

# Civil War Surgery

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Fig 1. 1/6th ambrotype of an unidentified Asst. Surgeon proud of his pretty wife on one arm and cradling his Model 1840 Medical Staff sword in his other. Unfortunately, he is quite cross-eyed! (Author's Collection)



Fig 2. Posed stereoview of Surgeon Gilbert, 5th NY performing arm amputation at Ft. Monroe, 1861. Note: he holds a Liston amputating knife whilst checking the patients arm pulse (tourniquet applied). Asst. Surgeon Martin holds a bow saw while above his head you can see the "Anesthesiologist" looking into the camera. Note the open capital operating set, folding pocket set, and bandages/medicines. (Author's Collection).



Fig 3. Capital USA Hospital Department operating set by Kern, similar to previous stereoview. Note the similar bow saw, screw tourniquet, and Liston amputating knives. (Author's Collection.)

## HISTORY OF MEDICINE: CIVIL WAR SURGERY

by Paul R. Johnson, MD, FACS

**A**s a practicing surgeon with an avid love for Civil War military history, it was fairly natural for me to have developed an active interest in the Civil War surgeon and his/her patient care practices. They labored under very difficult circumstances and provided empathetic skilled patient care despite the enormous volume of severely injured/maimed casualties. What seems to be unfortunate is the misinformation and misperception for these military medical staff members as being knife-happy and operating without anesthesia — as is frequently portrayed in movies and similarly misrepresented in history books.

Military medical care was advanced and consistent with the standards of care for the period of 1861–1865. At the beginning of the conflict, gunshot fractures were best treated with amputation (per contemporary protocol) as soon as the limb was condemned. Pasteur's and Lister's germ theory/antisepsis was not proposed for many more post-war years, and therefore infection was quite understandably not identifiable, nor properly treated. Also, chloroform and diethyl ether were liberally used for general anesthesia for operative procedures and wound treatments.

Reviewing data gathered by the Army Medical Department (as recorded in the 1870s in the *Medical And Surgical History Of The War Of The Rebellion*), rather good patient outcomes were effected despite the lack of basic modern therapies. For example, there were no intravenous fluids, nor the concept of volume resuscitation for hemorrhagic shock. The “ABCs” of airway/breathing/circulation were unknown. The golden hour of rapid patient transport was impossible at that time.

At least 620,000 deaths occurred during the Civil War; and every casualty was an American. It is very important to note that 2 to 3 times as many patients died from disease as compared to military trauma. Bugs killed far more soldiers than bullets, especially when consideration is given to poor personal hygiene, camp latrines upstream from drinking water sources, and city boys living with country boys in cramped quarters, which proved to be an incubator for infecting organisms such as mumps, mea-

sles, smallpox, typhoid, and other contagious diseases.

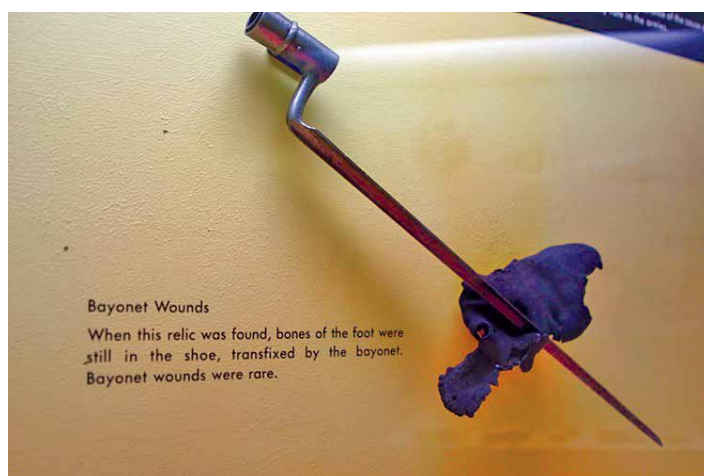
Regarding battle trauma, projectiles were the norm; particularly the 1-ounce Minie ball fired from accurate and long-ranged rifled muskets. Edged weapons rarely killed. Of a reported 246,712 wounds, only 922 bayonet/sabre wounds were reported for US soldiers.



**Fig 4. Minie ball fracture of femur (Courtesy Armed Forces Institute of Pathology).**



**Fig 4. (Slide #36) Minie ball fracture of femur. (Courtesy Armed Forces Institute of Pathology).**



**Fig 5.**

Bayonet Wounds  
When this relic was found, bones of the foot were still in the shoe, transfixed by the bayonet. Bayonet wounds were rare.



**Fig 6. Seventh Michigan cavalry soldier cut down by CS saber slash during Lee's retreat from Gettysburg. This patient lingered for more than 1 month, as evidenced by the skull's inflammation changes. (Courtesy Armed Forces Institute of Pathology.)**

Casualty evacuation improved after the Battle of Antietam with formation of a capable ambulance corps through the efforts of Surgeon Jonathan Letterman, Medical Director, Army of the Potomac. This was extended for the transportation of patients from the regimental battlefield hospitals to receiving US Army Hospitals in major cities via improved designs for hospital rail road cars, and US Army Hospital steamer transports such as the *US Ben Deford*, which served mostly in the Chesapeake Bay during the Army of the Potomac campaigns.



**Fig 7. Plenty of open drop general anesthesia was used: ether versus chloroform. Of interest, ether is very safe, and therefore administration relegated to non-physicians, which spawned the US profession of Nurse Anesthetists. (Internet.)**



**Fig 8. Two CDVs of Asst. Surgeon William Barrett, 53rd Mass. Vols. One showing him holding his MS sword, the other is the only known image of a military surgeon taking a pulse (Author's collection).**



**Fig 9. CDV of unidentified New York Asst. Surgeon posed as 'operating' on his wife's finger, with open folding surgical case. The lady is wearing dress similar to Zouave Vivandiere uniform. (Author's Collection.)**

Basic Civil War surgical practices of the day included initial removal of foreign bodies from the wound. The fairly low velocity of rifle muskets generated bits of uniforms, leather, paper, and other items impacting well into gunshot wounds. Bullets were removed via many rather ingeniously designed forceps, clamps, and screw devices. Wound suppuration was thought to be the lining being extruded itself. Healthy wounds developed "proud flesh" (granulation healing tissue), which is still recognized as



Fig 10. Companion Ft. Monroe 1861 stereoview showing leg amputation. Note the screw tourniquet applied, the ether mask held to patient's face (between both surgeons heads), and now there are two anesthesiologist mugging for the camera! (Author's Collection.)



Fig 11. Stereoview of Camp Letterman, Gettysburg, 1863 leg amputation. Note the ether mask, open surgical set, and Surgeon taking femoral pulse (Author's Collection.)



Fig 12. Rare New Orleans studio CDV of posed leg amputation. Patient is under anesthesia, there are a saw and instruments on plank, boot and sword on floor, and a very young African American attendant! An odd topic, but this is the only known image of an officer's long linen/cotton underwear's draw strings seen rolled up on his right leg! (Author's Collection.)



Fig 13. Companion Camp Letterman stereoview of posed amputation scene at the embalming tent. Note under high magnification, this "leg" amputation is in fact a right arm procedure, most probably on a corpse. Mistakenly identified in NY Medical Journal post-war as showing the amputation of General Sickles! (Author's Collection.)

# Civil War Disease

Cases	Disease	Cases	Disease
Deaths		Deaths	
• 1,155,266	Acute Diarrhea	• 11,898	Continual Fever
• 2,923		147	
• 170,488	Chronic Diarrhea	• 49,871	Typhoid - Malarial Fever
27,558		4,059	
• 233,812	Acute Dysentery	• 73,382	Syphilis
• 4,084		123	
• 25,670	Chronic Dysentery	• 95,833	Gonorrhea
• 3,229		6	
• 75,368	Typhoid	• 3,744	Delirium Tremens
27,050		450	
• 2,501	Typhus	• 2,410	Insanity
850		80	
• 30,714	Scurvy	• 2,837	Paralysis
383		231	

# Amputations – 29,990 (US)

Cases	#	Deaths	% Fatal
• Finger	7,900	198	3
• Forearm	1,700	245	14
• Upper Arm	6,500	1,273	24
• Toes	1,500	81	6
• Lower Leg	5,500	1,700	38
• Knee Joint	195	111	58
• Middle Thigh	6,300	3,411	54
• Hip Joint	66	55	88



**Fig 14. Similar folding pocket surgical set by Schive-ly, Phila., circa 1858, owned by Dr. James Reagles, 62 New York (Anderson's Zouaves) (Author's Collection).**

positive progress today.

After projectiles were removed, limbs were splinted in position of function by many of the devices and traction (Buck's traction) that are still used today. To prevent further hemorrhage, field and operating tourniquets were liberally and effectively employed. Most gunshot fractures required urgent amputation. Postoperatively, water dressings and splinting were effective to a point, but "hospitalism" (wet and dry gangrene) was common; treated by higher amputation if possible versus direct wound painting with various caustic compounds, with some success.

The closer to the trunk was the wound, the more lethal the resulting outcome. Some chest and abdominal wounds formed fistulas and decompressed visceral injuries with survivorship (such as Generals Joshua Chamberlain and H.A. Barnum). Head wounds were highly lethal, but not all were fatal. General Gabriel Paul was shot through his skull and both eyes at Gettysburg, but survived the war, although quite blind. At least six cases of depressed occipital skull fractures producing blindness remarkably regained vision after trephination successfully evacuated the hematomas which relieved the pressure on the visual



**Fig 15. Stereoview (taken during 7 days battles before Richmond, summer, 1862) of probable 16th New York Asst Surgeon treating a soldier's right inner thigh wound. Note: most probably his assistant is holding a U.S. Army Hospital Dept. knapsack (only known image). Also, consider that all of these soldiers were captured by CS forces shortly after this photograph. (Available from Internet).**



**Fig 16. Asst. Surgeon Anson Hurd, Indiana caring for severely injured CS soldiers – field hospital, Antietam. Note the bayoneted muskets used as tent shelter poles (Available from Internet).**



**Fig 17. Post-amputation soldiers at Marye's Heights, Fredericksburg, 1864 (Available from Internet).**

cortex.

Caring for the wounded entertained a significant personal risk. More than 250 surgeons died from trauma or disease during the American Civil War. More importantly, surgeons very frequently stayed behind the lines and were captured caring for their charges after battles and campaigns moved their lines of combat. Many surgeons caught consumption or dysentery during campaigns and from prisons, and many suffered long after they were exchanged (US surgeons normally had their surgical sets "liberated/repatriated" by their Confederate States soldier counterparts).



Fig 18. Capital operating set by Tiemann used by Brigade Surgeon Martin Kittinger, 100th N.Y., who also was very active on Morris Island during the Ft. Wagner campaign. He hailed from Buffalo, contracted TB during his confinement at Libby Prison (after 7 Day's Battles), and was later exchanged. He also knew and worked very well with Clara Barton in SC (Author's Collection).

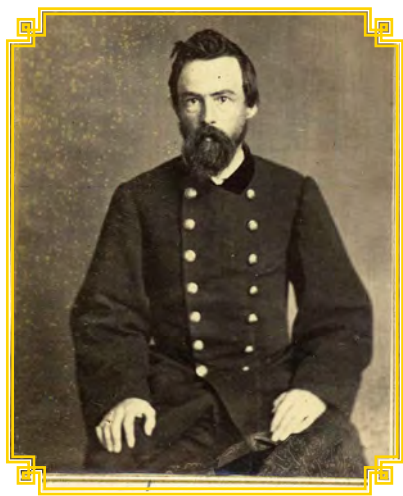


Fig 19. Regimental tribute to Surgeon Adams, Wheatfield, Gettysburg. Dr. Adams suffered from blindness after continuous strenuous service caring for his patients requiring his resignation (Author's Collection).



Fig 20. CDV of Asst. Surgeon Edward Revere, 20th Mass, mortally wounded West Woods, Antietam. His grandfather was Paul Revere; his brother Paul Revere was killed at Gettysburg (Author's Collection).





**Fig 21. (Slide #98) Brigade Surgeon Edwin Bentley performed the first successful blood transfusion (blood from a “strong German”), hip disarticulation amputation, carotid artery ligation, and later, at Indian war fort, delivered General Douglas MacArthur! (Author’s Collection.)**

Many medical advances were affected during the conflict. Brigade Surgeon Edwin Bentley was on the forefront of these innovations. He performed the first successful blood transfusion (utilizing the blood of a “healthy German”), successfully ligated the carotid artery for hemorrhage, performed shoulder joint resection sparing the hand, disarticulated hips, controlled leg bleeding with an abdominal aortic compressor (!), and was a proponent for conservative therapy for gunshot fractures, allowing them to heal in with time and wound care, sparing limbs. Dr. Bentley was on the forefront for African American education, serving on Howard University’s staff. In 1880, he delivered Gen. Douglas MacArthur at Little Rock Arsenal/fort!



**Fig 22. (Slide #90) Antietam monument to Clara Barton, “Angel of the Battlefield.” Whilst attending a wounded soldier near here, a bullet passed through her sleeve and killed her patient (Internet).**

Monumental efforts of several prominent ladies established the roles of women in the fields of nursing and medicine in America during the war. Clara Barton, Dorthea Dix, Mrs. Bickerdyke, Sister Adelaide Tyler, and a volume more elevated the field of nursing to the profession it is now. Remarkably, Mrs. Pheobe Pember rose to the post of administrator of Chimborazo CS Hospital in Richmond. And Dr. Mary Walker (and at least one other lady physician) served as Acting Assistant Surgeon — Dr. Walker was acknowledged for her efforts with the Congressional Medal of Honor.



**Fig 23. (Slide #93) Acting Asst. Surgeon Mary Walker served with distinction with the Ohio Regiment, and may have served as spy also. She received the Congressional Medal of Honor, which was later rescinded, but she refused to return it (Internet).**

The field of prosthetics grew out of the demand for these lifestyle stabilizing/improving devices. Some were designed with very functional grasping hand/finger levers. Plastic surgical and reconstructive procedures were directly developed to heal some of the most disfiguring wounds suffered during the conflict. Some of their results rival modern efforts today!

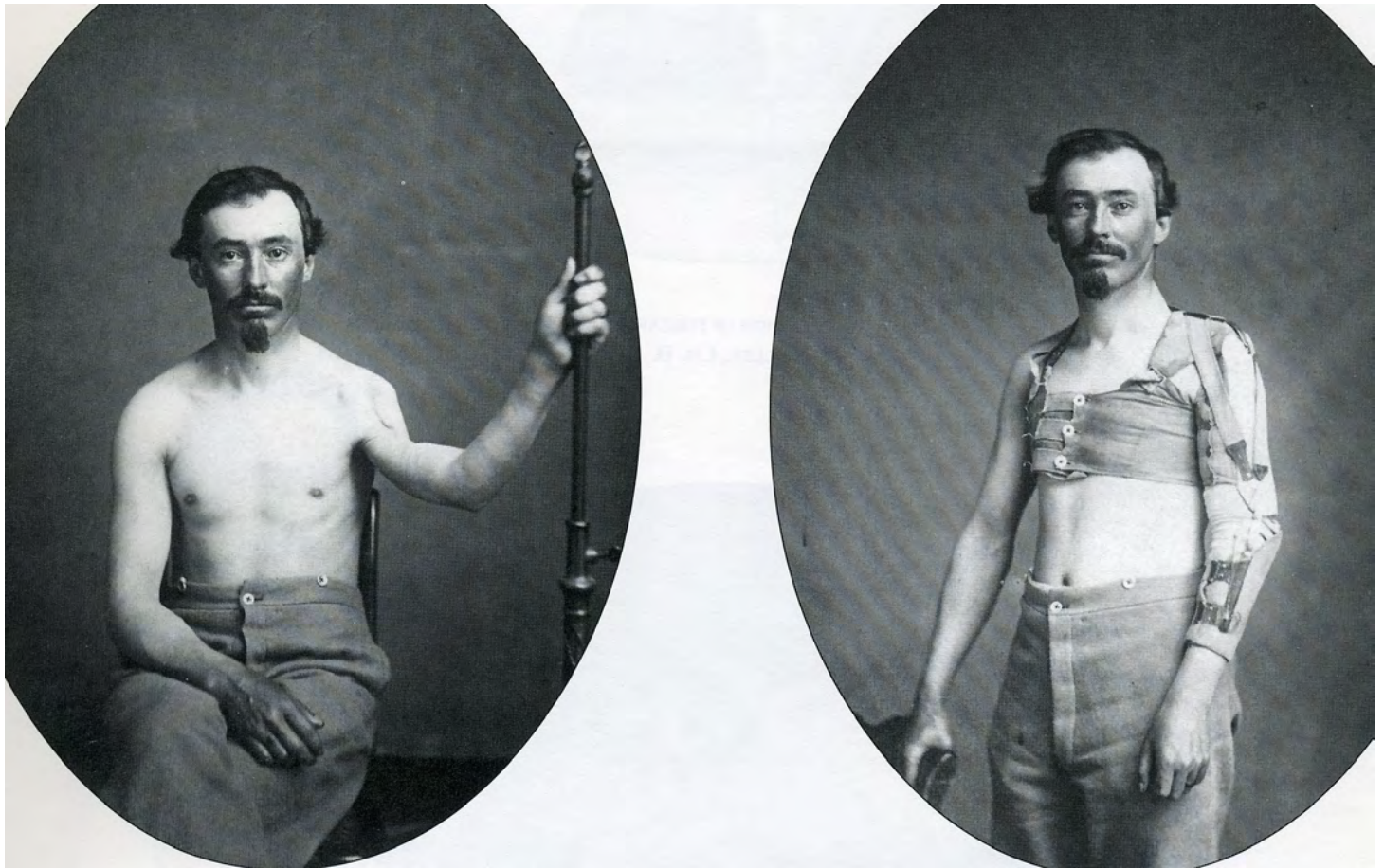


Fig 24. Results of left humeral head resection for gunshot wounding. With brace, a functional left hand results, and thus the limb is saved. According to Medical and Surgical History of the War of the Rebellion (Vol X, pg 591): "On Oct 20th, 1863, Corp. Peter Brock indeed underwent excision of the head and five inches of the shaft of humerus through straight incision by Surg. H. Janes, USV." (Courtesy Armed Forces Institute of Pathology.)



Fig 25. Not all abdominal wounds were fatal. Image of Gen. Barnum, NY, with gunshot fistula through which he would place and draw various linear objects for demonstrations! (Internet.)



Fig 26. (Slide #101) Pvt. John Bathurst, 45th PA, wounded at Cold Harbor. The field of prosthetics developed for the need of veterans of the Civil War (Author's Collection).



Fig 27. Pain relief was effectively achieved for the post-operative Civil War patient, but at a price. Morphine, opium, and laudanum were used liberally, but unfortunately, the scourge of drug addiction/dependence impacted all too many veterans (Author's Collection).



Fig 28. (Slide #107) Surgeon General Hammond was promoted over more senior medical army staff. They conspired against him (after Hammond forbade the use of Calomel-Mercury) and brought trumped up charges of misuse of whiskey funds. He was convicted and left the service, but ultimately was exonerated postwar upon review. He was a very talented Neurologist in private life (Internet).

Unfortunately, some negative medical issues and personalities also are notable from the Civil War era. Surgeon General Joseph K. Barnes attended Lincoln and, completely against normal dictums of medicine at that time, probed his head wound bullet tract full length with a Nélaton probe. Thus, he may have effectively “pithed” the President whilst he was still alive.



Fig 29. Asst. Surgeon Charles Leale, recently graduated from medical school and in the US service for several weeks, was the first to attend Lincoln at Ford's theatre. He removed the clot from the skull wound and performed an early version of CPR which resuscitated the President. Mary Lincoln requested that Leale stay with her husband and he was at his side until he died the following morning (Internet).

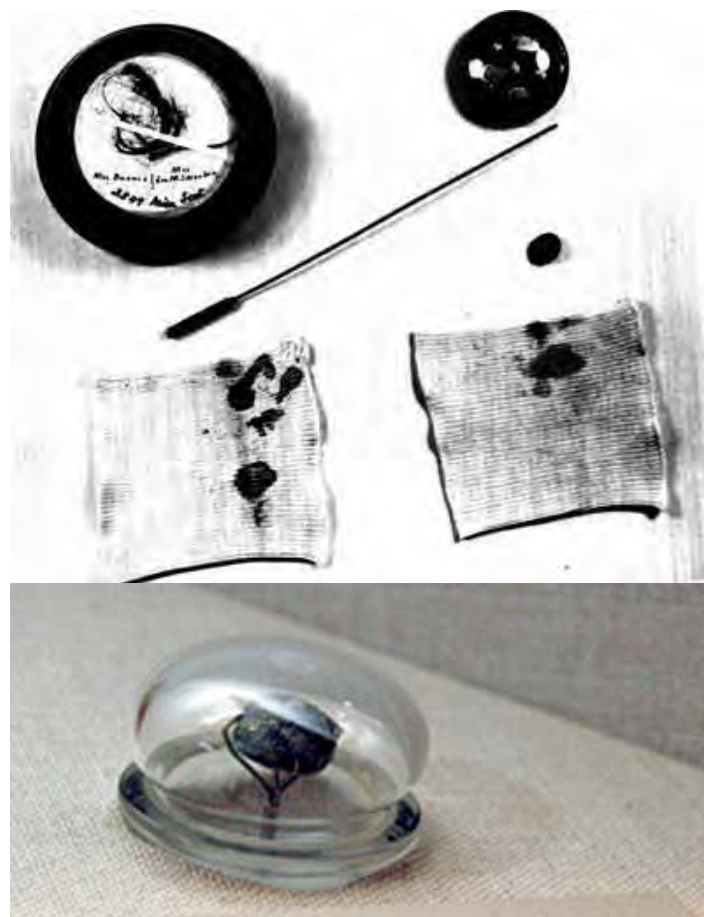


Fig 30. Lincoln's autopsy specimens include his hair, skull fragments, Nélaton probe, cuffs from surgeons, and the bullet Booth fired into Lincoln's head (Courtesy Armed Forces Institute of Pathology).

Dr. Samuel Mudd cared for J.W. Booth's leg fracture. He failed to throw out Booth's identified boot, and was tried/convicted of involvement and imprisoned at Ft. Jefferson, Key West. During his imprisonment, an outbreak of yellow fever ravaged the prison and killed the post surgeon. Dr. Mudd volunteered to care for both the infected prisoners and guards, and subsequently earned a pardon from President Johnson.



**Fig 31. Dr. Samuel Mudd (carpentry shop, Ft. Jefferson Prison) and Booth's boot. Archival information shows that Mudd met with Booth and other conspirators at Willard's Hotel, Washington, DC, before the assassination (Time Life).**

Further, the only Civil War criminal executed for the horrendous results at Andersonville was Capt. Wirz, who was an Austrian physician. However, the US equivalent to Andersonville was Elmira prison in New York, whose medical director was Surgeon Eugene Sanger. The CS prisoner death and disease rates under his supervision were also very horribly high.

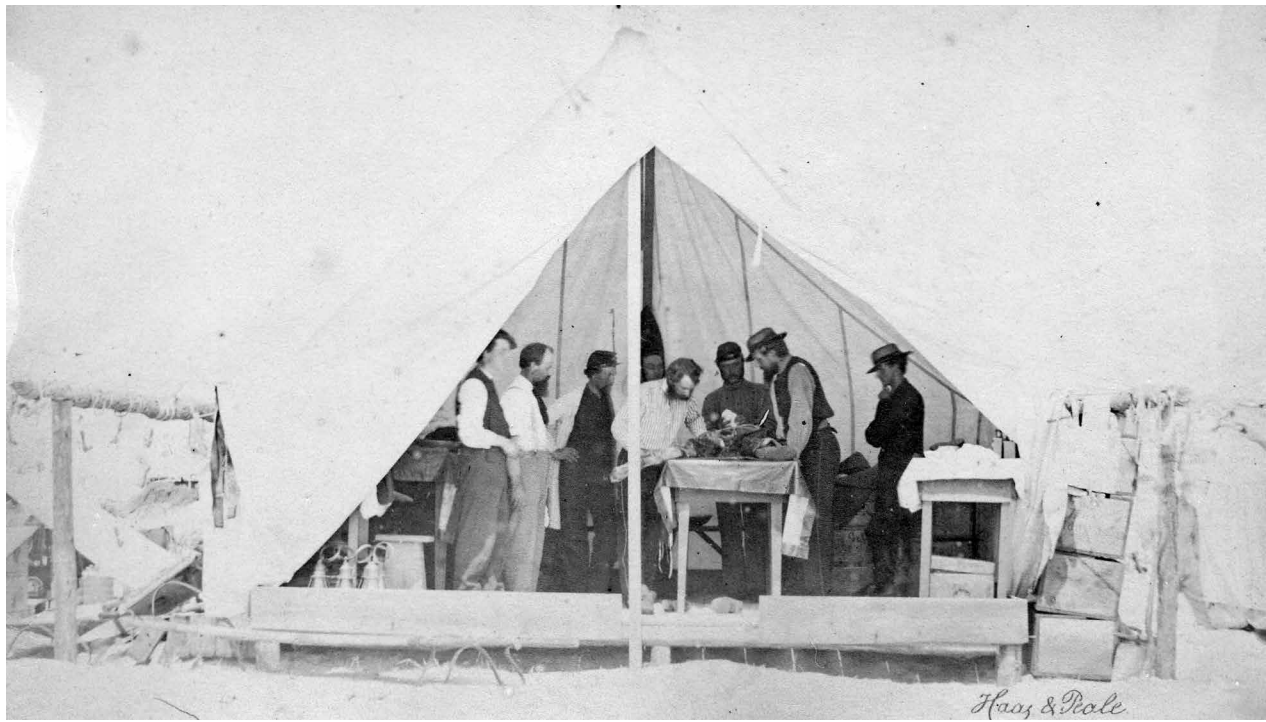
The topic of Civil War era surgery is too vast to be fully discussed in this article. I hope that our display and lecture presentation coupled with this article have served to acquaint the interested arms collector/historian in some small way with the prodigious efforts of these military medical pioneers. I stand in awe of what they did and their professional healing example. It is a tough legacy to follow, indeed.



**Fig 32. Image of the execution of Capt. H. Wirz, commandant of Andersonville. Note the private at "shoulder arms" without bayonet, but his rifle has its tompon in place! (Internet.)**



**Fig 33. (Slide #118) Surgeon Eugene Sanger Medical Director, Elmira Prison camp, NY (Author's Collection).**



**Fig 34. Rare albumen photo of Medical Inspector J.J. Craven operating on the limb of soldier on Morris Island, SC, during the 1863 Ft. Wagner campaign. He later cared for Jefferson Davis at Ft. Monroe during the ex-CS president's imprisonment. Surgeon S.A. Green (24th Mass) assists to Craven's left. Dr. Green disagreed with the efforts of Clara Barton during this time period. In the 1870s, Dr. Green became the Mayor of Boston. (Author's Collection).**



**Fig 35. (Left) Site of Gen. Hancock's wounding during repulse of Pickett's charge, Gettysburg. He was hit in the inner right thigh; the bullet had carried a saddle nail and matter which was removed by two Surgeons on the battlefield, but the bullet was not removed. Hancock was sent home to Norristown, PA, and expected to die. (Internet.)**

**Fig 36. (Right) Surgeon Lewis Read visited Hancock who was his neighbor and friend. As Read was leaving Hancock's home (with the expectation of his imminent death), Hancock asked Dr. Read to give it a go. Dr. Read placed Hancock on a chair on a table to simulate the mounted position whence the wound was received, aimed a Nélant probe like a rifle sighting in on his inner thigh and approached and penetrated the wound nearly immediately finding the bullet and successfully extracting it, which saved Hancock's life! (Author's Collection.)**



**Fig 37. Companion Camp Letterman albumen showing left arm resection via straight incision of humeral head for gunshot wound. I believe that we can confirm at this time that this image depicts Surgeon Henry Janes operating upon Corp. Peter Brock, 28th Mass after the surgery is completed and strap dressing is being applied (when a pause for image could be safely effected). Note: anesthesia is being performed, and the open surgical sets are to the left on the stool, and right on the bed. (Photo courtesy Wm. Frassanito's, Early Photography at Gettysburg.)**