

Chapter III

DENTISTRY IN THE CONFEDERACY: 1861–1865

Introduction

Military dentistry seemed to be more appreciated in the Confederate army than in its Union counterpart. Records show that as early as May 13, 1861, the Confederate army commissioned Dr JB Deadman as a post dentist. Perhaps this was because Confederate President Jefferson Davis, in favor of dental surgeons for the US Army when he was the secretary of war (1853–1857), was sympathetic to the dental cause.¹⁻³ More importantly though, the challenges of fighting against the heavily populated and industrialized Union forced the Confederacy to adopt unique approaches to organizing its army and conducting a war. One of these innovations was the introduction of dentists and dental care in military hospitals, which resulted in the conservation of much-needed personnel and the swift return of soldiers with dental problems to their units. Although dentistry in the Confederacy suffered severely from a shortage of trained dentists and a lack of supplies, the military medical leadership displayed a consistent willingness to employ dentists in new and creative ways.

Early Confederate Support for Dentistry

An example of early Confederate interest in military dentistry can be seen in the 1861 *Regulations for the Medical Department of the CS Army*, which required that the standard medical supply table for both field service and hospitals include teeth extracting sets. The regulations allowed one set for commands of 100 to 500 soldiers and two sets for commands of a thousand. For field service, the regulations called for a single set per unit.^{4,5} However, few surgeons were familiar with the instruments or their use. In 1863 Lieutenant George J Huntley wrote home about an extraction he experienced: "It took seven pulls to fetch it [his tooth] and I was pretty certain my head would come with it." The operation, which was done in the open, did not attract additional customers.^{6(p102)}

In 1861 Southern civilian dental offices were also busy taking care of the army's dental needs; when they were able, soldiers often visited dentists in the towns near their encampments. For example, in July 1861, just before the opening of the First Battle of Bull Run (Manassas), Sergeant Samuel Buck of Company H, 13th Virginia Infantry, asked Colonel Ambrose Powell (AP) Hill for permission to go to Winchester "to have a tooth filled" by a civilian dentist. Hill replied: "No, Sergeant, wait until tomorrow. You may have it filled with lead before night."^{7(p22)}

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II

Problems of Secession

Approximately one fifth of the country's 5,000 dentists (1860 estimate) were in the South, but they were almost entirely dependent on the North for their contacts with organized dentistry, supplies, and professional development. The war isolated them from both materiel resources and professional interchange. One contemporary source estimated that by 1864, there were only 250 to 300 dentists in the entire Confederacy.^{8,9} Virginia, for example, had only 40.¹

Dr Findley Clark compared the dental resources between the two adversaries:

At the North almost every State had its society. The American Association and American Convention were in full operation; besides three or four Dental colleges, and as many Dental journals. . . .

With us in the South it was very different. We had no dental society or journal, and owing to the irregularity of the mails, and stringency of conscription, we could not act collectively but had to do what we could individually. As the war went on, and the call for men was renewed and the conscription increased to fifty, we were thinned to almost a corporal's guard. Many towns, of several thousand inhabitants, had no Dentist.¹⁰

Actually, the South did have one dental society, the Georgia State Dental Society, founded in 1859 with 11 members. Although the Virginia Society of Surgeon Dentists was the first state dental society organized in the United States in 1842, it had held its last meeting in 1846.^{8,11}

Furthermore, the Confederacy lacked a fully accredited and functioning dental school of its own. The later shortage of Southern dentists can be attributed directly to the war, which curtailed the steady stream of dental graduates from the Baltimore College of Dental Surgery and the Pennsylvania College of Dental Surgery in Philadelphia. The Baltimore College of Dental Surgery was the primary source of prewar dental degrees for Southern students (49% of its students were from the South). A total of 59 students, 24 graduates and 35 future graduates, served in the Confederate forces with distinction.^{8,12,13}

The only dental school in the Confederate States, the New Orleans Dental College, was chartered in March 1861, but students did not start classes until that November. However, the war disrupted its curriculum, and the first graduates (four regular and five honorary) did not receive their diplomas until after the war, in 1868. Consequently, the school was not a factor in Southern dental education nor a source of dentists during the war.^{14,15}

The South's Only Dental Journal: The Southern Dental Examiner

The first issue of the only dental journal in the South, the *Southern Dental Examiner*, appeared in May 1860 with a message that the dentists of the South needed "a medium" through which they could "express and interchange their views to their mutual benefit." The firm of Brown and Hape of 30 Whitehall Street, Atlanta, Georgia, coincidentally the South's only dental supply house, published the periodical. Dr JPH Brown, one of the firm's proprietors, served as head editor, while

DENTISTRY IN THE CONFEDERACY: 1861–1865

Dr George S Fouke of Westminster, Maryland, was the corresponding editor.^{16,17}

The war had a dramatic effect on this sole source of dental journalism. Most of the other professional journals in the South had already suspended publication by July 1861, when the *Southern Dental Examiner* informed its readers that it would publish only every other month.¹⁸ By January 1862 the journal experienced difficulties in obtaining “suitable paper” for its press, and publication was delayed.¹⁹ The March issue turned out to be the journal’s last. The following editorial appeared in that issue and made an appeal for dentists to be included in the Confederate military:

We think it strange that no effort has, to our knowledge, been made to add to the efficiency of the Medical and Surgical Staffs of the army, by the appointment of dentists competent to treat and relieve the sufferings of hundreds of poor soldiers afflicted with neuralgia, fistulous discharges about the jaws, periodontitis, etc. Such cases instead of being treated for weeks and months by physicians and surgeons, without affording the slightest relief to the patients, would at once be referred to the dentist for advice and assistance. In England the staffs of some of the hospitals have included, for nearly a century, dentists in addition to the physicians and surgeons.

Physicians as a general thing do not make the teeth and their relation to the body a matter of sufficient study and importance, hence it can not be expected that they should be very successful in treating the diseases of the dental organs and their appendages.

We have thrown out the above views suggestively, trusting they may meet a favorable response, and if such a movement should be deemed practicable, that it may be the means of extending the sphere of usefulness of the dental profession.^{20(p127)}

The South's Only Dental Supply House: Brown and Hape in Atlanta

In 1860 Brown and Samuel Hape of Hapeville, Georgia, foreseeing a protracted war and subsequent shortage of dental materials, founded the South’s only dental supply company. In October 1860 Brown and Hape informed their customers that they had received an assortment of teeth and dental instruments as well as materials from the North, “all of which we offer at New York and Philadelphia prices.”^{21,22(p95)}

Because of the uncertainty of the Southern currency, the company advised its customers of a new payment policy in January 1861:

Owing to the great political excitement in our country, nearly all paper money, except Georgia, is taken at a discount in Atlanta. Therefore, dentists, when ordering goods, should remit in Georgia funds, or in gold or silver.

The profits upon gold foil being so very small, we cannot stand to be shaved upon uncurrent money; hence we are compelled to sell it “gold for gold,” or its equivalent in bankable funds.

For the same reason we are obliged to decline sending goods with bill to be *collected on delivery* by Express, unless persons will agree to pay in funds which are *par here*.^{23(p152)}

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II

In addition to the currency problem, Brown and Hape also faced the problem of obtaining dental supplies for its customers because of the Union blockade. Surgical instruments and medicines had been declared contraband by the US government, and running the blockade was a dangerous and uncertain business. Consequently, a shortage of dental supplies developed early in the war. The manufacture of gold foil, porcelain teeth, and other necessary supplies was soon affected by the scarcity of materials. Brown resorted to melting down scraps of platinum (essential to the manufacture of porcelain teeth) to get the metal he needed. For this process, he invented a special oxyhydrogen blowpipe. Needing feldspar, he prospected with "pick and shovel" and located excellent sources in Madison County, Georgia, and in Greenville, South Carolina, near the Saluda River. He carved tooth molds by hand and cast them out of gun metal. Brown also chemically refined gold foil in his own laboratory.^{21,24}

In July the company assured its customers that it was still in business by announcing in the *Southern Dental Examiner*:

Although we are represented in the army, we have not suspended, nor have we any intention of doing so, but shall continue to supply the profession with gold foil, teeth and materials just as low as they can be sold.^{18(p52)}

In November 1861 Brown and Hape used the *Southern Dental Examiner* once again to notify their customers of revised fees for dental materials, especially gold:

We are continually receiving letters from every portion of the Confederacy, asking: "How are you off for material? Do you sell Gold Foil, Teeth, etc., at the old rates?" To all we will say, that we have a large stock of material, and that we sell teeth, and nearly every other article, at the old rates. On some things we have been compelled to make a small advance. Gold Foil we sell at the old rate, when paid in gold, but when paid in paper we have been forced, from the advance of gold, and the increased price of all articles used in its manufacture, to add 5 per cent to the old price of \$28 per oz. We are the pioneers in the Confederacy in the manufacture of Foil, and are determined to increase and extend our manufactory just as soon as the times will admit.^{25(p85)}

Problems of Dental Care for the Confederate Soldier

Dental care was extremely expensive for Confederate soldiers, who were usually in the field, far from home, and earned only about \$18 a month. After the war Dr Watkins Leigh Burton (1830–1892), a dentist in Richmond, Virginia, wrote of the problem:

During the progress of the late unhappy war, it soon became apparent that the soldiers of the Confederate armies stood sadly in need of the services of dentists. Most of them being from extreme sections of the country, without means, being cut off from all communications with their homes, and their pay being totally inadequate to meet the most ordinary and pressing wants, it was out of the question for them to attempt to pay for dental operations. Particularly when it is remembered the price of one gold filling in the depreciated currency of the Confederacy, was more than six months pay of a private! The price demanded for gold foil in 1864 and the beginning of 1865 was sixty-four dollars per oz. in gold coin. This

DENTISTRY IN THE CONFEDERACY: 1861–1865

amount in confederate money would be, three thousand eight hundred and forty dollars, for the prevailing price of gold was sixty for one. Having to pay so enormously for materials—the value being enhanced from the fact of their having to run the blockade—the charges of dentists were proportionally high. The charge for a gold filling was \$120.00, for extracting a tooth \$20.00, and for an upper set of teeth on gold or vulcanite base, from \$1800.00 to \$4000.00. Let it not be understood that high prices were confined to dentistry alone. It was no uncommon thing to pay \$1800.00 for a coat, \$300.00 for shoes, \$1000.00 for cavalry boots, and from \$300.00 to \$500.00 for an ordinary felt hat.²⁶

Dental treatment was a luxury far beyond the financial means of the average Confederate soldier. Dr LD Carpenter, an Atlanta dentist who had been in practice since 1858, said that in the month of April 1865, he did “one million dollars’ worth of work in Confederate money value.” Dr WH Morgan of Tennessee commented on one of the consequences of this unfortunate situation, saying that “a large amount of suffering was occasioned by a low class of men following the army and pretending to practice Dentistry,” and he mentioned “One case . . . of a man preparing his cement, by the wholesale quantity, in a tin cup, enough to last all day, and filling the teeth of the soldiers indiscriminately with the same.”^{26–28}

In addition, the majority of Confederate troops had been serving for years without a dental examination. Their poor oral hygiene, lack of toothbrushes, and the “miserable and scanty” food that made up their field rations all contributed to the “wretched condition” of their teeth. On August 27, 1862, when the Confederate troops captured the railroad yard at Manassas Junction, Virginia, an observer noted that among the items the hungry soldiers stuffed in their haversacks and pockets were “ground coffee, tooth-brushes, condensed milk....” In Stonewall Jackson’s infantry, the “tooth-brush was a button-hole ornament.” One Confederate’s 1864 prescription for a toothache was: “1 Grain of Arsenic, 1 Grain of Morphine, Kresote [creosote] enough to make a paste of it, then put a piece the size of a pin’s head in the cavity & confine it there with a little wax or cotton.”^{26,29,30}

On July 16, 1863, 30 of the officers and medical staff of the Army of Northern Virginia encamped near Martinsburg addressed a petition to Confederate Secretary of War James Seddon. They argued that the “health comfort” of the soldiers would be greatly improved by “the services of a good Practical Dental Surgeon.” Furthermore, they recommended that Dr Robert E Grant be selected and allowed to “practice his profession” in the army.^{31,32} A former captain in the 37th Virginia Infantry, Grant had attended the Baltimore College of Dental Surgery but had not received a degree. Seddon approved the request on August 3.^{32,33}

The high fees during the war also affected civilian dentistry. All dental home care products, such as toothbrushes, dentifrices, and toothpicks, were scarce and expensive. Mary Boykin Chesnut of Mulberry Plantation near Camden, South Carolina, mentioned in her diary that a toothbrush cost \$10 and a visit to the dentist for a “look” at teeth “the whitest and most regular” cost \$350 in Confederate money. Old toothbrushes were rethreaded with hog bristles from slaughtered animals, while twigs became popular tools for cleaning teeth. Homemade toothpicks were carved from bone or wood, and ground charcoal was often used as a dentifrice.^{34,35}

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II

Conscription of Dentists: Dentists as "Special Practitioners"

To alleviate the chronic personnel shortages in the army, the Confederate congress passed the first universal conscription law for men in American history on April 16, 1862. The law applied to all men in the Confederacy between the ages of 18 and 35 and called them up for 3 years of service, but it also included a number of exemption categories. Physicians and hospital personnel were specifically exempt to assure the continued healthcare of the civilian population. In September 1862 the act was extended to include men to the age of 45, and a final conscription act in February 1864 broadened the call to all men from 17 to 50. In an effort to alleviate the costs of dental care for enlisted soldiers, dentists were included in the conscription laws.²⁶

Under the conscription law, physicians who had practiced at least 7 years were exempt from service, and some dentists tried to argue that the exemption should apply to them as well, claiming that they were practicing a medical specialty. One such dentist (referred to as "Mr. Benton, the dentist" by John Beauchamp Jones, a Baltimore native who served as a clerk under five Confederate secretaries of war) attempted to avoid conscription. Benton's attorney, George W Randolph, was the former Confederate secretary of war (1862) who had originally convinced President Jefferson Davis to sign the 3-year conscription bill. In 1863 Randolph defended Benton's exemption under the medical clause. However, Benton was eventually drafted and served as a hospital steward.³⁶⁻³⁸

Finally, to clarify this contentious issue, on December 29, 1863, a petition signed by 13 Virginia dentists, including Burton of Richmond, was presented to the Confederate congress. It recommended that dental surgeons who had practiced at least 10 years be exempt from military service. The petitioners argued that dentistry was a medical specialty outside the training of general medical practitioners, and that knowledge of dental and oral problems required years of training and experience. Therefore, there were few men who possessed the necessary specialized skills throughout the South, and not including them under the physicians' draft exemption would cause considerable hardship to the general population.^{39,40}

The group included a testimonial with the petition that was endorsed by 35 prominent Confederate army surgeons, including Dr William A Carrington, the medical director of the Confederate hospitals in Virginia, and several civilian physicians. It argued that the "professional services" of dental surgeons were "essential and necessary to the health, comfort and well being of every community," and, therefore, they should be "exempted from military service." Confederate army Surgeon General Samuel Preston Moore (1813-1889) and Surgeon James Harrison, the chief of the Confederate navy's Office of Medicine and Surgery, approved the petition. However, the War Department ultimately overruled all arguments for exemptions for dentists and ordered conscription to continue.^{26,40}

Unsatisfied with the decision, Dr John Hunter (1826-1902) of Salem, North Carolina, an 1856 graduate of the Pennsylvania College of Dental Surgery, decided to carry the matter to the Supreme Court of North Carolina. Hunter had been advised by a friend, Dr Benjamin Arrington (1827-1907), a prominent Raleigh dentist, to refuse conscription. Arrington wrote the brief, which claimed that dentistry

was “an exact specialty of medicine,” and loaned Hunter the money (nearly \$100) to carry the case to the higher court. The judge, Chief Justice Richard Pearson, ruled in favor of Hunter’s exemption, saying “I am satisfied not only that regular, educated dentists are physicians, but that the human family are much indebted to them.” This was “the first decision of the kind ever rendered in the United States giving to dentistry the legitimate right to professional distinction.” After the verdict, the Confederate congress changed the wording in the draft exemption clause to “the term physicians *not to include* dentists.” The Hunter decision finally settled the matter.^{26,41–43}

Once the wording in the clause was changed, Moore immediately made provision to assign the newly conscripted dentists to hospital duty. Because neither the Confederacy nor the Union ever established a commissioned corps of dental officers during the war, drafted dentists on both sides of the line continued to serve in military hospitals as stewards throughout the conflict.²⁶

The Perils of Conscription: the Case of Dr Watkins Leigh Burton

The most descriptive accounts of the Confederate dental service were provided by Dr Watkins Leigh Burton, whose experience illustrated the problems of dentists trying to establish their status under the conscription law. Burton was born on February 5, 1830, in Chelsea, near Richmond. He attended the Hanover Academy and worked as a clerk until becoming interested in dentistry. He began an apprenticeship with Dr John Wayt in Richmond, and at age 22 he enlisted in Company F, 21st Regiment, Virginia Infantry, which served at Harpers Ferry during John Brown’s raid.⁴⁴

On April 30, 1861, the governor of Virginia recommended Burton for appointment as a captain and assistant quartermaster in the Virginia militia, which was stationed at Fredericksburg. On March 13, 1862, Burton applied for a similar position in the provisional army of the Confederate States, but never received the appointment.^{45,46} However, Burton was inducted into the Confederate army on June 28, 1863, under the provisions of the draft. A week later, his attorneys began legal proceedings for his exemption. A writ of habeas corpus granted him temporary release from the army, and he returned to his dental practice to await a higher ruling on the case, which was delayed, apparently to await the decision on the Hunter case pending in North Carolina. Meanwhile, Burton’s status came to the attention of the Confederate adjutant and inspector general’s office. On February 12, 1864, the office wrote the Bureau of Conscription, saying Burton had a very weak claim for exemption and should be drafted immediately; additionally, it did not feel that dentists were included under the medical clauses of the conscription law.⁴⁴ A few days later, Surgeon General Moore intervened on Burton’s behalf. On February 15, he wrote Major TG Peyton, who was in charge of conscription at Camp Lee in Richmond, and asked him to defer drafting Burton until the secretary of war decided on his application for special duty.⁴⁴

The same day, Surgeon General Moore also wrote General Samuel Cooper, the adjutant and inspector general, requesting that Burton be appointed a hospital steward and assigned to the surgeon general’s office:

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II



*Watkins Leigh Burton, a dentist appointed a hospital steward by the Confederacy.
Reproduced from: Annals of Dentistry. 1946;5-6:55.*

DENTISTRY IN THE CONFEDERACY: 1861–1865

The Surgeons in charge of hospitals in this City state that patients frequently require the aid of a Dentist and it is thought that the services of Dr. Burton can be made very useful in the performance of such Dental operations as the soldiers may require.

Surgeons in the field have also made statements on this subject to the effect that Officers and Soldiers in the Army of Northern Virginia are frequently granted leaves of absence for the purpose of having Dental Operations performed; the assignment to duty in this City of a Dentist would render a protracted absence from their commands unnecessary.

The large size of Dr. Burton (his weight being upwards of 240 lbs) incapacitates him for the duties of a soldier and it is thought the interests of the Service will be promoted by his appointment to this duty.^{44(p57)}

On February 17, 1864, the same day that the Confederate congress ruled that dentists were eligible for conscription, Burton was appointed a hospital steward and ordered to report to the surgeon general for duty. However, the Bureau of Conscription was still unsatisfied; Colonel JW Preston wanted Burton's status better defined. On February 21 he complained to the War Department that Burton seemed to be conducting his personal business as usual from his home and doing little military work.^{44,47}

In order to clarify the situation, on February 25 Moore informed Dr Carrington, the Richmond medical director, that Burton was to be assigned as follows:

Dr. W. Leigh Burton, Dentist, has been appointed Hospital Steward, and will be stationed in Richmond. Information will be given to the Surgeons in charge of hospitals to have their patients who require dental operations to be collected on certain days in the week at some convenient place in each hospital, and Dr. Burton to be notified so that he can visit the hospital at the specified time, and perform the necessary operations.

To save time and to permit Dr. B[urton] to carry his instruments, an ambulance should be furnished him.^{44,48}

Burton's status underwent several administrative alterations over the next few weeks; however, he continued to function in some official capacity as a military dentist. On June 13, 1864, he was assigned by the Bureau of Conscription to "perform Dental operations" at hospitals in Richmond.⁴⁸ The same day, Moore repeated his advice to Carrington about Burton's administrative requirements.^{44,49–51} The next day, Carrington told the Richmond hospital chiefs:

You are directed to have the patients in the hospital under your charge who require dental operations collected on one day in each week & to some convenient place & to notify Dr. Burton corner 8th & Franklin St[reet]s so that he can attend at the time specified & perform the necessary operations.⁵²

Burton performed these duties until the end of the war.⁴⁴ Finally, systematic dental care was established in the Confederacy's largest medical complex in Richmond and soon spread to all of its general hospitals.

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II

Dental Surgeons and Hospital Duty, 1863–1865

Even before the conscription laws were clarified, the Confederates were pulling soldier-dentists from their units and contracting civilian dentists to serve the military. For example on March 20, 1863, Carrington told James McCaw (1823–1906), the medical officer in charge of Chimborazo Hospital in Richmond:

You are resp[ect]f[ully] requested to state (after consultation with your Division Surgeons) your opinion as to the advisability of a Surgeon Dentist making visits to your Hosp[ita]l at stated times say 2 or 3 weekly for such simple operations on the teeth (principally extraction) as may be required. The services of a Dentist very skillful in extraction can be procured on contract.⁵³

McCaw replied, "I have always required [dental] surgeon to extract teeth." Two days later, on March 22, Carrington asked the Confederate medical purveyor whether or not Chimborazo Hospital could be supplied with the necessary dental forceps. The medical purveyor replied that although there was a supply of dental instruments within the Confederate lines, there were none available at his depot. However, he hoped that McCaw would receive the forceps within a week.⁵³

The first conscripted hospital dentist was assigned to duty in March 1864. Dentists were given the rank of hospital steward because Surgeon General Moore could find "no authority of law" to appoint them to a higher grade. They received the pay equivalent for their grade, plus "extra duty pay" amounting to about \$10 a day. (For example, a typical month could look like this: extra duty pay at \$4 per diem for 30 days, \$120; commutation for room, \$40; company pay, \$18; monthly rations at \$125; clothing, two suits worth \$15 per month, \$15; monthly total: \$318.)^{26,40,54}

Dental patients admitted to the military hospitals were divided into three categories: the front line emergency cases, the convalescents, and the sick. The soldiers from the front received priority treatment so that they could return to their units. They were sent to the hospital for a particular dental operation and discharged as soon as possible. Burton made these comments on the problem of dental malingerers:

If it was argued by some officers that men from the front made the requirement of dental operations a pretext for absence from their commands, in order to have a day's relaxation in the city, they generally paid for it by the loss of one or more teeth. And even if they relished the operation, there was but little opportunity afforded them for any other enjoyment. After being discharged from the hospital they were conveyed, under guard, to the "Soldier's Home," where they remained until the "Provost Guard" escorted them to their commands. These measures appear harsh, and while no doubt they were very necessary in some cases, many men were deterred from having the benefit of dental operations rather than submit to them.^{24(p445),55}

Officers and enlisted soldiers not registered as patients in the hospitals were not entitled to dental treatment unless they had a special order signed by the medical director of their departments, which was rarely granted except in emergency cases.²⁴

Dentists were not allowed to "mess or lodge" at the hospitals. The uniform

DENTISTRY IN THE CONFEDERACY: 1861–1865

of the hospital steward was similar to that worn by an orderly or first sergeant in the Confederate army, except that the chevrons on the coat sleeves and the stripe down the trousers were black, the color indicating the medical department. The cap emblem was a gold “MS” embraced in two olive branches.^{40,56}

The surgeons in charge were usually cooperative and accommodating to the needs of an assigned dentist. Dental materials and appliances were paid for from hospital funds.⁵⁷ Burton described a typical hospital dental operating room:

A room with a good light, cold and warm water, soap and towels, and a servant or soldier, were invariably provided. The making of the operating chair was entrusted to the hospital carpenter, and generally constructed by a [c]rude design drawn in pencil. A tin basin placed upon a bench or stool answered for a spittoon. In cold weather a good fire was kept constantly burning in the room—that is to say, when the hospital was supplied with wood.^{24(p444)}

However, army dentists were provided with a special privilege: ambulance transportation to their respective hospitals, which caused some jealousy among their medical colleagues. Without this assistance, many dentists would have had to walk several miles to hospitals located outside the city, carrying their heavy instrument cases and dental materials. Some of the assistant medical surgeons, having to walk to their posts, made complaints to the medical department to have the service discontinued. Burton recalls the following incident:

In a case of the writer's, the ambulance having failed to call for him at the usual hour, and being compelled to walk to the hospital, he was of course behind time. This apparent dereliction of duty was reported promptly to the surgeon in charge, and eventually went the rounds of all official papers until it became at last so filled with endorsements that it was positively frightful to behold. The point made against the offender was, that as many of the surgeons were in the daily habit of *walking* to the hospital, the non-arrival of the ambulance could not be received as an excuse for not being in place at the proper time.²⁴⁽⁴⁴⁵⁻⁴⁴⁶⁾

Despite the physicians' complaints, the dental ambulance service continued up to the “last days of the Confederacy.” Dentists may not have had the rank, but they did get to ride to work.^{24(p446)}

The following orders from Medical Director Carrington to the senior surgeon of the Lynchburg hospitals, dated September 6, 1864, detail the duties of Dr Steward Bidgood and are an example of the typical itinerary of a hospital steward-dentist:

In accordance with the enclosed order Hosp[ital] Steward Bidgood, will be required to visit in rotation, and at stated times, the Hospitals at Lynchburg, Va. and perform such operations on the teeth and mouth as are found necessary. Suitable place should be provided for him and all facilities required furnished. I have furnished him with amalgam and some files and he has his own instruments. If he requires them or any such articles they should be procured on requisition or if not so much procurable purchased with the Hosp[ital] Funds of some of the Hospitals. It will be inconvenient for him to quarter or mess at any of the Hospitals and consequently should commute his quarters, rations & fuel. I have applied for extra pay for the dentists reporting to me and will inform you of the result of my

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II

application. In addition to plugging cleaning and extracting teeth, the Dentists have been serviceable in adjusting fractures of the jaw and in operating on the mouth and fauces.^{40,58}

Other dentists were assigned to a single hospital. For example, on November 3, 1864, Carrington advised Surgeon Davis of the Harrisonburg General Hospital that "Private J.W. Harris is detailed for duty at Gen[eral] Hosp[ita]l Harrisonburg, Va. and assigned to duty as Dentist to that Hosp[ita]l."⁴⁰

Some dentists were even assigned to hospitals near their homes and commuted, like Dr William Thackston (1820–1899) of Farmville, Virginia, an 1842 graduate of the Baltimore College of Dental Surgery. On April 20, 1864, Thackston enlisted as a private in Company D, 3rd Regiment (Booker's Regiment), Virginia Reserves. On March 3, 1865, he was assigned by Carrington as the "Dentist" to the general hospital at Farmville with the following remark:

Detailed from the Reserves as Dentist at Hosp[it]al Farmville. Will be allowed to reside at his residence near Burkeville, Va. and visit the Hosp[ita]l once weekly or as often as necessary.^{40,59,60}

This arrangement solved the problem of providing quarters for the dentist, saving the government money.

Finally, after a trial period of several months, on November 4, 1864, Carrington issued the following directive (Army Medical Department Circular 15):

I. As far as practicable in future, the operations of dentistry required in General Hospitals in Virginia, will be performed by officers, soldiers or conscripts assigned to those duties, who are dentists by profession.

II. Examinations will be made, at such times as may be fixed by the surgeon in charge, of each officer and soldier admitted into hospitals, and the necessary operation performed with the concurrence of the attending Medical officer.

III. Dentists are expected to be provided with their own instruments, but the necessary materials and files will be purchased with the hospital funds, and requisition made for other instruments thought necessary.

IV. Dentists will have the rank, pay and perquisites which their position in the army entitles them, and in addition, such extra duty pay for extraordinary skill and industry, as the Surgeon General will allow, in accordance with general order, No. 66, A & IG [Adjutant and Inspector General], office, current series.

V. Monthly reports of Dental operations and accompanying registers in accordance with forms furnished, will be forwarded through the Surgeon in charge and through this office, to the Surgeon General by the 5th of the month succeeding.^{26(pp183–185)}

Once this program was underway, the dental surgeons were kept busy with the backlog of restorations (fillings), extractions, dental prophylaxis (cleanings), and maxillofacial fractures and wounds. According to Burton, amalgam was the

most popular filling material at the time because it was inexpensive and simple to use. A typical day's work for a hospital dentist consisted of "from twenty to thirty fillings, the preparation of the cavities included, the extraction of fifteen or twenty teeth, and the removal of the tartar *ad libitum!*"²⁶(pp184–185)

Dentists also practiced some endodontic (root canal) treatment, saving many teeth that would otherwise have been extracted. Most commonly, these problems were treated with a paste containing arsenic, morphine sulphate, and creosote. While prosthetic work (dentures) was not allowed, dowel crowns (pivot teeth) were permissible.²⁶

In addition to the orders in Circular 15, hospitals kept monthly records that showed each date, patient's name, rank, regiment, company, and operation performed. Consolidated monthly returns listed the number of patients operated on and the number of extractions; fillings, prophylaxis, fractures, and miscellaneous operations; and the total number of operations. These reports were forwarded through the hospital's medical director to the surgeon general's office by the fifth of each month.^{24,26}

Toward the end of the war, almost all of the larger Confederate hospitals had a dental surgeon assigned to the staff, and the results of the dental hospital practice were so productive that support for regiment-level dentists grew. Findley Clark quotes one supportive source as follows:

Our own experience with soldiers, in and around Richmond during the last year, in connection with the statements of some of the most intelligent physicians and officers in the service, fully convinces us that out of every one hundred men sent to the hospital, or those on the sick list—exclusive of those wounded in battle—five, at least can be traced directly, or indirectly, to some derangement of the teeth; that might have been remedied in a few minutes, or hours. Thus we have of one hundred thousand men *five thousand* unnecessarily off duty. Now, this five thousand in every hundred thousand, might be returned to active duty, or prevented from leaving it, by the appointment of a few Dentists, say one to every army division.¹⁰(p73),⁵⁴

Dr Samuel Stout, the medical director of the general hospitals of the Confederate army and Department of Tennessee, explained his use of dentists and their future in the Confederate service in the September 1899 issue of *The Texas Medical Journal*:

In my administration as hospital director, I early directed the purchase of dental materials and instruments with the hospital funds, to be used by dentists detailed for that service in the hospital under the supervision of the surgeons. After, on several occasions, pressing the subject upon the attention of the Surgeon General, he issued a circular authorizing the employment of dentists of qualifications approved and vouched for by the medical directors, with the rank and pay of hospital stewards. . . . Thus you will see that I am the first army medical officer in high authority, who ever recognized the importance of the services of dental surgeons, and the first to use them in army practice. Had the Confederacy survived the conflict of arms with the U.S. government, I doubt not the regulations of its army and navy would have contained provisions for the utilization of the services of dentists, in both field and hospital service and aboard war vessels.⁵⁷(pp133-134)

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II

Stout's idea of adding uniformed dentists to the army in the field died with the Confederacy in April 1865. Had the war continued another year, it is likely that "provision would have been made for the recognition by law of the office of Dentist in the Confederate service."^{10,54}

Dentists in the Line

While the majority of Confederate dentists served in the medical departments of hospitals, many others joined front line units as ordinary soldiers because there was no dental service in the field. As in the Union army, some of the graduate dentists serving in the line did whatever dental work they could for their fellow soldiers. Those who had completed their dental training undoubtedly cared for their comrades; others, some of whom had their dental apprenticeships interrupted by the war, did not begin their formal dental education until after the conflict.

One such soldier-dentist was Dr Theodore Francis Chupein (1830–1901), a Charleston, South Carolina, dentist who began his dental apprenticeship at 17 and opened his own practice in 1852. He served in the Confederate army as a sergeant in the (South Carolina) Washington Artillery for the duration of the war, but still managed to practice dentistry. When General Shanks Evans heard of Chupein's dental training, he sent him to Charleston to pick up his case of dental instruments and assigned him to perform dentistry on the soldiers during a lull in the fighting. Because Chupein could not replace his instruments, he was forced to repair them and improvise new ones at the camp forge. Chupein did much to relieve suffering and prevent tooth loss until the soldiers could get back to their own dentists. He stressed oral hygiene to the point that the men of his company began carrying their toothbrushes in the button holes of their uniforms, a practice that spread throughout the army.^{61,62}

Another Confederate soldier, Dr William Hoffman (1836–1916), an 1861 graduate of the Baltimore College of Dental Surgery, served as a sergeant in Company M, 16th Regiment, North Carolina Infantry. Hoffman carried a kit of dental instruments with him throughout the war and created his own dental chair by driving a sharpened, forked stick into the ground to serve as a headrest and placing a cracker box or a log against the stick for a chair. Hoffman was captured on April 6, 1865, at Harper's Farm, Virginia, and taken to the prisoner-of-war camp at Point Lookout, Maryland. He continued to practice dentistry there on his fellow prisoners until he was released on June 3.^{42,63–65}

Fracture Wounds of the Jaw: Dr James Baxter Bean

Because much of the fighting in the Civil War was done from behind earthen field fortifications ("breastworks") in which the head was the most frequently exposed part of the body, many soldiers sustained jaw fractures. Surviving Confederate records show that hospitals in the South treated at least 3,312 gunshot fractures of the bones of the face, 1,604 of which were of the lower jaw. All but 340 patients were reported to have survived.⁶⁶

In 1864 the most common treatment for a fractured jaw was reduction and fixation by means of a gutta-percha splint. For example, James Hutchinson, Company

C, 53rd Georgia Regiment, 2nd Division, had incurred a fracture of the left maxilla, involving the first and second premolar teeth. At Jackson Hospital in Richmond, Burton wrote:

After forcing the fracture into its proper position, gutta percha—having been softened in warm water—was pressed on the teeth included in the fractured portion and extended to the firm teeth, the lower jaw closed and the teeth embedded in the lower portion. It was then carefully removed, placed in cold water to harden and readjusted afterwards. This accomplished all that could be desired. The fracture was held perfectly firm, the material afforded a pleasant rest to the jaw, and left an opening through which food might be received, and at the same time, it was not affected by the secretions of the mouth, or by discharges from the wound.^{26(pp185–186)}

In more complicated fracture cases that involved displacement and fragmentation, an “outer splint” of gutta-percha, which conformed to the “shape of the jaw,” was applied in addition to the interdental splint and held in place by a head bandage.^{26(p186)} Some surgeons also used splints made of pasteboard and softened with vinegar and water.^{26,67}

The best-known Confederate dentist was Dr James Baxter Bean (1834–1870). Born in Tennessee on July 19, 1834, Bean was an 1860 graduate of the Baltimore College of Dental Surgery and had practiced medicine in Micanopy, Florida, before receiving his dental degree. In September 1861, Bean published the first part of his article “Plaster and Its Manipulations” in the *Southern Dental Examiner*. In part three (January 1862), he described his technique of making a pair of calipers to measure the vertical dimension (space between the jaws), and his design for a simple, inexpensive articulator.^{68–71}

In May 1862 Bean moved to Atlanta, where he first worked at the dental supply firm of Brown and Hape. The following year he developed an interdental splint made of vulcanized India-rubber (vulcanite), which he used successfully in treating jaw fracture wounds.^{21,68}

During the winter of 1863, Samuel Stout was requested to administer anesthesia (chloroform) to a Confederate commissary officer’s wife who was having several teeth extracted by Bean at his dental office on Marietta Street. Of his first meeting with Bean, Stout wrote:

Dr. B[ean], then a stranger, excited my admiration by the dexterity and skill with which he extracted the lady’s teeth, upon which I sincerely complimented him. This drew us into a protracted conversation in regard to Dentistry and Surgery in general. Dr. B[ean] tendered his services at least one day in every week to perform operations upon the teeth of soldiers in hospitals in Atlanta, which I gladly accepted, as I found him highly intelligent and benevolently disposed. I directed the Post Surgeon, Dr. J.P. Logan, now Professor of Theory and Practice in Washington University, Baltimore, to inform the surgeons in charge of hospitals in the city of the tender made by Dr. B[ean]. Soon Dr. B[ean]’s visits to the hospital suggested to Dr. W[illis] F[urman] Westmoreland, now Prof[essor] of Surgery in the Atlanta Medical College, then Surgeon in charge of the Medical College Hospital, that Dr. B[ean]’s skill in Mechanical Dentistry might be made use of in the treatment of gun shot fracture of the inferior maxilla. The result of the suggestions of Dr. W[estmoreland] and the ingenuity of Dr. B[ean] was the production of a splint, which might be said to have been a perfect success.^{54,57}

A HISTORY OF DENISTRY IN THE US ARMY TO WORLD WAR II



*James Baxter Bean, a Confederate dentist who developed
an effective interdental splint made of vulcanite.
Courtesy of the National Library of Medicine.*

DENTISTRY IN THE CONFEDERACY: 1861–1865

In his capacity as medical director, Stout had already shown strong support for dental care. He made it a practice to assign all soldiers with dental training to dental duties long before doing so was required. His hospital directors determined the men's qualifications and, if satisfactory, appointed them to the rank and pay of hospital stewards. Stout used part of his hospital funds to buy dental materials and instruments and continually pressed for formal recognition of dental needs.⁵⁷

In June 1864 Dr Edward Covey, a medical inspector for Surgeon General Moore and a former US Army assistant surgeon (served 1856–1861), while on a tour of inspection of the Department of Tennessee, observed Bean's work in Atlanta. Covey and Stout were so impressed with Bean's method of treating jaw fractures that a special ward devoted to the task was established in the medical college hospital in Atlanta, and all cases in the area were to be sent there for treatment by Bean. Results in the ward were so good that during the evacuation of Atlanta in the summer of 1864, the patients in the ward were transferred to the Blind Asylum Hospital in Macon, Georgia, so that Bean could continue treating them. Over 40 cases were treated successfully in a 6-month period. These two hospitals were probably the first medical facilities in history to have special wards devoted exclusively to the treatment of maxillofacial war injuries.^{40,54,72}

Covey offered the following description of Bean's technique:

The instrument consists of an interdental splint . . . made of vulcanized india-rubber, having on both horizontal surfaces cup-shaped depressions, sufficiently deep to embrace the crowns of the teeth. In the adjustment of the instrument, the teeth are placed in their corresponding indentations in the splint, and kept in position, by the mental compress and occipito-frontal bandage, to be described. This compress and bandage have advantages over all others I have seen used.^{72(p83)}

One of Bean's patients was Major General James Patton Anderson of the Army of Tennessee, who was wounded on August 31, 1864, in the battle at Jonesboro, Georgia. Anderson sustained a compound fracture of the mandible when he was hit by a minié ball and was left unable to speak. After consulting with several surgeons, Bean decided to leave the wound alone for several days to allow the swelling to subside. Within 3 days it had gone down enough to allow Anderson to take liquid nourishment, and Bean began to take wax impressions and measurements necessary to make the splint. Three days later Bean inserted the interdental splint, forcing it into place, then carefully syringed the wound to remove more fragments and debris. Within days it was evident the operation had been a success. The swelling was gone, the jaw and teeth were properly aligned, and Anderson was comfortable enough to be released from the hospital on September 28. A follow-up visit on November 1 indicated full healing and only the need for some artificial teeth to replace those shattered by the bullet.^{72,73} Covey said that Anderson's fracture had "united with such little deformity, and with such perfect antagonism of his teeth, that the closest inspection does not detect that his inferior maxilla had ever been broken."^{72(p91)}

Another (future) Confederate general who sustained a jaw wound was Colonel John Brown Gordon. During the battle of Antietam (Sharpsburg), Maryland, on September 17, 1862, he was hit in the face by a minié ball, which "passed through

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II

his left cheek" and exited through his jaw, resulting in his fifth wound of the day. After being hit, Gordon fell forward into his cap, unconscious, and would have drowned in his own blood, except that a hole had been shot through the hat earlier in the battle. After being removed from the battlefield by litter, he was taken to a barn and treated by a surgeon. Attended to by his wife, Gordon recovered, and on November 1, 1862, was promoted to brigadier general. It is likely that his fracture was reduced and treated by means of an interdental splint, probably gutta-percha.⁷⁴

Meanwhile, reports of Bean's successful treatments were sent to Moore, who ordered Bean to Richmond to show his splint to the Confederate army medical board. At a meeting of the board, held in Burton's dental office, Bean presented his drawings and models and explained his splint. The board members argued that "the principles of it were not entirely new," but unanimously recommended its adoption for general use. Army dentists were to be "instructed in its construction," and a ward set up at the Robertson Hospital, at the corner of Third and Main Streets, Richmond, for the "exclusive treatment" of jaw injuries.^{26,75}

Apparently, some maxillofacial patients were also sent to Receiving and Wayside Hospital, on the corner of Franklin and 19th Streets in Richmond, which treated transient "sick and wounded soldiers, on furlough or honorably discharged from the service." Carrington ordered surgeons in charge at all Richmond and Petersburg hospitals to send the cases "for treatment of fractures of the maxillary bones" to a ward in this hospital, where at least one dentist was assigned. Listed on a roster report for the month ending February 15, 1865, there appears the following: "W.S. Wilkinson, Hospital Steward, date of commission November 4, 1862. On duty as dentist."^{40,75}

Moore officially confirmed Bean's duties on February 6, 1865, in Circular 24, which he issued to the medical directors of the various Richmond hospitals. The directors were ordered to set up well-lit wards within their hospital systems to which all jaw injury patients would be transferred. The use of Bean's apparatus would be supervised by the assigned hospital dentist. Once the ward was established, Bean would visit it to train personnel on the preparation and use of his splint, and patients could not be furloughed until treatment was complete.⁷⁶ The surgeon general, recognizing Bean's value, ordered him to be ready to go to any hospital requiring his expertise.⁷⁷ Two days later, Carrington told Moore that Receiving and Wayside Hospital had been set up to receive jaw injury patients from all Richmond and Petersburg hospitals. He asked that Bean be sent to train the "resident dentist" and surgeons.⁷⁸ That day, Carrington also notified the surgeons in charge of the Richmond and Petersburg hospitals to begin to transfer patients to the special facility and invited all medical officers to "call and examine the cases under treatment."⁷⁹

Following the war, Bean returned to Baltimore and established a highly lucrative civilian practice. He published several articles, but none on his interdental vulcanite splint. Dr Thomas Brian Gunning (1813–1899) of New York, Bean's Union counterpart, claimed to be the inventor of the interdental splint. Gunning had mended fractured jaws since 1840 and had successfully treated Secretary of State William H Seward (1801–1872) for a broken jaw with an interdental splint in 1865. It seems likely that both men developed the splint almost simultaneously, but be-



*Dr Thomas Brian Gunning, a Union dentist who developed an interdental splint during the Civil War.
Courtesy of Department of Special Collections,
the Joseph Regenstein Library, University of Chicago.*

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II



Gunning Mandible Splint, circa 1918. This splint was created to treat a jaw fracture that healed in the wrong position. The mandible was cut and fixed to the maxilla with the splint and gap in the jaw was filled with a bone graft. The horizontal pin, which may be removed quickly by the patient in case of nausea, locks the jaws together. The metal is an alloy of 80 parts silver and 20 parts copper (Maxillor) developed by the French Army Dental Corps.

*Photograph: Courtesy of the National Museum of Health and Medicine,
Armed Forces Institute of Pathology. NCP 3272.*

DENTISTRY IN THE CONFEDERACY: 1861–1865

cause of the war, neither was aware of the other's work. While Bean never published a single article on his splint, Gunning published a series of articles describing his invention in the *American Journal of Dental Science* in 1868. However, Bean's accomplishments are well documented in the Confederate military records.⁸⁰

Bean also developed a method of casting aluminum denture bases, invented an apparatus for the manufacture and administration of nitrous oxide gas, and was one of the founders of the Maryland State Dental Society in 1866, serving as its president in 1868. He died in September 1870, the victim of an avalanche while climbing Mont Blanc in Switzerland. Dr Bean is regarded as one of the pioneer dental surgeons in treating wartime maxillofacial wounds. As late as 1900, the *Chicago Times-Herald* credited Bean's interdental splint as "the means of saving scores of Southern wounded from disfigurement, if not death, from gunshot wounds in the jaw."^{68,81,82}

Through his support of Bean's work as well as military dentistry, in general, Surgeon General Moore was the first American official to incorporate the emerging profession of dentistry into military medicine. Some observers, such as Burton, were so impressed with Moore's official recognition of the role of dentistry that they concluded that dentists owed more to Moore "than to any man of modern times." Moore and others, such as Samuel Stout, reflected a willingness to change, innovate, and improve the health care of the soldiers, a spirit that was sadly lacking in the Union army and its medical department.³⁸

A Clear Need for Military Dental Support

By the end of the Civil War the need for military dental support was obvious to the soldiers who had fought on both sides of the front lines. Perhaps because the Confederacy was, in essence, creating new institutions, it was more willing to acknowledge a need for improvements. The 1863 conscription call-up left civilians lacking dental care, making people more aware of the service they had begun to take for granted. Assigning dentists to military hospitals was so beneficial to soldiers, ultimately reducing their time away from their duties, that the need for dentists appeared fully justified. After the Civil War the formation of the Southern Dental Association was a direct by-product of the first-hand experience dentists had gained during the conflict. Findley Clark was the first person in the postwar era to urge the creation of a permanent military dental corps: however, it would take another generation of effort before his vision could be realized.^{8,10}

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II

References

1. [Harris CA]. Importance of Army and Navy Dentists. *Am J Dent Sci*. 1859;9:444.
2. Freeman DS. *A Calendar of Confederate Papers with a Bibliography of Some Confederate Publications*. 1908. Reprint. New York, NY: Kraus Reprint Co; 1969: 288.
3. National Archives and Records Administration. War Department Collection of Confederate Records, 1850-1852. Record Group 109. Printed regulations for the medical department of the CS Army. Microfilm Publication M 253, roll 120.
4. National Archives and Records Administration. Collected Record Books of Various Executive, Legislative, and Judicial Offices, 1860–1865. Record Group 109. Vol 582. Chapter 6. Medical department medical purveyor's office. Entry 3.
5. *Regulations for the Medical Department of the Confederate States Army*. Richmond, Va: Ritchie & Dunnavant; 1861.
6. Taylor MW, ed. *The Cry is War, War, War: the Civil War Correspondence of Lts. Burwell Thomas Cotton and George Job Huntley, 34th Regiment North Carolina Troops*. Dayton, Ohio: Morningside House, Inc.; 1994: 102.
7. Buck SD. *With the Old Confeds: Actual Experiences of a Captain in the Line*. 1925. Reprint. Gaithersburg, Md: Butternut Press; 1983: 22.
8. Schwartz LL. War problems of dentistry: the South in the Civil War. *J Am Dent Assoc*. 1945;32:37–42.
9. National Archives and Records Administration. Record Group 109. Dr W Leigh Burton to Porter Miles. January 5, 1864. Letter. Microfilm Publication M 331, roll 42.
10. Clark FY. The employment of dentists in the Army and Navy. Cited in: *Transactions of the Southern Dental Association*. Cincinnati, Ohio: Wrightson & Co, Printers; 1870: 72–73, 151–152.
11. Koch CRE, ed. *History of Dental Surgery*. Vol 2. Fort Wayne, Ind: National Art Publishing Co; 1910.
12. Foley GPH, comp. Compilation of Civil War veterans who attended the Baltimore College of Dental Surgery. 1992. Located at: National Museum of Dentistry Archives, University of Maryland, Baltimore, Md.
13. Callcott GH. *A History of the University of Maryland*. Baltimore, Md: Maryland Historical Society; 1966.
14. American Academy of Dental Science. *History of Dental and Oral Science in America*. Philadelphia, Pa: Samuel S White; 1876.
15. New Orleans Dental College. *Dental Cosmos*. 1861;2:558.

DENTISTRY IN THE CONFEDERACY: 1861–1865

16. [Brown JPH]. Objects and aims. *Southern Dental Examiner*. 1860;1:1.
17. Obituary, Dr. George S. Fouke. *Dental Cosmos*. 1896;38:446.
18. [Brown JPH], Hape [S]. A word with our subscribers. *Southern Dental Examiner*. 1861;2:52.
19. [Brown JPH]. To our readers. *Southern Dental Examiner*. 1862;2:107.
20. [Brown JPH]. Dental surgery in the army. *Southern Dental Examiner*. 1862;2:127.
21. Georgia Dental Association. *History of Dentistry in Georgia*. Macon, Ga: Southern Press, Inc.; 1962.
22. Brown [JPH], Hape [S]. Business notice. *Southern Dental Examiner*. 1860;1:95.
23. Brown [JPH], Hape [S]. Business notice. *Southern Dental Examiner*. 1861;1:152.
24. Burton WL. Dental notes on the late Civil War. *Am J Dent Sci*. 1868;3:441,443–446.
25. Brown JPH, Hape S. Our policy. *Southern Dental Examiner*. 1861;2:85.
26. Burton WL. Dental surgery as applied in the armies of the late confederate states. *Am J Dent Sci*. 1867;3:181–188.
27. National Dental Association, Southern Branch [proceedings]. *Dental Cosmos*. 1911;53:1052.
28. Minutes [second annual meeting]. Cited in: *Transactions of the Southern Dental Association*. Cincinnati, Ohio: Wrightson & Co; 1870: 10.
29. Henderson GFR. *Stonewall Jackson and the American Civil War*. New York, NY: Longmans, Green & Co; 1936: 169.
30. Hotchkiss J. *Make Me a Map of the Valley: the Civil War Journal of Stonewall Jackson's Topographer*. Dallas, Tex: Southern Methodist University Press; 1973: xxviii, 271.
31. National Archives and Records Administration. Record Group 109. Petition, officers of Army of Northern Virginia to Seddon, July 16, 1863. Microfilm Publication M 437. No. G-319.
32. Stout WC. *The First Hundred Years: a History of Dentistry in Texas*. Dallas, Tex: Egan; 1969: 288.
33. National Archives and Records Administration. Compiled Military Service Record. Record Group 109. RE Grant. Company H, 37th Virginia Infantry. Microfilm Publication M 324, roll 834.

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II

34. Massey ME. *Ersatz in the Confederacy: Shortages and Substitutes on the Southern Home-front*. Columbia, SC: University of South Carolina Press; 1952.
35. Chesnut MB. *A Diary from Dixie*. Boston, Mass: Houghton Mifflin Co; 1949.
36. Jones JB. *A Rebel War Clerk's Diary*. Baton Rouge, La: Louisiana State University Press; 1993: 354.
37. Faust PL, ed. *Historical Times Illustrated Encyclopedia of the Civil War*. New York, NY: Harper and Row, Publishers; 1986: 613–614.
38. Cunningham HH. *Doctors in Gray. The Confederate Medical Service*. Baton Rouge, La: Louisiana State University Press; 1958: 243–246.
39. National Archives and Records Administration. Printed Records Relating to Confederate Congress. Record Group 109. Petition of dental surgeons of ten years' practice, for exemption from military service, December 29, 1863.
40. Hodgkin WN. Dentistry in the Confederacy. *J Am Dent Assoc*. 1955;50:648–654.
41. Obituary, Dr. J.W. Hunter. *Dental Cosmos*. 1903;45:70.
42. Fleming JM. *The History of the North Carolina Dental Society: with Biographies of its Founders*. Raleigh, NC: North Carolina Dental Society; 1939.
43. Walker JM. An interesting Supreme Court decision. *Dental Brief*. 1899;4:573.
44. Schwartz LL. American dentists: Watkins Leigh Burton (1830–1892). *Ann Dent*. 1946–1947;5–6:54–59.
45. US War Department. *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies, II*. Vol 51. Washington, DC: Government Printing Office; 1897: 54–55.
46. National Archives and Records Administration. Record Group 109. WL Burton to Secretary of War John P Benjamin, March 13, 1862. Letter. Microfilm Publication M 331, roll 42.
47. [Confederate States of America, War Department]. *Special Orders of the Adjutant and Inspector General's Office, Confederate States, 1864*. No 40; par 26: 93, 95. No 100; par 22, 29: 266, 268.
48. National Archives and Records Administration. Record Group 109. Surgeon General Moore to Surgeon Carrington. February 25, 1864. Letter. Microfilm Publication M 331, roll 42.
49. National Archives and Records Administration. Record Group 109. Pay voucher, WL Burton. May 5, 1864. Microfilm Publication M 331, roll 42.

DENTISTRY IN THE CONFEDERACY: 1861–1865

50. National Archives and Records Administration. Record Group 109. Surgeon General Moore to Surgeon Carrington. June 13, 1864. Letter. Microfilm Publication M 331, roll 42.
51. National Archives and Records Administration. Collected Record Books of Various Executive, Legislative, and Judicial Offices, 1860–1865. Record Group 109. Vol 364. Letter. Carrington to various hospital directors. June 14, 1864. Entry 3.
52. National Archives and Records Administration. Collected Record Books of Various Executive, Legislative, and Judicial Offices, 1860–1865. Record Group 109. Vol 364. Letters sent and received, medical director's office, Richmond, Va, 1864–1865. Carrington to various hospital directors. June 14, 1864. Letter. Entry 3.
53. National Archives and Records Administration. Collected Record Books of Various Executive, Legislative, and Judicial Offices, 1860–1865. Record Group 109. Vol 708. Carrington to McCaw. March 20, 1863. Letter. No 73 3.
54. Stout SH. Correspondence [WH Morgan]. *Dent Reg.* 1869;23:162–164.
55. Macaulay JG. Dentistry in the Confederate Armies. *SC Dent J.* 1950;8:13.
56. Thomson H. *Prisons and Hospitals*. Vol 7. In: Miller F, ed. *The Photographic History of the Civil War*. New York, NY: The Review of Reviews Co; 1912: 350.
57. Stout SH. Dental surgeons in the armies and navies. *Tex Med J.* 1899;15:132–134.
58. National Archives and Records Administration. Collected Record Books of Various Executive, Legislative, and Judicial Offices, 1860–1865. Record Group 109. Vol 364. Carrington to the senior surgeon, Lynchburg hospitals. September 6, 1864. Entry 3.
59. National Archives and Records Administration. Record Group 109. WWH Thackston, Company D, 3rd Virginia Reserves. Microfilm Publication M 324, roll 400.
60. 'He lent charm and dignity to his calling,' (William WH Thackston, MD, DDS). *Dent Radiogr Photogr.* 1953;26(no. 1):ii.
61. Obituary, Dr. Theodore Francis Chupein. *Dental Cosmos.* 1901;43:563.
62. Macaulay NW. *History of the South Carolina Dental Association: Centennial Edition 1869–1969*. Columbia, SC: the South Carolina Dental Association; 1969: 14.
63. Foley GPH, ed. *Proceedings of the 125th anniversary celebration of the Baltimore College of Dental Surgery, March 4, 5 and 6, 1965, Baltimore, Maryland*. Baltimore, Md: Alumni Association & Faculty of the Baltimore College of Dental Surgery, Dental School, University of Maryland; 1966: 177.
64. Baltimore College of Dental Surgery. *79th Annual Catalogue of the Baltimore College of Dental Surgery, Baltimore, Maryland, 1918–1919*. Baltimore, Md; 1918: 19.

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II

65. National Archives and Records Administration. Record Group 109. WH Hoffman, Company M, 16th North Carolina Infantry. Microfilm Publication M 270, roll 244.
66. Jones LL. Dentistry under the stars and bars. [DDS thesis]. Baltimore College of Dental Surgery, Dental School, University of Maryland; 1960: 10.
67. Bolton J. A simple interdental splint. *Richmond Med J*. 1866;1:318–319.
68. Obituary, James Baxter Bean, D.D.S., M.D. *Am J Dent Sci*. 1870;4:287–288.
69. Bean JB. Plaster and its manipulations. *Southern Dental Examiner*. 1861;2:53–57.
70. Bean JB. Plaster and its manipulations. *Southern Dental Examiner*. 1861;2:69–76.
71. Bean JB. Plaster and its manipulations. *Southern Dental Examiner*. 1862;2: 91–92, 93–95.
72. Covey EN. The interdental splint. *Richmond Med J*. 1866;1:81,83,88–91.
73. Warner EJ. *Generals in Gray: Lives of the Confederate Commanders*. Baton Rouge, La: Louisiana State University Press; 1959: 7, 111.
74. Eckert RL. *John Brown Gordon: Soldier, Southerner, American*. Baton Rouge, La: Louisiana State University Press; 1989.
75. Blanton WB. *Medicine in Virginia in the Nineteenth Century*. Richmond, Va: Garrett & Massie, Inc.; 1933.
76. National Archives and Records Administration. Collected Record Books of Various Executive, Legislative, and Judicial Offices, 1860–65. Record Group 109. Vol 741. Letters, orders, and circulars sent, surgeon general's office, Richmond, Virginia, June 1864–April 1865, II. No. 502, 508. Entry 3.
77. National Archives and Records Administration. Collected Record Books of Various Executive, Legislative, and Judicial Offices, 1860–1865. Record Group 109. Vol 741. Chap 6. Medical Department. Letters, orders, and circulars sent, surgeon general's office, Richmond, Virginia, June 1864–April 1865, II. Surgeon General Moore to Bean, February 18, 1865. Letter no. 508. Entry 3.
78. National Archives and Records Administration. Collected Record Books of Various Executive, Legislative, and Judicial Offices, 1860–1865. Record Group 109. Vol 364. Carrington to Surgeon General Moore, February 20, 1865. Letter. Entry 3.
79. National Archives and Records Administration. Collected Record Books of Various Executive, Legislative, and Judicial Offices, 1860–1865. Record Group 109. Vol 364. Carrington to surgeon-in-charge, Richmond hospitals, and to Dr Smith, Petersburg, February 20, 1865. Entry 3.
80. Gunning TB. Treatment of fracture of the lower jaw by interdental splints, I. *Am J Dent Sci*. 1868;2:53–65.

DENTISTRY IN THE CONFEDERACY: 1861–1865

81. Gunning TB. Treatment of fracture of the lower jaw by interdental splints, II. *Am J Dent Sci*. 1868;2:106–120.
82. Gunning TB. Treatment of fracture of the lower jaw by interdental splints, III. *Am J Dent Sci*. 1868;2:214–220.
83. Hyson JM Jr, Foley GPH. Thomas Brian Gunning and his splint for jaw fractures. *MSDA J*. 1997;40:35–38.
84. Schwartz LL. The development of the treatment of jaw fractures. *J Oral Surg*. 1944;2:193–220.
85. Pioneer military dentist [James Baxter Bean, MD, DDS]. *Dent Radiogr Photogr*. 1957;30:20.
86. Dental surgeons in the Army. *Chicago Times-Herald*. Cited in: *Dental Brief*. 1900;5:280.

