fitzsimons had both a Physiotherapy Department and an Education Department that offered vocational rehabilitation and recreational activities (Figures 5-6 and 5-7).¹⁰² During the 1920s, the physiotherapy department had eight to ten aides who provided more than 90,000 treatments annually, including massages, heat and light treatments, and electro- and hydrotherapy.¹⁰³ As medical chief at Fitzsimons, Bruns instituted a highly structured exercise program. When tuberculosis patients no longer had temperatures and were otherwise ready, they could begin to exercise in the wards for fifteen minutes a day, increasing up to an hour, after which they could join one of four walking classes progressing in length. Distances for each class were marked off on one of the hospital roads, as Bruns explained, with each class "walking at a certain



Figure 5-6. Interior view of vocational training classroom, Fitzsimons General Hospital, 1921, Scrapbook of L. E. Burns. Photograph courtesy of the Denver Public Library, Western Historical Collection, Image #Z-385.

pace to a designated point, resting a stated number of minutes, and returning at the same pace to the starting point.” Upon their return to the wards, nurses recorded a patient’s temperature, pulse, and respiration. Patients could advance from one class to another on a weekly basis and complete all four in a month. Bruns believed that “the work done by this department is of great value” and would not allow any vocational or educational classes to interfere with patients’ physical exercises.¹⁰⁴

Vocational rehabilitation was intended to prepare Fitzsimons patients for life after discharge from the hospital, while the recreational activities were designed to keep them from being bored or depressed during their long months of rest treatment. As one medical officer remarked, “The brains of some of these men are very, very active. It is important for the man to forget the process going on in his lungs and divert his mind by some light occupational exercise.”¹⁰⁵ The Education Department offered academic instruction in twenty-three subjects and vocational training in fields such as radio, cabinetry, mechanical and architectural drawing, agriculture, and raising poultry. In 1925, more than 700 patients took such courses. The Department proudly reported that colleges and universities accepted the academic courses for credit and that many patients “have perfected their talent to such an extent that they can, in cases of necessity, after leaving the hospital, use their knowledge in a business way.”¹⁰⁶

These programs all required additional space, equipment, supplies, and specially trained staff, all of which added to the cost of treatment. Decades later, a presidential commission evaluating veterans’ programs concluded that the federal



Figure 5-7. Rehabilitation Staff of the Education Department, Fitzsimons General Hospital, 1920.

Photograph courtesy of the Denver Public Library, Western Historical Collection, Image #Z-382.

rehabilitation program fell short of its goals because “the task of providing vocational rehabilitation to disabled veterans of World War I was much larger than anyone had estimated.” If some benefited from rehabilitation training, “undue liberalization of the laws and lax administration permitted too many men to come under its provision and enroll in courses from which they could gain very limited, if any[,] benefits and increased the cost of the program to an unwarranted level.”¹⁰⁷ Approximately 675,500 veterans applied for benefits, but federal officials deemed only about half of them eligible. Of those, 180,000 entered training, and 129,000 successfully completed their training courses. The program ultimately cost about \$645 million.¹⁰⁸

Invasive Therapies for Tuberculosis

In addition to rehabilitation, tuberculosis specialists developed a number of new therapies that increased the time and the cost of care for tuberculosis patients. By the end of the 1920s tuberculosis patients stayed in the hospital on average almost a year longer than those with any other diagnosis, including mental illnesses. Sexually transmitted diseases accounted for the greatest number of patient-days

due to the high infection rates, but tuberculosis ranked second during much of the interwar period. During the years 1929 to 1931, for example, gonorrhea accounted for approximately 150,000 days lost in the Army annually compared to 100,000 days lost to tuberculosis each year. Sexually transmitted diseases, however, required only a few weeks of hospitalization, while the average days per tuberculosis case ranged from 267 to 327.¹⁰⁹

Although tuberculosis rates in the United States were declining due to improved standards of living and control measures, treatment for those who contracted the disease proved frustratingly elusive to tuberculosis specialists—a generation of sanatorium and bed-rest therapy had failed to yield effective results. At the 1927 National Tuberculosis Association annual meeting PHS scientist William Charles White noted, “Because all the world longs for a cure for tuberculosis.... Not a year passes without at least one such claim.” He dismissed as useless, for example, a drug called Sanocrysin, made of gold salts, as well as the “Spahlinger Cure,” which involved twenty injections of a special compound. “One must draw a line of distinction between actual progress and the proclamation of progress,” he observed.¹¹⁰ Another speaker noted that because incipient or mild cases of tuberculosis had better recovery rates than serious cases, the current challenge to tuberculosis control was to “identify those incipient cases of tuberculosis.”¹¹¹ Tuberculin was an important tool in this effort. Though it was a failure as a tuberculosis cure, tuberculin did provide an effective test to determine if someone was infected with tuberculosis bacteria. During the interwar period, colleges, universities, and medical schools began giving students periodic tuberculin tests to monitor the extent and spread of the disease within their institutions.¹¹² Under the New Deal during the 1930s, the PHS also launched a health surveillance program to identify people with active tuberculosis to isolate and treat them.¹¹³

But early detection did little for those who were already very sick. To treat those patients, physicians continued to pursue new therapies. At Fitzsimons, in addition to bedrest and rehabilitation programs, medical officers tried new drugs, electro- and hydrotherapy, prolonged exposure of parts of the body to the sun, and “collapse therapy,” designed to help a diseased lung to heal itself through rest. These procedures, employed by civilian physicians as well as military, included “artificial pneumothorax,” which involved the injection of air or some other substance outside the lining of the lung to collapse it temporarily; “phrenectomy,” crushing or excising part of the phrenic nerve, which controls the movement of the diaphragm, to slow breathing; and “thoracoplasty,” surgery that removed portions of ribs to enable the lung to collapse permanently.¹¹⁴

In the 1920s, all Fitzsimons medical officers attended a year-long course of instruction on tuberculosis and diseases of the chest taught by Bruns and others.¹¹⁵ One of the students, Robert A. Bier, saved the mimeographed notes of Bruns’ weekly lectures from 1926 and 1927 that profiled tuberculosis treatment at Fitzsimons during this time.¹¹⁶ Bruns began his lecture series with an overview of the effects of tuberculosis on various parts of the body ranging from the characteristics of healed tuberculosis lesions on bones and soft tissues to the ultimate consumption of the lungs and other vital organs. He recommended conducting autops-

sies on every deceased patient because "no two cases were alike." Tuberculosis autopsies, he said, would make physicians "better diagnosticians, more accurate prognosticians, and safer therapists" because the information would enable the physician to correlate symptoms and physical signs, identify errors in diagnosis, and help in the interpretation of shadows on chest X-rays.¹¹⁷

Bruns distinguished between tuberculosis infection and tuberculosis disease, noting that infection could be detected simply with a tuberculin test, while the disease diagnosis required X-ray findings, physical signs, positive sputum tests, and symptoms such as cough and fever. In the same lecture Bruns defined "quiescent" tuberculosis as the "absence of all constitutional symptoms, [though] expectoration and bacilli may or may not be present," and "arrested" tuberculosis whereby "all constitutional symptoms and expectoration with bacilli [are] absent for a period of six months." He asserted that although tuberculosis bacilli in the sputum usually suggested tubercular activity, "a patient may have an old fibrous lesion with a thick walled cavity throwing out tubercle bacilli and still be in good health." Such a case, he said, "should be considered inactive." Bruns further complicated the diagnostics for his students by including a new partner in the task: the federal government. As he told the legislators, after Congress determined that the Veterans' Bureau should compensate beneficiaries with "active" tuberculosis, it had to *define* "active." A special government committee therefore defined active pulmonary tuberculosis as involving two or more of the following six characteristics: (1) sputum positive for tuberculosis bacilli; (2) inflammation and fluid in the lining of the lungs; (3) a cavity or collapse of the lung tissue; (4) active tuberculous lesions detected by physical examination; (5) shadows or other indications on chest X-rays; or (6) symptoms suggesting tuberculosis such as fever, weight loss, and rapid pulse.¹¹⁸ Given the complexity and difficulty of diagnosing tuberculosis this definition may have actually helped to clarify the process.

Bruns recognized the importance of X-ray, but believed that X-ray technology caused some physicians to neglect the extended, one-hour physical examination that was crucial to confirming radiological findings. Furthermore, X-ray machines and expertise were not always available and did not explain the origin or progress of the disease nor detect early or fresh lesions. Ever the Bushnell student, Bruns devoted four lectures to the physical examination of the chest, including one on the "Normal Chest" to provide a baseline of chest sounds to avoid erroneous diagnoses. He identified four kinds of cough—"dry, productive, paroxysmal, and emetic"—and offered a vivid description of sputum, noting "there is nothing typical about sputum in tuberculosis." It could be scanty or profuse, "usually odorless, but at times acquires a very disagreeable sweetish and nauseating odor." In far-advanced disease, it was "gray or greenish in color, made up of roundish and coin-shaped masses, which float around or sink to the bottom in the fluid mucous or saliva part of the sputum."¹¹⁹

Regarding treatment, Bruns noted that since the late nineteenth century, "Very little of importance has since been added to the treatment of tuberculosis, except tuberculin, pneumothorax, heliotherapy, and thoracoplasty."¹²⁰ But by the 1920s, the rest treatment appeared to have approached heroic proportions; Bruns recommended rest therapy from six months to "several years." Fitzsimons personnel

taught patients to lay completely at rest with muscles relaxed. This “jelly fishing,” as Bruns called it, allowed “respirations [to] become shallow and fewer. The patient scarcely breathes with the affected upper parts of his lungs, and thus quiescent, the activity of the lesions subsides and healing occurs.” Such rest must, Bruns underlined, be in the open air. Mental rest was important as well, so “too much reading, studying and conversing should not be allowed.” Regarding nutrition, he recommended vegetables such as spinach and carrots and “Bergundy [*sic*] or claret wines,” but he also believed that “gain in weight is stressed too much,” and that there was “nothing to be combated more energetically by the doctor than the tendency of tuberculosis patients to overeat.”¹²¹

Bruns was skeptical of some new therapies: “I believe it is a mistake to introduce into our army sanatoria every new treatment that comes along.”¹²² Fitzsimons’ medical officers, for example, rejected an “ozone treatment” developed in France and the so-called Holderness-Brunson treatment, which involved deep inhalations.¹²³ They did experiment with therapies such as a hotbox to heat patients’ bodies and thereby kill germs, and X-rays to attack tubercular growths.¹²⁴ Fitzsimons personnel used codeine instead of morphine and heroin for the treatment of cough, and no longer prescribed creosote, arsenic, or mercury, which had been widely used in the nineteenth century. They did employ therapies such as intravenous calcium chloride for gastrointestinal tuberculosis, a “judicious combination of heliotherapy, bismuth paste, and tuberculin” to close tubercular sinuses, “intramuscular injections of iron and strychnine” to treat anemia, and electric cauterization of ulcers caused by tuberculosis laryngitis.¹²⁵ Bruns also counseled his students to maintain a positive attitude with their patients because the optimistic physician “by his own enthusiasm arouses the same hope and firm belief in the minds of his patients.” This, Bruns believed, was the “keystone” that “leads to recovery in the end.”¹²⁶ He also believed that good spirits were promoted by a healthy climate and plenty of sunshine.

Heliotherapy

In the nineteenth century, health seekers advocated the value of sunshine in the healing process and scientists observed that sunlight exposure could kill bacteria.¹²⁷ In 1903 Niels Ryber Finsen of Iceland received the Nobel Prize for his work on the effects of light on skin lesions, especially lupus vulgaris—tuberculosis of the skin.¹²⁸ At the same time, Swiss physician Augusto Rollier developed a method of applying sunlight to patients therapeutically, beginning with five minutes on the feet with patients lying on their stomachs and then five minutes while lying on their backs, moving up to uncover more of the body in five-minute intervals over succeeding days. Thus, after three weeks patients would lie completely exposed to the sun one hour or more on their backs and another hour on their fronts.¹²⁹ After Rollier’s method was described at an international tuberculosis conference in Rome in 1911, Americans began to adopt the approach and were soon debating the length of time and amount of skin to be exposed and devising various lamps to use during cloudy weather.

Sunlight had always been a key component of treatment at Fort Bayard, but after the war medical officers began to employ it scientifically and call it heliotherapy. Bruns became a strong advocate. In 1922, he persuaded the Army to construct sun porches on the wards (Figure 5-8), telling his commanding officer that heliotherapy was "no longer in the experimental stage and cannot be considered a fad."¹³⁰ In his lecture on heliotherapy Bruns said, "One cannot help being impressed with the improved spirit among the patients on a heliotherapy ward. As their skin bronzes, their weight and strength increase, and they are able to expose themselves to the elements like the hardy and rugged races of centuries ago."¹³¹ He acknowledged that it was not clear how heliotherapy worked, but that "the skin is said to be a great anti-body factory, and increased immunity results from a healthy and active condition."¹³² Bruns speculated that the sun weakened the bacteria, eased pain, and that given such "remarkable results...the scientific reason is therefore of secondary importance."¹³³ Furthermore, patients "improve so markedly in general health and appearance that it is no wonder that they become enthusiastic over the sun treatment and cooperate so closely with their physician."¹³⁴ Fitzsimons' medical officers employed heliotherapy for nontubercular diseases such as diabetes, kidney disease, and depression, and to treat tuberculosis infections from one end of the body to the other.¹³⁵ For tuberculosis of the larynx



Figure 5-8. U.S. Army, Fitzsimons General Hospital, Denver, Colorado, exterior view, heliotherapy ward from south porch, n.d.

Photograph courtesy of the National Library of Medicine, Image #A05002.

or the middle ear (otitis media) they used metal mirrors to project sunlight onto the inner tissue, beginning with just thirty seconds, and continuing up to ten minutes of exposure. For tuberculosis of the testicles or anal region, Bruns instructed, "The patient assumes the knee chest position, separates his buttocks, and exposes the anal region to the sun."¹³⁶

From 1922 through 1924 Bruns treated forty-five patients for Pott's Disease, or tuberculosis of the spine, with heliotherapy. Although many physicians performed surgery in an attempt to fuse deteriorated vertebrae, Bruns was reluctant to do so because "tuberculosis, no matter how it manifests itself, is a general disease and requires general treatment."¹³⁷ He required Pott's Disease patients to spend three years at Fitzsimons. During the first two years they stayed in bed with a plaster cast around the torso with a removable "trough" that allowed exposure of the spine to the sun. Patients could only lie flat on their backs or on their stomachs, resting on the elbows. Heliotherapy sessions ran two hours in the summer and three hours in the winter. In poor weather, patients rested under sunlamps (Figure 5-9). If X-rays showed that the spine had healed, usually after two years, Bruns put patients into a jacket with a metal brace for a year, during which time they

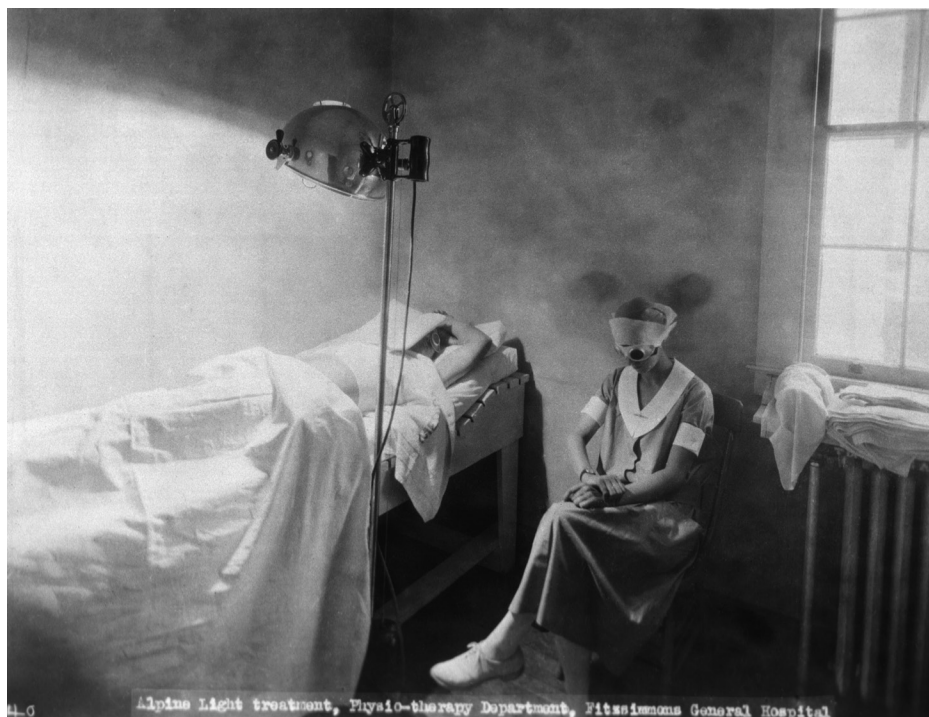


Figure 5-9. U.S. Army, Fitzsimons General Hospital, Denver, Colorado, alpine light treatment, Physiotherapy Department, patient attended by therapist, n.d. Photograph courtesy of the National Library of Medicine, Image #A07799.

continued heliotherapy and began graduated exercise. Bruns was delighted with the results after three years. Of forty-five cases, six were "apparently cured," six were "arrested," twenty-eight were improved, two patients died, and the remaining patients had complications or acted "against medical advice," presumably leaving the hospital. With results like this, in 1924, Surgeon General Merritte Ireland noted that heliotherapy had been employed at Fitzsimons "with excellent results."¹³⁸

Not all physicians were sanguine about the benefits of heliotherapy, and some cautioned that scientists did not yet understand how the sun acted on tuberculosis. A physician at the Jewish Consumptives' Relief Society sanatorium in Denver warned that heliotherapy could be as dangerous as tuberculosis if used "injudiciously," and another wrote that although heliotherapy might be valuable, "further investigation and many more scientific data are required before light should generally be prescribed" by physicians unfamiliar with the technique.¹³⁹ Such research did continue for decades and in the late 1980s, several groups of scientists were able to provide an explanation for why heliotherapy was effective: vitamin D. One group of researchers at the Webb-Waring Institute in Denver was able to "connect vitamin D, sunlight, and tuberculoimmunity and suggest that vitamin D should be considered a vital factor in the practical control of tuberculosis."¹⁴⁰ Fitzsimons' patients drank a lot of milk and often took cod liver oil, both of which contain vitamin D, so the sunlight could have activated the vitamin and supported the immune response against tuberculosis bacteria. Thus, as tuberculosis expert Michael Iseman writes, "Given what has subsequently been learned about the role of vitamin D as a potential enhancer of tuberculoimmunity, it is fascinating to consider that the physicians of this era may have stumbled onto early, valid forms of immunomodulation."¹⁴¹ Bruns and other physicians practiced what appeared to work, even though they did not understand it.

Artificial Pneumothorax

Bruns devoted several weeks of lectures to "collapse therapy," which predominated in the interwar period.¹⁴² Collapse therapy had two purposes. The first was to close lung cavities full of tuberculosis bacilli and thereby reduce the patient's bacterial load. As Bruns told his students, such cavities remained "as an active focus, excreting sputum swarming with tubercle bacilli, poisoning the lymph and blood with the products of the tubercle and mixed infection, and menacing the life of the individual."¹⁴³ The second purpose was an extension of the concept of rest therapy—if physicians could not get the patient to rest completely, they could at least "rest" the lung by reducing its size and/or retarding breathing. As historian Jack Spidle explains, "Instead of forcing the whole organism to rest in bed or on a chaise lounge, the diseased lung itself could be put at rest locally and allowed a chance to heal with the patient requiring much less extensive institutional care."¹⁴⁴ Collapse therapies were also intended to reduce the amount of dead and diseased tissue in the lungs and allow the beleaguered organs to recuperate. They involved a series of increasingly invasive procedures that ranged from temporarily collaps-

ing the diseased lung (artificial pneumothorax); to crushing or severing the nerve that controlled the diaphragm, paralyzing it on one side (phrenectomy); to rib removal that would permanently collapse the lung (thoracoplasty).

In earlier centuries, people had observed that tuberculosis sufferers sometimes improved after they experienced a spontaneous pneumothorax, the collapse of a lung. In the nineteenth century, some European physicians began to induce the process by compressing the lung using different methods and substances such as air, oil, paraffin, or even ping-pong balls.¹⁴⁵ American physicians did not adopt such artificial pneumothorax procedures until the 1910s. Medical officers at Fort Bayard did their first artificial pneumothorax in January 1913, and in the next four years gave the treatment to forty-nine patients. Forty of the patients had successful collapses, twenty-three of them dramatically improved, two patients soon died of heart failure, and eighteen left the hospital, their fate unrecorded.¹⁴⁶ The pace picked up at Fitzsimons after the war, where medical officers did 12,700 pneumothoraces during the 1920s. In 1932, one Fitzsimons unit gave pneumothorax treatment to 46.7 percent of its patients.¹⁴⁷ Other Army hospitals performed some pneumothorax procedures but generally transferred all active-duty tuberculosis patients to Fitzsimons and veterans with tuberculosis to Veterans Administration hospitals.¹⁴⁸

The pneumothorax was a familiar part of the landscape in tuberculosis sanatoriums between the wars. Patients with tuberculosis in just one lung were most suited for the procedure because their healthy lung could assume a greater burden. Physicians used only a local anesthetic to collapse the lung, but sought to minimize the pain because, as one team put it, "If the patient suffers at the first injection, he may not be persuaded to undergo the subsequent ones" and "may discourage other members of the same clinic from accepting the treatment."¹⁴⁹ With the patient lying on his or her side, arm raised overhead, the physician injected a needle between the ribs to insert air between the chest wall and the lung, thereby depressing the lung. The amount of air ranged from 500 to 1000 milliliters, and "refills" were required every few weeks as the air dissipated over time. Physicians used X-ray examinations to identify the section of lung to be collapsed and gauged improvement with subsequent X-rays and by observing changes in symptoms such as the reduction of fever or elimination of bacilli in the sputum. Many patients endured collapsed lungs (pneumothoraces) for a year or more. A woman at a civilian sanatorium wrote that "pneumothorax was a good friend to me," but after undergoing periodic injections for six years, she was "glad those days were gone."¹⁵⁰ Complications and dangers of the pneumothorax procedures included punctures of the lung, bronchial tubes, or lining of the lung, which could cause the lung to collapse completely or to rupture.¹⁵¹ Bruns recommended using a "large blunt needle" for the initial puncture to avoid such problems.¹⁵² Air embolisms, though rare, could be deadly, and cardiac failure could occur when one collapsed lung caused the other to enlarge and displace the heart.¹⁵³ Of Fitzsimons' 12,700 pneumothorax operations in the 1920s, medical officers reported sixteen cases of embolism and seven deaths during the procedure.¹⁵⁴

Unlike heliotherapy, patients feared the pneumothorax. Fictional accounts of life in tuberculosis sanatoriums tend to portray it as torture. In *The Rack*, author A.

E. Ellis' protagonist, Paul, receives a pneumothorax refill: "The needle distended. It penetrated and, with a crunching sound traversed 2 inches of coriaceous tissue.... Paul spoke quietly and cautiously—he always feared that talking during the refill might lead to undue expansion and subsequent perforation of the lung, as if he had divined this Dr. Vernet pushed in the needle a little farther."¹⁵⁵ In *The Magic Mountain*, Thomas Mann describes patients "whistling through their pneumothorax hole," and one female character dies from an "overblown" pneumothorax.¹⁵⁶ In the novel, *Sanatorium*, Donald Stewart creates a tuberculosis physician who sadistically enjoys pneumothoraces, rewarding patients who agree to them and punishing those who refuse.¹⁵⁷

An American Sanatorium Association survey in the 1930s found that physicians conducted "therapeutic" pneumothorax on anywhere from 1 to 68 percent of patients, with a national average of 10 percent.¹⁵⁸ Two-thirds of those patients had advanced disease lung cavitation and only about 38 percent had effective collapse procedures. The survey committee concluded that given the likelihood of problems and failure, pneumothorax should not be "undertaken lightly."¹⁵⁹ A British study of 2,100 professional papers on pneumothorax published between 1929 and 1939 found that only about one-third of the procedures were conducted under what the reviewers considered acceptable standards.¹⁶⁰ The number of patients with pneumothoraces at Fitzsimons was higher than in civilian sanatoriums, perhaps because a greater percentage of patients had moderate or advanced disease and were therefore candidates for the procedure, and because Fitzsimons surgeons generally underwent advanced training and were therefore skilled in the procedure. In 1935 Fitzsimons surgeons stated that "We believe that practically all cases of active pulmonary tuberculosis of recent onset.... should receive the benefit of artificial pneumothorax, particularly if the involvement is unilateral." By 1939, 65 percent of Fitzsimons patients with pulmonary tuberculosis had a pneumothorax.¹⁶¹

Phrenectomy

When efforts to induce artificial pneumothorax failed, physicians turned to other procedures. One of the greatest obstacles to successful pneumothorax was when the lining of the lung adhered to the chest wall due to tissue scarring, preventing the collapse. In such cases medical officers employed several procedures to effect collapse to close the cavities. One involved "unroofing" the tuberculosis cavity by incising and draining it of tubercular matter. Another was called the Jakobaeus operation, and involved cutting and cauterizing the adhesions that joined the lung to the chest wall to allow it to collapse. This could be painful and dangerous and was done rarely—only four times in 1929 at Fitzsimons and nine times in 1935.¹⁶² A more common method was to crush or excise the phrenic nerve that runs from the neck to the chest and regulates breathing. Medical officers at Fitzsimons began this procedure in 1922, extracting 5 to 12 centimeters of the nerve to paralyze one half of the diaphragm, causing it to rise in the rib cage, pressing against the lung to thereby collapse and "rest" it on that side. In 1930, Lieutenant Colonel (Lt. Col.)

Alexander Cooper reported that in 16 percent of the ninety-six patients whose phrenic nerves were cut, the diaphragm successfully rose to reduce the thoracic cavity and partially collapse the lower lobe of the lung. Of the ninety-six patients, 40 percent had relief from coughing, and one-third generally improved after the operation. Fifteen of the ninety-six patients, however, died within a year of the operation, so Cooper concluded that the procedure could be valuable in “selected cases” where tuberculosis infected only one lung.¹⁶³ Phrenectomy peaked in the 1930s, but then declined after a 1936 Veterans’ Bureau study concluded that the procedure “did not save or materially prolong life.”¹⁶⁴

Thoracoplasty

When patients did not improve with rest and pneumothorax, or adhesions prevented lung collapse, some specialists recommended more radical surgery. For years surgeons had been treating some forms of tuberculosis by cutting out tumors on the bone or joints, or cutting into and draining sinuses (i.e., fistulas, narrow elongated tracts that extended from a focus of infection, ultimately erupting through the skin and discharging pus).¹⁶⁵ But many physicians believed that pulmonary tuberculosis patients could not tolerate surgery due to their weakened condition. That changed after World War I. Wartime surgical experience with medical officers operating on hundreds of patients improved surgeons’ ability to recognize and avoid shock in patients and to surgically clean infected wounds. Such advancements enabled the profession to develop new surgical procedures for a much wider range of patients and conditions than before the war.¹⁶⁶ The most drastic and disfiguring procedure used to treat pulmonary tuberculosis during the interwar period was to cut and collapse the ribs. Early thoracoplasty had involved the removal of the entire length of several ribs, but this left the chest exposed and allowed the lung to swing in and out, leading to gastrointestinal or breathing difficulties and pneumonia. The nineteenth-century German physician Ferdinand Sauerbruch pioneered thoracic surgery after treating a patient whose lung collapsed after being gored by a bull.¹⁶⁷ His procedure removed a small part of each rib where it connected to the spine, allowing the rib cage to fold down, thereby collapsing the lung while still protecting it.¹⁶⁸ Medical Corps surgeon John Alexander learned the procedure while serving in the American Expeditionary Forces during the war. When he developed tuberculosis of the spine and had to spend two years in a cast, he wrote one of the first textbooks on the surgical treatment of pulmonary tuberculosis—*The Collapse Therapy of Pulmonary Tuberculosis*.¹⁶⁹

Medical officers at Fitzsimons began to employ thoracoplasty in 1922 and published several papers on their work.¹⁷⁰ Bruns and his colleague, Maj. Joseph Casper, reported on 120 such procedures. They observed that the surgery was most successful for young patients with strong, healthy hearts and tuberculosis in only one lung. Seriously ill patients were not good candidates, but, Bruns and Casper wrote, thoracoplasty could “give apparently doomed patients a chance, however slight, for recovery.”¹⁷¹ In fact, they wrote, patients often tended to “procrastinate and postpone the operation so that too often it becomes a desperate effort to save life.”¹⁷²

Thoracoplasty was a traumatic undertaking. Before the operation, nurses helped patients "empty their cavities" by coughing up as much tubercular material from their lungs as they could. Then, with the patient under general anesthesia and lying on his stomach or side, the surgeon would cut through the skin and muscles of his back, locating one rib at a time, freeing it from the connecting tissue, and removing about a half-inch of rib near the spine (Figure 5-10). Bruns and Casper cautioned, "it is much better to do too little than too much," and that physicians should remove only five to seven ribs at a time. The incision should be as large as required to work, but made gently, because it was not the length of the wound, but "the stripping and cutting of the ribs which causes shock." They instructed sur-

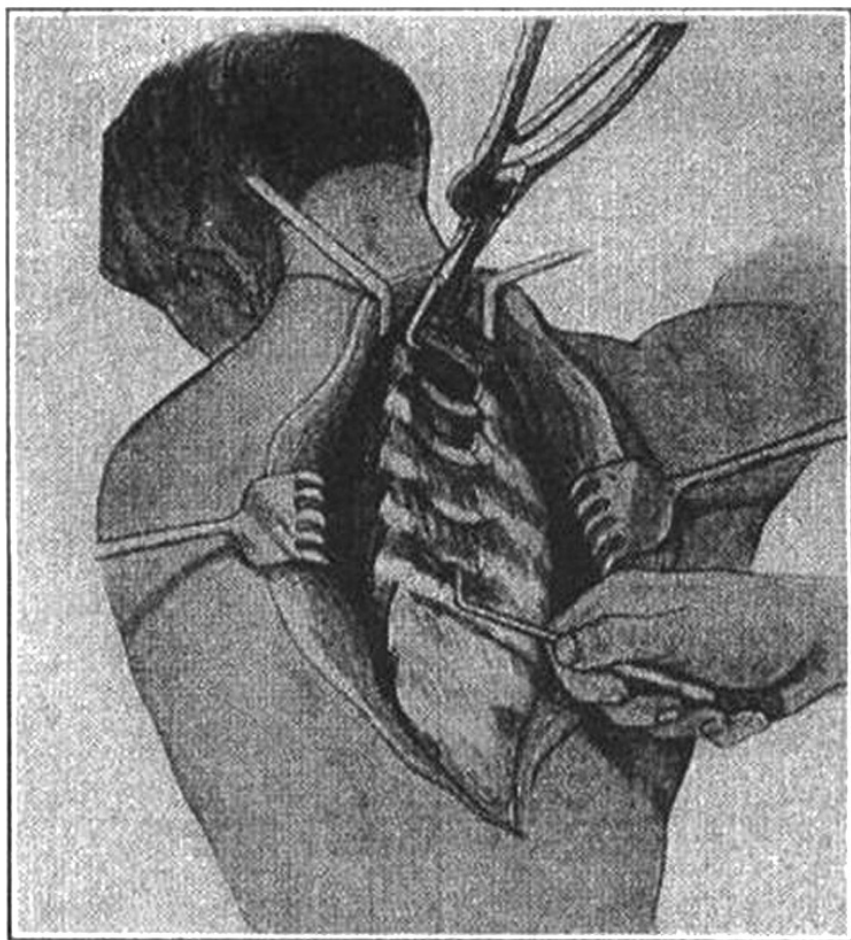


Figure 5-10. Illustration of thoracoplasty, in "The Nursing Care in Thoracoplastic Operations," *American Journal of Nursing* 29 (February 1929): 124-25.

Photograph used with permission of the *American Journal of Nursing*.

geons to remove any damaged tissue in the area, then sew up the muscles and the skin, close the wound, and apply a bandage strapped “firm enough to support the chest-wall and allow coughing.”¹⁷³ After the operation, nurses watched for signs of shock such as a drop in blood pressure, rapid pulse, or clammy skin. “So much tissue is dissected at the time of operation,” a civilian nurse explained, “that the whole wound weeps bloody serum much more freely than would be expected in an abdominal wound.” After the operation she gave patients pain medication and a salt solution or whiskey and glucose intravenously. And because of the bleeding, “fluids should be forced....if the patient is not vomiting.”¹⁷⁴ Some physicians did not prescribe narcotics for pain because the drugs would inhibit the coughing necessary to expel the tubercular material from the collapsed lung cavity. One nurse explained that a patient would need to indicate to the nurse if he had to cough, because if “the side, deprived of its bony framework is not supported, coughing causes more pain and may even result in hemorrhage or rupture of the lung and death.”¹⁷⁵ Writing in the 1950s, Robert J. Gosling, a medical officer at Fitzsimons, provided a detailed and graphic description of the effect of thoracoplasty on a patient’s body:

With thoracoplasty a number of anatomical and functional patterns are altered. The balance of the neck is disturbed, allowing a lateral deviation of the head and neck towards the unoperated side. The shoulder on the operated side may be elevated and displaced anteriorly. The chest is deformed and may shift toward the operated side. A scoliosis may develop with the primary curve in the thoracic area, convex to the operated side, compensated by a secondary cervical curve above and a lumbar curve below. There is restricted movement and range of motion in the shoulder joint. There may be impingement of the scapula upon the uppermost remaining rib. There is a possibility of an anteriorly displaced head and neck with an accompanying kyphosis. The pelvis may be prominent laterally, anteriorly rotated and elevated on the unoperated side.¹⁷⁶

Fitzsimons’ medical officers did not, apparently, make great promises to their patients about the effectiveness of thoracoplasty. Casper wrote in 1932: “The surgeon has no miraculous power and his work here, as in other departments of surgery, is beset with pitfalls, filled with disappointments, and only occasionally crowned with conspicuous success.” Even success, however, did not mean a cure for the underlying disease. “A patient must be made to realize that an operation for this condition is not curative,” Casper wrote. “It may be necessary to operate again, and no matter what is done surgically the disease still remains a medical condition, and medical treatment is as much indicated after as before surgical intervention.”¹⁷⁷

Because thoracoplasty was reserved for the sickest patients, twenty of the 120 patients who received the operation at Fitzsimons between 1922 and 1930 died within three months, some from shock, others of heart failure or infection.¹⁷⁸ But in several articles Bruns, Casper, and another Fitzsimons surgeon, Major (Maj.) William Thearle, described the dramatic improvement some patients experienced

as well as the drastic procedures they underwent. Perhaps the most impressive was that of "Colonel T." who developed tuberculosis in 1914, and arrived at Fitzsimons in 1924 at the age of forty-seven, in critical condition with tuberculosis in all lobes of both lungs as well as tuberculosis laryngitis, and producing two cups of sputum a day. He was "a seemingly hopelessly sick man and a truly desperate operator of risk." But after the removal of half of the ribs on the right side in November 1924, his "improvement was truly magical." The wound required five months to heal but after just three weeks the patient's voice was normal and he was producing less sputum. Surgeons removed the remaining ribs on the right side in June 1925, and by October his sputum was free from bacteria for the first time in ten years. Colonel T. gained forty pounds, could walk up to five miles a day, and even play golf. In April 1926 he developed tubercular meningitis and died within two weeks, but an autopsy confirmed that his lungs had healed dramatically.¹⁷⁹ Army records show that Col. T was actually Col. G. Soulard Turner (Figure 5-11), a cavalry officer who served from 1898 until his retirement on disability in 1920.¹⁸⁰

Thearle also reported on a female patient at Fitzsimons, most likely an Army nurse, who, after three years of active tuberculosis, received a pneumothorax in her right lung. She improved at first, but then suffered a complete lung collapse in March 1924 and became very ill. Surgeons collapsed the ribs on her right side under local anesthesia, but the wound became infected, and they had to remove three ribs completely and insert a drain in her chest. When the patient did not improve, surgeons removed four more ribs, along with parts of three more, and subsequently performed "four minor procedures for infected rib ends." She finally improved. Her weight gradually rose from 83 to 120 pounds, and her coughing and sputum subsided. Although Thearle concluded that her tuberculosis was "apparently cured," she still had an opening in her chest from the drain, and her spine was curved from "the complete collapse of half the chest" (Figure 5-12). But, wrote Thearle, "such is scarcely apparent when she is dressed for out of doors."¹⁸¹

In 1929, *American Medicine* declared the surgical treatment of tuberculosis, "a pronounced achievement and an advance over earlier techniques. It has a definite effect in limiting the mortality among individuals for whom the prognosis had been most unfavorable."¹⁸² However, these procedures were not free from controversy. In 1924, Watson Miller, chair of the American Legion Rehabilitation Committee, wrote to Surgeon General Ireland asking for information about pneumothorax and thoracoplasty because he had heard that some people believed that "a man suffering from pulmonary tuberculosis should not be operated upon to the extent required by the rib-sectioning incident to thoracoplasty."¹⁸³ Ireland sent him a reprint of Thearle's article, noting, "mortality in these operations is high," but "when one realized the hopelessness of this class of patients and their poor physical condition due to the advanced stage of the disease...the results appear to justify the operation."¹⁸⁴

Not everyone followed the path toward more aggressive therapies. In New York, Saranac Lake sanatorium physician Lawrason Brown worried that "a new generation of physicians has entered the field of treatment of pulmonary

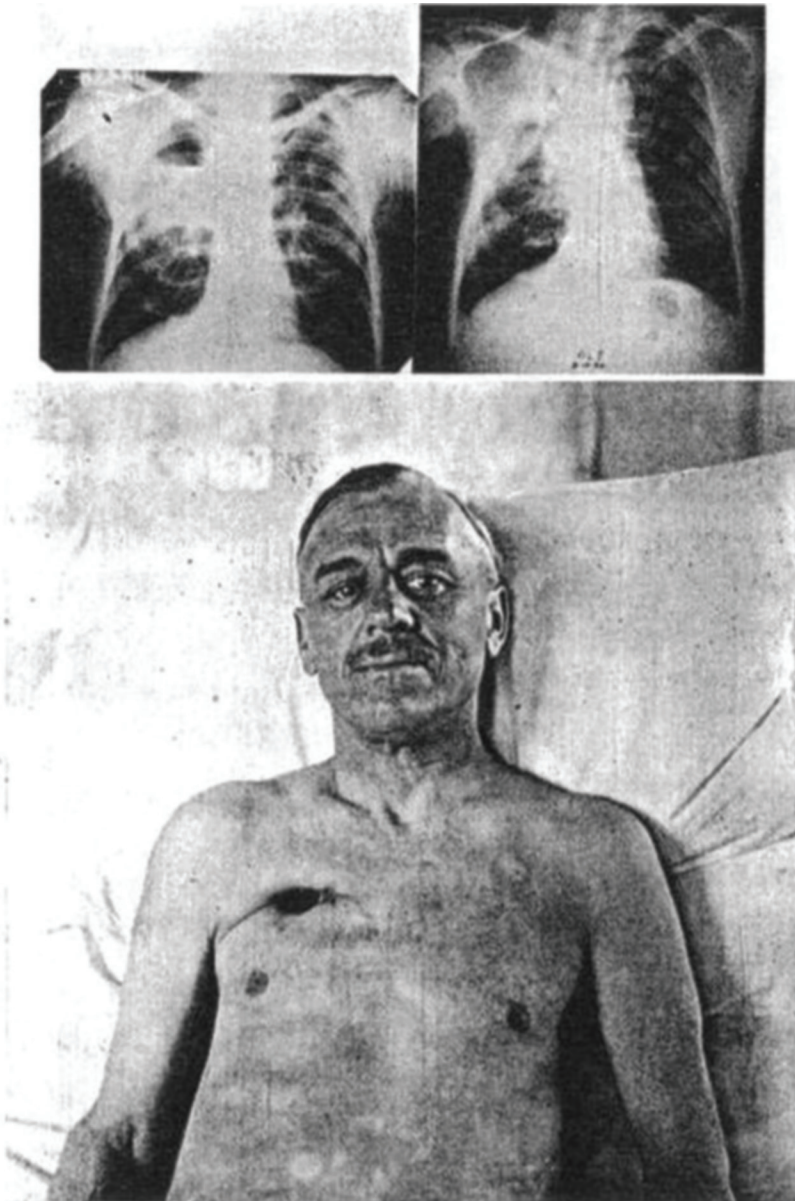


Figure 5-11. Photograph and X-ray images of Colonel G. Soulard Turner who underwent thoracoplasty at Fitzsimons General Hospital, in Earl Bruns and Joseph Casper, "Thoracoplasty in the Treatment of Chronic Tuberculosis," *American Review of Tuberculosis* 22 (1930): 753.

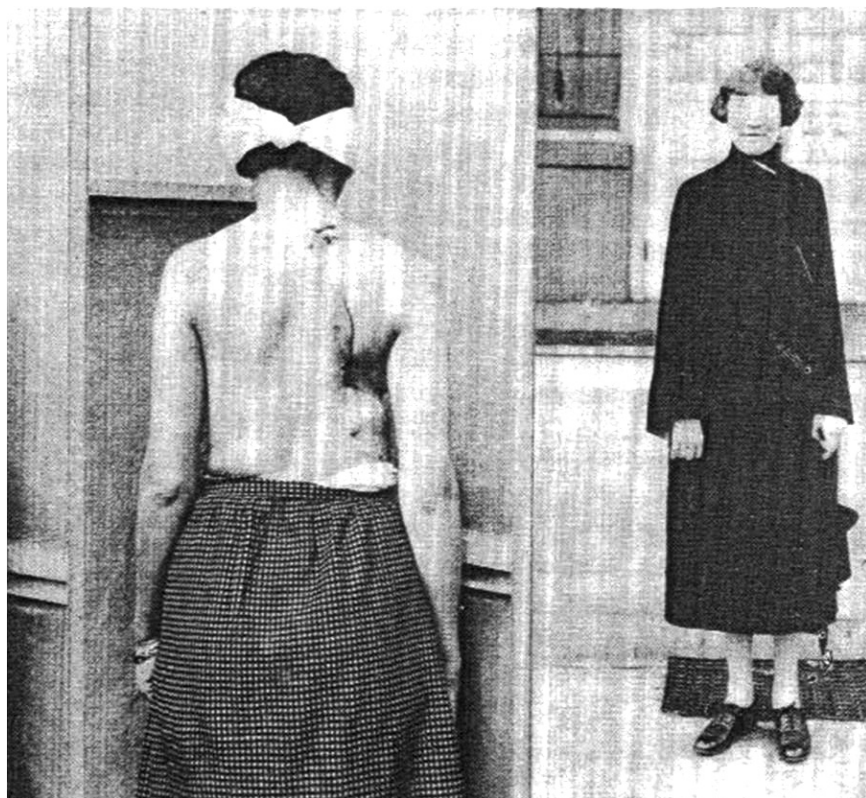


Figure 5-12. Photographs of a female patient at Fitzsimons General Hospital who underwent thoracoplasty described in William H. Thearle, "Extrapleural Thoracoplasty in Pulmonary Tuberculosis," *Southwestern Medicine* 10 (July 1926): 301.

tuberculosis. The rest treatment of Dettweiler, of Trudeau, of Walther, does not satisfy their desire for action."¹⁸⁵ Gerald Webb began to practice pneumothorax in 1912, but soon became wary of surgical interventions and did fewer and fewer.¹⁸⁶ Another specialist, James Waring of Denver, acknowledged that artificial pneumothorax was "a well-tried and proven procedure of incalculable benefit in properly selected cases."¹⁸⁷ But in 1934 he cautioned against "enthusiasm for surgery over the stethoscope," and lamented "this day of bold, well-nigh reckless surgery of the chest."¹⁸⁸ Physician and historian Thomas Dormandy has concluded that "despite all modifications and improvements, thoracoplasty remained a horrific operation; and it is not unreasonable to ask how it could have retained its popularity."¹⁸⁹

It didn't for long. Never a popular procedure, in the following decade thoracoplasty gave way to lung resection—the removal of diseased lung tissue itself. Evarts C. Graham, a surgeon at Washington University, had served in the Medical

Corps during the war and gained extensive experience in treating patients with lungs damaged by chemical weapons, pneumonia, empyema, and tuberculosis. Continuing his investigations after the war, in 1933 he performed the first surgical removal of an entire lung for treatment of lung cancer.¹⁹⁰ In the following years, surgeons applied this procedure to tuberculosis and began to remove portions of the diseased lung (lung resection) or completely removed a lobe or lung (lobectomy and pneumonectomy) rather than ribs. As with lung collapse, this reduced the amount of diseased tissue, making it easier for antibiotics to fight the tuberculosis bacilli.¹⁹¹ By the 1950s, the development of effective antibiotic therapy with streptomycin, isoniazid, and PAS (para-aminosalicylate), and the increasingly early detection of tuberculosis sidelined these surgical procedures in the United States. The resurgence of antibiotic-resistant tuberculosis in the 1990s, however, led physicians to return to lung resection and even thoracoplasty as the few tools available, absent effective antibiotics, to control the disease.¹⁹²

Discharge on Disability

In 1923, Col. Joseph Siler of the Office of The Surgeon General informed Fitzsimons' commander William Moncrief that the hospital "will be used as a salvage hospital with the idea that Army officers who are ordered there will be salvaged and returned to a duty status, provided this can be done within a reasonable period of time." He noted that "[General Edmund] Munson, Hutton, Bruns and others are shining examples of this."¹⁹³ Moncrief had reservations, however. Fitzsimons was different from "the old days at Fort Bayard," he said, because "the amount of work to be done is large, and more is required of the individual than was the case at Bayard." Officers with tuberculosis had less time for rest, recreation, and recovery, so that although "admitting that we have saved shining examples," Moncrief recommended that the Army take the Navy's approach of retiring on disability all officers who had not recovered their health after one year of treatment.¹⁹⁴

Throughout the 1920s, the Medical Department's policy regarding the discharge of personnel with tuberculosis was to retain enlisted men in the hospital for six months and officers and nurses for at least one year, until a retirement board determined whether they should be discharged for disability, or returned to full or partial duty.¹⁹⁵ Because the Army Medical Department generally sent tuberculosis patients to Fitzsimons for treatment, tuberculosis disability retirement policy was effectively determined by medical officers in Denver instead of Washington, and they considered it their responsibility to return as many patients as possible to active service. When tuberculosis patients appeared before retirement boards, they usually faced three officers who had been sick with tuberculosis themselves and were sympathetic with efforts to return them to active duty. In 1925, for example, the board consisted of Paul Hutton and Bruns, who had both been patients at Fort Bayard, and pathologist Maj. Shannon Van Alzah, who struggled with tuberculosis until his death in 1933. In 1931, Bruns even wrote about a method of thoracoplasty that "if successful, enables the patient to be returned to duty." It would be limited to resection of the upper five ribs, he explained, because "this

sacrifices very little normal lung tissue, causing a minimum amount of deformity."¹⁹⁶ (Bruns' own heart disease and lung damage from years of active tuberculosis did not prevent Surgeon General Ireland from promoting him to lieutenant colonel in May 1931.)

After a new Surgeon General, Robert U. Patterson, took office in 1931, however, this approach shifted. Patterson, who had never had tuberculosis, nor served at Fort Bayard or Fitzsimons, moved to change the Medical Department's tuberculosis policy soon after taking office. He noted that tuberculosis caused "chronic invalidism" and rued "the large amount of time which is lost by each case."¹⁹⁷ He therefore issued a new disability policy similar to that advocated nine years before by Moncrief. Officers "who have been under treatment for one year...and who are considered to have little or no prospect of *prompt* return to unlimited duty will be considered permanently incapacitated and will be recommended for appearance before a retiring board."¹⁹⁸ Patterson did not consult with Fitzsimons officers; he simply sent them the policy in March 1932. "My office has felt for sometime," he advised, "that a too liberal policy was being followed as regards continuance on the active list of military personnel suffering from pulmonary tuberculosis." As physicians, medical officers may be interested in salvaging the tuberculous, he wrote, but as military officers they "must remember that the first object of military administration is to keep the Army effective as a combatant force." Retaining officers with tuberculosis "seriously interferes with the foreign service roster" and it was difficult to find "protected duty" for convalescent Air Corps officers who were "subject to the many strains of flying." He also objected to returning officers to duty when they were undergoing artificial pneumothorax, noting that the Veterans Administration rated such tuberculosis patients as totally and permanently disabled. Patterson's policy was therefore to "*govern* medical officers at Fitzsimons General Hospital regarding the disposition of patients with tuberculosis."¹⁹⁹ Under this new policy, although enlisted men and officers who recovered quickly and fully from their illness could return to duty, most could not.

A month after Patterson announced the new retirement policy Earl Bruns' health failed catastrophically. His service at Fitzsimons had been interrupted with a two-year stint (1926–28) on duty at Sternberg Hospital in the Philippines, but his health deteriorated there so he went on sick leave before returning to Fitzsimons (1929–30). On 29 April 1932 Fitzsimons admitted Bruns as a patient with an array of conditions that can all be attributable to tuberculosis. He had a dislocated shoulder incurred during convulsions most likely caused by blood poisoning (uremia) resulting from kidney disease. He also suffered from heart trouble, high blood pressure, and periodontal disease so severe that he had lost all of his teeth. As Bruns was recovering from his collapse and struggling with kidney failure, Col. W. P. Chamberlain in the Office of The Surgeon General sent Fitzsimons' commanding officer an extraordinary letter complaining that medical officers at the hospital were undermining the new policy on retirement of officers with persistent tuberculosis. He noted that one Air Corps officer, Captain (Capt.) Charles B. B. Bubb, told his retirement board that "Col. Bruns, who is conceded to be unquestionably the finest expert in the Army on tuberculosis," expected Bubb to

fully recover and return to duty. Chamberlain wrote, “doubtless many junior officers have become indoctrinated with the same views. *It will be necessary to overcome this attitude.*” He added that “General Patterson feels that Colonel Bruns has lost perspective regarding the administrative problems of pulmonary tuberculosis in the army.”²⁰⁰

It was a measure of Bruns’ stature that the Surgeon General believed an individual as sick as he was could undermine his policy. But the environment within which the Medical Department struggled with tuberculosis was changing. The falling tuberculosis rates in American society meant that the War Department could be more selective in who served and bar men with any signs of tuberculosis from the ranks. Furthermore, budget pressures and the increasing costs of tuberculosis care had made it more difficult to retain tuberculous enlisted men, nurses, and officers on the active duty rolls. Thus, in October 1932, despite the Fitzsimons commander’s warning that “both [Bruns] and his wife will be heartbroken if it is necessary to separate him from active service,” the Medical Department replaced Bruns as chief of the Fitzsimons medical service and retired him on disability.²⁰¹ Bruns went to Tucson to recuperate, and died within months on 16 March 1933 in Beaumont General Hospital at Fort Bliss, Texas.

Bruns received a soldier’s burial in Arlington Cemetery and was honored in Denver a year later, on the anniversary of his death.²⁰² At a banquet, Governor (Gov.) Edwin C. Johnson declared that “the state of Colorado appreciates the contributions of Colonel Bruns to humanity,” and the Denver Sanatorium Association presented the Army with a portrait of Bruns, which was hung in Fitzsimons (see Figure 5-3).²⁰³ Perhaps referring to Bruns’ forced retirement, Col. Robert M. Hardaway, who succeeded Bruns as Fitzsimons’ chief of medical service, commented that “unfortunately we failed to honor him during his lifetime.” The new congressman from Denver, Rep. Lawrence Lewis, did, however, celebrate Bruns, stating, “Although ultimately Colonel Bruns died of the disease with which he was afflicted...his career is an inspiring example to us all.” Bruns, Lewis asserted, “surmounted physical disabilities and transformed what to a lesser man would have been a misfortune into an inspiration for greater achievement and service to humanity.”²⁰⁴

But the time when one could pursue a productive and rewarding career in the Army after a serious bout with tuberculosis was coming to an end. Within a year Surgeon General Patterson retired Paul Hutton and several other ailing medical officers on disability and appointed Col. Carroll Buck, a medical officer who had not had tuberculosis, as Fitzsimons’ commander. Buck would run Fitzsimons until 1941, struggling with the high cost and the politics of tuberculosis treatment during the dire years of the Great Depression. And when the country went to war again, recruits, trainees, and soldiers again showed up in its hospitals with tuberculosis, but this time the Army would have to look outside its own Medical Corps for “good tuberculosis men.”

Notes

1. Benjamin Goldberg, "Presidential Address: War and Tuberculosis," *Diseases of the Chest* (October 1941): 322 and 324.

2. *Annual Report of the Surgeon General*, 1930 [hereafter cited as ARSG, year], 8.

3. The average hospital stay for all admissions during the 1920s ranged between three and eight weeks, with about six weeks for a gonorrhea patient, the most common diagnosis for Army hospitals. ARSG, 1934, 22; and ARSG, 1933, 52.

4. On the history of Denver see Carl Abbot, Stephen J. Leonard, and David Macomb, *Colorado: A History of the Centennial State*, rev. ed. (Boulder, CO: Colorado Associated University Press, 1982); Stephen J. Leonard and Thomas J. Noel, *Denver: Mining Camp to Metropolis* (Niwot, CO: University Press of Colorado, 1990); and Lyle W. Dorsett and Michael McCarthy, *The Queen City: A History of Denver*, 2d ed. (Boulder, CO: Pruett Publishing, 1986).

5. Abbot, Leonard, and Macomb, *Colorado: A History of the Centennial State*, 270.

6. Gerald Astor, *The Right to Fight: A History of African Americans in the Military* (Novato, CA: Presidio, 1998), 133; and P. S. Halloran, endorsement, 12 August 1930, "Accommodations for T. B. Patients—Female," Record Group [hereafter cited as RG] 112, Entry 31, 1928–37, Box 284, National Archives and Records Administration [hereafter cited as NARA]. In fact, national surveys of African American nurses counted only one in Denver in 1924 (named Vivian P. Lee), and another in 1940. See Darlene Clark Hine, *Black Women in the Nursing Profession: A Documentary History* (New York, NY: Garland, 1985), 57, 138.

7. P. S. Halloran, endorsement, 12 August 1930, "Accommodations for T. B. Patients—Female."

8. Pete Daniel, "Black Power in the 1920s: The Case of Tuskegee Veterans' Hospital," *Journal of Southern History* 36, no. 3 (1970): 368–88. See also Vanessa N. Gamble, *Making a Place for Ourselves: The Black Hospital Movement, 1920–1945* (Oxford, UK: Oxford University Press, 1995); Thomas J. Ward, Jr., *Black Physicians in the Jim Crow South* (Fayetteville, AR: University of Arkansas Press, 2003); and Susan L. Smith, *Sick and Tired of Being Sick and Tired: Black Women's Health Activism in America, 1890–1950* (Philadelphia, PA: University of Pennsylvania Press, 1995).

On blacks and tuberculosis see Marion M. Torchia, "The Tuberculosis Movement and the Race Question, 1890–1950," *Bulletin of the History of Medicine* 49 (1975): 152–68; Claudia Marie Calhoun, "Tuberculosis, Race and the Delivery of Health Care in Harlem, 1922–1939," *Radical*

History Review 80 (2001): 101–19; David McBride, *From TB to AIDS: Epidemics among Urban Blacks since 1900* (Albany, NY: State University of New York, 1991); and Tera Hunter, *To 'Joy My Freedom* (Boston, MA: Harvard University Press, 1997), chapter 9.

9. Jeanne Abrams, *Blazing the Tuberculosis Trail: The Religio-Ethnic Role of Four Sanatoria in Early Denver* (Denver, CO: Colorado Historical Society, 1991); Leonard and Noel, *Denver: Mining Camp to Metropolis*; and Meindert Bosch, *Bridges across the Years: A Ninety-Nine Year History of the Bethesda Hospital Association of Denver, Colorado* (Denver, CO: Bethesda PsychHealth System, 1988).

10. C. G. Snow to S. F. Siler, 9 March 1921, RG 112, Entry 31-J, Box 53, NARA.

11. Office of Public Affairs, Fitzsimons, *Fitzsimons Army Medical Center: The Life and History, 1918–1996* (Aurora, CO: Fitzsimons Army Medical Center, 1998).

12. *Public Health Service Annual Report*, 1923, 203; and Godias J. Drolet, “Tuberculosis Hospitalization in the United States,” *American Review of Tuberculosis* 14 (1924): 623.

13. National Tuberculosis Association [NTA], *Directory of Tuberculosis Associations and Committees*, pamphlet No. 110 (New York, August 1919); and “Call Tuberculosis Worse than War,” *New York Times* 14 September 1919. The NTA was the forerunner of the American Lung Association.

14. Katherine Ott, *Fevered Lives: Tuberculosis in American Culture since 1870* (Cambridge, MA: Harvard University Press, 1996); and James A. Tobey, “An Index to State Tuberculosis Laws,” *Public Health Reports* 38 (1 June 1923): 1191–1200.

15. James A. Tobey, *The National Government and Public Health* (Baltimore, MD: Johns Hopkins Press, 1926), 107, 366–67.

16. Godias J. Drolet, “Tuberculosis Hospitalization in the United States: Results, Types of Cases, Facilities and Costs,” *American Review of Tuberculosis* 14 (1926): 600–5.

17. See, for example, National Tuberculosis Association, “Directory of Sanatoria, Hospitals, Day Camps, and Preventoria for the Treatment of Tuberculosis in the United States,” New York, NY, June 1923 and May 1934.

18. Ott, *Fevered Lives*, 80, n. 48.

19. Guenther Risse, *Mending Bodies, Saving Souls: A History of Hospitals* (New York, NY: Oxford University Press, 1999), 467; and Rosemary Stevens, *In Sickness and in Wealth: American Hospitals in the Twentieth Century* (New York, NY: Basic Books, Inc., 1989), chapter 5.

20. On standardization see Stevens, *In Sickness and in Wealth*, chapter 3.

21. ARSG, 1924.

22. *Fitzsimons Annual Report*, 1929 [hereafter cited as FZAR, year], RG 112, Fitzsimons General Hospital, Annual Reports, 1918–1930, Box 4, NARA.

23. FZAR, 1921.

24. Stevens, *In Sickness and in Wealth*, intro. According to Richard V. N. Ginn, the Medical Department hospitals lagged in the process of professionalizing hospital administration. See Ginn, *The History of the U.S. Army Medical Service Corps* (Washington, DC: Office of The Surgeon General and Center of Military History, 1997 [hereafter cited as Ginn, *Army Medical Service Corps History*]), 107.

25. See the discussion following Henry W. Hoagland, “The Treatment of Tuberculosis in the Army Hospitals,” *Transactions of the American Climatological Association* (1919): 28–30; and 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*]), 196.

26. Biographical information from Esther E. Rohlader, "A Curriculum Vitae of Colonel Earl Harvey Bruns, MC, June 1965," RG 112, Biographical Background Files, Box 8, NARA; Walter Reed Army Medical Center, *Medical Officers Who Have Made Contributions of Worth to the Science of Medicine* (Washington, DC: Historical Unit, U.S. Army Medical Service, 1949); and RG 94, Records of the Adjutant General, Adjutant General's Office, Box 4073, NARA.

27. E. H. Bruns, "Reconstruction and Rehabilitation of the Tuberculous Soldier," *Journal of the American Medical Association*, 71 (3 August 1918): 373–75; and Earl H. Bruns, "The Unit System in Large Government Tuberculosis Hospitals," *U.S. Veterans' Bureau Medical Bulletin* 1 (January 1926): 7–9.

28. Bruns, "The Unit System in Large Government Tuberculosis Hospitals." For unit system of ward management as described by Earl Bruns, see *FZAR*, 1929, 30.

29. Earl H. Bruns, "The Climatic Treatment of Tuberculosis," *American Review of Tuberculosis* 26 (1932): 125.

30. William H. Moncrief Sr. died at Fitzsimons Hospital in 1961. His son, William H. Moncrief, Jr., also became a medical officer. See "William H. Moncrief," *Army Medical Bulletin* 50 (1939): 144–45; and the William H. Moncrief Papers, Military History Institute, Carlisle, PA. For biographical information on Hutton, see Association of Military Surgeons of the United States Biographical Sketch Collection, c. 1901–41, Manuscript Collection 142, Box 4, National Library of Medicine. During the war Hutton served in France with the 32d Division and on Pershing's general staff, and was awarded the coveted Distinguished Service Medal for his work.

31. "Lieut. Col. Paul C. Hutton, War Veteran, to be Fitzsimons Commander Sept. 1," *Rocky Mountain News*, 19 June 1923.

32. Lisa M. Budreau, *Bodies of War: World War I and the Politics of Commemoration in America, 1919–1933* (New York, NY: New York University Press, 2009); and Joseph W. A. Whitehorne, *The Inspectors General of the United States Army, 1903–1939* (Washington, DC: Office of the Inspector General and the Center of Military History, 1998), 325.

33. Ginn, *Army Medical Service Corps History*, 91.

34. "Promotions in the Army Medical Corps," *Army and Navy Journal*, 9 October 1926. Surgeon General Ireland was able to get Congress to approve an Army medical center, bringing together the various Army medical schools, and the Army Medical Museum on the campus of the Walter Reed General Hospital in Washington, DC. In 1920 the Medical Department also established the Medical Field Service School at Carlisle Barracks, PA, to train medical officers on the military side of their duties such as tactics, military organization, law, leadership, logistics, map reading, and medical field service (Ginn, *Army Medical Service Corps History*, 92).

35. U.S. Congress, Senate Special Committee on Readjustment of Service Pay, "Readjustment of Service Pay," November and December 1921, 67th Cong, 101. On reorganization see Ginn, *Army Medical Service Corps History*; and James A. Tobey, *The Medical Department of the Army: Its History, Activities, and Organization* (Baltimore, MD: The Johns Hopkins University Press, 1927), 46–50.

36. Tobey, *The Medical Department of the Army*, 48.

37. Ginn, *Army Medical Service Corps History*, 94.

38. ARSG, 1926, 15.

39. William Moncrief to Mahlon Ashford, 28 December 1922, RG 112, Entry 31-J, Box 24, NARA.

40. W. M. Moncrief to Charles R. Reynolds, 22 October 1921, RG 112, Entry 31-J, Box 24, NARA.

41. William Moncrief, *FZAR*, 1922.
42. J. A. Wilson to commanding officer, 16 September 1926, RG 112, Fitzsimons General Hospital Reports, Laboratory Services, 1918–39, Box 6, NARA; and Earl H. Bruns to J. F. Siler, 24 January 1929, RG 112, Entry 31-J, Box 280, NARA.
43. E. H. Bruns to J. F. Siler, 24 January 1929, RG 112, Entry 31-J, Box 280, NARA.
44. *ARSG*, 1924, 322.
45. Paul Kostinen has argued that such streamlining required greater cooperation and coordination with the private sector, laying the groundwork for the military-industrial complex, in Paul A. C. Koistinen, “The ‘Industrial-Military Complex’ in Historical Perspective: The Interwar Years,” *Journal of American History* 56 (March 1970): 819–39. See also Whitehorne, *The Inspectors General of the United States Army*, 355; and Ginn, *Army Medical Service Corps History*, 94.
46. *FZAR*, 1924, 9.
47. *ARSG*, 1929, 8.
48. Surgeon General’s Office [hereafter cited as SGO], “Monthly Per Diem Operating Expenses for Period January 1 to March 31, 1924,” RG 112, Entry 29, Box 172, NARA.
49. On the bonus veterans, see D. Clayton James, *The Years of McArthur* (Boston, MA: Houghton-Mifflin, 1985); Jennifer D. Keene, *Doughboys, the Great War, and the Remaking of America* (Baltimore, MD: Johns Hopkins University Press, 2001); John W. Killigrew, “The Impact of the Great Depression on the Army,” Ph.D. dissertation, Indiana University, 1979; and William Pencak, *For God and Country: The American Legion, 1919–1940* (Boston, MA: Northeastern University Press, 1989). An exception is Stephen Ortiz who discusses veterans’ disability benefits policy in Stephen R. Ortiz, “The ‘New Deal’ for Veterans: The Economy Act, the Veterans of Foreign Wars, and the Origin of New Deal Dissent,” *Journal of Military History* 70 (April 2006), 415–38.
50. Walter P. Dillingham, *Federal Aid to Veterans, 1917–1941* (Tallahassee, FL: University of Florida Press, 1952), 170–71 and 219–20.
51. *ARSG*, 1929, 3.
52. J. F. Siler to P. C. Hutton, 9 January 1928, RG 112, Entry 31, 1928–37, Box 271, NARA.
53. See SGO, “Monthly Per Diem Operating Expenses for Period January 1 to March 31, 1924”; and Merritte Ireland, Memorandum, 14 October 1924, RG 112, Entry 29, Box 172, NARA.
54. On the history of veterans’ benefits see Stephen P. Ortiz, ed., *The Politics of Veterans’ Policy* (Gainesville, FL: University Press of Florida, 2012); Larry M. Logue, “Union Veterans and Their Government: The Effects of Public Policies on Private Lives,” *Journal of Interdisciplinary History* 22 (1992): 411–34; Theda Skocpol, *Protecting Soldiers and Mothers: The Political Origins of Social Policy in the United States* (Cambridge, MA: Belknap Press of Harvard University Press, 1992); Dillingham, *Federal Aid to Veterans*; Gustavus A. Weber and Laurence F. Schmeckebier, *The Veterans’ Administration: Its History, Activities, and Organization* (Washington, DC: Brookings Institution, 1934); and Peter Karsten, *Soldiers and Society: The Effects of Military Service and War on American Life* (Westport, CT: Greenwood Press, 1978).
55. U.S. Congress, 65th Cong., 1st sess., Senate Document 81, W. G. McAdoo, “The Duty of a Just Government,” August 15, 1917, 3.
56. Congress established an entirely new system based upon indemnity and compensation for World War I veterans, rather than gratuity. See Dillingham, *Federal Aid to Veterans*, 5.
57. K. Walter Hickel, “War, Region, and Social Welfare: Federal Aid to Servicemen’s Dependents in the South, 1917–1921,” *Journal of American History* 87 (March 2001): 1368.

58. According to a 1921 Bureau of War Risk Insurance study, on 5 May 1921, 26,266 patients were hospitalized, 10,266 of them for tuberculosis; 16,764 were in federal hospitals, the rest in contract hospitals. 10 June 1921, *Cong. Record*, 67th Cong., 1st sess., vol. 61, pt. 3, 2409–11.

59. Bess Furman, *Profile of the United States Public Health Service, 1798–1950* (Washington, DC: Government Printing Office, 1973), 328.

60. Hugh S. Cumming, "Tuberculosis Among the Ex-Service Men," *Journal of the American Medical Association* 79 (29 July 1922): 373–74; also published in *Public Health Reports* 37 (15 September 1922): 2241–52.

61. George Thomas Palmer and Henry W. Hoagland, "The Sanatorium Care of Tuberculous Soldiers by the Federal Government," *Transactions of the National Tuberculosis Association* 17 (1921): 471–72, and 475. For more on this situation, see Charles M. Montgomery, "The Medical Profession and the Tuberculous Ex-Service Patient," *Public Health Reports* 36 (2 December 1921): 2938–42; Cumming, "Tuberculosis Among the Ex-Service Men"; Philip P. Jacobs, "Tuberculosis as a War Problem," *Military Surgeon* 55 (1924): 498–514, 630–49, and 737–51; Godias J. Drolet, "Tuberculosis Hospitalization in the United States," *American Review of Tuberculosis* 14 (1924): 600–24; and Philip B. Matz, "The Tuberculosis Problem in the United States Veterans' Bureau," *American Review of Tuberculosis* 18 (1928): 776–93.

62. The President's Commission on Veterans' Pensions, *The Historical Development of Veterans' Benefits in the United States*, U.S. Congress, 84th Cong., 2nd sess., House Committee Print No. 244 ed. (Washington, DC: Government Printing Office, 1956), 43.

63. "400 Yanks Barred from Hospitals of Denver by Government Red Tape," *Denver Post* 21 April 1920.

64. Remarks by Rep. Carl Hayden, 30 March 1922, *Congressional Record*, 67th Cong., 2nd sess., vol. 62, pt. 5, 4814.

65. Correspondence regarding "Beneficiaries of the Soldiers' Home" February–May 1923, RG 112, Entry 31-J, Box 53, NARA.

66. Senate Report No. 233, 67th Cong., 1st sess., submitted 20 July 1921, *Congressional Record*, 67th Cong., 1st sess., 4092–95.

67. Report on "Consolidation of Government Agencies for Ex-Service Men," 19 April 1921, *Congressional Record*, 67th Cong., 1st sess., 458.

68. The American Medical Association opposed specialized hospitals for veterans, concerned that they would compete with other hospitals and limit their members' access to patients. AMA opposition intensified in 1924 when Congress extended veterans' benefits to non-service-related care, which some in the organization considered socialized medicine. Stevens, *In Sickness and in Wealth*, 127–29.

69. Furman, *Profile of the Public Health Service*, 344–47.

70. A. G. Crane, U.S. Army Medical Department Historical Unit and U.S. Department of the Army, Office of The Surgeon General, *Physical Reconstruction and Vocational Education*, and Julia C. Stimson, *The Army Nurse Corps*, vol. 13 (Washington, DC: U.S. Government Printing Office, 1923 [hereafter cited as Crane, *Reconstruction* and Stimson, *Army Nurse*]), 603–5. See also, for example, Administrator of Veterans' Affairs, *Annual Report*, 1932 (Washington, DC: Government Printing Office, 1932), 12–17.

71. Earl Bruns and others estimated that at war's end as many as 26,000 more soldiers and sailors might need hospitalization for tuberculosis discovered during their military discharge examinations and recommended 13,000 more tuberculosis beds in federal hospitals for demobilization. See letter from the Secretary of the Treasury, "Additional Hospital Facilities for Discharged Soldiers, Sailors, Marines, and Army and Navy Nurses," 1920, House Doc. 481, U.S. Cong., 66th Cong., 2nd sess., 24.

72. William H. Baldwin, "The Present Status of Soldiers and Draft Rejects with Tuberculosis," *American Review of Tuberculosis* 3 (1919): 328.

73. Members of Congress could—and still can—introduce private bills to address an individual's problem regarding a wide range of federal laws.

74. Remarks by Rep. Royal Cleaves Johnson (R-SD), on S. 2257, *Congressional Record*, 68th Cong., 1st sess., 10168.

75. The language reads, "Every commissioned officer, or enlisted man, or any other member of the military service who suffers a disability from disease contracted in line of duty shall be entitled to compensation, provided that the disease has not been caused by his own willful misconduct." Siler, *Communicable and Other Diseases*, 200.

76. Katherine Mayo, *Soldiers What Next!* (Boston, MA and New York, NY: Houghton Mifflin, 1934), 100.

77. Gustavus A. Weber and Laurence F. Schmeckebier, *The Veterans' Administration: Its History, Activities, and Organization* (Washington, DC: Brookings Institution, 1934), 459. See also William Pencak, *For God and Country: The American Legion, 1919–1940* (Boston, MA: Northeastern University Press, 1989), 185. On determining eligibility for hospital care and disability benefits for active-duty military personnel developing tuberculosis after 1925 see Alexander T. Cooper and Shannon L. Van Valzah, "Line of Duty in Pulmonary Tuberculosis," *Military Surgeon* 65 (July 1929): 53–58.

78. There is a small, but growing literature on the history of disabled veterans. See, for example, Beth O'Donnell Linker, *War's Waste: Rehabilitation in World War I America* (Chicago, IL: University of Chicago Press, 2011); Ana Carden-Coyne, "Ungrateful Bodies: Rehabilitation, Resistance and Disabled American Veterans in the First World War," *European Review of History* 14 (December 2007): 543–65; David A. Gerber, ed., *Disabled Veterans in History* (Ann Arbor, MI: University of Michigan Press, 2000); and Ortiz, *The Politics of Veterans' Policy*.

79. K. Walter Hickel, "Medicine, Bureaucracy, and Social Welfare: The Politics of Disability Compensation for American Veterans of World War I," in Gerber, *The New Disability History*, 245–46.

80. Rep. Carroll Reece remarks on S. 2257, 17 May 1924, *Congressional Record*, 68th, 1st sess., 8841.

81. U.S. Congress, House Committee on World War Veterans' Legislation, "World War Veterans' Legislation," pt 1., January 1926, 69th Cong., 1st sess. [hereafter cited as World War Veterans' Legislation].

82. World War Veterans' Legislation, 189.

83. World War Veterans' Legislation, 173.

84. World War Veterans' Legislation, 157.

85. World War Veterans' Legislation, 206.

86. World War Veterans' Legislation, 174.

87. World War Veterans' Legislation, 174.

88. World War Veterans' Legislation, 189.

89. World War Veterans' Legislation, 207–8.

90. H.R. 4474, and Dillingham, *Federal Aid to Veterans*, 49.

91. Dillingham, *Federal Aid to Veterans*, 50.

92. W. Paul Havens Jr., U.S. Army Medical Department Historical Unit and U.S. Department of the Army, Office of The Surgeon General, *Internal Medicine in World War II, Medical Department, United States Army in World War II*, vol. 2 (Washington, DC: U.S. Department of Defense, Department of the Army, Office of The Surgeon General, 1963): 331–32.

93. Dillingham, *Federal Aid to Veterans*, 54.

94. Hickel, "Medicine, Bureaucracy, and Social Welfare," 248.

95. William H. Baldwin, "The Present Status of Soldiers and Draft Rejects with Tuberculosis," *American Review of Tuberculosis* 3 (1919): 326.

96. Linker, *War's Waste*; and Beth O'Donnell Linker, "The Business of Ethics: Gender, Medicine, and the Professional Codification of the American Physiotherapy Association, 1918–1935," *Journal of the History of Medicine and Allied Sciences* 60 (July 2005): 320–54.

97. See, for example, Conrad E. Koeper, "Convalescent Hospital-Limited Service Corps," 10 March 1918, RG 112, Entry 10, Box 4603, NARA; and Estes Nichols, "Medical, Hospital and Social Aspects of Reconstruction for the Tuberculous," *Transactions of the National Tuberculosis Association* (1919): 174.

98. A. G. Crane, *Education for the Disabled in War and Industry. Army Hospital Schools: A Demonstration for the Education of Disabled in Industry* (New York, NY: Teachers College, Columbia University, 1921), 2.

99. Dillingham, *Federal Aid to Veterans*, 141.

100. E. H. Bruns, "Reconstruction and Rehabilitation of the Tuberculous Soldier," 375.

101. Fitzsimons General Hospital, *The Gift Book: Fitzsimons General Hospital, U.S.A* (Denver, CO: Wahlgreen Publishing, 1926).

102. Contemporaries and scholars refer to these activities by various terms including reconstruction, rehabilitation, occupational therapy, or vocational therapy. As Eliot Friedson has explained, "'Rehabilitation' is a vague and poorly delineated concept, and its concrete aims subject to a fair degree of variation. It has included physical training as well as vocational education, concrete surgical repair and correction as well as psychotherapy." Eliot Friedson, in Foreword, Glenn Gritzer and Arnold Arluke, *The Making of Rehabilitation: A Political Economy of Medical Specialization, 1890 to 1980* (Berkeley, CA: University of California Press, 1985), xx. I use the term rehabilitation for simplicity.

103. FZAR, 1927, 16; and FZAR, 1929.

104. FZAR, 1924, 13; and FZAR, 1922, 14–15.

105. Estes Nichols, "Medical, Hospital and Social Aspects of Reconstruction for the Tuberculous," *Transactions of the National Tuberculosis Association* (1919): 175. See also Harriet S. Lee and Myra L. McDaniel, *Army Medical Specialist Corps* (Washington, DC: Office of The Surgeon General, Department of the Army, 1968).

106. FZAR, 1927, 35; and ARSG, 1925, 382.

107. The President's Commission on Veterans' Pensions, *The Historical Development of Veterans' Benefits in the United States*, U.S. Congress, 84th Cong., 2nd sess., House Committee Print No. 244 ed. (Washington, DC: Government Printing Office, 1956), 132; Dillingham, *Federal Aid to Veterans*, 143; David R. Lyman, "The Limitations and Possibilities in the Federal Care of Tuberculous Ex-Service Patients," *Transactions of the National Tuberculosis Association* (1921): 83; and Mayo, *Soldiers What Next!*

108. Commission on Veterans' Pensions, *The Historical Development of Veterans' Benefits in the United States*, 130–32; and Dillingham, *Federal Aid to Veterans*, 141.

109. ARSG, 1934, 22–24.

110. William Charles White, "Progress in Tuberculosis Work," *Transactions of the National Tuberculosis Association*, 23rd annual meeting (1927): 62–64.

111. Hoyt E. Dearholt, "Progress in Public Education," *Transactions of the National Tuberculosis Association*, 23rd annual meeting (1927): 71.

112. Thomas D. Brock, *Robert Koch: A Life in Medicine and Bacteriology* (Madison, WI: Science Tech Publishers, 1988), chapter 18. On the more recent use of tuberculin testing see "Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection," *Morbidity and Mortality Weekly Report* 49 (9 June 2000).

113. In a distinct departure from the theory of “tubercularization,” a Public Health Service researcher, Wade Hampton Frost, proposed in 1937 that people with tuberculosis be identified and isolated and their contacts be tested for tuberculosis and also isolated and treated if infected. This established the principle of the Index Patient approach to epidemiology. See W. H. Frost, “How Much Control of Tuberculosis?” *American Journal of Public Health* 27 (August 1937): 759–66.

114. E. H. Bruns and Joseph Casper, “The Present Status of Chest Surgery in the Treatment of Pulmonary Tuberculosis,” *American Review of Tuberculosis* 26 (1932): 665–87. See also E. H. Bruns and Joseph Casper, “Thoracoplasty in the Treatment of Chronic Pulmonary Tuberculosis,” *American Review of Tuberculosis* 22 (1930): 739–56.

115. FZAR, 1921.

116. Bier donated his notes to the National Library of Medicine (NLM), “in memory of one of the Corps Finest Officers and Greatest Clinician, Colonel Edward [sic] H. Bruns.” “Fitzsimons General Hospital, Denver, Lecture Notes, 1926–1927,” NLM, WB 9 Y5 8L 1951 [hereafter cited as Lecture Notes, 1926–27].

117. E. H. Bruns, “Lecture IV, Pathology of Tuberculosis Autopsy,” Lecture Notes, 1926–27, 1.

118. E. H. Bruns, “Lecture VI, Diagnosis of Pulmonary Tuberculosis,” Lecture Notes, 1926–27, 2–3.

119. E. H. Bruns, “Lecture VI, Diagnosis of Pulmonary Tuberculosis,” Lecture Notes, 1926–27, 7.

120. E. H. Bruns, “Lecture XVII, General Treatment of Tuberculosis,” Lecture Notes, 1926–27, 1.

121. E. H. Bruns, “Lecture XVII, General Treatment of Tuberculosis,” Lecture Notes, 1926–27, 3–6.

122. Earl Bruns to Paul Hutton, 1 March 1922, RG 112, Entry 29, Box 403, NARA.

123. Thomas E. Scott, “Holderness-Brunson Treatment for Tuberculosis,” 30 June 1922, RG 112, Entry 29, Box 403, NARA.

124. FZAR, 1928, 26.

125. FZAR, 1931, 23; and E. H. Bruns, “Lecture XVII, General Treatment of Tuberculosis,” Lecture Notes, 1926–27.

126. E. H. Bruns, “Lecture XIX, The Psychology of the Tuberculosis Patient,” Lecture Notes, 1926–27, 9; and Earl H. Bruns, “The Climatic Treatment of Tuberculosis,” *American Review of Tuberculosis* 26 (1932): 133.

127. For example, Charles Denison, *Rocky Mountain Health Resorts: An Analytical Study of High Altitudes in Relation to the Arrest of Chronic Pulmonary Disease* (Boston, MA: Houghton, Mifflin, and Co., 1880); Guy Hinsdale, “The Sun, Health and Heliotherapy,” *Transactions of the American Climatological Association* (1919): 1–11; Horace LoGrasso and Frank C. Balderrey, “Heliotherapy in the Treatment of Pulmonary Tuberculosis,” *American Review of Tuberculosis* 10 (1924–25): 117–31; and Samuel H. Watson, “Heliotherapy in Tuberculosis: A Scheme for Proper Selection of Cases, with a Word about Technique,” *Southwestern Medicine* 10 (1925–26). Also on heliotherapy see Andrew McClary, “Sunning for Health: Heliotherapy as Seen by Professionals and Popularizers, 1920–1940,” *Journal of American Culture* 5 (1982): 65–68; Carolyn June McQuien, “Tuberculosis as Chronic Illness in the United States: Understanding, Treating and Living with the Disease, 1884–1954,” Ph.D. dissertation, University of Texas at Austin, 1993, 41–46.

128. The Nobel Foundation, see http://nobelprize.org/nobel_prizes/medicine/laureates/1903/finsen-bio.html, accessed 24 August 2012. Thomas Dormandy, *The White Death: A History of Tuberculosis* (New York, NY: New York University Press, 1999); and Henry W. Randle, "Suntanning: Differences in Perceptions Throughout History," *Mayo Clinic Proceedings* 72 (1997): 461–66.

129. U.S. General Hospital No. 20, Whipple Barracks, Ariz., "Rules for Sun Baths (Heliotherapy)," RG 112, Entry 31-J, Box 252, NARA and A. Rollier, "The Construction of an Institution for the Helio-therapeutic [sic] Treatment of Surgical Tuberculosis," *Tubercle* 2 (March 1921): 241–50.

130. E. H. Bruns, Memorandum, "Heliotherapy," 20 February 1922, RG 112, Entry 29, Box 403, NARA.

131. E. H. Bruns, "Lecture XIX, The Psychology of the Tuberculosis Patient," Lecture Notes, 1926–27, 7–8.

132. E. H. Bruns, "Heliotherapy in Tuberculosis," *Military Surgeon* 57 (1925): 383.

133. E. H. Bruns, "Heliotherapy in Tuberculosis Spondylitis," *American Review of Tuberculosis* 10 (1924–25): 136.

134. Bruns, "Heliotherapy in Tuberculosis Spondylitis," 137, 133.

135. Bruns, "Heliotherapy in Tuberculosis," 390.

136. E. H. Bruns, "Lecture XVII, General Treatment of Tuberculosis," Lecture Notes, 1926–27, 7; and Bruns, "Heliotherapy in Tuberculosis," 389.

137. Bruns, "Heliotherapy in Tuberculosis Spondylitis," 135. On Pott's disease, see also Linker, *War's Waste*, 36–52.

138. "Surgeon General Praises Work of Aides in Message," *The Re-Aides Post* (May 1924) in Estelle Angier, Medical Historical Unit, Personal Papers, Military History Institute, Carlisle, PA; and William C. Pollock, "Heliotherapy in Pulmonary Tuberculosis," *American Review of Tuberculosis* 14 (November 1926): 505.

139. I. D. Bronfin, "Heliotherapy in Advanced Pulmonary Tuberculosis," *American Review of Tuberculosis* 11 (1925): 96–111; and Edgar Mayer, "The Present Status of Heliotherapy in Tuberculosis," *Transactions of the National Tuberculosis Association*, 30th Annual Meeting (1934): 74.

140. Alfred J. Crowle, Elise J. Ross, and Mary H. May, "Inhibition by 1,25(OH)₂-Vitamin D₃ of the Multiplication of Virulent Tubercle Bacilli in Cultured Human Macrophages," *Infection and Immunity* 55 (December 1987): 2945–50. This research is explained by John Sbarbaro in a lecture, "Arts in Medicine," at the University of Colorado at Denver and Health Sciences Center, Denver, 2007, on DVD at the Denison Library, University of Colorado.

141. Michael D. Iseman, *A Clinician's Guide to Tuberculosis* (Philadelphia, PA: Lippincott Williams & Wilkins, 2000), 12.

142. On collapse therapies, see Dormandy, *The White Death*; Larry I. Lutwick, *Tuberculosis* (London, UK: Chapman and Hall Medical, 1995), 13–16; Ott, *Fevered Lives*; Linda Bryder, *Below the Magic Mountain: A Social History of Tuberculosis in Twentieth-Century Britain* (Oxford, UK: Clarendon Press, 1988), chapter 6; Godfrey L. Gale and Norman C. DeLarue, "Surgical History of Pulmonary Tuberculosis: The Rise and Fall of Various Technical Procedures," *Journal of Canadian Surgery* 12 (October 1969): 381–88; and R. Y. Keers, *Pulmonary Tuberculosis: A Journey Down the Centuries* (London, UK: Bailliere Tindall, Cassell Ltd., 1978), chapters 10 and 14.

143. E. H. Bruns and Joseph Casper, "Thoracoplasty in the Treatment of Chronic Pulmonary Tuberculosis," *American Review of Tuberculosis* 22 (1930): 739.

144. Jake W. Spidle Jr., *Doctors of Medicine in New Mexico* (Albuquerque, NM: University of New Mexico Press, 1986), chapter 4.

145. On the history of pneumothorax see James J. Waring, "The History of Artificial Pneumothorax in America," *Journal of Outdoor Life* 31 (1934): 16–18. On pneumothorax, see M. [Mary] E. Lapham, "The Treatment of Pulmonary Tuberculosis by Artificial Pneumothorax," *Stethoscopic Medicine Journal* 4 (1911): 742; Samuel Robinson and Cleaveland Floyd, "Artificial Pneumothorax as a Treatment of Pulmonary Tuberculosis," *Archives of Internal Medicine* (1912): 452–83; Roy W. Matson, Ralph C. Matson, and Mark Bascalion, "End Results of 600 Cases of Pulmonary Tuberculosis Treated with Artificial Pneumothorax," *American Review of Tuberculosis* (June 1923): 50.

146. Fort Bayard, "Annual Report for 1916," 6 February 1916, RG 112, Entry 26, Box 919, NARA; and Earl H. Bruns, "Artificial Pneumothorax in Treatment of TB," *New Mexico Medical Journal* (January 1915).

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148. ARSG, 1932, 262–63; and I. S. Kahn, "Artificial Pneumothorax Treatment of Pulmonary Tuberculosis at the Base Hospital Fort Sam Houston," *South Texas Medical Record* 14 (1920–21): 28–36.

149. Samuel Robinson and Cleaveland Floyd, "Artificial Pneumothorax as a Treatment of Pulmonary Tuberculosis," *Archives of Internal Medicine* (1912): 465.

150. Sudie E. Pyatt, "My Pneumothorax Days Are Over," *Journal of the Outdoor Life* 27 (1930): 344–45.

151. C. D. Parfitt and D. W. Crombie, "Five Years' Experience with Artificial Pneumothorax," *Transactions of the American Climatological Association* (1918): 52–80.

152. Abstract of E. H. Bruns, "Air Embolism as a Complication in Artificial Pneumothorax Therapy," *Colorado Medicine* 27 (1930): 237, in *Tubercle* 12 (December 1931): 126–27. See also Bruns, "Lecture XXI, Artificial Pneumothorax," Lecture Notes, 1926–27.

153. James L. Dubrow, "Effect of Permanent Pulmonary Collapse on the Heart," *Journal of the American Medical Association* 90 (28 April 1928): 1364.

154. Bruns, "Air Embolism as a Complication in Artificial Pneumothorax Therapy."

155. A. E. Ellis, *The Rack* (London, UK: Penguin Books, 1958, 1961), 277–78.

156. Thomas Mann, *The Magic Mountain* (various publishers, 1924), 48 and 301.

157. Donald Stewart, *Sanatorium* (New York, NY: Harper and Brothers, 1930), 81–82.

158. Ott, *Fevered Lives*, 99; and William C. Pollock, "Collapse Therapy in Pulmonary Tuberculosis," *American Review of Tuberculosis* 22 (1930): 780.

159. Andrew Peters, et al, "Survey of Artificial Pneumothorax in Representative American Tuberculosis Sanatoria, 1915–1930," *American Review of Tuberculosis* 31 (1935): 85–101.

160. Linda Bryder, *Below the Magic Mountain: A Social History of Tuberculosis in Twentieth-Century Britain* (Oxford, UK: Clarendon Press, 1988), 176–77.

161. FZAR, 1934, 20–21; and FZAR, 1939, 7.

162. FZAR, 1929 and 1935. See also Ralph C. Matson, "Surgical Treatment of Pulmonary Tuberculosis," *Transactions of the National Tuberculosis Association*, 23rd Annual Meeting (1927): 79–96; and Sam R. King and H. A. Patterson, "Severing Adhesions in Artificial Pneumothorax," *Southwestern Medicine* 19–20 (1935–36): 370–76; and FZAR, 1929.

163. Alexander T. Cooper, "Phrenicoexairesis in Pulmonary Tuberculosis," *American Review of Tuberculosis* 22 (1930): 779.

164. Philip B. Matz, "The End Results of the Surgical Treatment of Pulmonary Tuberculosis," *American Review of Tuberculosis* 33 (April 1936): 549.

165. See, for example, G. E. Bushnell, U.S. General Hospital, Fort Bayard, NM, 1904, "Surgical Report," RG 112, Entry 380, NARA; and Edward P. Rockhill, "Cases of Surgical Tuberculosis at Fort Bayard," 9 November 1918, RG 112, Entry 31-J, Box 20, NARA.

166. Ira M. Rutkow, *American Surgery: An Illustrated History* (Philadelphia, PA: Lipincott-Raven, 1998); Wilson Ruffin Abbot and F. J. Nordby, "The Prognostic Influence of Surgery upon the Sanatorium Tuberculosis Patient," *Southwestern Medicine* 9 (February 1925): 45–51; Matson, "Surgical Treatment of Pulmonary Tuberculosis," 79–96; H. G. Wetherill, "Surgery for Tuberculosis," *Journal of the American Medical Association* 80 (6 January 1923): 6–8; and Philip B. Matz, "The Surgical Treatment of Pulmonary Tuberculosis in the United States Veterans' Bureau," *American Review of Tuberculosis* 20 (1929): 809–32.
167. Dormandy, *The White Death*, 354–57.
168. Julia Irene Kemp, "Nursing Care in Thoracoplastic Operations," *American Journal of Nursing* 29 (1929): 123–24.
169. Herbert Sloan, "Historical Perspectives of the American Association for Thoracic Surgery: John Alexander (1891–1954)," *Journal of Thoracic and Cardiovascular Surgery* 29 (2005): 435–436; John Alexander, *The Collapse Therapy for Pulmonary Tuberculosis* (Springfield, IL: Clarence C Thomas, 1937).
170. *FZAR*, 1929, 28.
171. Bruns and Casper, "Present Status of Chest Surgery," 669.
172. Bruns and Casper, "Thoracoplasty in the Treatment of Chronic Pulmonary Tuberculosis," 742; and William H. Thearle, "Extra Pleural Thoracoplasty in Pulmonary Tuberculosis," *Southwestern Medicine* 10 (1926): 296–304.
173. Bruns and Casper, "Thoracoplasty in the Treatment of Chronic Pulmonary Tuberculosis," 748.
174. Kemp, "Nursing Care in Thoracoplastic Operations," 127. Also on nursing care, see Laura Ahrendt, "Thoracoplasty," *American Journal of Nursing* 38 (1938): 929–31.
175. Kemp, "Nursing Care in Thoracoplastic Operations," 128.
176. Robert J. Gosling, "Role of Physical Medicine in the Tuberculous Thoracic Surgical Patient," 1953, Medical Historical Unit Collection, Military History Institute, Carlisle, PA.
177. *ARSG*, 1932, 277.
178. Bruns and Casper, "Thoracoplasty in the Treatment of Chronic Pulmonary Tuberculosis," 750.
179. Thearle, "Extra Pleural Thoracoplasty in Pulmonary Tuberculosis," 299.
180. War Department, The Adjutant General's Office, *Army Register* (Washington, DC: Government Printing Office.) 1 January 1925, 798; and 1 January 1927, 829.
181. Thearle, "Extra Pleural Thoracoplasty in Pulmonary Tuberculosis," 304.
182. Editorial, "Surgery for Pulmonary Tuberculosis," *American Medicine* 35 (June 1929): 336.
183. Watson B. Miller to M. W. Ireland, 22 December 1924, RG 112, Entry 29, Box 403, NARA.
184. M. W. Ireland to Watson B. Miller, 14 January 1925, RG 112, Entry 29, Box 403, NARA.
185. Lawrason Brown and Homer L. Sampson, "The Fate of the 'Good Chronic' Case of Pulmonary Tuberculosis," *Transactions of the National Tuberculosis Association* (1934): 336.
186. Helen Clapesattle, *Dr. Webb of Colorado Springs* (Boulder, CO: Colorado Associated University Press, 1984), 249–59 and 396.
187. Patricia Paton, *A Medical Gentleman: James J. Waring, M.D.* (Denver, CO: Colorado Historical Society, 1993), 117.
188. James J. Waring, "The History of Artificial Pneumothorax in America," *Journal of the Outdoor Life* 31 (1934): 16.
189. Dormandy, *The White Death*, 358.

190. James S. Olson, *A History of Cancer: An Annotated Bibliography* (New York, NY: Greenwood Press, 1989), 233–34.

191. The major role played by surgery in the “conquest” of tuberculosis after World War II has been largely neglected. An exception is Barron H. Lerner, *Contagion and Confinement: Controlling Tuberculosis along Skid Row* (Baltimore, MD: Johns Hopkins University Press, 1998), 62.

192. Benjamin J. Pomerantz, et al., “Pulmonary Resection for Multi-Drug Resistant Tuberculosis,” *Journal of Thoracic and Cardiovascular Surgery* 121 (2001): 448–53; R. K. Dewan, et al., “Thoracoplasty: An Obsolete Procedure?” *Indian Journal of Chest Disease and Allied Sciences* (1999): 83–88; and Lisa Belkin, “A Brutal Cure,” *New York Times Magazine* (30 May 1999): 34–39.

193. J. F. Siler to William Moncrief, 12 February 1923, RG 112, Entry 31-J, Box 43, NARA.

194. William Moncrief to J. F. Siler, 13 March 1923, RG 112, Entry 31-J, Box 43, NARA.

195. William Moncrief, “Policy of Retaining Officers, Members of the Army Nurse Corps, and Enlisted Men, in the Service, after They Develop Manifest Tuberculosis,” 13 March 1923, RG 112, Entry 31-J, Box 43, NARA.

196. *FZAR*, 1931, 39.

197. *ARSG*, 1931, 135.

198. Emphasis in the original. Robert U. Patterson, “Policy of the Surgeon General as Regards Military Personnel with Pulmonary Tuberculosis,” 22 March 1932, RG 112, Entry 29, Box 108, NARA. The policy was slightly different for nurses who could return to duty after treatment for a “minimal lesion,” but were then sent before a retiring board if they suffered a reactivation. Enlisted men who had been diagnosed with tuberculosis needed a special waiver to return to duty or reenlist.

199. Robert U. Patterson, “Policy of the Surgeon General as Regards Military Personnel with Pulmonary Tuberculosis,” 22 March 1932, emphasis added.

200. W. P. Chamberlain to C. D. Buck, 7 October 1932, RG112, Entry 31-J, NARA. Emphasis in the original. Bubb was retired on disability in March 1934 but returned to duty during World War II as a colonel in the Army Air Corps, serving as chief of staff of the 8th Bomber Command and 8th Air Force in England, 1942–43.

201. C. D. Buck to S. J. Morris, correspondence, 10 August 1932, RG 112, Entry 31, 1928–37, Box 280, NARA.

202. “Col. Earl H. Bruns Expires in El Paso,” *Rocky Mountain News*, 17 March 1933.

203. The portrait was done by artist J. I. McClymont, Colorado Springs, and has hung in the Bruns Conference Room of Building 500 on the site of the former Army hospital post, now called the Fitzsimons Life Science District.

204. Information on the Bruns Memorial comes from the scrapbooks and diaries of Lawrence Lewis, Lawrence Lewis Papers, 385 N11, C4, Colorado Historical Society, Denver. See also “Memory of Colonel Bruns is Eulogized at Banquet,” *Rocky Mountain News*, 25 May 1934.

