RICE UNIVERSITY

IMPROVISATION, ADAPTATION AND INNOVATION: THE HANDLING OF WOUNDED IN THE CIVIL WAR

by

Ralph Molyneux Mitchell II

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

Thesis Director's Signature:

Houston, Texas

April, 1975
ABSTRACT

IMPROVISATION, ADAPTATION AND INNOVATION: THE HANDLING OF WOUNDED IN THE CIVIL WAR

Ralph Molyneux Mitchell II

Critics of Civil War medical practices tend to isolate them from all other aspects of the war and evaluate them against twentieth century standards. This results in a distorted picture of successes and failures. Only when viewed in proper historical perspective and evaluated as components of vastly different logistics systems can the Confederate and Union Medical Departments be judged properly.

Efforts by the Confederacy to support its army were hampered by shortages of capital, labor, food, supplies and transportation. These shortages kept its logistics system in the embryonic stages of development throughout the war. The Union, on the other hand, was able to support its army for exactly the opposite reasons. An abundance of capital, labor and raw materials combined with an excellent transportation network and a strong industrial base to insure the success of Union logistics and, in a war of attrition, to guarantee victory.

Reflecting the poverty of its logistics system, the Confederate Medical Department, under the strong leadership of Samuel Preston Moore, managed not only to survive four years, but to acquit itself admirably on many battlefields. To care for
the wounded, surgeons relied on their abilities to improvise and adapt. Such skills, early learned and often used, carried them through periods of total logistical failure. There were never established in the South medical supply, ambulance and field hospital systems with a statutory basis. Only in its system of general hospitals did the Medical Department achieve any degree of standardization and efficiency. Beyond that, its accomplishments fit in well with the overall accomplishment of the Confederacy—that of conducting an improvised war throughout.

In stark contrast to the struggles of Confederate surgeons was the ease with which Union surgeons handled their wounded. Under innovative men like William A. Hammond and Jonathan Letterman, medical supply, ambulance and field and general hospital systems were established and standardized within the Union Army. Medical officers in the North were also capable of improvising and adapting to a countless variety of situations, but after 1863 there was little need for improvisation. More time could be spent refining a medical system already receiving world acclaim. Under the aegis of a sound logistics system, Union surgeons saw innovation become routine.

No one will deny that the wounded on both sides suffered terribly. Despite the primitive state of the art, practices, which by today's standards seem barbaric, were saving men's lives. The mortality rate of wounded soldiers was less
than that of any previous conflict. Had aseptic and anti-
septic procedures been known to Civil War surgeons, countless more lives could have been saved. Discovery of those tech-
niques, however, would belong to the post-war generation.
Still, the medical triumphs of the Civil War should not be overlooked. For the first time in a war medical and surgical activities were systematically reported and analyzed. Major advances were made in dentistry, nursing and pharmacy. Military health lessons learned during the war gave impetus to the public health movement, and innovations in hospital design and construction were also introduced. Surgeons took the life-
saving surgical skills learned in battle into civil practice where, as leaders in the medical field, they made major contributions to American medicine for the next half century.

From a military standpoint, Civil War medical contributions had far-reaching effects. Letterman's field hospital and ambulance systems led to improved methods in caring for the sick and wounded in armies throughout the world and remained basically unchanged in the United States Army until after World War II.
ACKNOWLEDGMENTS

There are several people who helped make the task of writing this thesis much easier. My thanks go to Professors Floyd S. Lear, Sanford W. Higginbotham and Albert Van Helden for their helpful comments and suggestions and to Richard E. Wood for the information he found and passed on to me as he was conducting his own research. Frederick R. Zuber gained my undying gratitude by proof reading my final draft. Particular thanks also go to my mentor, Doctor Frank E. Vandiver, for keeping me pointed in the right direction and showing me examples of what good writing should be.

My mother, Mrs. L. G. Rohrbaugh, deserves special credit for locating and obtaining for me several important documents pertaining to Union and Confederate medical activities. Finally, I want to thank my family whose patience and understanding were of inestimable help during the critical writing stages of my thesis.
# TABLE OF CONTENTS

ACKNOWLEDGMENTS .................................................. ii
LIST OF ILLUSTRATIONS .............................................. v

Chapter

I. THE POVERTY OF CONFEDERATE LOGISTICS ...................... 1
   Introduction ................................................... 1
   Confederate Logistics ........................................... 4
   The Confederate Medical Department ......................... 13

II. THE SUCCESS OF UNION LOGISTICS ............................... 34
   Union Logistics ................................................ 34
   The Union Medical Department ................................. 44

III. BATTLEFIELD EVACUATION AND TREATMENT .................... 93
   Wounds ......................................................... 93
   Battlefield Treatment of Wounds .............................. 94
   Evacuation to Confederate Field Hospitals .................. 100
   Evacuation to Union Field Hospitals ......................... 102
   Confederate Field Hospitals ................................ 114
   Union Field Hospitals ....................................... 121

IV. THE FINAL STEPS ................................................ 144
   Evacuation to Confederate General Hospitals ............... 145
   Evacuation to Union General Hospitals ...................... 148
   Confederate General Hospitals ............................... 162
   Union General Hospitals .................................... 167
   Final Disposition of Confederate Wounded .................. 174
   Final Disposition of Union Wounded ......................... 175

V. THE WAR YEARS IN PERSPECTIVE ................................. 182
   1861 ......................................................... 182
   1862 ......................................................... 184
   1863 ......................................................... 186
   1864 ......................................................... 187
   1865 ......................................................... 189
<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Confederate Field Ambulance</td>
<td>23</td>
</tr>
<tr>
<td>2.</td>
<td>Chimborazo Hospital, Richmond, Virginia</td>
<td>26</td>
</tr>
<tr>
<td>3.</td>
<td>Dunton's Regimental Medical Wagon</td>
<td>61</td>
</tr>
<tr>
<td>4.</td>
<td>Perot's Medicine Wagon</td>
<td>61</td>
</tr>
<tr>
<td>5.</td>
<td>Autenrieth Medicine Wagon</td>
<td>62</td>
</tr>
<tr>
<td>6.</td>
<td>Autenrieth Medicine Wagon - Side View</td>
<td>62</td>
</tr>
<tr>
<td>7.</td>
<td>Medicine Pannier</td>
<td>63</td>
</tr>
<tr>
<td>8.</td>
<td>Upper Tray of Medicine Pannier</td>
<td>63</td>
</tr>
<tr>
<td>9.</td>
<td>Wicker Hospital Knapsack</td>
<td>64</td>
</tr>
<tr>
<td>10.</td>
<td>Regulation Hospital Knapsack of 1862</td>
<td>64</td>
</tr>
<tr>
<td>11.</td>
<td>Surgeon's Field Companion</td>
<td>64</td>
</tr>
<tr>
<td>12.</td>
<td>Regulation Hospital Tent</td>
<td>65</td>
</tr>
<tr>
<td>13.</td>
<td>Sibley Tent</td>
<td>65</td>
</tr>
<tr>
<td>14.</td>
<td>&quot;Finley&quot; Two-wheeled Ambulance - Front View</td>
<td>72</td>
</tr>
<tr>
<td>15.</td>
<td>&quot;Finley&quot; Two-wheeled Ambulance - Side View</td>
<td>72</td>
</tr>
<tr>
<td>16.</td>
<td>Rucker Four-wheeled Ambulance - Rear View</td>
<td>73</td>
</tr>
<tr>
<td>17.</td>
<td>Rucker Four-wheeled Ambulance - Side View</td>
<td>73</td>
</tr>
<tr>
<td>18.</td>
<td>&quot;Moses&quot; Ambulance - Front View</td>
<td>74</td>
</tr>
<tr>
<td>19.</td>
<td>&quot;Moses&quot; Ambulance - Rear View</td>
<td>74</td>
</tr>
</tbody>
</table>
21. Army Wagon Used as Ambulance .............. 75
22. Sedgwick Hospital Ward Ventilation Plan ...... 81
23. Satterlee Hospital ................................ 82
24. Mower Hospital .................................. 83
25. British Cacolet .................................. 105
26. British Cacolet Open for Use and Closed for Traveling ................. 105
27. British Mule Litter .............................. 105
28. Interior of an Improvised Hospital Car ........ 152
29. Hospital Car - Side View ...................... 152
30. Hospital Car - Top View ....................... 152
31. U. S. Army Hospital Steamer D. A. January ... 154
32. Steamer D. A. January - Upper Deck .......... 154
33. Steamer D. A. January - Cabin Deck .......... 154
34. Steamer D. A. January - Middle Deck .......... 155
35. Steamer D. A. January - Lower Deck .......... 155
CHAPTER I
THE POVERTY OF CONFEDERATE LOGISTICS

No one won the Civil War. An army emerged victorious and the Union was preserved, but people on both sides suffered terribly. Men and boys went away to fight for a cause they hardly understood. All possibilities considered, odds were two to one against their safe return. They could be struck down by disease or enemy bullets and could die from either, or, at best, they could escape both and return home bearing the lifetime scars of fratricide.

Soldiers on both sides worried about their families at home. Could they take care of themselves? Would incapacitation or death take the family provider from them forever? There was good cause for worry. Previous American and foreign wars had been unkind to sick and wounded soldiers.

Disease had always been the greatest killer on the battlefield. Field sanitation and hygiene were ignored, and few diseases had known cures. Until such cures were found, treatment consisted of long rest periods followed by
slow recovery or death. As late as the Mexican War ten Americans had died of disease for each one killed by the enemy.¹ Casualty statistics for the Civil War showed great improvement. In the Confederate Army three men died of disease for each one killed in battle. The ratio for the Union Army was even more respectable at two to one.² Disease would still remain the greatest crippler of armies, but its force as a killer was slowly being reduced. Immunization and other medical techniques such as isolation were controlling epidemics and reducing morbidity.

Prior to the Civil War the handling of wounded had been haphazard. Frederick the Great had used Prussian executioners as surgeons. Both he and Napoleon I left wounded to die on the battlefield without medical care or removed them to nearby structures and abandoned them.³ Americans had never had to deal with large numbers of wounded and were not prepared for such undertakings at the beginning of the war.⁴ Medical organization and administration were inadequate and unsuitable for large armies, and the urgency of war did nothing to ameliorate the situation. Wartime, it was thought, was the worst period of all for change. Detailed studies were abandoned in favor of hasty improvisations. It is a credit to American
resourcefulness that Civil War surgeons were able not only to adapt to a countless variety of situations, but to provide modern medicine with many important innovations as well.

Organizing Confederate and Union medical departments to handle large numbers of sick and wounded was of primary importance. Good ideas and techniques were not enough. Each had to be logistically supportable. Could the logistics systems of both armies support their medical departments?

In the great surge of economic expansion between 1848 and 1860, the North greatly surpassed the South. Even though the South enjoyed a higher relative increase in railroad mileage between 1850 and 1860, the North held the advantage in miles of track, 22,385 to 8,783. Inland and overseas shipping, manufacturing and finance were monopolized by shrewd Northerners. The North also had greater food production than its agrarian neighbors. Population figures for 1860 showed twenty-two million inhabitants in the North to only nine million in the South. Three and one half million of the latter were slaves. In the face of such odds the South began to develop a logistics system. Devoted to procuring, moving and sustaining men and equipment, logistics was the most important military art next to fighting itself.
For the Confederate Army, logistics was not a simple matter. A war of movement would increase its complexity. There were no supply manuals to guide the army's logistics efforts at the outset. It is not surprising that the first supplies were received largely from the generous donations of private citizens.⁶

Early logistics efforts were patterned after those of the old United States Army. In order of rank, the following officers headed those efforts:

<table>
<thead>
<tr>
<th>TITLE</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartermaster General</td>
<td>Supplies and Transportation</td>
</tr>
<tr>
<td>Commissary General of Subsistence</td>
<td>Food</td>
</tr>
<tr>
<td>Chief of Ordnance</td>
<td>Arms and Ammunition</td>
</tr>
<tr>
<td>Surgeon General</td>
<td>Medical Activities</td>
</tr>
</tbody>
</table>

The last officer was never considered on a staff level equal to any of the other service chiefs. As the war became more complex, the services were subdivided into many departments. Supply services' operations became more difficult and more centralized until the ultimate decision-making responsibility fell to the President and the Secretary of War. Neither was an expert in logistics management, and neither had time directly to oversee logistics operations.
Coordination was unwisely left to the service chiefs. At all levels of command timely and efficient support efforts and distribution of supplies required good cooperation under one logistics coordinator. Since no such man was ever appointed to oversee all activities, there never was one unified logistical effort. Centralization was accomplished within separate departments, but between them parochialism and fierce competition for money, labor and materials detracted from the overall logistics effort. Lack of coordination and cooperation was one of the most serious flaws in Confederate logistics. There were, of course, many others.

Labor shortages hurt manufacturing throughout the war. Skilled labor was not judiciously impressed for vital jobs, and many badly needed craftsmen found themselves fighting in the ranks.

By midsummer 1861 the Confederate logistics system was creaking under the strain of increasing demand and decreasing supply. The blockade, in effect since April of that year, was beginning to take its toll of revenues and goods. Short-term enlistments were expiring. There was a shortage of arms. Waterways were available but means of conveyance largely absent. Roads were in poor condition,
and railroads were not living up to transportation expectations. There were no funds to build or repair transportation facilities. The Quartermaster Department handled all transportation and naturally gave its own shipments priority to the disgruntlement of the other services.9

Logistical success depended to a large degree on the efficiency of Southern railroad operations. The age of the railroad made possible the age of extended warfare. Geographical restrictions were removed, and logistics became a problem of much greater proportion than ever before experienced. Food, clothing, ammunition, shelter, medical care and transportation had to be provided to armies operating far from bases of supply. As the Confederate forces increased in size, so did the logistics problems.10 An examination of Confederate railroads reveals the shortcomings which reduced potential efficiency to dismal mediocrity and eventual failure.

Nowhere in the South was there a closed system of rails. Tracks were loosely knit, trunk lines were inadequate, and there were no alternate lines for existing east-west routes. There were never adequate railroads between Texas and the remainder of the Confederacy. The width of rail lines varied from four feet, eight and one half inches to
five feet, six inches. Trains and repair parts also varied, and few of the latter were interchangeable. Labor, iron and capital shortages retarded and practically stopped new construction. After 1861 not one rail was produced by the Confederacy, and few were imported. Engines and rolling stock suffered similar production declines. In the absence of a labor force there was even a shortage of fuel. Some relief was realized with the establishment of a depot system. Large and small quantities of supplies were stock-piled close to where they would be needed, but the system was not used to its full potential. Supply efforts were never coordinated properly, nor were the railroads regulated prior to 1863. A victim of states' rights protective instincts, the Confederacy at first did not understand the need for military and civilian cooperation and centralized control. Competition between the two resulted in private freight often being carried ahead of munitions and medicines while food awaiting shipment lay spoiling at railroad sidings and depots. The government simply could not afford price competition with private industry. Only when this fact became clear was any positive action taken. In May of 1863 the Confederate Congress finally empowered the War Department to seize and manage railroads, regulate freight
schedules and interchange as needed rolling stock. Only state-owned railroads were exempt.\textsuperscript{12} It was a move of desperation accomplished too late.

Advantages of interior lines were outweighed by numerous disadvantages. Rail lines were insufficient and strategically misplaced. There were too many gap and gauge problems. There was no growth, and railroad owners refused to sacrifice personal interests for the good of the Confederacy. Unified effort came too late. Viewed separately, these problems were difficult enough to solve, but combined, they were impossible to overcome. Failure of the Confederacy properly to use and maintain its railroads was a major factor in the ultimate defeat of the South. Railroad failures, however, should not be blamed for wrecking logistics. The Confederate logistics system was never sound. Economic planning alone was piecemeal, spasmodic and crisis-oriented.\textsuperscript{13}

It was expected that the Trans-Mississippi territory would contribute large quantities of salt, sugar, bacon, beef, wheat, wool and cotton to the war effort. That department was also to be a channel for supplies coming from Europe through Mexico and from Mexico itself. Money was needed to purchase supplies, but there was a
Confederacy-wide scarcity of funds and a growing lack of confidence in Confederate currency which eventually forced the Government to impress goods not offered for its dollars.\textsuperscript{14} Money problems combined with inflation and competition for scarce supplies to ruin the open market system of procurement.\textsuperscript{15} There were also other problems in the Trans-Mississippi territory.

Before impressment, the Government had competed with state officials and private speculators for supplies. Labor shortages, inferior transportation systems, severe weather, primitive industry and Union invasions and raids reduced crop output and production.\textsuperscript{16} When in July 1863 Vicksburg and Port Hudson fell, the Confederates lost control of the Mississippi River, and the Trans-Mississippi Department was separated from its home government. General Edmund Kirby Smith, commanding that department, attempted to establish a self-sustaining logistics system.\textsuperscript{17} Subsistence, quartermaster, cotton and ordnance bureaus were established, but Smith discovered that his logistics experts could not stockpile supplies any better than their counterparts in the East. His was a production-consumption operation which kept him on the defensive most of the war. The department which had been expected to furnish the
Confederacy with vital supplies could not even satisfactorily provide for its own needs. Faced with such difficulties, the Confederate logistics system needed strong leadership to sustain it for even a short period of time.

Lucius B. Northrop was the Confederate Commissary General for all but the last four months of the war. At the beginning of the war he had divided the various military departments into purchasing and collecting districts. The varied size, resources and importance of each department made his system unwieldy, and the army field ration constantly dwindled. In the spring of 1863 he tried a new system. Each state in the Confederacy was assigned a Chief Commissary. States were divided into districts and sub-districts controlled by Chief Purchasing Commissaries and commissary agents respectively. With this system, it was expected that all resources could be identified and made available. Complicated as it was, the system might have worked if sources of food had actually been available and the agents reliable. Transportation problems aside, the destruction and loss of crops alone caused a scarcity of food that Northrop's system could not overcome. Hindered by "tunnel vision", Northrop spent more time blaming others
for his problems than seeking a solution to them. True, inflation, transportation problems and lack of funds hampered his operation; but those problems were not so serious as to dictate the type of crisis management that kept the Confederate Army underfed for five years.¹⁹

Quartermaster operations fared little better. Headed first by Abraham C. Myers and later—from 7 August 1863 till the end of the war—by Alexander R. Lawton, the department was by far the most complicated, yet its problems were the easiest to understand. Transportation was inadequate, funds were inadequate, and even if funds had been adequate, there simply were not enough supplies available for purchase. Supplies had to be found within boundaries likely to shrink. Industry had to be expanded without money, labor or raw materials. If these tasks could not be accomplished, overseas markets had to be tapped. Early in the war purchases abroad were not well organized. Purchasing efforts were competitive and self-destructive. Confederates believed the conflict would be brief. If not, European nations would surely break the blockade. Neither was the case, and a unified effort to purchase abroad was not effected until the spring of 1864.²⁰ By then it was too late.
By 1863 a serious horse and mule shortage decreased the Army's mobility by reducing the number of general purpose wagons available. Later, ambulance wagons also diminished. Supply efforts deteriorated daily until by the end of the war the supply system was a system in name only.

Confederate logistics and the fighting ability of the Army suffered from the low esteem in which the Quartermaster and Commissary departments were held. In contrast to their failures was the successful operation of the Ordnance Department under Josiah Gorgas. Facing the same odds as the other department chiefs and fighting the problems of funding and transportation, Gorgas was able to supply arms and munitions to soldiers until the end of the war. He was successful for several reasons. The most important were that he was gifted with broad vision and was flexible in plans and thoughts. He had a unique ability to adapt to change and select the most talented and qualified subordinates. To supply the Army, he established many munitions factories and depots and found efficient ways to extract raw materials from Confederate territories. He also established a system of blockade running that was second to none. Unlike his colleagues, he believed he
could supply the Army during offensive operations. He was never a defeatist, and his dedicated efforts resulted in achievements far greater than those of his counterpart in the North.²²

Medical Department success was partially dependent on the success of the overall logistics effort. Before it could care for the wounded, the department had to be supplied and given food and adequate transportation. Ironically, it was not at all dependent on the Ordnance Department—the most efficient in the system.

Success was also dependent on the leadership, organization and administration of the Medical Department. Southern medical development on the eve of the Civil War was at least as far advanced as that in the North. Quackery was also increasing, and some incompetent doctors found their way into the Confederate Armies. Most surgeons were appointed by state governors without qualifying examinations. Of the six thousand surgeons who entered the service, only twenty-six had any previous military experience. Twenty-four of those had resigned from the United States Army to serve the Confederacy. Most were assigned organizing and administrative duties, leaving only a handful of experienced medical officers to care for the wounded in the field.²³
After a slow beginning, growth of the Medical Department had been rapid. Provision for a Medical Department was made by law on 26 February 1861. The law authorized one Surgeon General, four surgeons and six assistant surgeons. As late as 27 April there still had been no attempt to organize the department. By that summer, epidemics and battle casualties had provided the impetus for a rapid increase in medical personnel and facilities. Congress appropriated money directly for the "establishment and support of military hospitals." A hospital food supply fund was to be used by the Commissary General to feed hospital patients. Rations not consumed would be commuted into money and used to purchase hospital supplies. The fund also supported privately maintained hospitals engaged in treating soldiers. Other legislation permitted the Secretary of War to make contracts with railroad and shipping companies to move items donated or purchased for hospitalized soldiers. Congressional action did not stop there. Other liberal appropriations permitted the rapid expansion of the Medical Department and included the production of drugs, hospital furniture and alcohol and the importation of hospital supplies from abroad and through enemy lines.

Nine days after the Battle of First Bull Run (Manassas),
on 30 July 1861, the leadership of the Confederate Medical Department fell upon the capable shoulders of Samuel Preston Moore. Following Doctor David C. DeLeon and Doctor Charles H. Smith who had interim charge of the department, Surgeon General Moore remained at that post for the duration of the war. His appointment marked the beginning of an improvement in field medical service which had heretofore received direction from a temporary officer occupying one small room in Richmond. 26

Despite "liberal appropriations" from Congress, Moore found his department pressed for money, trained men, supplies and transportation. These shortcomings demanded that Medical Department surgeons be skilled in improvisation and adaptation. Such skills, early learned and often practiced, would carry them through periods when they would be left to fend for themselves. 27

Preparation for contingencies involved good organization and discipline. A rigid disciplinarian with great organizational ability, Moore was the right man for the job. He wasted no time in bringing order out of chaos and putting together a medical service which, if logistically supported, was comparable to that of the North. Regular sick calls, sanitary inspections and periodic medical reports were
required of all commands. Physical and mental examinations eliminated undesirable soldiers and undesirable surgeons. Refresher courses were given to all surgeons requiring them, and manuals for military surgery as well as journals and textbooks were published and distributed to all medical officers. In addition, Moore established the oldest American Military Medical Society, popularized the use of one-story hospital wards, had a key role in establishing pavilion-type hospitals and was the first to realize the importance of dentistry in military medical activities. 28

Moore was not the only talented member of the Medical Department. Many subordinates were accomplished administrators and innovators. The most distinguished of Moore's subordinates was Samuel H. Stout, Medical Director of Hospitals in the Army of Tennessee. He designed better ventilated and more comfortable pavilion hospitals and organized mobile hospitals capable of transferring patients to general hospitals more rapidly. Their employment saved many lives in the Georgia campaign in 1864. 29

Organization of the Confederate Medical Corps usually followed Union organization. The Surgeon General was assigned five assistants. There were eighteen medical directors for the armies and corps, while eight medical
directors were responsible for groups of hospitals. Thirteen medical inspectors divided their time between camps, field hospitals and general hospitals. Surgeons and assistants were assigned to all commands down through regiment. The chain of command included the Surgeon General, medical directors of armies and corps and division, brigade and regimental surgeons. Surgeons in commands down to regiment performed administrative tasks which included supervising subordinates, advising commanders at all levels on medical matters and passing information, supply requests, reports and orders up and down the chain of command. Professional treatment of sick and wounded, organizing, equipping and supplying field hospitals, and improving field sanitation—with commanders' approvals—were the main responsibilities of regimental surgeons. Each regiment was authorized one surgeon and one assistant surgeon to handle those tasks. Early failures and justified complaints by exhausted surgeons led the Medical Department to request one additional assistant surgeon per regiment. All attempts to obtain the second assistant through Congressional legislation proved unsuccessful. Had the legislation been approved, it is doubtful that sufficient surgeons would have been available. All Southern medical schools except
the Medical College of Virginia were forced to close during the war. That institution turned out a total of four hundred doctors, with classes graduating every six months. Skilled surgeons were hard to find. Still, Confederate medical officers were not unlike their Union counterparts. Out of ignorance, both disregarded septic and antiseptic measures and believed that suppuration or "laudable pus" was essential to the healing of wounds. Few understood anything about logistics, and fewer still understood why the Quartermaster Department maintained such an iron grip on the Medical Department. Why couldn't needed supplies be delivered? The answer was simple. What the logistics system had provided for was not what the Quartermaster Department could or would provide.

There was a coordination problem to solve. The Quartermaster Department controlled all transportation and had considerable jurisdiction over medical personnel and supply. Too often commanders, medical officers and Quartermaster authorities failed to coordinate supply and transportation matters. This was the greatest and most persistent impediment to efficient care of the wounded. Surgeons were almost always hampered by shortages of medical and surgical supplies. All the blame could not be heaped
upon the Quartermaster Department. The supply problems of the Medical Department were often aggravated by Confederacy-wide problems. Northern embargoes included medical supplies. There was a major shortage of quinine. Other shortages included bottles, jugs, vials, operating tables, sponges, corks and bedpans. Instruments were also difficult to obtain. The Medical Department issued four different types. There were instruments for major and minor operations, a pocket case of instruments for the surgeon to carry and a field case for use at regimental aid stations and hospitals. To replace shortages, instruments were captured or smuggled from the enemy. A small effort to manufacture them produced crude end products unfit for medical use. In the absence of issued instruments, surgeons used personal sets. 33

Procurement, then, required more than strict adherence to supply regulations. It required imagination in the form of improvisation, adaptation and innovation. Pharmaceutical laboratories had been established but were still unable to meet the demand for medicines. Native plants and trees, it was discovered, offered satisfactory substitutes for many scarce drugs. Blockade running could not be counted on as a steady source for medical supplies, since medicines took priority behind ordnance and clothing.
Those items not run through the blockade were procured from
the enemy by several means. Smuggling and surreptitious
trading with northern merchants was profitable, particularly
in the West. The early superiority of Confederate over
Union cavalry produced many captured wagon loads of medical
supplies. Battle victories also gave Confederate forces
the medical spoils of war when military necessity did not
require their destruction.  

Where procurement problems ended, transportation
problems began. To be of any use, available medical sup-
plies had to be transported with the armies. Division
hospitals, serving the needs of seven to eight thousand troops,
required enough medical supplies to fill twenty wagons.
Quartermaster officers were always hard-pressed to keep
that many wagons available, let alone rolling. When pri-
orities dictated, wagons were taken from the medical depart-
ment and used for more important missions.  

Against all odds, the Medical Department managed to
take to the field with the rest of the army. Its first
protracted test under Surgeon General Moore came during the
Peninsular Campaign in the late spring of 1862. The results
were predictable. Nothing went right. Organization was
faulty, particularly at brigade and regimental levels where
more surgeons were needed. There was also an insufficiency of trained personnel in the enlisted ranks. Surgeons had failed to submit proper reports and in most cases did not keep casualty lists nor register patients in field hospitals. Ambulance service was impromptu and unsatisfactory, and transportation delays caused much suffering among the wounded. There was no cooperation between Quartermaster, Commissary and Medical Departments. Hospitals were not supplied as requested, and rations and money from the hospital fund were not delivered. It was a story that would be repeated throughout the war. Mistakes—particularly those directly attributable to the Medical Department—would soon be corrected, but some problems would take years to overcome, and others could never be solved.

Field experience taught Surgeon General Moore the need to establish brigade and, if needed, division field hospitals prior to battle. About thirty stretcher bearers detailed from each regiment delivered wounded to regimental aid stations where emergency treatment could be administered. From there the wounded were taken by stretcher or ambulance to the brigade field hospital where they received more definitive care, were operated on if necessary and evacuated to a general hospital if recovery could not be accomplished
in the field. Stretcher bearers were often accompanied by other able-bodied men who preferred helping wounded comrades to facing a similar fate in the front lines. Men with slight scratches arrived at field hospitals in the protective arms of a host of friends, many of whom they had never met. Quick as they were in finding the field hospitals, the hosts of friends always seemed to have trouble finding the front lines again. To stop this practice, General Robert E. Lee directed on 11 August 1862 that an infirmary corps be comprised of two soldiers from each company. They were the only troops permitted to care for the wounded or remove them from the battlefield. 37

Those wounded fortunate enough to be recovered from the battlefield had several obstacles to overcome before starting on the road to recovery. One of them was a ride in a Confederate ambulance (Figure 1). Each regiment was authorized two four-wheeled and two two-wheeled ambulances. Few ever saw that number. Ambulance shortages noted at First Manassas persisted throughout the war. There simply were not enough wagons and animals available. The best Confederate ambulances were those captured from Union forces. More often than not, a ride in a Confederate ambulance meant a ride in any type of wagon medical officers
Figure 1. Confederate Field Ambulance
could commandeering. The best that can be said of the Con-
federate ambulance service during the war is that it went
from poor to helpless. 38

With more important tasks of mustering and outfitting
its military forces, creating a fiscal system and obtaining
recognition from abroad, the Confederacy devoted little
time to consideration of the general hospital problem. In
1861 only fifty thousand dollars were appropriated by
Congress for the establishment and support of military
hospitals. In 1862, after the spring and summer campaigns
against the city, Richmond became one vast hospital. Mor-
tality was high, and something had to be done about it.
Large hospitals, capable of efficient administration and
much better care, had to be constructed. By the end of
that year a system of general hospitals was being organized.
Farsighted legislation by Congress produced increased
hospital appropriations and guaranteed building programs
for the future. Facilities for disabled veterans were pro-
vided, and the War Department was getting better control
over its general hospitals. To ease the logistics burden,
small hospitals were closed in favor of larger ones. There
was one notable exception. The Robertson Hospital, managed
by Sally L. Tompkins and always containing less than one
hundred patients, was permitted to remain open because of its overwhelming success in returning men to duty. Since those in charge of military hospitals had to be military personnel, President Davis gave Miss Tompkins a commission as Captain of Cavalry. She was the only woman to earn a regular commission in the Confederate Army. In a time of crisis few dared argue with success.

Richmond was definitely the hospital capital of the Confederacy. All over the South old buildings were converted into general hospitals. Most of the new construction took place around Richmond where huge hospitals like Chimborazo (Figure 2), Winder and Jackson dominated the area. General hospitals had quartermaster and commissary officers assigned to them, and hospital commanders were delighted to be relieved of those encumbering duties. Undoubtedly those assignments increased the operating efficiency of the hospitals.

By the early months of 1864 there seemed to be little need for further hospital expansion. Many general hospitals were partially or completely closed and remained so until the battles of the Wilderness and Spottsylvania that May caused most to be reopened. Then all were crowded beyond capacity until July when normal operations were again resumed.
Figure 2. Chimborazo Hospital, Richmond, Virginia.
From that time until the collapse of the Confederacy, the hospital situation in Virginia remained unchanged. To the south and west deteriorating military fortunes made it more difficult for patients to receive proper care. As the general hospitals fell to the enemy, medical officers had to resort to the early war technique of improvisation, and improvise they did until the very end. What else could they do?

There was no national benevolent organization for soldiers' relief in the Confederacy. There were, however, many individual donations of money and supplies for the troops. These were followed by community programs and eventually, in states like Georgia and South Carolina, by state-level relief. As early as 1861 the Confederate Congress made some meager attempts to adopt an organization similar to the United States Sanitary Commission, but their efforts fell woefully short. One act, calling for consolidation of hospital supplies donated for the wounded, and another, calling for the Secretary of War to collect and distribute clothes, shoes, blankets and other items of necessity donated by civilian agencies, were not heeded. Most donations still found their way to hospitals, but there was no agency standing by with support when the medical
supply and evacuation systems broke down.

Operating in the shadow of an overburdened logistics system, the Confederate Medical Department did well to survive. But the department was not conspicuous for its survival. It was conspicuous for its achievements. Against overwhelming odds, Samuel Preston Moore developed a system to handle sick and wounded and made that system work. It had many defects, but the job got done. No one who understood the poverty of Confederate logistics could have asked for more.
Notes for Chapter I


4. It is estimated that 617,528 men died in the Civil War. Of that total 359,528 were Union soldiers and 258,000 were Confederate. Of those, 110,070 and 94,000 respectively died from wounds. Assuming the above figures are correct, Thomas L. Livermore's figures indicate that of 385,245 Union soldiers wounded, 110,070 died and 275,175 survived. Similarly, of 329,000 Confederate soldiers wounded, 94,000 died and 235,000 survived. Some deaths occurred before medical attention could be given, but others did not occur until the wounded had been cared for by medical personnel. From this it is reasonable to assume that Union medical officers cared for over 300,000 wounded and Confederate medical officers cared for over 250,000 wounded. See Stewart Brooks, *Civil War Medicine* (Springfield, Illinois: Charles C. Thomas, 1966), p. 125; Thomas L. Livermore, *Numbers and Losses in the Civil War in America: 1861-65* (Bloomington: Indiana University Press, 1957), pp. 63-64; Charles B. Johnson, *Muskets and Medicine or Army Life in the Sixties* (Philadelphia: F. A. Davis Company, 1917), p. 250.


8. Ibid., p. 98.


10. Vandiver, Rebel Brass, pp. 81-82.


15. Vandiver, Rebel Brass, pp. 88-91
16. The entire Louisiana sugar crop for 1862 was not harvested because of a Union invasion. See Windham, "Problem of Supply," pp. 150-54, 168.


21. Vandiver, "Tattered Flags," pp. 243-44. See also Vandiver, Rebel Brass, pp. 104-05; Brooks, Civil War Medicine, p. 32.


24. Cunningham, Doctors in Gray, p. 21. See also War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies, Series 4, Volume 1 (Washington: Government Printing Office, 1880-1901, pp. 115, 248, 580 (Hereafter cited as O.R.). A report by the Confederate Inspector General dated 23 May 1861 showed the poverty of Medical Department operations before Congressional legislation improved them. Referring to the 8000 man force at Harper's Ferry the report stated, "The hospital department is very deficient in every respect. There are a few beds in the general hospital, but there is
no provision whatever made for the care of wounded men, in
the event of an engagement taking place." See O.R., Series
1, Volume 2, p. 869.

25. Edwin B. Coddington, "Soldiers' Relief in the
Seaboard States of the Southern Confederacy," The
Mississippi Valley Historical Review, Vol. 37, No. 1
(June, 1950), 19-20.See also O.R., Series 4, Volume 1,
pp. 339, 580 599, 812, 887, 939, 1045; O.R., Series 4,
Volume 2, pp. 112, 120, 199, 294, 392-93; O.R., Series 4,
Volume 3, pp. 139, 480, 626-27, 1111.

26. Horace H. Cunningham, Field Medical Services at
the Battles of Manassas, University of Georgia Monographs,
No. 16 (Athens, Georgia: University of Georgia Press,
1968), p. 23. See also Brooks, Civil War Medicine, pp. 20-


28. Moore established the Association of Army and
Navy Surgeons of the Confederate States in 1863. In 1864
he commissioned dentists in the Medical Corps and eventually
established a dental corps separate from the medical corps.
See Williams, "Samuel Preston Moore," pp. 624-26; Bell
Irvin Wiley, They Who Fought Here (New York: The Macmillan
20-21.

29. Mobile hospitals could be moved at a moment's
notice. They were lightly equipped, but capable of per-
forming all field hospital functions. Their proximity
to railroads made the transfer of patients a simple matter.
See Wiley, They Who Fought Here, p. 226; Coddington,

See also Brooks, Civil War Medicine, p. 26.

31. Carrington Williams claimed in the article cited
that Confederate regiments were authorized two assistant
surgeons. Nowhere has that claim been substantiated. See
John Q. Anderson, A Texas Surgeon in the C.S.A., Confederate
Centennial Studies, No. 6 (Tuscaloosa, Alabama: Confederate
Publishing Company, Inc., 1957), p. 9; Cunningham, Field


35. Brooks, Civil War Medicine, p. 32.


37. The infirmary corps actually received its baptism of fire in the Seven Days' Battles over a month before Lee directed its organization. Gunpoint diplomacy discouraged men in the ranks from helping evacuate the wounded. See Cunningham, Field Medical Services, pp. 75-76, 79.

38. Wiley, They Who Fought Here, p. 230. See also Cunningham, Field Medical Services, p. 72; Brooks, Civil War Medicine, pp. 36-37.


If poverty and deterioration characterized the Confederate logistics systems, the opposite held true for Union logistics. The principles upon which logistical organization was based differed little from those followed in the Revolutionary and Mexican Wars. What had changed was the method of transportation. Railroads and steamboats broadened concepts and reduced geographical restrictions of war.¹

Before refining and adapting the system to large-scale warfare, logistics officers had some urgent problems to solve. At the beginning of the war manpower mobilization outdistanced material mobilization. In only four months the Union Army increased in size from seventeen thousand to almost half a million men with no mobilization plan whatever. Commanders had armies but no equipment. Until an adequate logistics system could be organized, states had to shoulder most of the burden of outfitting and supplying their volunteer soldiers. The disaster at First Bull Run
provided the catalyst for rapid organization of the logistics system. After that battle, favorable legislation and appropriations poured forth from Congress.²

Procurement and distribution of supplies were controlled by the four major departments—Quartermaster, Subsistence, Ordnance and Medical.³ On their performance hinged the success or failure of the logistics effort. Administration of the Union Army was accomplished by separating the country into geographical departments and the forces into armies. Departments were further divided into districts. Depots and sub-depots were established throughout the country to supply the armies and insure a continuous flow of needed items.⁴ All that was needed to make the system work was good coordination and centralized control. Both proved difficult to achieve.

Answering only to the Secretary of War and not responsible to the Commanding General or any logistics coordinating officer, logistics department chiefs often went their separate ways to the detriment of the overall Union effort. In each department old routines and a lethargic spirit resulted in inefficiency. Some of the "Old Guard" simply refused to acknowledge the problems they faced. Many young officers in the field were inexperienced, and
on-the-job training was the best they could hope for. Only in the Medical Department did young officers bring with them the professional attainments of civil life. They still had much to learn about organization and administration.

Money was available to support the logistics effort, but department chiefs had little control over fund requests. These were based on pre-war laws and best-guess estimates from field commanders. Early needs were grossly underestimated as departments suffered the pains of practical experience. Lessons were well learned, but accuracy in fund requesting was a goal never fully attained. It is important to note, however, that money for the Union armies was available throughout the war. In that respect the North had a decided and significant advantage over the South. Money could open many doors.

Foreign procurement was one of the early success stories for the Union. Unable initially to meet war demands, Northern industries turned to Europe for help. Foreign procurement was large in 1861 and 1862, but by 1863 it had virtually ceased. In less than two years the North had become self-sustaining. In doing so it gave up an opportunity for preclusive buying and offered the South a chance to exploit the European markets. At home the North had to
overcome profiteering and fraud. Still, its procurement program within the United States ranked it among the first-class powers of the day. Toward the end of the war the program remained independent under conditions of almost total mobilization.  

Having procured the necessary supplies and equipment, the Union was faced with a staggering distribution problem. Road nets varied from good to poor. Only near large cities were they reliable. Rivers and coastal waters provided good routes for steamers and, as arteries of supply, cost next to nothing to maintain. Railroads were expensive, but nowhere was Union superiority over the Confederacy more evident than in its railroad operation and administration.  

Initially possessing over two thirds of the nation's railways, Northerners concentrated mostly on improving the operation of existing facilities. Still, during the war they managed to construct about four thousand miles of new lines and increased their advantage over the South in procurement, production and maintenance of locomotives, rolling stock and track. The productive capacity of Pennsylvania in those commodities was twice that of the entire South. 

There were many trunk lines available to form an
excellent railroad net, but no standard had been agreed upon by railroad builders. Gauges varied from four feet, eight and one half inches to six feet. Consequently, rail lines did not connect. This problem caused many costly delays in shipping men and material. Non-standardization of gauges was the most glaring deficiency of Northern railroads. Even that deficiency did not detract much from their otherwise marvelous efficiency.

Men like Daniel C. McCallum and Hermann Haupt were in no small way responsible for that efficiency. On 11 February 1862 McCallum, a brilliant organizer and administrator, became the Military Director and Superintendent of Railroads in the United States. Haupt was simply a genius in railroad construction and management. On 22 April 1862 he was called upon to be Lincoln's construction and transportation expert. In the South there was no one comparable to either man. Haupt reconstructed railroads and bridges almost as fast as the Confederates could destroy them. Union forces, on the other hand, had practically destroyed the Confederate rail networks by 1864. McCallum was empowered to take over any civilian railroad needed for military operations. That this rarely had to be done was indicative of the excellent civil-military cooperation
during the war.  

Railroad control had been centralized under the Military Railway Service since 31 January 1862, and few civilians were complaining. Military demands on civilian railroad companies were not arbitrary. Each company was notified of its military requirements well in advance, and the flow of civilian traffic remained largely undisturbed. In addition, the military was admonished not to interfere with civilian traffic. In Special Order Number 337, dated 10 November 1862, Secretary of War Stanton demanded, under threat of severe penalty, that Union officers permit the railroad officers to do their jobs unmolested and support them in every way possible. The order also specified that cars at destinations be unloaded day or night and that tracks, fuel and water be protected. How different this system of cooperation was from the "states' rights protectivism" of Southern railroads.

Under Haupt's insistent demands and watchful eye, Union railroads ran on schedule. So, then, did the flow of supplies. Priorities were given to subsistence, forage, ammunition and hospital supplies respectively. Those requirements met, infantry regiments might then be transported.
Good administration was complemented by constant innovation. Ambulance cars and trains freed countless thousands of medical evacuation support troops for duties at the front. New techniques in construction and destruction of track were introduced. Steel rails replaced iron ones, and coal replaced wood as a fuel on trains. All innovations led to greater operating efficiency, so that by the end of the war the North had one of the best railroad systems in the world.

The Civil War demonstrated how railroads could keep armies in the field supplied indefinitely. Such an achievement by the North undoubtedly shortened the war. Mobility had been of prime importance in winning the war, and the superior use of railroads by the North insured the success of the Union forces. Both sides committed errors, particularly in failing to use rolling stock to maximum capacity, but superior management techniques by the North made its errors far less costly than those of the South. In spite of their railroads, the Confederate armies survived four years of uncertain logistics. Because of their railroads, the Union armies enjoyed logistical support that, in a war of attrition, guaranteed victory. Sufficient to win a war, the logistical effort was still far from perfect.
As with Confederate logistics, serious leadership and management problems had to be overcome for Union logistics to be successful.

Ordnance Department problems started at the top. A lack of drive and imagination by Colonel Henry K. Craig and his successor, Brigadier General James W. Ripley, was responsible for the department's failure to keep pace with the demand from the field. Major problems included shortages of munitions, confusion in distribution and slowness in accepting new armament. Field commanders complained incessantly about arms shortages and inferior weapons. Had the Ordnance Department been under the same financial limitations as its counterpart in the South, it would have proceeded quickly from inefficiency to a state of collapse. Instead, it relied on a booming Northern industry to help it survive in mediocrity.

Agricultural output in the North was sustained and even increased in some areas throughout the war. There was always sufficient food to feed the armies. The Subsistence Department had been headed by Colonel George Gibson for over forty-three years when he died in 1861. He was replaced by sixty-two year old Colonel Joseph P. Taylor, a veteran of thirty-two years service in the department, who died in
office in 1864. Soldiers might well have joked that bad army rations got them both. Taylor was replaced by Colonel Amos B. Eaton who held the post for another ten years. Under such entrenched leadership, the Subsistence Department responded slowly to change. It was difficult to shed outdated ideas and plans which had been successful in other wars, but money and food were plentiful, and the department managed to feed its army better than any other large army in history. There were complaints of shortages, particularly from the Medical Department, but these usually occurred during large battles when other shipments were given priority over food. By 1864 the army ration was so large that much was being wasted. Reductions were accomplished without complaints from the field, and the army remained well fed until the end of the war.  

Under Brigadier General Montgomery C. Meigs the Quartermaster Department enjoyed even greater success. It had suffered little when its head, Brigadier General Joseph E. Johnston, resigned to take a Southern command. Meigs was a man of dynamic energy and unbounded resourcefulness who knew how to circumvent red tape and Congressional interference. His introduction of efficient supply procedures ended most complaints of shortages. In fact, after the first
few hectic months of the war the Quartermaster Department received little adverse comment. Still, there were some major problems which prevented even greater efficiency. Profiteering contractors were never brought entirely under control. Some failed in their obligations, causing temporary supply shortages. Others sought to defraud the Government by charging exorbitant prices or producing inferior goods. 18

Meigs also had to contend with inter-departmental conflicts over supplies and transportation. Early Medical Department complaints serve to point out some of the difficulties. After several battles the wounded could not receive proper care because Quartermaster wagons with promised medical supplies had not arrived. There were also legitimate complaints of railroad cars filled with medical supplies being abandoned on railroad sidings while wounded at the front suffered from the shortage. In other cases, such as after the Peninsula Campaign in 1862, medical supplies and equipment were abundant, but lack of transportation in the rapid move of the Army of the Potomac northward caused them to be left behind. Sometimes medical equipment arrived at the front in unserviceable condition and had to be returned to the Quartermaster Department for replacement.
or repair. A refinement of the system produced much more satisfactory results during the last two years of the war. Meigs made the depot system work and, by the end of the war, had the Union army supplied with more equipment than it could ever hope to use. His success depended on available funds, efficient transportation and energetic leadership. In none of those was the Quartermaster Department lacking.

At the outbreak of war the Union Medical Department under Surgeon General Thomas Lawson had an organization with performance capabilities far below those of Imperial Rome. In the time of Hadrian a physician was assigned to practically every legion and warship. Bandages and instruments were available, and some hospitals had plumbing, kitchens and pharmacies. In the time of Lawson the Medical Department was designed to care for fifteen thousand men scattered throughout the country. There were scarcely more than one hundred doctors, a handful of clinical thermometers, a gross or two of surgical kits, few hospitals and ambulances and none worthy of the designation. Lawson died in May of 1861 and was replaced by Surgeon General Clement A. Finley, a man of equal incompetence. Under both men inefficiency, inaction and confusion
characterized Medical Department activities. Until these "old guard" surgeons were removed by Congressional action, younger men capable of instituting modern scientific methods and proper procedures would be frustrated by bureaucratic inertia.\textsuperscript{21} Frederick Law Olmsted best summed up the major problem of Medical Department administration in 1861. In a scorching critique of Surgeon General Finley he wrote,

It is criminal weakness to entrust such important responsibilities as those resting on the surgeon-general to a self-satisfied, supercilious, bigoted, block-head, merely because he is the oldest of the old mess-room doctors of the frontier-guard of the country. He knows nothing, and does nothing, and is capable of knowing nothing and doing nothing but quibble about matters of form and precedent, and sign his name to papers which require that ceremony to be performed before they can be admitted to eternal rest in the pigeonholes of the bureau.\textsuperscript{22}

After the humiliating setbacks of 1861, the Union army needed better medical support.

Pre-war organization of the Medical Department called for a surgeon general with the rank of colonel, thirty surgeons with the rank of major and eighty-four assistant surgeons with the rank of first lieutenant or captain depending on years of service. By the end of the war over twelve thousand surgeons had cared for almost three million Union soldiers. An Act of Congress which had removed the
"old guard" in April of 1862 had completely reorganized the Medical Department, creating, in addition to posts for surgeons and assistant surgeons, posts for an assistant surgeon general, medical inspector general, medical inspectors, medical purveyors and medical cadets. The rank of brigadier general was authorized for the surgeon general.\(^23\)

William A. Hammond, a brilliant regular army surgeon, was promoted over many medical officers of superior rank and greater longevity and, in April of 1862, replaced Finley as Surgeon General. From that time forward the Medical Department achieved spectacular successes. Major accomplishments under Hammond included the establishment of record-keeping for sick, wounded and dead, a system for classifying diseases, preparation and distribution of hygiene and sanitation manuals and more efficient medical procurement and allocation procedures. Hammond also recommended the establishment of an ambulance corps, a corps of medical assistants, an army medical museum, an army medical school and a permanent general hospital in Washington. All recommendations were eventually adopted, but when they were, Hammond was no longer the Surgeon General. Found guilty, but later completely exonerated, of charges that he used questionable procurement techniques, the man whose
farsightedness was largely responsible for the success of the Medical Department was dismissed from the Army in disgrace in August of 1864. Hammond's legacy did not end there however. His successor, Joseph K. Barnes, was a man of equal intelligence and competence. He saw that most of Hammond's programs were carried out to the benefit of the Medical Department and the Union Army. Even so, the road to success was difficult.

Organization alone caused medical officers a lifetime of headaches. There were four types of surgeons in the Union Army. Regular Army surgeons, commissioned by the President, held most of the key medical positions and staff assignments. Brigade surgeons (Special Surgeons of Volunteers), having passed a special examination, were commissioned by the President to serve on brigade staffs or in any higher level assignments their abilities might warrant. Regimental Surgeons (Surgeons of Volunteers) were commissioned by governors of states and performed duties as regimental and assistant regimental surgeons. Contract Surgeons were civilian doctors hired to fill in gaps anywhere from field hospitals to general hospitals. Tenure was indefinite but usually short. The quality of contract surgeons ranged from good to poor but usually remained closer to the latter.

Each regiment was authorized a surgeon, a first
assistant surgeon and later a second assistant surgeon. On 25 May 1861 the President directed that they be appointed by governors of states after passing an examination. Appointments were to be subject to the approval of the Secretary of War. An Act of Congress on 6 August 1861 required vacancies in regiments to be filled in the same manner as the original appointments. State reaction was mixed. Some gave difficult examinations. Others gave none at all. Most regiments received qualified doctors. Some received "quacks." To insure quality, the War Department directed on 20 June 1861 that boards of medical officers be formed to examine medical officers of questionable qualifications. In that manner many unqualified surgeons and "quacks" were weeded out. Artillery batteries and cavalry detachments did not even receive "quacks." Neither law nor orders had provided for medical officers for those units, so for most of the war they relied on nearby regiments for medical support.  

Armed with varying degrees of medical knowledge and little else, regimental surgeons took to the field. There the problems began. Neither surgeons nor line officers knew what the actual duties of medical officers were. Few line officers had the foresight to exploit the advantages to the
health of their commands that the medical officers could produce in the name of the commander. Confusion, conflict of authority and discontent marked the greater number of relationships between surgeons and commanders and seriously impaired the efficiency of the Medical Department. Medical officers compounded the difficulties by failing to submit critical reports, avoiding or ignoring medical supply tables and refusing to care for the wounded of other regiments. Quartermaster transportation for medical supplies was slow and unreliable. Hospital tents were hard to find and there was no ambulance corps. In the absence of any guidance from Surgeon General Finley, the Army of the Potomac, destined to be a guiding light in medical innovation, published a general order on 9 September 1861. The order contained specific directions for the administration of that Army's medical department. Hospital and ambulance service was defined, and a system of control over hospital patients was established.

Except in the Army of the Potomac, brigade surgeons were as ignorant of their duties as were regimental surgeons. An Act of Congress on 22 July 1861 created a corps of brigade surgeons. A second act approved on 2 July 1862 redesignated them Surgeons of Volunteers and attached them
to the General Medical Staff under direction of the Surgeon General. Few brigade surgeons proved unworthy of the confidence of the difficult examining boards they successfully faced. In the absence of instructions from higher headquarters, they let common sense and professional knowledge dictate proper courses of action. Each went his own way. The best that could be hoped for under such fragmented conditions, however, was temporary success. A unified effort was needed to provide efficient medical service.

Again the Army of the Potomac led the way. On 3 October 1861 General George B. McClellan ordered brigade surgeons to follow regulations he outlined for the proper conduct of their offices. Duties included training medical personnel, supplying regiments with medical items, controlling ambulance service, coordinating the use of field hospitals and submitting numerous medical reports pertinent to the command in and out of battle. Medical departments of other armies soon followed suit.

Regimental surgeons were often too busy during a battle to worry about the conduct and performance of enlisted assistants. This duty fell to hospital stewards. One was assigned to each regiment. Beside following the troops closely into battle, he supervised cooks and nurses,
kept medical records and accounts, assisted surgeons and, in their absence, performed minor surgery and prescribed medicines. Working under him as hospital attendants were the regimental band of approximately fifteen men and a detail of ten men from the regiment. These twenty-five men also served as litter bearers. Hospital stewards were usually capable and dependable, and surgeons appreciated their versatility.  

Medical inspectors had the simple task of inspecting all medical surgical and sanitary aspects of camps and hospitals. They were the eyes and ears of the Surgeon General. If they were worthy of the position they held, they also assisted medical directors in correcting deficiencies rather than simply reporting their findings. Results were as important as reports.

Having achieved a semblance of organization early in the war, the Medical Department would have to rely on battle testing to see if it were capable of supporting the Union Army. The First Battle of Bull Run showed just how much work was left to be done. Field hospitals had not been prepared in advance, and divisions marched into battle without a single ambulance following them. There was little cause for optimism in 1861.
As far as western medical officers were concerned, 1862 started off badly with the Battle of Shiloh occurring in April. In that battle the Army of the Ohio was moved to the battlefield with such haste that it was forced to leave behind all tents, bedding, ambulances and medical supplies. Quartermaster and Commissary Departments were criticized for lack of support, and hospital attendants detailed from regiments and regimental bands were considered practically useless. The major problem was the inadequate medical administration system under which surgeons were forced to work. It was still geared for small unit actions and was too inflexible to be adapted to major battles. Later that month, it should be remembered, the "old guard" would be gone and Surgeon General Hammond would begin the agonizing process of developing a new system in the midst of a war.

If any lessons were learned from Shiloh, they were not passed on to the Army of the Potomac during the Peninsular Campaign that summer. Even under the direction of Charles Tripler and Jonathan Letterman, two of the Union's most capable surgeons, that army's medical department had difficulty establishing a satisfactory system to care for the wounded. There was a shortage of surgeons, and those
available lacked military discipline and training. Few submitted required reports. The ambulance service was terrible, and medical supplies were poorly transported and distributed. Road priorities and lack of transportation caused many medical items to be destroyed or abandoned. There was never adequate coordination between medical, quartermaster and commissary officers. All those difficulties prompted Tripler to recommend some changes. He felt it was necessary to have one surgeon per two hundred and fifty men and to have a staff of administrative and executive medical officers to fill gaps and go where needed. He also wanted quartermaster and commissary officers attached to corps medical detachments. Such officers, he felt, would eliminate most supply, transportation and subsistence problems his medical department had been experiencing. The system had to be changed, but that would be the task of Letterman who replaced Tripler on 4 July 1862.34

Letterman was the pathfinder for the Union Army. With the general approval of Surgeon General Hammond, he revamped the medical supply system, devised a workable system of field hospitals and organized an efficient ambulance corps. So quickly did he rebuild the medical department of the Army of the Potomac that it was functioning efficiently
almost immediately upon that organization's rapid return from the Peninsula. It is well he did act quickly, for his efforts bore fruit in the battles of South Mountain, Antietam and Fredericksburg that year. Letterman's system opened the door to success for the Union Army Medical Department, but it did not eliminate all the problems. Getting organized took time.

Medical departments of western armies took another year to adopt the Letterman system. After Chickamauga and Chattanooga the Army of the Tennessee had a battle proven medical department capable of supporting the army under extremely adverse conditions. Soon thereafter, other western armies developed similar programs, so that by the end of 1863 the Union Army as a whole had a medical system that worked. There remained only the task of refining that system.

Not until 4 November 1863 did it become obligatory for medical directors to submit to the Surgeon General after each engagement lists of killed and wounded. Prior to that time it had merely been customary for them to do so. In the new Medical Department there was no room for the vagaries of local custom. Orders and regulations specified exactly what would be reported and how it would be reported.
At a time when the Confederate Medical Department was struggling for survival, the Union Medical Department was seeking perfection.

Centralization was the major theme of the Medical Department of 1864. Regimental and brigade field hospitals were replaced by more efficient division and corps field hospitals. The ambulance corps followed similar lines. Supplies and subsistence were handled by attached quartermaster and commissary officers rather than by medical officers who had neither the time nor inclination to perform such functions. That effort was also centralized at division level since, from a transportation point of view, it was impractical for all brigades and regiments to draw their supplies from depots far away. 38

Tripler and many other medical officers had stressed from the beginning that the Medical Department would never operate at full efficiency until it could remove the shackles of its dependence on other departments (Quartermaster in particular) to support its medical effort. It was logical that all aspects of medical evacuation be controlled by the Medical Department. Forced to use transportation assets which belonged exclusively to their own department, medical officers would be more conscientious
about keeping them in good operating condition. If they failed, they could blame no one but themselves. In any event, the proposed autonomy would eliminate uncertainties. The Quartermaster Department could not arbitrarily take away medical department transportation when it might be most needed to evacuate wounded. Most medical activities would also be independent of the caprices of brigade and division commanders. Medical supplies could no longer be left behind. Only after realizing that the Letterman system, built on the autonomous principle, was the best system available did Congress enact legislation leading to Medical Department autonomy. On 11 March 1864 an Act of Congress gave official sanction to an ambulance system which had been operating unofficially for over eighteen months. All ambulances and the responsibility for maintaining them belonged to the Medical Department. It was not until the publication of a War Department general order on 8 February 1865 that the Medical Department assumed the same complete control over hospital steamers.\textsuperscript{39} Progress had been difficult but continuous.

Despite all precautions, the Medical Department was vulnerable to the uncertainties of combat. Nowhere was this more evident than in the Wilderness in May of 1864.
the Medical Department of the Army of the Potomac was as well prepared for battle as any department could have hoped to be. The medical system worked well during the battle, but a rapid withdrawal by Union forces caused the department to leave behind over one thousand wounded soldiers. Most were recovered under a flag of truce within two weeks. Some were not recovered for a month. Had the system broken down? Those left behind had been given sufficient hospital tents, supplies and rations and were under the care of Union surgeons and medical attendants who volunteered to stay with them. The system had not failed. Circumstances beyond the control of medical officers had forced a rapid withdrawal. Without an efficient medical system, a lack of time would have forced the army to abandon thousands more. Even in the throes of defeat, the Medical Department could claim success.

Medical success depended not only on good organization and administration, but on a good supply system as well. Before the commencement of hostilities there was one major purveying depot and four sub-depots issuing medical supplies to the entire army. With the outbreak of war the Medical Department had to overcome general shortages of medical supplies, manufacturing delays and inadequate funds.
Purveying depots sprang up in the East and West and were liberally outfitted. Thirty depots and countless sub-depots were in operation by the end of the war. Stockpiling was accomplished, medical supply tables standardized and chemical production and quality control laboratories established, the latter often without Congressional authority. By producing most of its own drugs after 1862, the Medical Department saved the government millions of dollars which would have gone to profit-taking businessmen. 41

Early in the war medical supplies were transported from medical purveyors to quartermasters who delivered them to regimental hospitals. Transportation shortages soon changed that system to one in which regimental surgeons called for and transported supplies from sub-depots to their own camps. Later, Letterman's system provided for regimental pick-up near brigade headquarters where medical purveyors had delivered the supplies. In later wars this method of supply became known as supply point distribution. There were few supply problems after 1863, and if success can be measured by the ability to transport medical items of ancillary value, it is noteworthy that by the end of the war field hospitals had received almost fifty thousand tons of ice through the supply system. 42
Surgeons were never in doubt about the amount and types of supplies they were authorized. Supply tables had been available since 1861, and Surgeon General Hammond saw that they were revised as needed and strictly followed. Divisions were authorized three army wagons and one medicine wagon (Figures 3-6) to carry hospital supplies. Brigades were authorized one medicine wagon which carried one month's supply of medical items for each regiment. Until supply point distribution at brigades was established, regiments were authorized an army wagon or, after 1862, a medicine wagon capable of carrying three month's supplies. Following the supply trains, these wagons were inaccessible during battle and of little use to anyone. More convenient were the eighty-eight pound chests called medicine panniers (Figures 7-8). Each regiment was authorized one. Panniers contained the most necessary medicines, dressings and appliances and were conveniently placed in ambulances accompanying the regiments. For immediate use, each regimental medical officer was authorized a twenty pound hospital knapsack (Figures 9-10) which contained items most needed for battlefield emergency treatment. Carried by orderlies, knapsacks were frequently separated from surgeons in the heat of combat. This prompted some surgeons to carry a small case
known as the surgeon's field companion (Figure 11). Weighing only a few pounds, it contained mostly pain killers and bandages. 43

Surgeons were issued one of three different cases of instruments. One contained instruments for capital (major) operations. Another contained instruments for general and minor operations. The last contained instruments for regimental surgeons to use in camp and on the battlefield. It was called a field pocket case. Teeth extracting instruments and dissecting cases were furnished to field and general hospitals. 44

Each regiment was authorized three hospital tents (Figure 12) and one Sibley tent (Figure 13) for medical use. Hospital tents could accommodate eight patients and could be joined to form wards. Sibley tents could accommodate the same number but were conical and poorly ventilated. They were used more for administration than patient care. When practical, floor boards were placed in each tent. Sheets and pillowcases were rarely available, and patients had to make do with rough, coarsely made blankets. All tents could be heated. 45

Any success in supplying Union medical departments prior to 1863 had to be attributed to individual initiative
Figure 3. Dunton's Regimental Medical Wagon.

Figure 4. Perot's Medicine Wagon.
Figure 5. Autenrieth Medicine Wagon.

Figure 6. Autenrieth Medicine Wagon - Side View.
Figure 7. Medicine Pannier

Figure 8. Upper Tray of Medicine Pannier
Figure 9. Wicker Hospital Knapsack

Figure 10. Regulation Hospital Knapsack of 1862

Figure 11. Surgeon's Field Companion
Figure 12. Regulation Hospital Tent

Figure 13. Sibley Tent
rather than a good system. Tripler had supplied the Army of the Potomac with three months' worth of medical items by late 1861. He faced the same task on the Peninsula when surgeons forgot to bring their supplies with them. Letterman faced an identical problem upon the army's return from the Peninsula. Ambulances and most medical supplies had been left behind, in some cases over protests of medical officers and in others without their knowledge. 46

Before sub-depots became mobile, the delivery of medical supplies was made more difficult by regimental competition for scarce items and by tactical considerations which moved some regiments far from their bases of supply. Railroads were usually jammed with reinforcements and high priority supplies. When medical supplies did reach the front, commanders' priorities sometimes excluded their being transported with the main columns. Worse yet, some commanders dumped wagon loads of medical supplies so they could use the wagons for missions they considered more important. When Letterman's system of brigade supply began in October of 1862, the practice of dumping was stopped. 47

In December of 1862 at Fredericksburg, Union medical supplies and ambulances exceeded anything ever before seen. The same held true at Gettysburg in 1863, but the medical
effort there was hindered by an unfortunate order reducing by half the number of medical supply wagons each brigade could take into battle. Prior to the Battle of Chickamauga on 19-20 September 1863, the Army of the Cumberland carried three months' medical supplies as well as reserve supplies for each corps. With such abundance it was clear that 1863 was the first year the medical supply system worked properly.

By 1864 the entire Union Army carried three months' medical supplies, and most armies maintained another three months' worth in reserve. On the difficult marches of General William T. Sherman's army through Georgia in 1864 and through the Carolinas in 1865, medical directors were well satisfied with their medical supplies. As the campaign in Georgia drew to a close, Surgeon George E. Cooper, Medical Director of the Army of the Cumberland, wrote,

Never, from the hour of starting from Chattanooga till the present time, has this army wanted in medical stores, and always has there been a sufficiency on hand to meet any emergency. 49

After a battle on the road to Goldsboro in March of 1865, Sherman's medical director, John Moore, remarked

Although this battle occurred nearly at the close of a long march of two months' duration, without an opportunity of replenishing supplies, there was no lack of any
article essential to the comfort of the wounded. 50

Success was the result of a combined effort. Letterman was brilliant and innovative, but without men like Montgomery Meigs and Hermann Haupt to support him, his medical supply system would have failed.

Field hospital administrators could also boast of a success story. Army regulations recognized only regimental field hospitals and general hospitals in 1861. In regimental hospitals inefficiency, bungling and confusion were the order of the day. Supplies were difficult to obtain and needlessly duplicated. Surgeons often refused treatment to men outside their regiments, causing an inequitable distribution of work during battles. Surgeons of a heavily engaged regiment might spend days caring for wounded while those of adjacent regiments stood idle. In 1862 Tripler was the first to combine regimental hospitals into brigade hospitals. That same year Letterman organized brigade hospitals into division hospitals. By 1863 corps hospitals were introduced to make the best possible use of medical personnel and equipment in large battles. Regimental and brigade hospitals remained until 1864, but after 1862 most field hospitals were combined to form division or corps
hospitals. Centralization was the key to success.

On 30 October 1862 Letterman set forth the requirements for a division field hospital. Corps medical directors would designate one hospital area per division. The hospital would be manned by a surgeon-in-chief, an assistant surgeon responsible for food and shelter and another assistant surgeon responsible for maintaining records. Three of the best qualified surgeons would be in charge of all surgery. They would be assisted by three other capable surgeons. Other medical officers, hospital stewards and nurses of the division would dress wounds and give general assistance where needed. Division hospitals remained the mainstay of the Union medical effort for the remainder of the war. East and West, medical directors acknowledged the superiority of the division system over all other hospital systems. Near the end of the war the system was applied to the railroads. A train bearing hospital personnel and equipment was introduced in the Army of the Potomac as an advance movable depot hospital. Staffed with twenty-five surgeons and over one hundred enlisted assistants, it was capable of handling twenty-five hundred wounded for four days. Lee's surrender at Appomattox shortened its field use to only eighteen days.
Second only to an efficient hospital system was an efficient ambulance system. Vehicles designed for the express purpose of carrying sick and wounded soldiers were unknown in the United States Army prior to 1858. Up to that time any available means of conveyance was used. In the two years before the war, one model of a four-wheeled ambulance and two models of a two-wheeled ambulance had been approved for experimentation. The four-wheeler was the only one tested, and it achieved satisfactory results. For reasons unknown to this day, the untested two-wheeled ambulances were adopted and recommended by a board of officers as the best for transporting badly wounded men. Experience would show that they were utterly unfit for any such purpose. 53

Working with a planning figure of four percent, the board of officers had recommended two four-wheeled and ten two-wheeled ambulances be assigned to each regiment (Figures 14-17). In the Army of the Potomac this would have required five hundred four-wheeled and twenty-five hundred two-wheeled ambulances. They would have formed a column twenty-five to thirty miles long. Faced with this impracticality, the Medical Department recommended, and had allotted, one four-wheeled and five two-wheeled ambulances per regiment.
Even at that reduced allocation, the Quartermaster department could not meet the demand from the field. It would take two years to overcome the deficiency. Control problems added to the difficulties. Until Tripler stopped the practice, many of the two-wheeled ambulances were used as pleasure carriages or cabs for officers. The order ending those frolics also specified that the Quartermaster Department keep all but one ambulance per regiment in a central location till needed. This would permit rapid concentration under centralized effort.\textsuperscript{54}

Many new forms and varieties of ambulances were tested during the war (Figures 18-20). Patient comfort was the major consideration. Other considerations were durability, lightness and ease of maintenance. Experimentation was continuous, but poor roads and rolling fields always seemed to offset any ambulance improvements made in the name of creature comfort. After the Battle of the Wilderness, Surgeon A. N. Dougherty reported favorably on the use of wagons (Figure 21) as substitutes for ambulances saying, "The wagons...were not more uncomfortable than ambulances usually are."\textsuperscript{55}

If ambulances needed improvement, the system under which they operated needed it more. Tripler saw the need
Figure 14. "Finley" Two-wheeled Ambulance - Front View

Figure 15. "Finley" Two-wheeled Ambulance - Side View
Figure 16. Rucker Four-wheeled Ambulance - Rear View

Figure 17. Rucker Four-wheeled Ambulance - Side View
Figure 18. "Moses Ambulance - Front View

Figure 19. "Moses" Ambulance - Rear View

Figure 20. "Moses" Ambulance - Wagon and Tent
Figure 21. Army Wagon Used as Ambulance
for a separate and distinct ambulance corps of volunteers organized into companies with officers and non-commissioned officers to lead them. Letterman felt the same way. Deciding that an efficiently run ambulance corps could not be under quartermaster control nor under the direct control of surgeons whose battlefield requirements precluded their attention to, and supervision of, such details, Letterman recommended to General McClellan the following ambulance system:

1. A separate ambulance corps would be commanded by a captain at corps, a first lieutenant at division, a second lieutenant at brigade and a sergeant at regiment.

2. Three ambulances, each containing one driver, two stretcher bearers, two stretchers, medical supplies and food, would accompany each regiment.

3. All other ambulances would remain with the corps ambulance train accompanied by two medical officers and one hospital steward.

4. No person except ambulance corps members would be permitted to carry wounded from the battlefield.

5. The ambulance corps would be self-contained in matters of maintenance and repair of equipment.

Realizing Congress would be opposed to adopting an untested system, McClellan made his own army the test vehicle. On 2 August 1862 General Order number 147 of that army made
Letterman's system a reality. Antietam and Fredericksburg were the first testing grounds. Both battles proved the system's viability. Wounded soldiers were recovered from the battlefield faster than ever before without confusion or disorder.

Other departments soon followed the Army of the Potomac. In March of 1863 the Department of the Tennessee, at the insistence of its medical director, E. P. Vollum, and with the hearty endorsement of its commander, Major General Ulysses S. Grant, adopted a similar system.

After one year of battle testing, Letterman's system was refined in a new general order issued by the Army of the Potomac on 24 August 1863. By then the entire Union Army operated with similar ambulance systems. Still, it was not until 11 March 1864 that an Act of Congress gave the Medical Department authority over the ambulance corps. That act, based on Letterman's system, made the ambulance system uniform throughout the Army. By July of 1864 the ambulance corps of the Union Army had become large and efficient. In the Army of the Potomac alone the corps could boast sixty-six officers, twenty-six hundred enlisted men and almost eight hundred ambulances ready for service in the front line.
Early general hospital inadequacies were not confined to the Confederacy. At the outbreak of war the Union knew practically nothing about large military hospitals. There were some large multi-tiered civilian hospitals, but in 1861 the largest military hospital was located at Fort Leavenworth, Kansas. It had forty-one beds. 61

All the early general hospitals were extemporized, the buildings formerly consisting of schools, warehouses, factories, hotels, large private residences, churches and town halls. Some civilian hospitals offered their beds to the Army for fifty to seventy-five cents per day. The first general hospital was opened in May of 1861 in Washington, D.C. Other hospitals quickly opened in other major eastern and western cities. That year the hospital system extended north to Elmira, south to New Orleans and west to Little Rock. 62

First attempts to construct new hospitals ended in dismal failure. Tripler felt there should be enough new construction to accommodate twenty thousand patients, but Congress permitted the Surgeon General to plan for hospitals accommodating only fifteen thousand. By the time the plans were submitted, rising construction costs reduced the actual construction to two buildings with accommodations for four
hundred men. As the battlefields of Virginia produced the large numbers of wounded soldiers anticipated by Tripler, many small hospitals then extant had to be put in order quickly to alleviate the serious general hospital deficiency.  

Surviving the disasters of 1861, the Medical Department attempted to construct ridge-ventilated wooden sheds for hospital buildings in 1862. The buildings were comfortable in warm weather, but, having no sash or shutter to close the ventilators, permitted cold wind and snow to penetrate in the winter. Living conditions for the patients inside became unbearable. Barracks buildings, vacated for the Peninsula Campaign, were little better as hospitals, but some around Washington retained that status until the end of the war. It took a mass influx of broken bodies from the Peninsula to persuade Congress to authorize sufficient funds for good hospital construction.  

Two major questions had to be considered in the construction of general hospitals. Would the layout permit efficient administration, and would it permit proper ventilation? Lessons were learned by trial and error. The pavilion system seemed the most logical and least objectionable (Figure 22). Surgeons, architects and builders collaborated
on many different models in attempts to refine the pavilion system (Figure 23). The circular hospital plan proved to be the most efficient (Figure 24). After considerable study and deliberation, the War Department published a circular on 20 July 1864 specifying how general hospitals would be constructed. Dimensions were included, but the circular did not demand absolute uniformity. Rather, it was to be used as an experience-based guideline for the Quartermaster Department to use in new construction of hospitals. Certain overall design configurations were acceptable, but experience dictated the best dimensions for individual buildings. So many buildings had already been erected by the time the circular was issued that there was little need for more construction. The few that were erected under the plan proved quite satisfactory.\textsuperscript{65}

In four years the Union Army had developed a general hospital system which provided the basis for today's general hospitals. By 1865 there were two hundred and five hospitals capable of handling 136,894 patients.\textsuperscript{66} The achievement was remarkable.

In the North there were several officially sanctioned national organizations for soldiers' relief. The first was sanctioned on 13 June 1861 when the President signed an
SEDOWICK HOSPITAL, GREENVILLE, LA.—Plans of ward, ventilation and heating: 1, 1, 1, Nurse's rooms; 2, Water-closets; and 3, Bath-rooms, at the free end of the ward. The double-lined circle indicates the position of the rain-water tank.
Figure 23. Satterlee Hospital

Figure 24. Mower Hospital

General plan of Mower Hospital, Chesncty Hill, Pa.—Scale 153 feet to the inch: 1, 1, 1, Wards; 2, Reception-room, laundry, etc. In the building between this and 12 is the kitchen, etc.; 3, Knap-ack-room, band quarters, etc.; 4, Store-rooms, etc.; 5, Operating-room; 6, Butcher's shop; 7, Guard-house; 8, Boilers, coal, etc.; 9, Sutler's; 10, Carpenters' shop; 11, Chapel; 12, Administration building; 13, Ice-house; 14, 15, Railroad depots; 16, 17, Corridors; 18, 19, L-shaped buildings, used as barracks, store-rooms, etc.
order approving the United States Sanitary Commission. Originally designed to investigate and advise on matters of "sanitary and hygienic interest," this precursor of the American Red Cross brought about instead a purging and cleansing of the Medical Department. Under Frederick Law Olmsted it inspected camps, hospitals, food, clothing, medical supplies, ambulance service and recruitment, exposing negligence and incompetence whenever discovered. Its workers went to the field to nurse and nourish and distribute medical supplies, food and clothing worth fifteen million dollars. Relief lodges were set up in large cities to feed and shelter soldiers in transit and disabled soldiers. The commission also published many professional medical articles during the war. Most were of great help to surgeons in the field and were some of the best medical and surgical treatises then extant. They covered every topic from field sanitation to amputations. The total value of the commission's services was placed at twenty-five million dollars. Complementing its work was the Western Sanitary Commission. Organized on 5 September 1861, it performed precisely the same services for western armies.

Another organization welcomed in most camps was the United States Christian Commission. Its members were
conspicuous for their presence on many battlefields as well as their great personal sacrifice. Members of the commission donated vast stores of food to the armies but were remembered most for performing personal services for the wounded that regular hospital attendants could not or would not do. One member, a minister of a large Philadelphia church, was seen washing the bloody clothing of the wounded in a stream at Antietam. Another at Gettysburg was seen crawling on his hands and knees bearing those whose wounds were so severe that they could not be carried otherwise. In that manner he rescued over one hundred men who, lying too close to a stream, would surely have been washed away when the stream suddenly rose. Many other members performed a great service in aiding surgeons and ministering to the sick and wounded.  

There were numerous other state and local aid societies giving whatever aid they could to the Medical Department. As in the South, the people in the North who sent their men off to war did what they could to help.

To a large extent the Union Medical Department reflected the logistics system of which it was a part. Success spawned success. But the Medical Department went beyond that. As the Union logistics system began to operate
smoothly, surgeons dared to be innovative. With sufficient resources at their command, they boldly changed ambulance and hospital systems. Procedures had to be perfected, lessons had to be learned on the battlefield, and, as always, the wounded paid the price.
Notes for Chapter II


21. The promptings and persuasion of the United States Sanitary Commission finally resulted in Congressional action. A reform bill, passed by Congress and approved by the President on 17 April 1862, removed the "old guard." See Meneely, War Department, pp. 227-29.

22. Meneely, War Department, p. 228.


24. Brooks, Civil War Medicine, pp. 18-20.


26. Johnson, Muskets and Medicine, pp. 123, 126. See also M. S., Part 1, Volume 1, pp. App. 45, App. 286; O. R., Series 1, Volume 5, pp. 77-78; Weist, Medical Department in the War, p. 8.

27. O. R., Series 1, Volume 5, p. 78. See also M. S., Part 1, Volume 1, p. App. 45; Weist, Medical Department in the War, pp. 9-11.

28. O. R., Series 1, Volume 5, pp. 94-95.


30. Smith, Medicines for the Union Army, p. 9. See also M. S., Part 1, Volume 1, p. App. 50.


32. O. R., Series 1, Volume 2, p. 344.


34. O. R., Series 1, Volume 11.1, pp. 192-98, 211. See also M. S., Part 1, Volume 1, p. App. 70.
35. **O. R.,** Series 1, Volume 5, pp. 26-27. In addition to hospital, ambulance and supply systems, Letterman also established a system of hospital identification using colored flags and established a system of passes authorizing patients to travel to and from general hospitals. See Jonathan Letterman, *Medical Recollections of the Army of the Potomac* (New York: D. Appleton and Company, 1866), p. 179.


37. **M. S.,** Part 1, Volume 2, p. XIV.


39. **O. R.,** Series 1, Volume 5, p. 102. See also **M. S.,** Part 1, Volume 1, p. App. 149; **M. S.,** Part 3, Volume 2, pp. 984-86.


44. **M. S.,** Part 3, Volume 2, pp. 918-19.


46. **M. S.,** Part 1, Volume 1, p. App. 46. See also **O. R.,** Series 1, Volume 11.1, pp. 182-83, 220.


49. Ibid., pp. App. 150, App. 299.

50. Ibid., p. App. 322.

51. Ibid., p. App. 48. See also Cunningham, Field Medical Services, p. 45; Adams, Doctors in Blue, pp. 63-65; Hastings, Railroads: An International History, pp. 29, 32.


56. O. R., Series 1, Volume 5, p. 102. See also Letterman, Medical Recollections, pp. 23-30; Ridinger, "Hospitalization at Gettysburg," p. 5; M. S., Part 1, Volume 1, p. App. 96; Brooks, Civil War Medicine, p. 36; Thomas T. Ellis, Leaves From the Diary of an Army Surgeon; or, Incidents of Field Camp and Hospital Life (New York: John Bradburn, 1863), pp. 183-84; O. R., Series 1, Volume 11.1, pp. 217-19.

57. M. S., Part 3, Volume 2, pp. 935-41. See also Letterman, Medical Recollections, pp. 31, 73-75.


59. Letterman's main complaint about the Act of 11 March 1864 was that it regulated the number of ambulances and men not by the number of regiments, but by the number...
of men in each regiment. This produced seasonal as well as battle fluctuations. See M. S., Part 3, Volume 2, pp. 938-43. See also Letterman, Medical Recollections, pp. 31, 73-75, 161-78; Weist, Medical Department in the War, p. 15.


61. M. S., Part 3, Volume 1, pp. 896-97. See also Brooks, Civil War Medicine, p. 41.


63. O. R., Series 1, Volume 5, pp. 88-91, 100-07.

64. M. S., Part 3, Volume 1, pp. 908-09. See also M. S., Part 1, Volume 1, p. App. 51.


66. M. S., Part 3, Volume 2, p. 902. See also Brooks, Civil War Medicine, p. 43.


CHAPTER III

BATTLEFIELD EVACUATION AND TREATMENT

There were many ways men could be wounded in the Civil War. The more exotic ranged from stepping on land mines to having artillery weapons explode in their faces. Over ninety-nine percent of the wounds, however, were caused by more conventional means. Muskets and pistols accounted for ninety-three percent of all wounds. The projectile which was responsible for most of those was a one ounce, .58 caliber, cylindro-conical lead bullet called the minie ball. Fired from a rifled musket, it struck its human target not with the dull thud of the round balls, but with a noise which sounded as if someone had given the man a slap with the palm of the hand.

Artillery accounted for only six percent of the wounds. Bayonets and sabers stood even further back. Accounting for less than one percent of all wounded, these romanticized weapons were more useful as digging instruments and as spits over cooking fires. Their psychological effect on the enemy--the fear of being run through by cold steel--
was their greatest contribution in the war. Yet there were instances when both were used with devastating effectiveness. Short, heavy, sharp sabers made from saw mill files were used by mounted Indians and Texas cavalry troops at Pea Ridge, Arkansas, in March of 1862. One blow could crush a skull or make deep gashes in the body. In the battle a number of Union soldiers were killed by those weapons and surgeons cared for several more who had been severely wounded. The psychological effects of the reports of that battle were not lost on other Union soldiers.\(^3\)

Having been wounded in some manner, soldiers on both sides found themselves far from out of danger. The ebb and flow of clashing forces might place the wounded alternately on Union or Confederate held ground and subject them to fire from both sides. Those who were able to move ran, walked or crawled to the rear in search of aid stations. Those too incapacitated remained where they fell, awaiting medical assistance and hoping not to be wounded again or killed by screaming artillery shells and whizzing bullets. Surviving those dangers, they still faced the possibility of being trampled or run over by friendly or enemy soldiers, horses and wagons passing back and forth in waves of panic or controlled frenzy. If they were still alive after that
they could only hope that help would come quickly. If it did not, they might bleed to death, starve, die of thirst or succumb to the elements. Those who found themselves on the "wrong side" after the battle had their wounds cared for last, if at all.

No adequate system of battlefield first aid was ever developed. Hemorrhage was a major problem for the wounded soldier. Until he was brought back to the aid station his only bandage was a dirty handkerchief or a strip of sweaty shirt. At the aid station the assistant regimental surgeon did little more than staunch bleeding vessels and apply temporary dressings.⁴

Suffering was not a characteristic peculiar to either side. Since the fortunes of battle dictated how much the wounded would have to endure on the battlefield, neither time nor the improvement of evacuation techniques could do much to ameliorate that suffering. Almost without fail the wounded of a victorious army suffered less than those of a defeated one. The latter fell into enemy hands and could not be recovered by their own medical personnel until truces were arranged. Time wasted was often the difference between life and death.

At the First Battle of Bull Run the Confederates
captured almost fifteen hundred wounded Union soldiers. Some had lain on the field several days without food or water. Union surgeons remaining with them had been captured and stripped of most medical items. Those wounded who could not be transported to Richmond were left at field hospitals and private dwellings where most died within ten days.5

Western armies suffered a similar fate less than one month later. On 10 August 1861 the Battle of Wilson's Creek was fought near Springfield, Missouri. Retreating Union forces left eight hundred wounded to the mercy of the Confederates. According to the surgeon who remained with them, the enemy took most of the medical supplies and all transportation for their own wounded, leaving Union casualties to fend for themselves. It took five or six days of deprivation before all were removed.6

Both sides suffered in the battle for Fort Donelson in February of 1862. The battlefield was cold, wet and muddy. There, Union and Confederate wounded had to be removed with picks and axes from the mud into which they had frozen fast. Some of the Union wounded who tried to stop Confederate stragglers from stripping them and taking their valuables were pinned to the earth with bayonets and
their items then taken. Those who did not die from the bayonet wounds lay frozen in the mud for a day, stripped and alive, but unable to move. A Union officer left for dead remained alive only because his bleeding wounds had frozen. For twenty-four hours he lay with his head frozen to the ground while opposing forces fought for, and twice passed over, the ground where he fell. Miraculously, he and others survived the ordeal.  

Time and again the story was repeated. In April of 1862 at Shiloh the wounded on both sides were forced to lie in a cold, pelting rain for two days without medical care as contending armies passed over them several times. Similar occurrences were reported less than two months later during the Peninsular Campaign.

In August of 1862 the Second Battle of Bull Run resulted in a crushing defeat for the North. Captured medical supplies and equipment helped Confederate forces treat and evacuate their wounded quickly. Union soldiers were not so fortunate. Those supplies returned to Union medical officers were hardly sufficient to treat all the wounded. Three days after the battle three thousand of the four thousand wounded lay unattended on the battlefield. Five days later six hundred remained. Some lay six or seven
days under blistering heat and violent thunderstorms without food or water. The ordeal of one soldier defied belief. Wounded in the shin, the 2nd Wisconsin's Sheldon E. Judson arrested the bleeding with his handkerchief. He was placed in an ambulance and taken to some woods on the battlefield where others needing medical attention had been collected. There he was propped against a tree and promptly attacked by a swarm of hornets. After a painful night he and his group were abandoned, taken prisoners by Confederate pickets, abandoned again and shelled by Union artillery. Following several futile attempts to get help from passing Confederate troops and ambulances, Judson and the others were finally collected by some sympathetic "rebs" and deposited alongside several hundred other wounded Union soldiers. There they remained for six days without treatment and with but one cracker per day to sustain them. Judson spent two of those days and one night lying without protection in a pool of water. A truce finally ended his immediate suffering, and he was taken to a general hospital in Washington where he recovered.

Another soldier of the same regiment decided help would never come and crawled nine miles to the nearest Union field hospital to have his shattered leg amputated, but
others chose to wait for help. One embarrassed soldier, bleeding profusely from a wound in the buttocks, was ordered to the rear by a member of the medical corps. Cursing loudly, the soldier announced that he would not leave the field until he received "a more honorable wound."\textsuperscript{11} Whatever the outcome, one thing was certain—he belonged to the army which lost the field, and the wounded of that army could expect to suffer more.

Less than a month later at Antietam the situation was reversed. Victorious Union forces collected their wounded as fast as they fell, but retreating Confederate forces left behind over two thousand of theirs. Good weather and rapid collection and care of Confederate wounded saved them from a fate similar to that suffered by Union soldiers at Second Bull Run.\textsuperscript{12} For the remainder of the war the story was the same. Men suffered and died waiting for help. At Chancellorsville and Chickamauga in 1863 and the Wilderness in 1864 many wounded on both sides were burned to death as the dense thickets in which they fell caught fire. In such circumstances neither friend nor foe was able to render aid.\textsuperscript{13} Unable to move, wounded soldiers learned the ultimate horror of death on the battlefield.

Suffering was not confined to humans. Animals were
wounded and suffered as well. In January of 1863 at the battle of Murfreesboro a Union officer wrote in his diary:

Many wounded horses are limping over the field. One mule I heard of, had a leg blown off on the first day's battle; next morning it was on the spot where first wounded; at night it was still standing there, not having moved an inch all day, patiently suffering, it knew not why nor for what.14

No one would come to care for the mule, save with a pistol to end its misery.

After 1862 wounded soldiers, particularly those from the Union, could be reasonably sure that their comrades would make every effort to recover them from the battlefield. Ambulance systems had been established and recovery techniques practiced. Still, recovery under fire was a dangerous undertaking. During the siege of Petersburg in September of 1864 one Union corps lost ten killed, six wounded and nineteen captured trying to recover its wounded. In the process two ambulances took direct hits from enemy artillery.15

If a wounded man survived on the battlefield he soon found there were several painful steps to take before he could begin his recovery. North and South, the systems were the same. Litter bearers from each regiment collected all who could not walk and delivered them to an aid station
located just beyond enemy musket range. Those who could not be evacuated under fire were evacuated under the cover of darkness or as soon after the battle as possible. An assistant surgeon at the aid station examined the wounds, applied dressings and ligatures where needed and sent the men by ambulance to the nearest field hospital. These hospitals were initially located out of the range of enemy artillery (about 1-1/2 to 2 miles from the front lines), but were often subjected to its fire when battle lines shifted. If ambulances were not available, litter bearers would have to carry wounded soldiers to the hospitals. Guidons marked the route to the hospitals by day, but at night ambulances and litter bearers had to grope their way to and from those establishments. Tripping over felled trees, falling into creeks and often losing their way, they, and their human cargoes, undoubtedly added some new words to the ageless vocabulary of angry soldiers.

Evacuation of Confederate wounded was hindered by poor staff cooperation between the Medical, Subsistence and Quartermaster Departments. Commanders did little to help the situation when they failed to advise their medical officers of expected troop movements. Ambulances and animals to draw them were always critically short. Any vehicle could...
pass for an ambulance, so anything which could be moved was used. Most were little more than springless wagons, pulled over rough roads by debilitated animals.\(^{17}\)

At Shiloh Confederate ambulances had removed the wounded to field hospitals as quickly as could have been expected. At Antietam Lee's medical director, Surgeon Lafayette Guild, reported that many wounded fell into the hands of the enemy for lack of transportation.\(^{18}\) The absence of transportation was only half the problem. Lack of a responsive ambulance system under the Medical Department combined with a shortage of animals and vehicles to produce the sad results of crisis management. The Confederate Medical Department survived that crisis only through improvisation. From Bull Run to Appomattox the story was the same. Those forced to ride in makeshift ambulances could justifiably complain of being "jolted to death;" but they should have considered it a miracle that any transportation was available. Somehow most of the Confederate wounded reached field hospitals, considerably worse for wear, but alive with a chance to survive.

Evacuation of Union wounded to field hospitals ran a chronological gamut from failure to success. During the war over fifty thousand litters were purchased and issued
to the Medical Department. The best of these weighed twenty-four pounds, were quickly collapsable and could be used as cots since they were equipped with legs. Introduced in 1863, they represented two years of development.\textsuperscript{19}

Design characteristics of ambulances called for light vehicles on springs with shallow beds, strong canvas covers and a hinged back gate. Two-wheeled ambulances met the characteristics but failed in the field. According to one surgeon, "they were too light in their construction, unsuited to the rough miry roads of the country, and were easily broken."\textsuperscript{20} Field testing before the war would have shown how terrible the two-wheeled ambulances were. Battle testing proved it. Tripler spoke for all medical officers when in May of 1862 he wired Hammond, "We must have four-wheeled ambulances; two-wheeled are good for nothing."\textsuperscript{21} Those who had the misfortune of riding in the latter added hearty endorsements for their early replacement. Known as "avalanches," the two-wheelers were of little use on bumpy roads. One of the first soldiers to ride in one as a legitimate passenger was Lieutenant Oliver Wendell Holmes, Jr., who was wounded in the chest. In a letter home he described his ride:
I was taken from the canal boat and put into one of the two wheeled ambulances which were then in vogue as one form of torture.... The ambulance was broken—the horse balked and the man didn't know how to drive—whenever we came to a hill, and there were several, there we stopped, head downward, till some of the men along the road gave us a boost and started our horse forward again.\textsuperscript{22}

Four-wheeled ambulances did not offer much more comfort, but they were sturdier and less prone to tip over. After 1861 two-wheelers were used only when four-wheelers were unobtainable. They were never completely phased out.

Cacolets or mule litters (Figures 25-27) were thought to be more comfortable than jolting ambulances. When tested they proved to be equally as damaging to their human cargoes and were rarely used.\textsuperscript{23} Failing in that effort, medical officers turned their attentions to the four-wheeled ambulance and continued to improve its design throughout the war.

There were never sufficient ambulances to cover a battle when sick and wounded soldiers accompanied their units. If those sick and wounded could not be sent to general hospitals, field hospitals had to be established along the route of advance to accommodate them and free the ambulances for service. Keeping patients out of ambulances on the march also helped reduce the number of breakdowns.
Figure 25. British Cacolet

Figure 26. British Cacolet Open for Use and Closed for Traveling

Figure 27. British Mule Litter
As a matter of supply economy, ambulances broken down beyond repair would be stripped of all usable parts. Those parts would be carried on other ambulances until needed. Each improvisation and innovation pointed to success, but early in the war it was difficult to see how the Medical Department could ever have a workable ambulance system.

At First Bull Run the ambulance corps consisted of a few ambulances with civilian drivers hired by the Quartermaster Department and answering to no one. At the first sounds of gunfire they panicked and fled, leaving the wounded behind. Not one wounded man made the twenty-seven mile trip back to Washington in an ambulance. All made their way back as best they could. Following that disgrace was another at Wilson's Creek, Missouri. There, a Union force of five thousand men took two ambulances into battle and, after a hard fight, left eight hundred wounded behind. At Belmont, Missouri the story was again the same. With only two or three springless wagons for ambulances, General Grant, then commanding the District of Southeast Missouri, was forced to leave three hundred wounded in the hands of the Confederates. The year 1861 was a time for mistakes. So, it seemed, was 1862, at least
in the beginning.

At Shiloh a critical shortage of ambulances kept some of the wounded stranded on the battlefield for several days. In the Peninsular Campaign it became obvious that a shortage of ambulances was not the only problem. Their use had to be coordinated by some agency responsible only to the Medical Department. From this revelation the first ambulance corps was organized. If nothing could be done about the ambulance shortage, something surely could be done about handling available assets efficiently.\(^2^6\)

It was unfortunate that the Army of the Potomac did not arrive at the Second Bull Run battlefield in time to participate in the battle. The two corps placed in reserve were ready to test Letterman's new ambulance system, but they were never used. Instead, the Army of Virginia stumbled through another medical disaster. Of its three corps, the one best equipped had only forty-five of the one hundred and seventy ambulances authorized. A call for private citizens to assist in evacuating wounded received overwhelming response. Wagons of every description were pressed into service, but many who volunteered to drive them became lost enroute and never saw the battlefield. Single lane roads were jammed with two-way traffic, and rain
made them practically impassable. Those who did reach the battlefield were of little help. Some drivers were drunk, some stole from the wounded, and most refused to obey orders. Many ran when they heard the first shots. Of all the remaining ambulances none were held in reserve. As a consequence, horses were overworked and were given no time to recover. After the battle one hundred and fifty ambulances were dispatched to enemy-held territory to recover the wounded. Only one reached its destination. From start to finish the employment of ambulances had been a disgrace.

Antietam marked the turning point in the evacuation of wounded to field hospitals. There, on the bloodiest day in American history, members of the newly formed ambulance corps manned three hundred ambulances under a new system. Evacuation was quick and orderly, and by the day after the battle the field was completely cleared of wounded. Ten thousand Union and four thousand Confederate soldiers were brought in to field hospitals for treatment. Making the feat even more remarkable was the fact that some units participated in the battle without ambulances. Relying solely on vehicles controlled by the ambulance corps, they saw their wounded evacuated as quickly as those from units
having ambulances. The Letterman system had passed its first test with near-perfect marks.

Two months after Antietam the ambulance system passed another severe test. At Fredericksburg the battlefield was cleared of wounded the night following the battle. When it became evident that Union forces would have to abandon the town, the ambulance corps evacuated all the wounded to prearranged locations on the north side of the Rappahannock River. Ambulances contained food and beverages for their occupants so that none would want for anything. Refinement had already begun. An ambulance system had been successful even when its supported force quit the battlefield. Letterman was jubilant, exclaiming, "Everything in the ambulance system was well conducted. Promptness, order and precision characterized the actions of this corps throughout that exciting day." 

As news of Letterman's success flowed west his ambulance system was adopted everywhere as the best form of evacuation. As early as 29 December 1862 a variation of his system was tried with good results at the Battle of Murfreesboro. Confederate soldiers were so amazed at the efficiency with which wounded from both sides were recovered that they preferred to watch rather than fire upon the
ambulance corps as it went about the battlefield. 30

On both sides of the Mississippi River the system had to be good enough to compensate for what was expected to be a permanent shortage of ambulances. As late as May 1863 the best equipped corps of the Army of Virginia had only forty-one ambulances. Those still to be supplied numbered 129. 31 The Army of the Potomac was in much better shape but had other problems. At the Battle of Chancellorsville, fought just south of the Rappahannock River, Letterman complained that instead of accompanying the army, most ambulances were not permitted to cross the river and were placed on the north bank where they were of little use. Even so, the few employed on the south side of the river managed to evacuate eight thousand wounded before Union forces withdrew. Had it not been for the order forbidding the use of most ambulances, all the wounded could have been evacuated during the battle. Twelve hundred had to be left in Confederate hands. After the battle, splendid cooperation between Lee and Hooker and the medical directors of both sides resulted not only in a transfer of the captured wounded, but in a transfer made efficient by the free flow of surgeons, ambulances and supplies within each other's lines. 32
In July of 1863 the Battle of Gettysburg marked the high point of Letterman's ambulance system. The battle lasted three days and ended on 3 July. By early morning on 4 July one thousand ambulances had evacuated 14,193 Union and 6,000 Confederate wounded. That feat would never again be duplicated in the Civil War. It represented the ultimate combination of abundant equipment and an efficient system. The Army of the Potomac could boast of its accomplishments, but in other armies there was still much to be done.

It was not till after the Battle of Chickamauga in September of 1863 that the Army of the Cumberland adopted Letterman's ambulance system. Slow to respond to change, that army had used ambulances as carriages and freight wagons. Consequently, when ambulances were needed for legitimate use in the battle they were as broken down as the horses that pulled them. The story seemed to repeat itself in other armies. Serving under commanders with vastly different inclinations and temperaments, medical directors realized that the success of any ambulance system they adopted depended upon the attitudes and support of those commanders. Centralization of an ambulance system for the entire Union Army would remove all uncertainty. For
years, pleas for such a system had fallen on deaf ears. By 1864 Congress could no longer ignore the obvious. That year a uniform system was established.

Through the campaigns of 1864 and 1865 success of the ambulance system came to be routine and expected, but exceptions to the rule could always be found. One Union officer, wounded in the Battle of Drewry's Bluff near Richmond in May of 1864, was placed in a captured Confederate ambulance (mule and springless wagon). The black driver was given instructions to take him to a field hospital nearby but decided that the officer would make a nice trophy for his master in Richmond. Only the timely intervention of a Union cavalry reconnaissance party near the city spared the officer that fate. The ambulance was turned around and, under escort, retraced every painful mile until it arrived at the proper destination. In another strange incident a Union cavalry brigade was ordered to retreat after the Battle of Bull's Gap, Tennessee on 11-12 November 1864. All but the most severely wounded were placed in ambulances and taken with the column. After running into an ambush the column made a more precipitous retreat to where reinforcements were waiting. Attacked again in the middle of the night, the brigade was seized by
panic and retreated in confusion and disorder. Ambulances were upset on the road, and the wounded were left to get away as best they could. The surprising fact was not how many were captured—for it was assumed that most were lost—but how many managed to escape after being so unceremoniously dumped upon the road in the black of night. The fear of capture helped most escape and return safely inside Union lines. 36 Seen alone the incidents appear insignificant, but, combined with similar occurrences on other battlefields, they show that there was always room to improve the system. It is a tribute to Union surgeons that until the end of the war they did just that.

Union and Confederate wounded arriving at field hospitals had mixed emotions. There was a feeling of relief that the jolting had stopped and medical care was at hand. That feeling was marred by a concomitant fear of the unknown. Horrible stories of brutal treatment by surgeons passed quickly from soldier to soldier and were known to all. Each expected the worst.

Wounds introduced a special form of bacterial contamination. Bullets fired at slow speeds did not create sufficient air friction to be self-purifying. Upon entering the body they contained germs from the hands of
the men who fired them and pushed into the wound bits of filthy clothing they happened to strike. If the wound did not become infected from the bullet or clothing, it soon would become so as surgeons' dirty hands and instruments and unsterile cleansing and bandaging procedures introduced deadly microbes. Those germs produced toxemia, septicemia, pyemia, tetanus and hospital gangrene among the more direct effects, and produced numerous indirect diseases as well. Recovery from the wound was often secondary to fighting infections. Paradoxically, the South, with a dearth of medical supplies, was better able to prevent the formation and spread of infection than the North. Wounds were cleansed with boiled rags instead of contaminated sponges. Unsterile lint in bandages was replaced by sterile cotton baked in ovens. Boiled horse hair replaced silk in ligatures and sutures. These improvisations presented unsuspecting Confederate surgeons with the basic principles of asepsis. Having no time to analyze what they had seen, they relinquished the laurels of discovery and went about the grim business of repairing broken bodies.

Confederate field hospitals consisted of a series of wall tents fourteen by fifteen feet with eleven foot ceilings and oil cloth or canvas floors. Each tent could accommodate
eight to ten patients. Bed sacks were filled with straw when available, but most often patients lay on the floor. When tents were not available or it was impractical to use them, churches, private homes, vacant buildings and warehouses were pressed into service. 39

During battles Confederate surgeons worked days without food or sleep to clear field hospitals of wounded. What little time they had away from the operating tables was spent examining and dressing wounds. During operations they were assisted by hospital stewards and male nurses, though a woman's services were occasionally offered for that duty and gratefully accepted. Three of every four operations were amputations. Even so, Confederate surgeons practiced conservative surgery. Patients' lives were their first consideration. Future comfort and usefulness was secondary. 40 Chloroform was generally available but there were occasions when amputations were performed without anesthesia and, in some extreme cases, without even a drink of that great panacea—whiskey. Brave was the man who submitted to unanesthetized surgery, but braver still were those detailed to hold him still. Surgeons' decisions to amputate were rarely questioned. Those who did question them usually did so with force. Private William A. Fletcher,
for example, saved his injured leg and perhaps his life by violently kicking with his good leg the doctor who insisted upon relieving him of the injured one. He represented the exception to the rule. Amputation undoubtedly saved more wounded soldiers than it killed.\textsuperscript{41}

To the passer-by a field hospital in operation was a horrible sight. Groans and moans could be heard everywhere. Surgeons with bloody hands and clothing worked quickly on patients as a steady flow of fresh blood seemed to drip from the operating tables. Completing the macabre scene was the ever-present pile of amputated arms and legs which caused even hardened veterans to grow queasy and hurry on.\textsuperscript{42} It was a simple matter for the casual observer to attach the label of "butcher" to surgeons presiding over such activities. Indeed that stigma has carried forward to the present day, but in most cases it was undeserved. Given the primitive state of the art, surgeons did well to save as many lives as they did. That was their principal duty, and it mattered not whether those they saved were friend or foe. Jonathan Letterman spoke for all surgeons when he said, "Humanity teaches us that a wounded and prostrate foe is not then our enemy."\textsuperscript{43} Of course, priorities of treatment for friend over foe sometimes resulted
in unavoidable inequities, but that was expected.

At First Bull Run Confederate surgeons set the first of many war precedents by treating captured Union wounded. That battle also marked the successful opening of a new supply channel for them. Among the items captured from Union forces were seven medicine chests, six sets of surgical instruments and seven ambulances in working condition. After the battle General P.G.T. Beauregard praised the work of his surgeons and reported that a hospital marked with a yellow flag had to be evacuated when it became the target of Union artillery. It was the first time hospitals had mistakenly been fired upon, but it would not be the last.

In 1861 captured Union surgeons were treated like any other prisoners. Not until Thomas J. (Stonewall) Jackson's Shenandoah Valley Campaign would their status change. During the Battle of Winchester on 25 May 1862 Jackson captured a large field hospital but returned the surgeons unconditionally to their own forces. This led to formal agreement between McClellan and Lee that doctors and other medical personnel be considered non-combatants and be released if captured. The practice was continued throughout the war and received world recognition. After
the war many of the great nations of the world concluded similar agreements. 45

It is not practical to dwell on all the problems facing Confederate surgeons at field hospitals. There were just too many. In the Peninsular Campaign surgeons still had not learned to submit proper reports. Their inadequate staffs were too overworked to care about such secondary matters as casualty lists and hospital registers. Supplies were short and medical directors were embarrassed to report that captured Union wounded were left with more medical supplies than most Confederate forces possessed at the beginning of the battle. Still, wounded prisoners were given all possible consideration. 46

Things had not changed much at Antietam. Field hospitals were poorly equipped, reports were missing and transportation shortages forced the Army of Northern Virginia to leave many of its wounded behind. At a time when his field hospitals should have been functioning smoothly, Medical Director Lafayette Guild could not even report their status to Surgeon General Moore. 47

Compounding the field hospital problems were occasional cases of stupidity. After the Battle of Corinth, Mississippi on 3 October 1862 a captured Confederate surgeon
in charge of one hundred wounded prisoners chose not to requisition needed supplies from a Union medical depot. He had been repeatedly urged to do so and had been assured that any supplies requisitioned would be delivered promptly. His stubbornness caused much unnecessary suffering. 48

Sometimes, as was the case at Fredericksburg in 1862, there were insufficient tents for a field hospital. Patients could not be left outside in bad weather, so when all available buildings were filled with wounded, those not having accommodations were shipped directly to general hospitals. In peak periods during a battle this severely taxed the overburdened transportation assets of the South. 49

By 1863 surgeons were doing well to keep field hospitals in operation at all. At Chancellorsville they tried to care for the Union wounded their forces had captured, but without sufficient food, clothing and medical supplies for their own casualties there was little they could do. At Gettysburg a wounded Confederate soldier under care of his own surgeons felt relieved to fall into Union hands. After surveying the Union field hospital he remarked:
Besides the great want of medicines in our army, it has been my experience and observation; generally, that one Yankee surgeon was worth half a dozen of ours. Their discipline was much superior to ours.\textsuperscript{50}

The comment was understandable but unfair. There was little difference in skill between surgeons on both sides. The North had a field hospital system with abundant supplies. The South had neither. Discipline made the Union system work.

After Gettysburg the treatment of wounded in Confederate field hospitals remained the same until the end of the war. Surgeons did not give up trying to improve techniques. At Chickamauga in September of 1863 they noticed how quickly their wounded recovered in open air tents and mild weather. Lessons such as that were duly recorded and disseminated so other surgeons could learn.\textsuperscript{51} If the means to improve field hospitals were lacking, the dedication of the surgeons who manned them was not. They worked with what little they had and somehow kept field hospitals running until the end of the war.

There is no doubt that the Confederate wounded were deprived of the appurtenances which, in Union field hospitals, made life a little more tolerable. Field hospitals reflected the poverty of Confederate logistics. Bare necessities were
considered luxuries. Surgeons labored under difficult and trying conditions, but they never gave up. Improvising where necessary and adapting to the multitudinous changes of war, they accepted the responsibilities of establishing and running field hospitals for the Confederacy. It was a duty they performed faithfully until the last wounded man had been treated.

Union field hospitals, like those of the Confederacy, were placed beyond the range of the enemy's muskets but were rarely beyond the range of his artillery. Hospital tents were used sparingly at first as surgeons selected a wide assortment of available buildings to use instead. Those patients assigned to a hospital tent might find themselves sleeping on the floor. More often, cots were improvised from materials at hand. During the siege of Vicksburg, Union surgeons took advantage of an abundance of sugar cane growing near field hospitals to construct sturdy cots. When such exotic materials were unavailable, pine branches could always be used.

Before sanitary inspections became routine, hospital tents contained ten men so close together that there was hardly walking room between them. The floor was often muddy and foul with excrement and the patients' clothing
was filthy with vomit and rank with perspiration. Flies
and body lice were in constant attendance. Male nurses
would not or could not do much to help. Most were
skulkers, shirkers or invalids barely able to care for
themselves. Female nurses would not stand for such filth.
Few in number, they made their presence felt and appreciated
particularly when they took over supervision of the diet
kitchens. One hospital matron who cared for wounded in
western field hospitals best represented the no-nonsense
attitude of dedicated women volunteers. She thought nothing of
by-passing regulations to clean up hospitals or procure
fresh food for her patients. Not even the loud protests of
a recuperating general officer could stop her from giving
him a long overdue bath. When a staff officer complained
to General William T. Sherman about the meddling "Mother"
Bickerdyke, Sherman was heard to remark, "Oh well, I can't
do anything for you. She outranks me."
Surgeons appreciated her efforts, for they realized the valuable
contributions she and other female nurses were making. A
woman's touch in field hospitals was not to be taken lightly.

Surgeons in Union field hospitals had one major
advantage over their counterparts in the South. They were
part of a logistics effort which showed daily improvement.
Even so, they faced similar problems.

An operating room might be a tent, a room in a building, an open air shed or the great outdoors. Operating tables were part of the medical supply issue, but when they were not available, any door torn from its hinges and placed over two barrels made a reasonable substitute. 56

Conservative surgery to save mangled limbs was practiced whenever possible, but the nature of wounds caused three of every four operations to be amputations. Surgeons worked quickly and efficiently. During peak periods they rarely slept more than one night in three. No sooner was one man removed from the table than another was in his place ready for the anesthetic. Pure chloroform or a mixture of ether and chloroform were the anesthetics most commonly used. Overdoses of the former led to a few deaths, but the uncertain conditions under which the drug was administered made the number seem surprisingly small. 57

Some amputations were performed in almost total darkness. Others were performed under fire. One surgeon, George M. McGill, was operating under heavy fire when an enemy artillery shell came to rest directly underneath his operating table. The shell did not explode and the operation continued with the prayerful working postures of that
surgery and his assistants being a little more sincerely adopted.\(^58\)

Away from the operating table, those cases deemed hopeless were made as comfortable as possible, while surgeons turned their attentions to those whose injuries were afforded a chance of recovery. All wounds were treated first with simple water dressings. As they began to suppurate, a mild soothing ointment called simple cerate (two parts fresh lard and one part white wax) was applied. Maggots frequently infested the wounds, causing patients much anxiety. They served a useful purpose in cleaning the wound, but few could tolerate their annoying presence. If the patients survived the infection, they had a chance to recover. If not, they wasted away quickly. Field hospitals were grim indeed, but not entirely without humor. One captain from Kentucky was shot in the mouth while leading a charge at the Battle of Nashville. The bullet knocked out some front teeth, struck the tongue and apparently disappeared. Examining surgeons could find no trace of it. The next day nature extracted the bullet which, it turned out, the captain had swallowed.\(^59\) It was a case of "biting the bullet" taken to its literal extreme.

Surgeons and members of their medical staffs did their
best to treat each case properly, but they were human and errors were occasionally made. One surgeon had a case end disasterously when, instead of tying off an artery to stop hemorrhage, he placed the ligature tightly around the principal nerve and watched the wounded man bleed to death. In other cases, liberal doses of medicines were given to patients who could not tolerate them. Worse yet, incorrect ingredients were occasionally combined to form strange medicines. A hospital steward trying to relieve his patient's "biliousness" made such an error. The concoction offered caused the man to purge his system unexpectedly and in every manner possible for the next few days. The "biliousness" was cured but replaced by something much more incapacitating and infinitely more uncomfortable. One can only wonder how many cases did not turn out so humorously. Going without food and sleep for days at a time, surgeons found it difficult, if not impossible, continuously to keep their professional skills on a high level of excellence. Mistakes were bound to be made, and they were by no means confined to patient care.

Early in the war field hospitals were poorly managed. At First Bull Run there appeared to be sufficient medical supplies, but most were inaccessible. Some surgeons cared
for Union and Confederate wounded alike. Others refused care to men not in their regiments. Field hospitals were captured as Union forces retreated through them and left them to the mercy of the enemy. Nothing went right. In the West surgeons also complained bitterly of hospital shortages. 61 If the adage stating, "the army losing the battle learns more," was correct, the North learned a lot in 1861.

Starting off much like 1861 ended, 1862 was to be the year of change. At the battles of Fort Donelson in February and Winchester in March, complaints were the same. Supplies were in the general area of the battlefield but inaccessible. Accusing fingers were pointed at Quartermaster and Commissary Departments. 62 The light of progress continued to be dim until the Battle of Shiloh in May. There the first tent hospital was improvised and the beneficial effects of recuperating in tents rather than buildings was first noted. Still, there were serious supply shortages and personnel problems. Men detailed to act as nurses and cooks proved inefficient and caused the wounded much unnecessary suffering. This prompted surgeons to recommend the formation of a hospital corps of volunteers, enlisted as hospital attendants and performing no other function. Surgeons also
recommended that a corps of medical purveyors be established to act not only as purveyors of medicines, but as quarter-masters for the Medical Department. 63

All the problems of the Medical Department seemed to surface in the Peninsular Campaign. In an effort to keep malingerers from boarding hospital ships, Tripler refused to evacuate sick men from field hospitals. When the wounded started pouring in there was no room for them. Food, supplies, tents and transportation were scarce. Poor cooperation between medical, quartermaster and commissary officers was compounded by poor cooperation between surgeons and line officers. Regimental surgeons were reluctant to treat the wounded of other regiments. Contract surgeons performed reckless amputations, then failed to prescribe post-operative pain medicine. 64 Several hospitals came under heavy enemy fire. All lacked the transportation to move patients quickly. Consequently, thousands had to be abandoned as the army moved rapidly from one position to another. Those wounded who found their way to crowded regimental field hospitals were not guaranteed a tent or cot. Many suffered from exposure. Those captured by the enemy were accompanied by surgeons and medical supplies but still suffered terribly as they were forced to wait almost three
weeks before being evacuated to Richmond. Confederate surgeons did what they could to relieve the suffering, but they had problems of their own.

Out of the chaos came three important innovations—supply, hospital and ambulance systems. They had been proposed before, but the disaster on the Peninsula and the perseverance of Jonathan Letterman forced their early introduction in the Army of the Potomac. The combination of field hospitals at division level insured faster and better treatment for those wounded in future battles.

Each battle offered new lessons to surgeons. At Second Bull Run they discovered how useful medicine wagons could be, employing several to outfit most of their field hospitals. Having lost the field they were obliged to leave those supplies in the twenty-one field hospitals captured by the Confederates.

At Antietam surgeons realized how valuable the United States Sanitary Commission could be. Field hospitals were well supplied with all medical items, but there was a shortage of food. Until priorities permitted the release of food shipments, the Commission furnished large quantities of subsistence items to the fourteen thousand wounded.

Care of the wounded at Antietam was excellent. Field
hospitals were run efficiently despite awesome numbers of patients. Few soldiers had to wait for medical attention. Discipline among medical staffs was strictly enforced. One surgeon, who found some cooks and nurses willfully negligent of their duties to the wounded, placed them under arrest and had them tied up by their thumbs to apple tree limbs with their toes barely touching the ground. There they remained until they understood that they were to be faithful to their duties. After a day or two of "apple tree suspensions" everything seemed to function much more smoothly. 68

Friends and relatives visiting Antietam hospitals after the battle were appalled at the number of amputees, and quickly labeled all surgeons butchers. Vehemently defending his surgeons, Letterman maintained that, if anything, they had been too conservative and should have used the knife more. His hospital system had worked and many lives were saved by the prompt attention of his medical officers. Once again, surgeons noted that patients in fresh air tents recovered faster than those in closed buildings. 69

As 1862 drew to a close surgeons reported more and more the successes of their field hospitals. After the Battle of Corinth, Mississippi on 3-4 October, one surgeon
reported that splendid cooperation between quartermasters and his staff led to the rapid and successful treatment of almost five thousand Union and Confederate wounded. At Fredericksburg the story was the same. Each member of the medical corps had been briefed on his duty and position. So efficiently were his field hospitals run, that one corps medical director, Surgeon Charles O'Leary, could boast:

If the men could have been taken directly into general hospitals from the field, their condition would hardly have been improved.\(^7\)

From the start to finish the field hospital system appeared to be flawless. There was, however, one minor oversight. Someone forgot to bring the tent stoves, and in that cold December of 1862 many recuperating patients nearly froze to death.\(^1\)

By 1863 few Union field hospitals lacked sufficient medical supplies. Surgeons were happy to settle into a well tested routine rather than guess about what system might work. They could not afford to become complacent however. At Chancellorsville they were severely tested. During that battle one surgeon reported having to move a division hospital five times because of enemy shelling. Most medical equipment had to be left on the north side of the Rappahannock River, so medical officers improvised,
using pack mules to get supplies across the river and
ripping off doors of houses to use as operating tables.
More important, they decentralized the medical effort as
the situation dictated. Small detachments of medical per-
sonnel insured complete battlefield coverage as the river
behind them kept large field hospitals too far away to be
immediately useful. 72

Gettysburg provided the next and greatest challenge.
There, a drastic reduction in transportation, brought about
by an order releasing wagons to haul extra ammunition,
caused hospital tents and other necessary supplies to be
left in Frederick, Maryland, some twenty-five miles from
the battlefield. They would not be available until two
days after the battle. Though not questioning the expe-
diency of the order, Letterman pointed out to his commander,
Major General George G. Meade, that the effect was:

...to deprive this department of the appliances
necessary for the proper care of the wounded,
without which it is as impossible to have them
properly attended as it is to fight a battle
without ammunition. 73

Meade was sympathetic, but ammunition had priority. It is
to the credit of Letterman's medical officers that they were
able to adapt so well to such adverse conditions. In three
days of hard fighting there was never a lack of medical
supplies for surgeons to use in the immediate treatment of wounded. Still, there were problems. Without equipment and tents to care for and shelter the wounded, the field hospital system functioned slowly. How well they might have been cared for was seen in the case of the Union Twelfth Corps. Refusing to obey the orders reducing medical transportation, it arrived on the battlefield fully equipped. All wounded from that corps were removed from the field, sheltered, fed and had their wounds dressed within six hours after the battle. Every capital operation had been performed within twenty-four hours of receipt of the wound. As the wounded of that corps began to recuperate, those of other corps lay in woods and leaky buildings, drenched by hard rains and feeling miserable. Those placed too close to streams were washed away when the streams suddenly rose. Some bodies were found in the brush as far away as the Monocacy River in Maryland.74

After the battle surgeons relied on the United States Sanitary and Christian Commissions to provide badly needed items of subsistence. Without their help some patients might have missed three or four days' meals. Ever in attendance, the Commissions gave many soldiers reasons to hope for recovery. Camp humor also helped. Amid the pain and
suffering of post-battle recovery there were always incidents which amused even the most despondent patients. In one case a soldier with a severe throat wound was believed to be dead and taken to a grave site. When the stretcher was set down the jolt returned him to consciousness. Looking into the open grave which was to be his final resting place, he recognized the body of a brave lieutenant of his own regiment. Turning to the litter bearers, he declared with grim fun that he would not be "buried by that raw recruit" and ordered the astonished men to carry him back to the hospital. He survived and made a complete recovery.75

Gettysburg had shown that Union surgeons could overcome almost any difficulty. Their system was perfected and could be adapted to any situation. In reaching for perfection they never forgot how to improvise. At Chickamauga, for example, they seized cotton bales to make mattresses for the severely wounded.76

By the early months of 1864 division hospitals were so well organized that they could operate practically independent of the units to which they were assigned. Typical of the service the wounded could expect to receive for the remainder of the war was that furnished by Sherman's combined Armies of the Cumberland, Tennessee and Ohio during
the campaign through Georgia. A large mobile field hospital containing one hundred tents and all appurtenances followed the armies, keeping near the rail lines at all times. It received most of the wounded and provided them with the necessary care until they were well enough to be sent back to Chattanooga. A permanent detail of commissary officers provided food comparable to that served in general hospitals. In the campaign as far as Atlanta, the hospital was moved eight times without incident. Its successful functioning over a four month period clearly demonstrated the ability of the Medical Department to support sustained combat operations.

In a way, mobile field hospitals represented the final step in the maturation of a field hospital system. Of course, there would always be flaws to correct. Until the last shot was fired, there would be complaints of supply and food shortages, inequitable treatment and abandonment of wounded. Medical officers did their best to eliminate all problems. If they fell short in isolated cases, they could not be discouraged. Often the fortunes of war dictated the degree of success they could expect to achieve. The power to correct deficiencies was not always in their hands. When it was, they acted with vigor and determination,
improvising when necessary, adapting their system to changing situations, and, above all, improving the state of the art with constant innovation. In four years of handling wounded, Union field hospitals had gone from dismal failure to spectacular success.
Notes for Chapter III

1. M. S., Part 1, Volume 1, pp. App. 67, App. 80, App. 241. The first casualties of the war were two Union soldiers at Fort Sumter who were killed when the cannon they were firing exploded.


5. O. R., Series 1, Volume 2, p. 503. See also Cunningham, Field Medical Services, p. 36; Brooks, Civil War Medicine, p. 13; M. S., Part 1, Volume 1, p. App. 7. In his report of the battle, Brigadier General Irvin McDowell complained, "Among the missing are reported many of our surgeons, who remained in attendance on our wounded, and were, against the rules of modern warfare, made prisoners." See O. R., Series 1, Volume 2, p. 322.


8. M. S., Part 1, Volume 1, pp. App. 31, App. 42. See also Brinton, Personal Memoirs, p. 155; Wiley, Life of Johnny Reb, p. 263. After the first three days of the Battle of Fair Oaks, a Union surgeon recorded in his diary that rebel wounded from the first day were still where they fell, alive but uncared for. See Ellis, Leaves, pp. 58, 143.


10. Cunningham, Field Medical Services, pp. 51-52.

11. Ibid., pp. 51, 58.

12. Ellis, Leaves, pp. 280-81. See also Letterman, Medical Recollections, p. 46.


28. O. R., Series 1, Volume 19.1, p. 110. See also Adams, Doctors in Blue, pp. 76-79; Ellis, Leaves, pp. 280-81; M. S., Part 1, Volume 1, p. App. 98. Even with an efficient ambulance system the rules were sometimes stretched a bit. When it was determined that one of the bravest and most beloved officers of a Massachusetts regiment had been mortally wounded and could not tolerate an ambulance ride, twelve of his men were given permission to carry him by litter over three miles to a comfortable death bed. See


32. Ibid., pp. App. 138-40. See also Adams, Doctors in Blue, pp. 90-91; Letterman, Medical Recollections, pp. 129, 138-42.

33. Miller, Photographic History, p. 308. See also Letterman, Medical Recollections, p. 158; Adams, Doctors in Blue, p. 91; M. S., Part 1, Volume 1, p. App. 142.

34. M. S., Part 1, Volume 1, p. App. 266.


37. Steiner, Disease in the Civil War, pp. 11-12. See also Miller, Photographic History, p. 236.


44. O. R., Series 1, Volume 2, pp. 446, 503, 571.

45. Cunningham, Doctors in Gray, pp. 130-31. See also Miller, Photographic History, p. 228; Williams, "Samuel Preston Moore," p. 626. At least one surgeon, Doctor Will Fennell, abused his special status during a lull at his field hospital by going into the fight at Seven Pines as a combatant. Union marksmen were accommodating and soon wounded him severely. The South could ill afford needless losses like that. See Wyeth, Sabre and Scalpel, pp. 202-03.


47. O. R., Series 1, Volume 19.2, pp. 659-60.

48. O. R., Series 1, Volume 17.1, p. 177.

49. O. R., Series 1, Volume 21, p. 557.


51. Miller, Photographic History, p. 266.

52. Letterman, Medical Recollections, p. 39. See also Johnson, Muskets and Medicine, p. 131.

53. Johnson, Muskets and Medicine, p. 107.


55. Brooks, Civil War Medicine, p. 31. See also Horace Wardner, "Reminiscences of a Surgeon," Military Essays and Recollections, Volume III, ed. Roswell H. Mason (Chicago:


61. Surgeon W. S. King, Medical Director for McDowell's Army recalled that having directed an ambulance with two wounded men inside to proceed to a regimental field hospital, he returned to the scene some hours later to find the wounded men in the ambulance, outside the field hospital and still uncared for. The regimental surgeon in charge of the hospital told King he felt his obligation extended no further than to the men of his regiment. King's exact answer and order to the surgeon were obviously recorded in more subdued language in his official report. Suffice it to say, the men were immediately taken into the hospital and cared for. See O.R., Series 1, Volume 2, pp. 398-403. See also M. S., Part 1, Volume 1, pp. App. 3, App. 7, App. 17.


CHAPTER IV

THE FINAL STEPS

After treating their wounded at field hospitals, surgeons on both sides made arrangements for the disposition of each case. The lightly wounded would remain at the field hospital or convalesce in an area nearby until they were able to rejoin their units.¹ Those requiring further treatment and those no longer fit for field service were evacuated to general hospitals. The trip was usually a painful ordeal.

Surgeon John G. Perry of the 20th Massachusetts Regiment accompanied the rear guard during Hooker's withdrawal from Chancellorsville. Along the way Perry's horse kicked him and broke his leg in several places. The rear guard left him where he lay, but a surgeon friend found him and placed him in an ambulance headed north. For several days he received an excruciatingly painful jolting. Making the trip more unbearable was the fact that his ambulance mate, who had died early on the trip, rolled on top of him each time they went over a bump. Upon reaching the
railroad depot, Perry was placed in a freight car half filled with corn and sent to Alexandria, Virginia. There, car and passenger were switched to a railroad siding and abandoned. Having finally been discovered in the car, Perry was taken to a general hospital where he was told his leg had developed gangrene and would have to be taken off. To save his leg he "escaped" from that hospital and secured passage on a steamboat to Washington where he prevailed on a surgeon at a general hospital there to help him get home. Through the United States Sanitary Commission he secured passage on a hospital train bound for his home in New York. Upon arriving there he was unable to locate a doctor who could set the broken leg, so with the help of his brother-in-law, he set the leg himself with good and permanent results.² If this was the care an officer received, what might a private expect?

From the beginning of the war the South had little to offer in the way of transportation to general hospitals. Steamers were pressed into service on the Mississippi River until the fall of Vicksburg, but railroads accepted the burden of evacuating most of the Confederacy's wounded. Ambulances and springless wagons transported the wounded from field hospitals to railroad depots or steamer landings.
Then the men would be taken to large cities and transferred by ambulance or wagon to general hospitals. If the distance between field and general hospitals was short, wagons carried the wounded directly from one to the other. A trip of any distance in a springless wagon caused terrible suffering.  

No attempt was ever made to use steamers for the express purpose of transporting wounded. They were simply used when available without concern for on-board sanitation or treatment. Railroad cars were little better. Most were unheated and poorly ventilated. Straw, pine boughs and anything else available were placed on the floors of freight cars to cushion the jolts. Beyond that, little was done. Whenever possible, surgeons accompanied trains but they could rarely be spared from more pressing duties. Food and water were to be made available at rest stops when trains were expected. Unfortunately, trains were never expected. Scheduling was haphazard and delays frequent. In the unlikely event the trains started on time, they might be delayed for days if Union cavalry tore up railroad tracks or if worn out road beds caused them to leave the tracks and wreck. After the latter occurred, one wounded Texan who survived remarked: "I went all through the Tennessee campaign,
and I tell you that I saw some hard times, and then to get nearly killed on an old car, is rather disheartening."

Typical of the difficulties experienced in transporting wounded to general hospitals were the problems encountered by medical officers attempting to evacuate the Chickamauga casualties. Railroads were from ten to twenty-five miles from the battlefield. Roads were bumpy, and ambulances were in short supply. Most of the fifteen thousand wounded required evacuation. It took the ambulances more than a week to deliver them to the railroad depots where some had to wait another week to obtain further transportation. The only good rail lines near Chickamauga led to Atlanta; so, regardless of ultimate destination, more than ten thousand wounded soldiers were received into general hospitals in that city which, at the time, had a hospital capacity of only eighteen hundred.

On occasions when railroads were inaccessible, the wounded were bound to suffer more. After the Battle of Gettysburg they had to be taken all the way to Virginia by wagon. On the way they were attacked by Union raiding parties which captured wounded officers and destroyed wagons. Brigadier General John D. Imboden's cavalry brigade escorted one ambulance train seventeen miles long. During the trip
Imboden listened to the shrieks of the wounded as they were bounced and jostled over rutty roads. Many pleaded to be shot or left beside the road to die peacefully. At one point where the ride was particularly rough, Imboden wrote: "During this one night I realized more of the horrors of war than I had in all the two preceding years." Without the constant attendance of the Richmond Ambulance Committee on Virginia soil, the suffering of the Gettysburg wounded would have been even greater. Throughout the war that benevolent organization spent many thousands of dollars in caring for the wounded of the Army of Northern Virginia. With forty ambulances and one hundred members, it matched any ambulance service the Confederate Army could produce.

In evacuating its wounded from field to general hospitals, the Union Army also used wagons, trains and steamers. The first phase of the journey usually involved a trip by ambulance or wagon to railroad depots or boat landings. More often than not, ambulances could not be spared from the front, so springless wagons were filled with pine boughs which were covered with blankets to form crude mattresses. Despite those attempts to provide some comfort, the jolting received by soldiers placed in the wagons was still terrible.
Early in the war there was no system for admitting patients to general hospitals. Surgeons in the field sent their wounded to large cities without regard for space available. There, the wounded might be kept at or near debarkation points until arrangements could be made for their receipt in the hospitals. During that time they suffered considerably from want of attention. When they were sent to the hospitals, the transportation provided for that trip gave them a jostling not conducive to early recovery. Local citizens would not stand for such treatment of their heroes. In Philadelphia, for example, they built a receiving hospital completely from private donations. Fire companies in that city built no less than twenty-six luxurious ambulances costing five hundred to eight hundred dollars each. Rather than place the wounded in the care of hired drivers, the firemen drove and maintained the ambulances themselves without compensation. As a result of those efforts, many grateful soldiers received the tender care they deserved.  

In 1862 the Medical Department developed a system of sequential transfer. Before or during large engagements, patients were removed from general hospitals near the battlefield and sent to others further north. Thus freed, the
evacuated hospitals could accept large numbers of patients without taxing their facilities. With that system in effect many costly delays at debarkation points were averted. But that solved only part of the problem.

Hospital trains often had to travel long distances to reach their destinations. Patient comfort was critical, for on a long trip it could mean the difference between life and death. In the first two years of the war hospital cars were, like those in the South, freight cars bedded with hay, straw, leaves or pine boughs. By 1863 passenger cars were being converted into hospital cars (Figure 28). Doctor Elisha Harris, a member of the United States Sanitary Commission, devised a scheme whereby stretchers could be converted into hanging beds by suspending them from rubber straps or gutta-percha strings attached to the sides of the cars. Thirty cots could be placed in each car. It was the first of many innovations. Since there was no uniform plan for converting passenger to hospital cars in 1863, benevolent associations took it upon themselves to convert them as they saw fit. One such car had fifty-one berths as well as a stove, water tank and water closet. Most, however, followed the Harris plan and could accommodate thirty recumbent patients. A typical hospital train
might consist of two cars with berths, two for sitting wounded and a boxcar for cooking and storage. The train would have a surgeon and nurses accompanying it.  

Leading the way in hospital train innovation was the Army of the Cumberland. By September of 1863 it was using the first hospital cars specifically designed for that purpose (Figures 29-30). Few hospital trains were molested by the enemy, but those of the Army of the Cumberland were never touched. Smokestacks and other exterior parts of engines and tender cars were painted brilliant scarlet and contained gilt ornamentation. At night three red lanterns were suspended in a row beneath the engine headlight. No one could mistake those trains for anything else. 

As the war progressed, other innovations were made. Hospital cars were fitted with elliptical and India-rubber springs to equalize the motion and deaden the jarring. Most trains were equipped with kitchens, dispensaries, stoves, sanitary facilities, quarters for nurses and doctors and offices for the latter. During the last eighteen months of fighting, some trains were used as general hospitals and had capacities of up to two hundred patients. By the end of the war, hospital trains had transported 225,000 sick and
Figure 28. Interior of an Improvised Hospital Car

Figure 29. Hospital Car – Side View

Figure 30. Hospital Car – Top View
wounded patients to general hospitals. 15

Originally under control of the Quartermaster Department, hospital steamers (Figures 31-35) carried the wounded up coastal waterways and western rivers. Evacuation by water transports was hampered by the uncertainty of their use. Vessels fitted for medical evacuation would be taken without notice by Quartermaster officers and returned later, filthy and stripped of everything necessary for patient comfort. Medical officers complained, but little action was taken by anyone before 1865. Through an Act of Congress in February of that year, the Medical Department assumed complete control over all hospital steamers assigned to it. 16

Unlike the surgeons in charge of hospital trains, those in charge of steamers were Assistant Commissaries of Subsistence and Quartermasters as well. When supplies could not be obtained through Army sources, the Sanitary Commission was usually standing by to provide whatever was needed. 17

Traveling on a hospital steamer was not the peaceful journey one might imagine. Most were overcrowded and uncomfortable. The trip took at least several days, during the course of which patients had to be treated and even operated upon, and bandages had to be changed. For the
Figure 31. U. S. Army Hospital Steamer D. A. January

Figure 32. Steamer D. A. January - Upper Deck

Figure 33. Steamer D. A. January - Cabin-Deck
Figure 34. Steamer D. A. January - Middle Deck

- AA: Lower deck
- BB: Hatchways
- C: Boilers
- D: Middle deck
- E: Space for sick
- F: Nurse's quarters
- G: Cold water
- H: Stairs to lower deck
- I: Stairs to upper deck
- K: Water-closets
- L: Nurses' stairs from cabin deck
- M: Nurses' stairs to lower deck

Figure 35. Steamer D. A. January - Lower Deck

- A: Pool of stales
- B: Space for wood and coal
- C: Boilers
- D: Stores
- E: Pastry room
- F: Kitchen
- G: Carpenter's shop
- H: Blacksmith's shop
- I: Engines
- J: Donkey engines
- K: Wheels
- L: Wastelands
- M: Water-closets
- N: Main deck
- O: Stoves
- P: Cold water
wounded, each day was just an extension of their agony. One hospital volunteer told of having to put her fingers in her ears to avoid the shrieks of the men as doctors examined them and changed their dressings. When the steamers finally reached their destinations, there was still the painful wagon ride to the hospital awaiting each man. At that point those who could be conveyed to their homes nearby might be furloughed for convalescence there. By that time, however, most were too weak to take advantage of the opportunity. No matter what means of transportation were used, going to the general hospital was an ordeal few ever forgot.

Errors abounded early in the war as Union surgeons attempted to establish an adequate system to transport their wounded to general hospitals. At First Bull Run they relied on an untested ambulance system which failed completely. At Fort Donelson, Grant had to intercede with higher authorities to obtain sufficient hospital steamers. That accomplished, some steamers were filled with wounded soldiers and sent off without a surgeon on board.

At Shiloh the steamers controlled by the Medical Department and Sanitary Commission were of great service. Those outfitted by individual states were of little use,
causing undue suffering and confusion. One steamboat captain from Ohio refused to take on board any wounded but those from his state. The authority of medical officers on that vessel was ignored, and desertion of malingerers was even supported. 20

During the Peninsular Campaign the North used its control of the sea to good advantage. Coastal steamers evacuated thousands of wounded soldiers. Existing rail lines were deemed sufficient to deliver the wounded to boat landings, but poor control of the rail effort resulted in serious delays. Typical of the difficulties were those described by one surgeon after the Battle of Fair Oaks on 31 May 1862:

The patients were transferred to the depot, half a mile distant, where they were immediately ordered to be removed by the railway cars; but through some misunderstanding, they lay by hundreds on either side of the railway track, and much of the time exposed to a drenching rain, without shelter. Shivering from the cold, calling for water, food, and dressings, these sufferers afforded the most heart-rending spectacle that it has been my lot to witness. Many died from this exposure, and others prayed for death to relieve them from their anguish. 21

Poor planning had been the main problem. Without a good evacuation system to help them, medical officers would
continue to have difficulties transporting their wounded to general hospitals.

In some smaller engagements those difficulties did not always surface. For example, after the battle of Cedar Mountain on 9 August 1862, 480 of the wounded were transferred by train some seventy miles over rough track from field hospitals to general hospitals. Lying in cars filled with straw, all, including thirty recent amputees, survived the trip. That feat could not be duplicated several weeks later at the Second Battle of Bull Run. As in the first battle on that ground, many wounded soldiers walked or found their own transportation to general hospitals in Alexandria and Washington. Between six and seven hundred wounded were carried to those cities in hacks, omnibuses and a wide assortment of other vehicles pressed into service from the capitol; but that number was insignificant when compared to the much greater number left at field hospitals without transportation.

Somehow, in the two weeks between Second Bull Run and Antietam, the Medical Department got organized and established a good system of evacuation from field to general hospitals. After the Battle of Antietam rail lines to the immediate area of the battlefield could not be depended upon. It
was therefore necessary to transport patients by ambulance from field hospitals to Frederick where they would be put on trains and sent north. The railroad operated on schedule, rest and food halts were made, and Frederick was never overcrowded as ambulances arrived on time to meet each train. Thousands were evacuated efficiently and quickly. \(^{24}\) Letterman could take the lion's share of the credit, but railroad men played no small part in this first major success of the evacuation system.

At Fredericksburg the wounded were again moved rapidly from field to general hospitals. Despite the fact that a combination of trains and steamers had to be used to complete the trip, there was little delay. One group of fifteen hundred wounded made the trip to Washington in seventeen hours without the loss of a single man. Detracting from the success, however, were the miserable conditions under which the wounded were forced to travel. Railroad cars had no straw and many were uncovered. Steamers had no bedding whatever. \(^{25}\) Had it not been for the short transportation times many would have died of exposure or been jolted to death. To eliminate the latter, a unique idea was introduced in 1863 after the Battle of Chancellorsville. Those unable to get up were carried on their beds
to waiting trains and transported to general hospitals. With that procedure, the patients never left their beds. 26 Improvisation such as that was a great help to those who would otherwise have had to remain at field hospitals for months.

Gettysburg provided the most severe test for the evacuation system. The problem there was one of scope. As Meade set off in pursuit of Lee, the few medical officers detailed to remain behind were too busy caring for the multitudes of wounded to consider evacuating them. Transporting so many men to general hospitals seemed an impossible task until Hermann Haupt arrived on 9 July 1863 to take charge of railroad operations. From that time on, everything ran smoothly. Trains contained medical officers, medical supplies, hay and water. With Haupt in charge, they ran precisely on time. The United States Sanitary and Christian Commissions, as well as other benevolent organizations, provided food, water, supplies and shelter along the way. In two weeks 15,425 wounded were moved to general hospitals. This relieved medical officers around the battlefield of a tremendous logistical burden. More important, it was clearly seen that rapid dispersion of the disabled diminished the fighting force less than any other
plan for them. Fewer men were taken from the ranks to assist in caring for the wounded. 27

After Haupt got the transportation moving at Gettysburg, there was little that could be done to improve the system. The North had proven beyond a doubt that it could handle mass casualties. From that time on, success was just a matter of adapting to new situations.

During the Wilderness Campaigns of 1864 the Army of the Potomac was hard-pressed to mobilize sufficient assets for the transportation of its wounded. After the battles around Spottsylvania Court House fifteen hundred men were sent to general hospitals in Washington each day. In all, just under twenty-two thousand were transported to that city by steamer from Fredericksburg and Belle Plain. Even with that effort, one thousand of the wounded had to be abandoned. Had it not been for excellent organization and control of the evacuation by medical officers, thousands more would have suffered a similar fate. 28

Not all the wounded evacuated from the Wilderness were fortunate enough to travel by steamer. Some were loaded on ambulances and made the fifty mile trip back to Washington general hospitals in those vehicles. The trip, which lasted thirty hours, took them across the Rappahannock
River. On the south side of the river one ambulance upset going down a steep bank and threw out three wounded men, breaking again limbs which had earlier been broken by bullets. Other ambulances upset in the water, giving unexpected baths to many. All went without food for twenty-four hours. Despite those problems, only one man of the forty-six died. One killer--time--had been reduced on trips to general hospitals. If there were some way to keep the wounded from being jolted to death, mortality rates would drop still further. Hospital trains, with ever-increasing creature comfort innovations, served just that purpose.

Nowhere were they more effectively used than in Sherman's campaigns through Georgia. The Army of the Cumberland alone had three hospital trains which ran regularly over a line of communication hundreds of miles long. At least one train left the field hospitals each day. When Sherman's armies were before Atlanta, some hospital trains made trips as long as 472 miles.

Means to insure patient comfort continued to be invented or improved until the end of the war. For a wounded soldier, the trip was never enjoyable, but at least in the North it became tolerable.

In the early period of the war, general hospitals of
the Confederacy were inadequate to meet the medical needs of its armed forces. Most hospitals were transformed churches, warehouses, hotels, and private dwellings, and few had sanitary facilities and proper ventilation. Surgeon General Moore was working as quickly as limited Congressional appropriations permitted to open large general hospitals like Chimborazo (11 October 1861), but progress was slow, and the majority of the Confederacy's wounded would have to be cared for in less agreeable accommodations. For example, after the Battle of Shiloh Confederate wounded were taken to Corinth, Mississippi, where all available space was used for general hospitals. At one of the larger buildings, the Tishomingo Hotel, every bit of floor space was covered with the mangled forms of dead and dying soldiers. Nurses knelt in blood and water to minister to the wounded. Outside, amputated limbs decorated the yard. In such overcrowded and unsanitary conditions, it is no wonder that soldiers developed the attitude that being placed in a general hospital meant certain death. When offered the opportunity, most preferred to risk a long and painful journey in order to recuperate at home.

Infections similar to those found in field hospitals
were also present in general hospitals. Patients already weakened by months of hard campaigning succumbed quickly as deadly germs attacked their emaciated bodies. Little could be done except to let the infection run its course and hope the patient was strong enough to survive. Surgeons, seeking to check the spread of infection, were unaware that with their contaminated hands and instruments they were spreading it themselves. They did discover that by eliminating ward congestion and isolating patients with specific infections they could reduce the possibility of epidemics. This was done whenever possible, but, for the most part, the practice was confined to large hospitals.

By September of 1862 women were employed as hospital matrons, nurses and cooks. They proved to be more efficient and dedicated than the incapacitated men they replaced. Their zeal and industry were a blessing to doctors and patients alike. Mortality rates were reduced in spite of the fact that few women had received medical training. Instinct was a wonderful substitute. The major problem with women was that there were not enough of them in general hospitals where, throughout the war, the ratio of male to female nurses remained five to one.

Of the 150 general hospitals constructed by the
Confederacy, Chimborazo (Figure 2) was the largest. It represented the best efforts of the Confederate Medical Department to care for its wounded. With 150 pavilions (40-60 beds each), 100 Sibley tents (8-10 beds each) and a staff of 120 medical personnel, the hospital had accommodations for eight thousand patients. Relying solely on money received from the commutation of rations, Chimborazo never drew operating expenses from the Confederate Government. Instead, it was able to lend the Government three hundred thousand dollars. Some of its facilities included five ice houses, five soup houses, a bakery capable of producing ten thousand loaves of bread per day, a brewery and a farm for grazing cows and goats. In addition, there were numerous bath houses and an efficient waste removal system. Under the capable direction of Surgeon James B. McCaw, Chimborazo was made a completely independent institution when early in the conflict (October 1861) the Secretary of War designated it an army post.  

With all its facilities for obtaining and processing food, Chimborazo nevertheless experienced occasional shortages. Large gardens worked by convalescents were limited by seasonal changes, so during periods when food could not be grown, it had to be found elsewhere. Canal boats,
traveling between Richmond, Lynchburg and Lexington, located whatever provisions were available and traded goods such as cotton, yarn and shoes for them. This was sufficient to sustain food service operations, but during periods when Confederacy-wide food shortages were experienced, hospital patients could not expect preferential treatment. For months at a time all they might have available for rations were small quantities of dried peas, meal and sorghum. Those craving meat were quick to learn the art of preparing "prime roast of rat," while the rats which frequented the premises soon became adept at avoiding the grasp of strange men in white hospital gowns.

Quartermaster and commissary officers assigned to general hospitals usually ensured a smooth flow of supplies and food. Surgeons, happy to be relieved of those encumbering duties, were still quick to criticize those officers whose poor performance warranted such action. In situations where rapid movement and relocation were required, smaller general hospitals often went weeks without quartermaster or commissary support. During those periods when surgeons should have been attending to the many medical problems associated with a move, their ingenuities and resources were taxed largely in supplying their wants. Instead of
correcting those situations, the Confederate government allowed them to become worse, and during the last two years of the war, medical officers found themselves having to improvise more and more to keep their small, mobile general hospitals functioning.  

Toward the end, the deteriorating military situation made surgeons' tasks almost impossible. The failing fortunes of the Confederacy had an adverse effect on the general hospital system, reducing efficiency to the point of failure. In four years a hospital system had been instituted, developed and destroyed. That there were such outstanding hospitals as Chimborazo is a credit to the Confederate Medical Department and its leaders. Severely limited by logistics problems, medical officers did well to keep general hospitals in operation until the end of the war.

Early Union general hospitals were much the same as those in the Confederacy. All were extemporized. There was no such thing as a typical general hospital. Some were heated and had running water, toilet facilities, good ventilation and proper drainage. Others lacked everything.

Surgeon General Hammond was no less enthusiastic than his counterpart in the South in pressing for the
construction of pavilion hospitals. In all, 204 were built during the war. Their capacities ranged from one hundred to thirty-five hundred. The largest was Satterlee Hospital (Figure 23) in Philadelphia.  

When the ground surrounding general hospitals was suitable, tents could be added to increase the capacities. If they were added directly to the existing structure, they formed a series of elongated pavilions. Wooden pavilions contained 60 patients each, but those formed from tents could contain many more. Of the two, wooden pavilions were preferred because they seemed to be more durable.

Typical pavilion general hospitals had wood and plaster construction. Buildings contained floors above ground and fireproof roofs. To facilitate patient handling, hospitals were built as close to railroads as possible. Each ward had a small dining room, accommodations for three attendants, latrines with running water, and adequate heat and ventilation. Other hospital facilities might include administration buildings, chapel, school, library, water reservoir, laundry, hot water boilers, kitchen, storehouses, operating rooms, post office, fire department and gas lights. Public water and sewer systems were used when available. Otherwise, wells, springs, ponds and streams supplied the
necessary water. At each general hospital the surgeon-in-charge had full and complete military command over all persons and property connected with the establishment. His staff included an executive officer to handle administrative paperwork; one ward physician for each seventy-five patients; wardmasters, medical cadets, hospital stewards and a chaplain. Hospital stewards were responsible for quartermaster and subsistence activities. A one thousand bed hospital contained between 120 and 200 staff members. High personnel turnover, however, detracted from efficiency. Hired civilians often quit without notice, and soldiers acting as ward nurses were usually physically unfit or unreliable and frequently had to be replaced. A detail of able-bodied men specially enlisted and trained as members of a medical corps would have improved efficiency and enabled the number of hospital employees to be materially reduced. Unfortunately, it was not until an Act of Congress in 1887 authorized the enlistment of such men that a trained corps of hospital nurses was formed.

After being admitted to General Hospitals, patients went through a thorough inprocessing. They were weighed and measured and had their complete medical description
recorded. Also recorded were their units, states and the names of next of kin. Following that, each was issued hospital clothing and assigned a ward, bed and hospital number. From that time until they were released, patients were required to follow the rules and regulations outlined by hospital commanders. At most installations, discipline was strictly enforced. Some patients thought it excessive. At Satterlee hospital one wounded soldier, obviously on the road to recovery, complained bitterly:

I can't say much, either, for the red-taped, big-headed, stuck-up fools, that required the poor sick soldiers to come to "Attention" and rise up every time those practicing army surgeons and their dude scholars [medical students] came into the ward.  

Surgeons were usually more compassionate than that soldier's letter indicated, but good discipline was still essential to efficient hospital operation. It was not, however, the only criterion.

Surgeons constantly had to guard against the spread of infection. Their tasks were made all the more difficult by their limited knowledge of asepsis and antisepsis. There were also some confusing statistics to consider. As the beneficial effects of proper ventilation were proven to them, surgeons everywhere recommended the construction of
well ventilated pavilion hospitals. Fresh air was believed necessary for quick recovery. In fact, by 1864 the American Medical Association considered ventilation "the great lesson of the war." Yet there was a strange contradiction to that statement. The Negro general hospital in Nashville consisted of a series of hot, ill-ventilated, four-storied warehouses. Patients recovered faster in those buildings than in the pavilion hospitals later constructed for them. In the latter they suffered a markedly higher rate of pneumonia and related chest infections. Still, the evidence in favor of good ventilation was overwhelming, and the circulation of fresh air continued to be stressed for the remainder of the war.

Bromine and iodine, first considered cleaning solutions, were unknowingly used as disinfectants in latrines and on floors, hospital furniture and bedpans, but apparently not on medical instruments. By 1863 bromine was being used to cure hospital gangrene. This antiseptic measure was not recognized as such since only the cure for, and not the cause of, the infection was known.

It was difficult for soldiers in general hospitals to understand that surgeons were trying to give all patients the best possible care. Individual complaints seemed more
important as patients struggled to survive. One officer recounted how each day for weeks his wounds were probed without anesthetic to a depth of six inches. Another patient complained about the poor way his wounds were dressed, and recorded bouts with erysipelas and gangrene to support his contention. Similar stories came from all general hospitals. Soldiers felt alone and afraid in large impersonal wards far from their comrades and often just as far from their homes. After visiting several of those establishments, Letterman was convinced that, "life in a General Hospital tends to destroy the good qualities of a soldier...." Good morale was an important part of recovery. The will to live frequently determined whether a soldier would survive the long ordeal of hospitalization, so it was important to keep him as happy as possible.

Female nurses were always a welcome sight. They were appreciated not only for their tender and thoughtful care, but also for the touch of home they represented. An Act of Congress on 3 August 1861 provided for the employment of female nurses at the discretion of hospital commanders. Between three and four thousand served in Union hospitals during the war. They were complemented by countless women volunteers who flocked to large city hospitals to offer
their services. In addition to women volunteers, there were those from the United States Sanitary and Christian Commissions who always seemed to be in general hospitals to cheer up the patients.

Confederate surgeons even offered their services on at least two occasions. After Gettysburg nine of them assisted forty-one Union surgeons in a general hospital near that town. Two months later, after Chickamauga, four of the forty-three surgeons attending to the wounded in Chattanooga general hospitals were Confederate. In neither case was the service anything but voluntary.

During the last two years of the war, general hospitals could only benefit from the expanding logistics system of which they were a part. An abundance of food and supplies eliminated virtually all commissary and quartermaster problems. New hospitals could be built wherever and whenever needed. For the siege of Petersburg, a hospital was established near City Point, Virginia. By definition it was a depot field hospital, but with its enormous and well-planned facilities, it put most general hospitals in the North to shame. Covering two hundred acres, it increased in capacity from 5414 to 8800 beds in only a few months. By March of 1865 it contained ninety stockade pavilions and twelve hundred
hospital tents. Every convenience for the care of the wounded was available. Nothing was overlooked. In dry weather there were even eight sprinkling carts used to keep the dust down. At the same time the dust was being sprinkled, Confederate surgeons in general hospitals all over the South were wondering how they could obtain food and medical supplies for just one more day. The contrast was appalling.

In 1863 Union general hospitals had a capacity of 58,715 beds. By the end of the war that number had been increased to 136,894. After 1863 the hospitals were never filled to capacity. Still, in four years over one million patients had been cared for in a hospital system limited in size only by the scope of the conflict.

Long stays were the rule in Confederate and Union general hospitals. A stay of less than six weeks for anything but minor surgery was practically unheard of. Some patients remained for more than a year. Dying seemed to be the only way to leave a hospital quickly, though some found desertion to be just as fast.

In the South convalescents in general hospitals were at first permitted to go home to complete their recovery as soon as they were able to travel. Subsequent relapses from
hemorrhages and an increasing reluctance of soldiers to return to camp when able caused an abatement of the practice after 1863. For the last two years of the war, patients convalesced at hospitals or were discharged if boards of medical officers found them unfit for further service. If a board deemed them fit for further service, they returned to the battlefield, usually to their former regiments.

In the North the system was a bit more sophisticated. Boards of medical officers also decided the final disposition of patients. If soldiers could not return to the battlefield, they would be medically discharged or placed in an invalid corps to perform non-combat functions such as nursing and guard duty. When it was decided that a man should return to the battlefield, he could be sent there directly or by way of a convalescent camp. If he returned directly, he would be issued a complete set of equipment from the hospital quartermaster. Then he would be given a pass from the hospital director authorizing him to travel to, and rejoin, his regiment. The regiment would also be notified that he would be returning.

When a soldier had the misfortune of being sent to a convalescent camp to complete his recovery, he could expect to trade a bed in a warm ward for bare ground in an unheated
tent. Morale would be low and mortality high. If he survived the stay in camp, he would be shipped back to his regiment, often long before he was fit to travel. Life in a general hospital was difficult, but in a convalescent camp it was pure misery. In fact, soldiers named one of the more famous ones near Washington "Camp Misery." 59

If a patient had a doctor friend or could get someone like the governor of his home state to apply the necessary pressure, he might be given sick leave instead of facing the discomforts of a convalescent camp. Only when acts regulating the granting of furloughs were passed did the practice of granting sick leaves become standardized. 60

From field to general hospitals, the Union Army had a transportation system far superior to that used by the Confederate Army. As the assets of the latter diminished, those of the former grew. The same held true for general hospitals. The Confederacy went far toward meeting the needs of its wounded, but in the end its general hospitals could not function without logistical support. As they collapsed one by one, those in the North flourished under the aegis of a sound logistical system.
Notes for Chapter IV


5. Cunningham, Doctors in Gray, pp. 124-25. See also Livermore, Numbers and Losses, p. 106.

6. Ridinger, "Hospitalization at Gettysburg," p. 44. See also Cunningham, Doctors in Gray, p. 121.

7. Cunningham, Doctors in Gray, pp. 17, 121-22.


9. M.S., Part 1, Volume 1, p. App. 44. See also O. R., Series 1, Volume 5, pp. 76-77; Brockett, Philanthropic Results of the War, pp. 89-92.


11. Weist, Medical Department in the War, p. 16.


Indicative of the complete turnabout of success in evacuating casualties were the orders received by Surgeon John H. Brinton after the battles of Second Bull Run and Antietam. After the former he was ordered to go from Washington to Alexandria to coordinate the badly fouled transportation of the wounded. After the latter he was instructed to proceed to Frederick to collect specimens for the pathological museum. Two weeks had made quite a difference. See Brinton, Personal Memoirs, pp. 195-96, 203.


29. Three wounded men, for whom no ambulances were immediately available, were carried twelve miles in the rain by stretcher. See Charles A. Humphreys, *Field, Camp, Hospital and Prison in the Civil War, 1863-1865* (Boston: George H. Ellis Company, 1918), pp. 55-57.


31. Cunningham, *Doctors in Gray*, p. 69. See also Cunningham, *Field Medical Services*, pp. 78-79.


34. Cunningham, *Doctors in Gray*, p. 73. See also Winfrey, "Virginia Military Hospitals," p. 4; Brooks, p. 51.


38. Cunningham, *Doctors in Gray*, p. 69.

40. Brooks, *Civil War Medicine*, p. 43.


42. General DeChanal, "Good Order and Cleanliness," *Civil War Times Illustrated* vol. 6, no. 6, (October, 1967), 40-42. See also *M. S.*, Part 3, Volume 1, pp. 953-54.


51. Tripler felt the Sisters of Charity made much better nurses than Dorthea Dix's hospital matrons because the former were more disciplined, more discreet and judicious and more reliable. See O. R., Series 1, Volume 5, pp. 102-03. See also Brooks, *Civil War Medicine*, p. 54; Ellis, *Leaves*, p. 84.


54. Brooks, Civil War Medicine, p. 43. See also M. S., Part 3, Volume 1, p. 964; Smith, Medicines for the Union Army, p. 1.


57. Brooks, Civil War Medicine, pp. 60-61.

58. Ibid., pp. 60-62. See also DeChanal, "Good Order and Cleanliness," pp. 43-44; O. R., Series 1, Volume 5, pp. 94-95.

59. Hoge, Boys in Blue, pp. 87-91.

60. Brooks, Civil War Medicine, pp. 60-61. See also Perry, Letters from a Surgeon, pp. 53-55.
CHAPTER V

THE WAR YEARS IN PERSPECTIVE

Critics of Civil War medical practices often evaluate them against twentieth century standards. There is also a tendency to isolate a study of medical activities from all other aspects of the war. This results in a distorted picture of successes and failures. Confederate and Union Medical Departments operated as part of overall logistics efforts in their respective armies. The mutuality of that arrangement allowed the departments not only to reflect the fortunes of their logistics systems, but to be contributing factors in those fortunes as well. Seen in proper historical perspective, the activities of both medical departments clearly indicate how successful each was in caring for its wounded.

In 1861 the Confederate Medical Department was hindered by a logistics system still in the embryonic stages of development. There was a shortage of food, supplies and transportation, and interdepartmental bickering over those matters was accomplishing nothing. Ambulance and hospital
systems did not exist. Southern surgeons were no less
talented than those in the North, but most were inexperi-
enced in military and medical administrative procedures.\(^1\)
Only with the strong leadership of men such as Samuel
Preston Moore did the Medical Department survive the first
year.

Similar problems plagued the North. The logistics
system was inadequate to meet the needs of a mushrooming
army. Under "vintage" leadership the Medical Department
was slow to act and slower to change. There was no plan for
coordinating medical services, nor was there an adequate
ambulance or field hospital system. Surgeons were inexperi-
enced in military matters and unaware of their duties.
Consequently, the regimental hospitals they managed were
poorly run. Supplies and equipment were short or inaccessible.
There were supply tables, but few understood how to
use them. To relieve some of the problems, Tripler combined
regimental into brigade hospitals.\(^2\) That was one of the
few positive steps taken in 1861.

Ideas more than action were prevalent in the Union
Medical Department that year. Surgeons were busy analyzing
their problems and suggesting solutions. Of the many recom-
mendations submitted, the establishment of an ambulance corps
was the most important.³

By 1862 the South had begun to feel the strain of transportation decentralization. Railroads were inadequate to meet the needs of the military and civilian populations, and without some form of centralized control, the military seemed to be getting second priority on shipments. Compounding the problem was the fact that under increased wartime traffic the railroads were deteriorating faster than the decreasing labor force could repair them. Depending on trains to evacuate wounded to general hospitals, the Medical Department faced a difficult situation about which it could do little.

Still hampering field operations was the lack of uniform ambulance and hospital systems. This problem would continue for the remainder of the war. Only for general hospitals was there a definite system established. By the end of 1862 patients in Confederate general hospitals were cared for as well as Union soldiers were in northern hospitals.⁴

Particularly noteworthy was the initiation of a policy to release captured Union surgeons. That led to reciprocal agreements declaring medical officers non-belligerents and providing for their release as soon as practicable after
capture. The wounded on both sides benefited from that policy as surgeons became more willing to remain with them when capture became imminent.  

In the early months of 1862 it seemed the Union Medical Department would continue to have the same difficulties it experienced in 1861. Transportation and supply problems caused hard feelings between medical officers and those representing the Quartermaster and Commissary Departments. Disasters on the Peninsula and at Second Bull Run showed altogether too clearly the pressing need for ambulance and field hospital systems.

With Surgeon General Hammond and Medical Director Letterman assuming key leadership roles in the Medical Department, it became possible to effect some badly needed reforms. Supply, ambulance and field hospital systems were established and successfully tested in the Army of the Potomac. Those systems were quickly adopted by other Union armies. There was also a sharp increase in general hospital construction. Efficiency replaced disorganization at all levels of the Medical Department.

Coinciding with those improvements were general improvements in the logistics system. Railroads operated efficiently, and quartermaster and subsistence officers
finally were beginning to understand how to solve the problems of supplying and feeding large armies. 8

By 1863 the courses of both medical departments had been established. The South was still groping unsuccessfully for a solution to its medical problems, while the North was testing supply, evacuation and hospital systems already proven successful at Antietam and Fredericksburg. In caring for their wounded, Confederate medical officers realized more and more that, instead of counting on an already faltering logistics system to support them, they would have to rely on their abilities to improvise. Union medical officers, on the other hand, were capable of improvising, but found little need to do so after 1863. Supported by a logistics system of practically unlimited scope, they streamlined their operations with constant innovation. 9

Hospital trains specifically designed for that purpose were first used by Union forces in 1863. Cars built to accommodate hospital patients replaced those which were little more than padded boxes. 10 The Confederacy could boast of nothing like them.

So efficient and so well organized had the Union Medical Department become, that it could function without much equipment when circumstances required. In the battles
of Chancellorsville and Gettysburg medical officers were forbidden to take essential supplies and equipment with them. Still, they managed to evacuate and care for the wounded quickly and efficiently. At Gettysburg their accomplishments were spectacular, for after the battle only one third of the Union surgeons were left behind to treat more wounded soldiers than had ever been collected in any previous engagement. Without efficient organization the job never could have been accomplished. Handling the more than twenty thousand Gettysburg wounded had required a combined operation. Aided by railroad officials, civilian volunteers and quartermaster and commissary officers, as well as many benevolent organizations, surgeons evacuated most of their patients to general hospitals all over the Northeast. Nowhere in the Confederacy was such large-scale cooperation possible. For the South, the term "unified effort" seemed to be confined to the vernacular of combat troops.

As their logistics system began to show signs of failing completely in 1864, Confederate surgeons worked under insurmountable handicaps. All around them the Confederacy was disintegrating. Medical stores were almost impossible to obtain, and in mobile defensive actions the few
supplies available usually had to be abandoned or destroyed. At a time when centralization of effort was critical to Medical Department survival, the inability of railroads to make long hauls necessitated the use of many small hospitals. Because of their proximity to the battlefield, the hospitals had to be shifted constantly. In doing so, surgeons lost much valuable equipment which could never be replaced. The mortality rate of patients also rose significantly since few of the wounded were strong enough to tolerate multiple moves.  

In stark contrast to the struggles of Confederate surgeons was the ease with which Union surgeons handled their wounded. The jobs of medical officers became so routine that they were able to take time to conduct advance planning and seek further refinements of a medical system already receiving world acclaim.

Supplies and equipment were practically unlimited, and surgeons were so well acquainted with standard procedures that it was not difficult for them to construct tent hospitals of four to five thousand bed capacities in only a few days. Nor was it difficult for them to adapt to new situations. An extemporized corps in the Army of the Cumberland, commanded by Major General James B. Steedman, organized
its medical department with personnel from many different commands. From the start, members of that department functioned as efficiently as if they had been together for years.\textsuperscript{13} Nowhere was the argument for standardization better illustrated.

During the last few months of the war, Confederate surgeons were without essential medical supplies. Daily, field and general hospitals were forced to close as the Union Army tightened its death grip.\textsuperscript{14} Only an end to the struggle gave the ever-increasing numbers of wounded soldiers an opportunity to recover in peace.

Somehow the Confederate Medical Department survived four years and even acquitted itself admirably on many battlefields, but it labored under tremendous disadvantages. There were never established ambulance, field hospital and medical supply systems with a statutory basis. Only in its system of general hospitals did the South achieve any degree of standardization and efficiency. Beyond that, the accomplishments of the Medical Department fit in well with the overall accomplishment of the Confederacy—that of conducting an improvised war throughout.\textsuperscript{15}

For Union medical officers 1865 was another year to refine existing systems. Hospital trains became train
hospitals, and no article essential to the care of the wounded was overlooked. Evacuations from field to general hospitals made up in speed what they lacked in comfort. Patients could tolerate some jolting if it did not last too long. With the increased efficiency of all aspects of the handling of wounded, mortality was reduced. Suffering was still a large part of hospital life, but surgeons were learning more ways to save lives. Cases like Samuel C. Wright of the 29th Massachusetts Volunteers gave everyone cause to be optimistic. Participating in 21 battles, Wright was shot twice in the head, twice in the legs and once in the arm. He also broke his leg, lost an eye, was run over by a wagon, had typhoid fever; and he still lived to be 79.

Southern counterparts of Wright undoubtedly inspired Bell I. Wiley to write:

If glory be measured by suffering, the South's greatest heroes are not those who died at the cannon's mouth on Cemetery Ridge or in any of the other gallant charges made by soldiers in gray, but rather those who, sorely wounded or desperately ill, lived to experience the unspeakable agony of hospitalization.

No one will deny that the wounded on both sides suffered terribly. But practices, which by today's standards seem barbaric, were not only significant improvements over
Revolutionary War practices, but were saving men's lives as well. The mortality rate in the Civil War was less than in any previous conflict. Had the war been fought 30 years later, countless more lives would have been saved, as surgeons would have adhered to the germ theories advanced by Robert Koch and Louis Pasteur. The war also ended before Joseph Lister proclaimed antisepsis; otherwise the mortality rate would have been still lower. Despite the empirical discovery of asepsis by southern surgeons and the use of some anti- septic measures by northern surgeons, little was understood about those fields during the war, and on both sides the chance for fame was forfeited. Discovery belonged to the post-war generation.

Medical and sanitary accomplishments of Civil War surgeons were quickly overshadowed by the introduction of bacteriology and aseptic surgery. For that reason historians have tended to overlook the triumphs of the period. For the first time in American history, wartime medical and surgical activities were systematically reported and analyzed. Post-mortem operations were accomplished on a large scale, and pathological specimens were collected for the new Army Medical Museum. From these practices surgical skills were improved, and life-saving surgery became more common and less
dangerous. Anesthesia was also found to be safe and useful. Surgeons who participated in the war were also able to take their required skills into civil practice where, as leaders in the medical field, they made major contributions to American medicine for the next half century.\(^{21}\)

Along with advances in dentistry and pharmacy, the Civil War was responsible for the birth of American nursing. For the first time in our history, the importance of women's roles in caring for the wounded was realized. Women also helped surgeons stress the importance of cleanliness in camps and hospitals. The military hygiene lessons learned during the war were not lost on the civilian population. Rather, they gave impetus to a public health movement which made major progress after the war.\(^{22}\)

General hospitals constructed during the war not only provided models from which to design future civilian hospitals, but also furnished a modern system of administration for them to use. Closely associated with civilian and military hospitals after the war was the United States Sanitary Commission, later known as the American Red Cross.\(^{23}\)

From a military standpoint, Civil War medical contributions had far-reaching effects. Along with major equipment improvements and innovations there was established an
efficient medical organization controlled by a competent surgeon general. Equally important was the establishment of supply, field hospital and ambulance systems. The results achieved from such efficient systems astonished European medical experts and led to improved methods in caring for the sick and wounded in armies throughout the world. Letterman's field hospital system dictated the basic structure of United States Army medical care through World War II. His ambulance system remained in effect until the introduction of helicopters in the Korean War rendered it obsolete.

In any large organization there is always room for improvement. During the Civil War Confederate and Union Medical Departments seemed to substantiate that observation with alarming regularity. Surgeons did their best to solve the myriad problems which confronted them daily, but in the process mistakes were made and patients suffered the consequences. As members of medical departments which reflected the fortunes of sharply contrasting logistics systems, surgeons relied on their skills in improvisation, adaptation, and innovation to give their wounded the best available care. In the Union Medical Department those skills meant constant improvement; in the Confederate Medical Department they meant survival.
Notes for Chapter V

1. Brooks, Civil War Medicine, p. 9. See also O. R., Series 1, Volume 2, p. 501; Cunningham, Field Medical Services, p. 41.


7. Ellis, Leaves, pp. 300-02. See also Adams, Doctors in Blue, pp. 32-33, 76-79; Brinton, Personal Memoirs, p. 205.


10. Weist, Medical Department in the War, p. 16.
11. M. S., Part 1, Volume 1, pp. 140-42. See also Miller, Photographic History, VII, p. 308; Adams, Doctors in Blue, pp. 90-91; Letterman, Medical Recollections, pp. 159-60.


13. Brinton, Personal Memoirs, pp. 296-300. See also M. S., Part 1, Volume 1, p. App. 324. It is important to remember that in 1864 there were still isolated instances in which supplies and equipment were short and medical officers were completely disorganized. Absolute perfection was an impossible goal. See M. S., Part 1, Volume 1, pp. App. 187, App. 323. See also Fatout, Letters, pp. 81-82.


15. Cunningham, Field Medical Services, pp. 72, 92-93.

16. M. S., Part 1, Volume 1, p. App. 204. See also Weist, Medical Department in the War, p. 16; Adams, Doctors in Blue, p. 59.

17. Brooks, Civil War Medicine, p. 10.


I. Primary Sources


Ellis, Thomas T. *Leaves From the Diary of an Army Surgeon; or, Incidents of Field Camp, and Hospital Life.* New York: John Bradburn, 1863.


Humphreys, Charles A. *Field, Camp, Hospital and Prison in the Civil War, 1863-1865*. Boston: George H. Ellis Company, 1918.


Wormley, Katharine Prescott. The Cruel Side of War with the Army of the Potomac. Boston: Roberts Brothers, 1898.


II. Secondary Sources


__________________________


Henry, James O. "The United States Christian Commission in the Civil War." Civil War History, Vol. 6, No. 4


