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MASTER OF MILITARY STUDIES

**TITLE: LOGISTICS FOR THE GETTYSBURG CAMPAIGN:
REFOCUSING AN ARMY IN WAR**

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF MILITARY STUDIES

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Executive Summary

Title: Logistics for the Gettysburg Campaign: Refocusing an Army in War

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Thesis: In the Gettysburg Campaign, the personalities of Federal logisticians proved decisive in repositioning supplies for the Army of the Potomac (AoP). In the end, logisticians pushed a more than sufficient amount of supplies forward to enable General Meade to conduct his pursuit of the Army of Northern Virginia.

Discussion: Following the Battle of Chancellorsville in May 1863, the Confederate Government met and decided to launch a second invasion of the north. In response, the Union's Army of the Potomac had to reposition itself and its supply base from the long-term fixed facility of Aquia Landing to several forward bases along the route, ending up at Westminister, MD. The actions of three senior leaders were critical to successfully shifting the AoP. Independently and in concert using railroads, waterways, and logistics convoys, these individuals rapidly repositioned supplies from northern Virginia to Maryland and Pennsylvania in order to support the army's changing main effort. This analysis is based on the logistics principles contained in Joint Publication (JP) 4-0.

Conclusion: Senior leaders need to be intimately involved in the decision-making process in a rapidly changing environment. The logistics principles described in Joint Publication 4-0 are appropriate and sufficient. Federal logisticians successfully shifted the supply base to enable AoP operations and Meade's pursuit was not hindered by logistics.

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Logistics comprises the means and arrangements which work out the plans of strategy and tactics. Strategy decides where to act; logistics brings the troops to this point...¹

Most of the written military history of any war is focused on the strategic and tactical actions of the combatants. The study of logistics is largely ignored. The American Civil War is no different in that among the thousands of books written on the subject, very few address logistics. The intent of this work is not to discuss the tactical minutiae of the Battle of Gettysburg. Instead, this composition will investigate the importance of personalities in the application of joint operational-level logistics principles in the campaign which culminated in the famous battle.

In the Gettysburg Campaign, the personalities of Federal logisticians proved decisive in repositioning supplies for the Army of the Potomac (AoP). In the end, logisticians pushed a more than sufficient amount of supplies forward to enable General Meade to conduct his pursuit of the Army of Northern Virginia

Why Gettysburg? – General Background

Rather oddly to modern conceptions, the *Official Records of the War of the Rebellion* are replete with correspondence from leaders in the Army of the Potomac other than Hooker to Edwin Stanton, the Secretary of War, General Henry Halleck, the General-in-Chief of the Army, and even President Lincoln. Generals constantly made recommendations or requests outside the standard chain of command. When Ambrose Burnside commanded the AoP, several of his subordinates, including Joe Hooker, contacted these same individuals and worked to undermine Burnside's authority. Although Burnside himself worked hard to prove his own incompetence, the chief conspirators were removed from their positions of command. However, their scheming created conditions among the higher ranking leaders where it might occur again.

The Political Situation in the North

Understanding the political situation in the North is important for its bearing General Meade's appointment. On the 13th of May, Lincoln called Hooker to the capital to discuss Hooker's plans for the summer campaign. The President discovered a leader no longer sure of himself. Despite his boisterous rhetoric following the disastrous battle at Chancellorsville, Hooker was uncertain of his next campaign move. Amidst the search for answers following Chancellorsville, Hooker even urged his subordinates to go to Washington and the White House to air their feelings.²

Throughout May, rumors circulated around the capital that Hooker was about to be fired. Of his eight subordinate corps commanders, three owed their jobs to Hooker (Sickles, Howard, and Stoneman) and Hooker had publicly criticized two of them after Chancellorsville (Howard and Stoneman).³ Newspapers on 17 May even reported that Hooker had been fired.⁴

On June 10, 1863, Hooker sent a message to President Lincoln in which he proposed to attack Richmond if Lee moved away towards Maryland.⁵ Lincoln completely disagreed with his commander's assessment and, instead, advised him not to do so, reminding him that Lee's army was the true objective.⁶ Though lacking a solid military background, Lincoln was a well read and intelligent leader. He next told Hooker to move on Lee's flank while using interior lines to attack Lee when an opportunity presented itself. Halleck immediately followed with his own message to Hooker confirming his agreement with the President's assessment.⁷

By 13 June, various reports from cavalry reconnaissance helped Hooker determine that Lee was moving his army north for another invasion. The final objective was unclear but Hooker sent a message to Halleck informing him of Hooker's findings.⁸ Hooker also told Halleck that he intended to move north and cover Harper's Ferry. Soon Hooker became reticent

and, believing that he had lost the confidence of the President, began a telegraphic argument with Halleck in the belief that Halleck and the President were micromanaging Hooker's army. Eventually, this hypersensitivity, combined with an overestimation of the Rebel army's size, led Hooker to send Halleck a message at 1300 on June 27th essentially challenging the General-in-Chief to relieve him if Halleck did not support Hooker's desire to withdraw the garrison from Harper's Ferry as it was threatened by Lee's movements.⁹ Halleck responded that, while he lacked the authority to relieve Hooker himself, he would raise the issue with the President. The President immediately relieved Hooker and, on June 28th, appointed Major General George G. Meade commander.

The Political Situation in the South

An understanding of the situation in the South is important in explaining why the armies met at Gettysburg. The commander of the Army of Northern Virginia, Robert E. Lee (1807 – October 22, 1870) was a Virginian who graduated from West Point in 1829. Commissioned in the engineers, he served in a variety of positions in the Army including earning promotion and renown during the Mexican War and later serving as the Superintendent of West Point. Later, he led the Marines who put down John Brown's rebellion at Harpers Ferry. After resigning his commission at the beginning of the Civil War, Lee failed in his first field command in West Virginia. In 1862, Jefferson Davis recalled Lee to serve as his military advisor; then Lee received command of what became the Army of Northern Virginia after Joseph E. Johnson was wounded during the Seven Pines Campaign. Though he didn't receive overall command of all Confederate armies until February of 1865, he remained a close advisor to the Confederate government on military strategy. He continued to lead the ANV until Grant destroyed it in the Petersburg and Appomattox Campaigns when Lee formally surrendered his forces. After the

war, Lee served as the president of Washington College, died there, and is buried at the renamed Washington and Lee University.¹⁰

Lee did not believe Fighting Joe Hooker was a competent commander. After learning that the Northern papers referred to Hooker as “Fighting Joe,” Lee derisively called him “Mr. F.J. Hooker” in his correspondence. Lee’s thorough victory at the Battle of Chancellorsville certainly helped confirm this opinion.¹¹

Lee was a voracious reader of Northern newspapers. Various papers reported that in the spring and early summer of 1863, a large number of Union enlistments were expiring and the soldiers would be released to return home. The situation included approximately 48,000 soldiers. This knowledge led Lee to conclude that the Union would act very cautiously in the early campaign season until replacements filled the ranks. However, this thought was tempered by the expectation that an invasion of the North would, undoubtedly, cause a large number of people to form an army of defense just as it had in the South previously.¹²

An in-depth analysis of the modern joint campaign planning process defined in Joint Publication 5-0, *Joint Operation Planning*, is beyond the scope of this paper. The process consists of seven steps and is conducted by a commander and his staff. Essentially, these steps are an analytical method with the ultimate goal of publishing an operations order. *Joint Operation Planning* combines elements of the Joint Operation Planning Process (JOPP) with operational design.¹³

Such a formal process was alien to 19th-century leaders. While General Lee had a staff that assisted him in executing his wishes on the battlefield, as well as in every day requirements, that staff lacked a formal planning function. Instead, Lee himself, like all senior American commanders of his era, conducted planning based on his own judgment in consultation with the

senior civilian leaders.

On May 15, 1863, Robert E. Lee traveled to Richmond to meet with Confederate Secretary of War James A. Seddon, and President Jefferson Davis.¹⁴ This pivotal conference decided the Confederate strategy to conduct an offensive north of the Potomac River as soon as practicable. While the actual discussions have been debated for many years and there are no notes of the meeting itself, clearly Lee could not have launched an invasion of the North without approval of the civilian chain of command. In his own summary of action, dated 31 July, Lee stated the objective of the invasion was to draw the Union forces away from their strong defensive position near Fredericksburg and, "if practicable, the transfer of the scene of hostilities north of the Potomac."¹⁵

Historians have made several suggestions for Lee's reasons to shift the focus of the war northward. Merely to feed his soldiers in another area is not a persuasive argument.¹⁶ The leaders of the South recognized that Vicksburg would fall soon and there was nothing more that Richmond could do about it. The notion that Lee would take his army north and not get into a major engagement is ludicrous. While Lee may not have planned on attacking a large Union force as a matter of policy he had to expect something more than a skirmish. The benefits of a significant victory in Union territory could possibly offset the pending loss of Vicksburg in the public's eye. A major victory in the North might also persuade the war-weary elements to force the government to the peace table.¹⁷

The operational concept, as determined in the 15 May conference, called for an attack to clear the Federal forces out of the Shenandoah Valley, specifically the force of Major General Robert H. Milroy around Winchester, Virginia. Lee further reinforced these comments in his final campaign report of January 1864. He even stipulated a secondary aim of disrupting Union

plans for a summer offensive.¹⁸ Overall, the objectives of the campaign were to relieve pressure out west, gain food and forage for the ANV, and stimulate dissatisfaction for the war in the north especially through a victory on northern soil.¹⁹

The Physical Network

When one looks at a contemporaneous map of the roads that lead from Virginia to the small town of Gettysburg, Pennsylvania, one readily sees that the village is a major crossroads.²⁰ Ten separate roads meet in Gettysburg. A military view of terrain mobility easily shows that the routes from south to north are channelized by the Appalachian Mountain range. Generally, the mountains run southwest to northeast. Lee's army's movements were largely shielded by the Blue Ridge Mountains and Lee tasked General J.E.B. Stuart's cavalry to provide flank security during the shift. Behind the line of the Blue Ridge lies the Shenandoah River that flows northward into the Potomac River near Harper's Ferry. While some roads crossed over the mountains, the greater portion followed the valleys. The Shenandoah Valley naturally flows into the Cumberland Valley in Pennsylvania and leads directly to Harrisburg, the state's capital, on the other side of the Susquehanna River. Just to the east of the Cumberland Valley lies the quiet town of Gettysburg and all of the roads from the valley to the capital city lead to the town.

As the armies proceeded north, there were several natural barriers to their movements. The primary river which both armies had to cross was the Potomac. In addition to the Potomac, each army had to cross creeks and other tributaries too numerous to mention. The Confederates used Union bridges near Harper's Ferry as well as their own to move north over the Potomac. Federal engineers maintained a stockage of bridging materials near the Washington Navy Yard and the *Official Records* abound with messages between Major General Daniel Butterfield, the Army of the Potomac Chief of Staff, and several engineer officers and subordinate corps

commanders planning future bridges as the Union forces moved north.

There are five railroads which were key to both Union and Confederate forces in the eastern theater of war (see Appendix A – Map of Railroad Network). For the Gettysburg Campaign itself, railroads proved essential to repositioning logistical support personnel and supplies of all types.²¹ Working northward from Fredericksburg, Virginia, the Federals used a portion of the Richmond, Fredericksburg, and Potomac Railroad from Falmouth to Aquia Landing. This allowed them to shift supplies from the forward battle area back to Aquia to be loaded onto ships for removal to the next major depot in Alexandria. To the west the Orange and Alexandria Railroad travels from further south in Virginia through Orange Courthouse, Manassas Junction, Fairfax Station, and terminates in Alexandria. The next major railroad of concern during this campaign is the Baltimore and Ohio which leads north from Alexandria to the city of Baltimore. Just south of the city, the railroad line travels west through Harper's Ferry and Martinsburg, West Virginia and on to Ohio. North of Baltimore are the next two railroads significant for this campaign. Heading due north is the North Central Railroad (NC RR) which leads up to York and Harrisburg, Pennsylvania. South of York is a major intersection called Hanover Junction, and a fork of the NC RR leads west to Hanover and terminates on the Baltimore Pike at Littlestown about nine miles southeast of Gettysburg. Heading west from Harrisburg is the Cumberland Valley Railroad which travels through Carlisle and Chambersburg on its way south to end in Hagerstown. The second railroad leading north of Baltimore is the Western Maryland which leads northwest to Westminster. This last railroad was a single track without any siding long enough to pass a full-length train.²²

The Logistics Situation on May 20, 1863

At the close of the Chancellorsville Campaign, the main Union logistics bases were at

Alexandria Depot in DC, Baltimore, Maryland as well as Harrisburg and Philadelphia in Pennsylvania, and New York City. The most significant forward bases were at Aquia Landing and Falmouth in Virginia and Harper's Ferry, West Virginia. As the forces moved northward during the Antietam Campaign, additional logistics bases were established in Frederick and Westminster in Maryland. These depots remained in operation during the shift south, though at a reduced level.²³ The primary logistics base at Aquia had a rail line and 126 rail cars that moved supplies from the depot to Falmouth. Aquia held a wagon repair shop, stables, veterinarians, and a hospital, too. Aquia received most of its stores from the Alexandria Depot via barge.

A Change of Command

Through General Order Number 194, on 27 June President Lincoln appointed George Gordon Meade, a Pennsylvanian by upbringing though born in Spain, as the Commander of the Army of the Potomac.²⁴ This new appointment had a significant effect on the pursuit of Lee's beaten Army of Northern Virginia. Meade (December 31, 1815 – November 6, 1872) was the son of a Philadelphia merchant serving as a U.S. Navy purchasing agent in Cadiz, Spain. He graduated from West Point in 1835 but only served for about a year before resigning his commission. After about six years he reentered the army and, though originally commissioned as an artillery officer, served as an engineer.

When the war began, he received a commission as a brigadier general of Pennsylvania volunteers. Eventually, he led the only Union division to successfully break the lines at the Battle of Fredericksburg. This notable achievement led to his appointment as V Corps Commander, which he led during the Chancellorsville Campaign. Following the Gettysburg Campaign and despite criticism of a perceived lack of aggressive pursuit of Lee's army, Meade remained in command of the AoP through the rest of the war. However, his freedom of

command was limited in March of 1864 when Lincoln appointed Ulysses S. Grant as the General-in-Chief of Union forces.

Following the war, Meade commanded the Division of the Atlantic from Philadelphia and Military District No. 3 (Alabama, Georgia, and Florida) during Reconstruction. Meade later died of pneumonia and complications from wounds received during the Peninsular Campaign.²⁵

When Lee learned of Hooker's replacement by Meade, he informed his staff, "General Meade will commit no blunder in my front, and if I make one he will make haste to take advantage of it."²⁶ Lee assessed Meade as competent as well as aggressive, unlike Hooker.

Logistics – Basic Situation and Biographies

Following the end of the Battle of Chancellorsville, General Hooker pulled the Army of the Potomac north of the Rappahannock River and moved his headquarters to Falmouth across the river from Fredericksburg. He then waited to see what General Lee's Army of Northern Virginia did. From October of 1862, the army's quartermasters, in coordination with the Quartermaster General's Office in Washington, D.C., established the main logistical base along the Aquia²⁷ Creek at what is now known as Aquia Landing. Commissary agents, ordnance supply sections, general supply personnel, medical, and railroad support sections all operated there and provided all manner of sustainment from Aquia. Earlier in the war, enterprising logisticians had added rail ties and timber to barges to expedite delivery of supplies. With these specially adapted barges, train cars were loaded at the primary depot in Alexandria along the Orange and Alexandria Railroad line then pushed to the port to be loaded onto the barges and shipped directly to Aquia wharf for onward movement to Falmouth without unpacking and repacking. This entire process was completed in about 10 hours at a savings of \$3,000 per day.²⁸

Aside from Alexandria Depot and Aquia, the Army previously established arsenals which

provided supplies including artillery pieces and shells at Schuylkill near Philadelphia and Pittsburgh, Pennsylvania.²⁹ The army also had arsenals located near the quartermaster depots in Baltimore, Harrisburg, and Washington, DC.

In order to understand the logistical decisions and actions, one must first know the persons who made the major decisions. Montgomery C. Meigs (May 3, 1816 - January 2, 1892) served as the Union Army's Quartermaster General based in Washington D.C. He was a trained engineer who served as the Union's Quartermaster General during the Civil War and for a long time afterwards (from 1861-1882). As such, he was ultimately responsible for the purchase and distribution of supplies to all Union forces. Meigs was born in Augusta, Georgia, but his family moved to Philadelphia when he was young. In 1831 he attended the University of Pennsylvania and then in 1836 graduated from the United States Military Academy. He designed and supervised construction on several major landmarks in the Washington D.C. area, including the Washington Aqueduct and the Cabin John Bridge. Meigs also suggested using Robert E. Lee's land in Arlington as a national cemetery and is buried there himself.³⁰

Herman Haupt (March 26, 1817 - December 14, 1905) served as the chief of military railroads for the Army of the Potomac.³¹ Born in Philadelphia and graduated from the United States Military Academy in 1835, he soon resigned his commission and went to work in the railroad industry as an engineer. By the beginning of the Civil War, some leaders began to recognize the importance of the railroads and, in April 1862, Secretary Stanton called him to active service.³² Ultimately, when he became the head of the military railroads for the AoP he tried at all times to work through the active civilian leaders of the railroads. As an engineer, he was a prolific inventor and experimenter and wrote several books on bridge construction and tunneling. Shortly after the Gettysburg Campaign, he resigned his commission but remained

active in supporting Union Army and the military railroads. After the war, he served in various railroad jobs and helped build the transcontinental railroad. He died of a heart attack while riding as a passenger on the Pennsylvania Railroad.³³

Rufus Ingalls (August 23, 1818 - January 15, 1893) served as the Quartermaster General in the AoP during the Gettysburg Campaign. Born in what is now Maine (then still a part of Massachusetts), he graduated from the United States Military Academy in 1843. Following graduation, he served in the western frontier and later in the Mexican War. Following this war, he became a quartermaster and served in this role for the remainder of his career. After the Battle of First Bull Run (or First Manassas), he became the Quartermaster General for what became the AoP. He remained in this capacity until his friend and West Point classmate General Grant assumed overall command of the Federal Armies in 1864. Grant made Ingalls responsible for supplying all armies operating against Petersburg and Richmond. Ingalls established the large supply depot at City Point, Virginia to accomplish this task. Later he served as Quartermaster General of the Army in 1882, retired in 1883 and died in 1893.³⁴

Logistics – Defined and Applied in the Campaign

What is logistics? Jomini's quote that began this treatise is actually not all inclusive for modern logisticians. While our understanding of logistics has evolved over time, Joint Publication 4-0 defines logistics as planning and executing the movement and support of forces.³⁵ It also provides a framework for modern logisticians to analyze historical events through the lens of logistic principles.

JP 4-0 defines seven principles of logistics designed to provide logisticians a guide to analytical thinking when developing courses of action or assessing plans. These principles are not a rigid set of rules but guidelines and they may not apply in every situation. They are good

tools to analyze plans. The principles are: responsiveness, simplicity, flexibility, economy, attainability, sustainability, and survivability.³⁶

Short definitions of each of these principles are required for clarity of understanding.

Responsiveness is providing the right support when it's needed and where it's needed.

Responsiveness is characterized by the reliability of support and the speed of response to the

commander needs. **Simplicity** is defined as a minimum of complexity in logistics operations.

Simplicity fosters efficiency in planning and execution, and allows for more effective control

over logistic operations. **Flexibility** is the ability to improvise and adapt logistic structures and

procedures to changing situations, missions and operational requirements. Flexibility is reflected

in how well logistics responds in an environment of unpredictability. **Economy** is defined as the

amount of resources required to deliver a specific outcome. Economy is achieved when support

is provided using the fewest resources within acceptable levels of risk. **Attainability** is the

assurance that the minimum essential supplies and services required to execute operations will be

available. Attainability is the point at which the CCDR or JFC judges that sufficient supplies,

support, distribution capabilities, and line of communication capacity exist to initiate operations

at an acceptable level of risk. **Sustainability** is the ability to maintain the necessary level over

the duration of operational activity to achieve military objectives. **Survivability** is the capacity

of an organization to prevail in the face of potential threats. Survivability is directly affected by

dispersion, design of operational logistic processes and the allocation of forces to protect critical

logistic infrastructure.³⁷

Before one can analyze the success or failure of Union logisticians to move supplies, one

first needs to determine the Army of the Potomac's requirements. A Union soldier was entitled

to a pound each of hardtack and meat plus sugar, coffee, desiccated vegetables, bread, and

several other items daily.³⁸ According to a contemporary account by an unnamed Quartermaster, the ration averaged three pounds per man per day.³⁹ Even understanding that often soldiers did not receive this full ration due to marches, the logistician must still plan for this number. There are a multitude of different troop strengths according to the abstracts of returns contained in the *Official Records*. It is reasonable to assume that logisticians planned based on their numbers. After the Chancellorsville Campaign and in preparation for the Gettysburg Campaign, on 19 June, Rufus Ingalls provided a report of the number of men as well as horses and mules assigned to the trains, ambulances, and as pack animals and officers' mounts (see Appendix C for recapitulation).⁴⁰ The Union troop strength reported by Ingalls that day was 142,098.⁴¹ While not all of these soldiers ended up fighting at Gettysburg, this was the number tracked by Ingalls. For planning, logisticians usually round up to provide a safety margin. Assuming a very small one of 145,000 soldiers at three pounds per man per day, this equals 218 short tons (a short ton is 2000 pounds instead of 2200) for the soldiers. Add to this the requirement for the horses and mules that need 12 pounds of grain and 10 pounds of hay per day.

For transportation purposes, horses and mules were used interchangeably but teamsters found the mules more amenable and slightly more durable for pulling loads than horses.⁴² In March of 1863, the Army of the Potomac had approximately 53,000 horses total.⁴³ By Ingalls' above referenced report, this figure dropped to 51,120, which means that 563 short tons of forage were required for the animals every day. Adding human and animal subsistence and one sees the total daily requirement for the AoP as 781 short tons; and this doesn't begin to account for ammunition or sundry items. Given that only half of the wagons were actually dedicated to subsistence (approximately 2,151 of 4,302 available) and that a wagon carried 2,500 pounds each, the wagons carried 3.44 days of subsistence.⁴⁴ Some may argue that horses and mules

were available as pack animals and could carry 200 pounds.⁴⁵ After accounting for all of the mules and horses required for wagons, ambulances, cavalry and artillery, using pack animals would only allow another 0.39 days of subsistence.⁴⁶ It doesn't seem reasonable that all of these pack animals were used this way. More likely, many of them were used to carry officers' stores or simply spares.

Through all of this math one may establish a reasonable estimate of the subsistence sustainability of the Union's AoP. After making allowances for the likelihood that wagons were not all loaded to capacity, one may safely state that the log trains carried three days of supply for the Army during the Gettysburg Campaign. On the march, men often ate less than when idle on the line so these rations could be extended out to six to eight days, a number borne out by Ingalls' report of the Antietam Campaign.⁴⁷

This Union Army, through the efforts of Meigs and others, in 1862 became interested in the French Flying Column concept. This model created lighter more agile combat formations while centralizing support into field trains at regiment or division-level. Once in effect, this concept provided commanders greater flexibility through faster rates of movement and enhanced ranges of moving columns.

As early as January 2, 1862, Meigs circulated a translated pamphlet on the logistics system in support of the Flying Column.⁴⁸ In March of 1863, Hooker attempted to place this into effect in the Army of the Potomac prior to the Chancellorsville Campaign. The reorganization eliminated brigade, regimental, and divisional trains travelling with the soldiers on the march. Instead, these were consolidated at the rear of the column into a corps train. This rearrangement allowed the marching column more flexibility and maneuverability. It also allowed the trains the freedom to travel on separate roads screened from potential enemy avenues of approach by the

friendly column. The soldiers on the march carried eight days of rations plus clothing in their knapsacks.⁴⁹

This is important because the AoP began moving from the Falmouth/Fredericksburg line mainly on June 11 and arrived on the battlefield of Gettysburg piecemeal on the 1st and 2nd of July. In total each corps moved with 11 days of rations for the men but only three for the trains. Over the 21 days they moved north, the columns required resupply seven times. This is the point at which the Quartermaster General of the Army, Montgomery Meigs, in close coordination with Rufus Ingalls and Herman Haupt, displayed the principles of logistics.

On 14 June, Hooker issued the formal order to his Chief Engineer, Gouverneur K. Warren, to oversee the evacuation of stores, rail cars, and wounded from Aquia to Alexandria Depot.⁵⁰ The day prior, Rufus Ingalls showed flexibility by informing Meigs of this decision and that the army would be supplied over the Orange and Alexandria Railroad.⁵¹ Also on the 13th, Ingalls ordered Colonel Daniel H. Rucker, the commander of Alexandria Depot, to contract a ship immediately in order to withdraw 10,000 wounded convalescing at the hospital in Aquia.⁵² Actual clearance of the depot fell to the Cavalry Corps' Chief Quartermaster, Lieutenant Colonel Charles G. Sawtelle. Ingalls informed him to expedite movement of the wounded, not to burn anything without Ingalls' express consent, and to work with the US Navy to move the supplies on the 13th as well.⁵³ Meigs concurred with these movements.

To assist in the evacuation of Aquia, Stanton ordered Major General John A. Dix to send all available transports from Fortress Monroe to the depot on the 14th.⁵⁴ Dix immediately complied and requested that the transports be rapidly returned so that he could threaten Richmond with his forces.⁵⁵

On 15 June, President Lincoln issued an emergency call for forces to defend Pennsylvania and Maryland from invasion.⁵⁶ That day, Meigs demonstrated responsiveness and flexibility as his new task was to equip the emergency forces. He immediately telegraphed the quartermaster in Harrisburg to purchase horses in the surrounding area. Due to legal requirements that only soldiers in the Federal service could be issue uniforms and the fact that the emergency volunteers were not being nationalized, Meigs initially refused to issue uniforms for these men. After a day of telegraphic arguing, Secretary of War Stanton interceded and authorized the issue of uniforms. He also told the local quartermaster to fix prices and compel the issue of supplies locally.⁵⁷ Meigs interceded with a message to Ingalls not to destroy the 126 rail cars known to be operating between Aquia and Falmouth. Meigs recommended that the cars be sunk off the pier so that they could be recovered if and when the Federals reoccupied the line.

To insure the plan's attainability, on 16 June Meigs ordered Rucker to shod as many horses as possible and have them ready for issue to the AoP. He also sent messages off to New York, Philadelphia, and Indianapolis for them to ship horses to Alexandria as rapidly as possible and to continue until he ordered otherwise.⁵⁸ Also by the 16th, the depot at Aquia was completely evacuated of supplies less the rolling stock which would be moved the following day.⁵⁹ This totaled over 500 railcar loads of army and railroad property, plus the wounded soldiers, all of which were removed with nothing being left behind or destroyed.⁶⁰

As the AoP moved north, Ingalls established a series of resupply points. These included Dumfries, Occoquan, Manassas, Fairfax Station, Edwards Ferry, Frederick, Union Mills, and Westminster.⁶¹ Every corps did not stop at each of these locations but these were the places Ingalls arranged to have supplies dropped off as each corps moved.

As the AoP moved north, Haupt moved about the area supervising repairs of bridges supporting the army's movement. Earlier in the war, on May 25, 1862, Meigs ordered that "railroad companies... shall hold themselves in readiness for the transportation of troops and munitions of war... to the exclusion of all other business."⁶² Haupt used this order and the congressional law upon which it was based to gain the cooperation of the railroad companies.

While the AoP moved north covering Washington, DC and Baltimore from the ANV, Haupt travelled into the Harrisburg vicinity to survey the rail lines, arriving on 30 June where he met with Governor Curtin and his military advisor, Colonel Thomas Scott.⁶³ On July 1, Haupt moved to Baltimore to organize the Western Maryland Railroad support to Westminster Depot.⁶⁴ Realizing the limitations of the line (lack of siding to pass trains and no telegraph line) Haupt couldn't establish a schedule like on other lines. Instead, he demonstrated his flexibility by designing a train convoy system by which five trains of ten cars would dispatch together giving Haupt a capacity of 1,500 tons per day. This line operated from 2 July to 7 July.⁶⁵ Meanwhile, Haupt himself led the Construction Corps in repairing the various lines in Maryland and south-central Pennsylvania, especially the Northern Central line between Hanover Junction and York (the most direct route between Harrisburg and Washington, D.C.). Despite the number of bridges destroyed by the Confederates (19 between Hannover and Harrisburg and 12 more between Hannover and Wrightsville), Haupt's men opened the line between York and Washington, DC along the Northern Central by 5 July and all of the bridges were rebuilt within 10 days.⁶⁶

Meade's pursuit

Contemporary commentators argued that Meade missed an opportunity to possibly end the war in the immediate aftermath of the battle of Gettysburg. In his history published in 1881,

John Laird Wilson, a reporter from the *New York Herald*, argued that Meade originally intended to launch an immediate counterattack following the repulse of Pickett's Charge but that the AoP's lines were too long. By this, Meade meant that the time required to send messages along the Union lines to coordinate the attack was too great and daylight expired. Then, Meade compounded the problem by following a longer route in an attempt to get behind Lee.⁶⁷

Immediately after the battle, Meigs directed the Baltimore Depot to halt all through shipments of horses on 4 July and move them to Frederick, MD.⁶⁸ By 6 July, there were over 5,000 horses on the way from New York, Philadelphia, Baltimore, Harrisburg, Indianapolis, Detroit, and Chicago.⁶⁹ Ingalls reported that there were too many supplies at Frederick and, in fact, the trains spent two weeks after Lee crossed the Potomac hauling supplies from the Frederick Depot back to Alexandria.

Lee departed the battlefield on Saturday, July 4, 1863 and moved south to cross the Potomac River near Williamsport. Meade did not decamp until the following day. Haupt even sent a message to Halleck on 6 July recommending the movement of General French from Frederick, MD, to seize the South Mountain Gap and hold it against Lee's army until the AoP could catch up. Failing this, he advocated using the railroad to move large numbers of troops to Front Royal or Gordonsville instead of marching behind Lee, understanding that the AoP could never catch up that lost rest day.⁷⁰ This concept had some merit but, given the limitations of the Western Maryland Railroad, whatever corps were sent around would likely not have their trains. Without these supplies, the units would not have had staying power when confronted with the advancing Army of Northern Virginia. Once the rail line opened from Gettysburg itself on 7 July, the line was almost completely taken up with evacuating the wounded of both sides. Between the 7th and 22nd of July, Dr. Edward Vollum, who worked for the Medical Director of

the Army of the Potomac, reported moving 11,425 wounded men to Baltimore, New York, York, and Harrisburg on 53 separate trains.⁷¹ Moreover, shifting corps would necessarily break apart the command structure of the AoP which had a new commander and just experienced a large number of leader changes during the campaign and battle, including one corps commander killed and two others wounded.

However, as John G. Moore discovered in his mathematical study of foraging and field trains, the sheer size required in the field trains, “*did not allow the pursuit of a defeated force.*”⁷² Simply put, no army in the Civil War possessed the capability to launch a vigorous pursuit *en masse*.⁷³ Only the cavalry maintained the mobility required to move, locate, and fix an enemy infantry formation. At Gettysburg, the cavalry of both sides were tired from fighting already and the Union cavalry lost several leaders. Meade dispatched General Pleasonton’s Cavalry Corps to determine the Confederate Army’s location, movements, and to harass Lee’s army in retreat. In their pursuit, the cavalry captured four battle flags, several supply trains, and more than 1,300 soldiers. However, they lost a brigade commander and never attempted to get ahead of Lee’s army to halt its progress south; this idea appears to have been beyond the scope of their orders.⁷⁴

The Army’s official history, published originally in 1969 by the Center of Military History, accepted Meade’s statement that his army was too mangled to pursue immediately and required rest.⁷⁵

Writing almost one hundred years after the battle, E.J. Stackpole assessed Meade and several other prominent Civil War generals against the Principles of War and determined that Meade lacked only “offensive.” This deficiency is what allowed Lee’s army to escape. To Stackpole, Meade was a thoroughly conventional commander who could be counted on to follow orders to the letter and not make mistakes. Most significantly, he also pointed out that, as Meade

had only recently assumed command, he did not know his staff. Meade inherited a chief of staff, Daniel Butterfield, and staff that failed him to prepare for follow on operations after the conclusion of the battle itself.⁷⁶

Once Meade ordered the pursuit of Lee on the 5th of July, Ingalls ordered the corps trains to link up with their respective corps near Middletown so as not to interfere with the pursuit march. He also ordered all those originating in Winchester to pass through Frederick to resupply as they moved west. Additionally, as the army moved behind the ANV, Ingalls directed new advanced depots in Berlin, Harpers Ferry, and Sandy Hook.⁷⁷ Clearly, the trains themselves did not hinder the pursuit, yet Lee and his army escaped. Instead, the nature of AoP operations (cumbersome trains), a staff that did not prepare for the next logical event, and the fact that Meade allowed his army to rest and recover at the end of the engagement all conspired to negate an effective pursuit of Lee.

In the Final Analysis

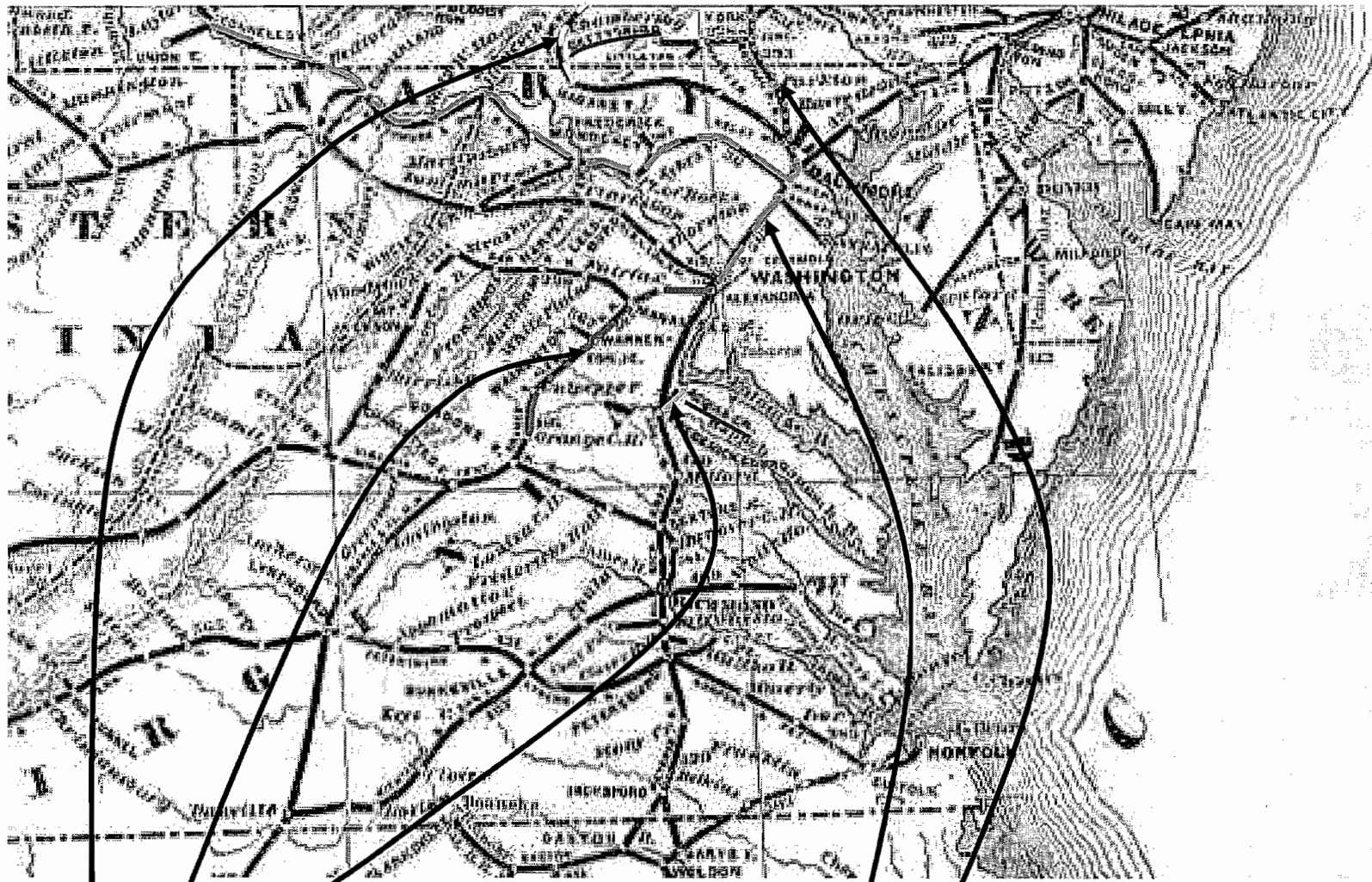
Confederate General Robert E. Lee's stated objectives of the campaign included removing Federal forces from the Shenandoah Valley, taking the hostilities to the North, and disrupting the Union commander's plans for a summer offensive. Ultimately, the campaign failed and the only aim clearly achieved was the removal of Millroy's forces from Winchester. As written by Brigadier General Stephen Dodson Ramseur, "our great campaign, admirably planned and more admirably executed up to the fatal days at Gettysburg, has failed."⁷⁸ The campaign culminated in the Battle of Gettysburg which cost the South dearly in soldiers and leaders for the future.

The lessons of a study of the logistical implications of the Gettysburg Campaign are clear. When confronted with a crisis-type situation, senior leaders in the logistical field must be

involved in the decision-making and directing of support. As Quartermaster General of the AoP, Rufus Ingalls worked closely with the commanding general to gain an understanding of his intent. He then communicated his understanding and requirements to Meigs to maximize the plan's sustainability while personally attending to the flexibility and attainability. Ingalls developed as simple a plan as possible with corps moving along different routes nearly simultaneously. Absent the close involvement of Montgomery Meigs, the Union Army may not have moved the required stocks near enough to the battlefield to be of any use. In directing and reconstructing the railroads, Herman Haupt displayed responsiveness and flexibility as well. The logistics principles described in Joint Publication 4-0 of responsiveness, simplicity, flexibility, economy, attainability, sustainability, and survivability are sufficient. While not an absolute checklist to guarantee success, they provide logistics planners and executors the necessary advice to direct their efforts.

In the Gettysburg Campaign, the personalities of Federal logisticians proved decisive in repositioning supplies for the Army of the Potomac (AoP). In the end, logisticians pushed a more than sufficient amount of supplies forward to enable General Meade to conduct his pursuit of the Army of Northern Virginia.

Appendix A – Map of Railroad Network



Map 1 - Close Up of Railroad Network in Virginia and Maryland⁷⁹

- Key:
- = Richmond, Fredericksburg, and Potomac Railroad
 - · — = Orange and Alexandria Railroad
 - · · · · = Cumberland Valley Railroad
 - — — = Baltimore and Ohio Railroad
 - · · · · = North Central Railroad

Appendix B – List of Major Union Personalities

Logistics Personnel

Army Chiefs:

Quartermaster General
Ordnance General
Commissary General

Major General Montgomery Meigs
Brigadier General James W. Ripley
Brigadier General Joseph P. Taylor

Army of the Potomac:

Quartermaster General
Assistant Quartermaster
Commissary General
Chief of Ordnance
Acting Chief of Ordnance
Medical Director (Surgeon)

Brigadier General Rufus Ingalls
Captain William G. Rankin
Colonel Henry F. Clark
Captain Daniel W. Flagler
Lieutenant John R. Edie
Dr. Jonathan Letterman

Cavalry Corps:

Chief Quartermaster

Lieutenant Colonel Charles G. Sawtelle (replaced after
evacuating Aquia and moved to Alexandria Depot
as AoP Ast QM)

Other Important Personnel

Army of the Potomac:

Chief of Staff
Assistant Adjutant General
Chief Engineer
Engineer Brigade Cdr

Major General Daniel Butterfield
Brigadier General S. Williams
Brigadier General Gouverneur K. Warren
Brigadier General Henry W. Benham

Note: This table was compiled by the author from a variety of sources.

Appendix C – Rufus Ingalls’ Recapitulation of June 19, 1863

Date (1863)	Command	Number of officers, men, and means of transportation in each command.									Pack Mules
		# of Officers	# of Men	Means of Transportation					Horses		
				Horses	Mules	Army Wagons	Wagons, Two-horse	Ambulances	Cavalry	Artillery	
June 1	First Corps	949	14,237	393	2,578	404	6	67	120	543	0
June 1	Second Corps	1,039	14,572	670	2,795	496	7	117	110	455	0
May 1	Third Corps	1,212	20,864	951	2,326	525	13	98	141	1,130	0
May 1	Fifth Corps	1,050	18,324	879	2,621	496	7	166	9	860	0
May 1	Sixth Corps	1,483	26,041	1,001	2,933	557	11	167	159	1,034	0
June 1	Eleventh Corps	621	12,616	1,100	1,549	414	10	83	204	467	216
June 1	Twelfth Corps	530	9,401	879	1,480	365	12	94	102	397	0
May 1	Cavalry Corps	719	11,687	1,085	2,404	313	4	86	12,386	699	0
May 1	Artillery Reserve	51	1,408	489	1,307	291	3	15	1	1,499	0
May 1	Engineer Brigade	83	2,115	757	526	120	2	12	12	0	0
May 1	Patrick's Brigade	138	1,865	67	24	21	1	4	4	0	0
May 1	HQ AoP	62	1,031	600	1,085	300	13	19	65	0	0
Totals		7,937	134,161	8,871	21,628	4,302	89	928	13,313	7,084	216

Table 1 – Recapitulation of June 19, 1863 Report⁸⁰

Endnotes

¹ Antoine Henri Jomini, *The Art of War* (Philadelphia: J.B. Lippincott & Co, 1862; Westport, CT: Greenwood Press, Publishers, 1992), 62.

² Stephen W. Sears, *Gettysburg*, (Boston: Houghton Mifflin Company, 2003), 23.

³ Sears, *Gettysburg*, 20.

⁴ Sears, *Gettysburg*, 25-26.

⁵ U.S. War Department, *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies*, series 1, vol. 27, pt. 1, (Washington, DC: Government Printing Office, 1880-1901; Harrisburg, PA: The National Historical Society), 34.

⁶ *O.R.* series 1, vol. 27, pt. 1, 35.

⁷ *O.R.* series 1, vol. 27, pt. 1, 35.

⁸ *O.R.* series 1, vol. 27, pt. 1, 38.

⁹ *O.R.* series 1, vol. 27, pt. 1, 60.

¹⁰ Mark M. Boatner III, *Civil War Dictionary*, rev. ed. (New York: David McKay Company, Inc, 1988), 476-477.

¹¹ Sears, *Gettysburg*, 155. Stephen W. Sears, *Chancellorsville* (Boston: Houghton Mifflin Company, 1996), 28.

¹² U.S. War Department, *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies*, series 1, vol. 27, pt. 3, (Washington, DC: Government Printing Office, 1880-1901; Harrisburg, PA: The National Historical Society), 161. The military governor of the Department of the Monongahela based in Pittsburgh, PA, Major General W.T.H. Brooks, announced a proclamation on June 16, 1863 calling for troops to rise and defend their homeland and promising that they would be returned to their homes to resume their previous occupations once the threat is reduced. He also promised that these troops would not be transferred to other departments.

¹³ Joint Chiefs of Staff, *Joint Operation Planning*, JP 5-0, (Washington, DC: The Joint Staff, 2008), xiii, xvii. The process's seven steps are: Initiation, Mission Analysis, Course of Action (COA) Development, COA Analysis and Wargaming, COA Comparison, COA Approval, and Plan or Order Development.

¹⁴ Sears, *Gettysburg*, 1.

¹⁵ U.S. War Department, *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies*, series 1, vol. 27, pt. 2, (Washington, DC: Government Printing

Office, 1880-1901; Harrisburg, PA: The National Historical Society), 305. Hereafter, all references from the *Official Records* are annotated by *O.R.*

¹⁶ Kent Masterson Brown, *Retreat from Gettysburg: Lee, Logistics & the Pennsylvania Campaign* (Chapel Hill, NC: University of North Carolina Press, 2005), 12-14. This is the argument implied by Kent Brown in his book. His book is specifically focused on logistics and he argued that Lee's reasons for launching the invasion were to keep his army from being stripped of units to be sent to other theaters and to obtain stores before his army collapsed. These arguments seem petty. While the forage and subsistence situation was certainly a concern and a secondary objective and Lee had recently successfully argued against sending Pickett's division to Vicksburg, organizing a campaign based on these concerns makes little military sense. While the Virginia countryside may have been mostly cleared, the Confederacy still maintained a railroad line from the deep south and could easily shift supplies from other regions of the country. The notion that Lee launched the campaign to the north simply to keep his forces together is even more appalling. This concept assumes (and Brown specifically writes) that, if Lee did not launch the campaign, he would have sat idle in Virginia. For a commander of Lee's known aggressive mentality, this supposition can not be sustained.

¹⁷ Sears, *Gettysburg*, 17.

¹⁸ *O.R.* series 1, vol. 27, pt. 2, 313.

¹⁹ Douglas Southall Freeman, *Lee's Lieutenants: A Study in Command*, abridged by Stephen W. Sears, (New York: Scribner, 1998), 543-544.

²⁰ Earl C. McElfresh, *A Theater Map of the Gettysburg Campaign 1863*, 1:500,000, Olean, NY, McElfresh Map Company, LLC., 2003, A Civil War Watercolor Map Series. This was the map upon which all observations regarding the physical network are based. It is specifically designed to show the reader of today how the roads, railroads, rivers, and terrain existed at the time of the conflict.

²¹ Thomas Weber, *The Northern Railroads in the Civil War: 1861-1865* (New York: King's Crown Press-Columbia University, 1952), 164. There seems to be no standard for size of military trains specified in any of the books. An average train on the Western Maryland Railroad supporting the AoP near Gettysburg was 10 cars and each car had a capacity of 10 tons. This is not representative of true averages across all lines as the standard train floated from Alexandria to Aquia was 16 cars (Weber, 159).

²² Weber, 163. Russell Weigley, *Quartermaster General of the Union Army: a Biography of M.C. Meigs* (New York: Columbia University Press, 1959), 277-278.

²³ *O.R.* series 1, vol. 27, pt. 3, 129. The depot at Frederick still housed a hospital treating men from the previous campaign. On June 15th, the Commander of Baltimore, Major General Schenck, ordered the head surgeon at Frederick to prepare his stores for destruction in the event the enemy presented itself too close.

Endnotes

²⁴ *O.R.* series 1, vol. 27, pt. 3, 369. The command was actually exchanged on the 28th but Secretary of War Halleck issued the order directing the transfer on the 27th.

²⁵ Encyclopedia Britannica Online, s.v. "Meade, George G." <http://www.search.eb.com/eb/article-9051670> (accessed January 2, 2010). Boatner, 539-540.

²⁶ quoted in Burke Davis, *Gray Fox: Robert E. Lee and the Civil War* (New York: Wing Books-Random House Value, 1999), 221.

²⁷ Aquia is infrequently referred to as Acquia, most particularly by Herman Haupt in his *Reminiscences*. Regardless of the spelling, there was only one location and it was Aquia Landing. At the landing the railroad line ran from the pierside down through Richmond on the Richmond, Fredericksburg, and Potomac Railroad.

²⁸ George B. Abdill, *Civil War Railroads* (Seattle: Bonanza Books-Crown Publishers, 1961), 48. Weber, 159-160.

²⁹ *O.R.* series 1, vol. 27, pt. 3, 162-163. Meigs sent a message to General Brooks in Pittsburgh instructing him to supply newly formed local units from the Arsenal in Pittsburgh with 11,000 rifled muskets plus accouterments and ammunition that was in abundance there.

³⁰ Encyclopedia Britannica Online, s.v. "Meigs, Montgomery C(unningham)." <http://www.search.eb.com/eb/article-9051825> (accessed 24 Dec. 2009). David W. Miller, *Second Only to Grant: Quartermaster General Montgomery C. Meigs: a Biography* (Shippensburg, PA: White Mane Books, 2000), 3-16. Boatner, 542. Weigley, 19, 23-24, 59-70, 296.

³¹ Technically, Colonel Daniel C. McCallum served as the superintendent of military railroads while Haupt served as his subordinate. Haupt's actual job title remains in some dispute and he signed messages differently at different times. During the Gettysburg Campaign he usually signed his messages with, "In Charge of United States Military Railroads." Essentially, his specified job remained as chief of construction for the military railroads but, in effect, he served as the head of military railroads for the designated army under McDowell, Pope, McClellan, Burnside, Hooker, and Meade.

³² Herman Haupt, *Reminiscences of General Herman Haupt* (Milwaukee: 1901; Kessinger Publishing), 43.

³³ Encyclopedia Britannica Online, s.v. "Haupt, Herman." <http://www.search.eb.com/eb/article-9039538> (accessed December 24, 2009). Boatner, 386. Abdil, 10.

³⁴ Petersburg National Battlefield, Rufus Ingalls, <http://www.nps.gov/archive/pete/mahan/edbiosri.html>. U.S. Army Quartermaster Foundation, Brigadier General Rufus Ingalls -

Quartermaster General 1882-1883, http://www.qmfound.com/BG_Rufus_Ingalls.htm. Boatner, 425.

³⁵ Joint Chiefs of Staff, *Joint Logistics*, JP 4-0 (Washington, DC: The Joint Staff, 2008), GL-8. JP 4- describes those aspects of military operations that deal with: design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of materiel; movement, evacuation, and hospitalization of personnel; acquisition or construction, maintenance, operation, and disposition of facilities; and acquisition or furnishing of services. The Union Army's logistics organization and functions were very similar to the modern system. While they are combined today, the Union Army had separate Subsistence and Quartermaster Departments. The Subsistence Department was responsible for obtaining and preparing rations for men and animals. The Quartermaster Department had seven functions that summarize as transporting everything and supplying the army with everything less subsistence, arms, and ammunition (James Alvin Huston, "Challenging the Logistics Status Quo During the Civil War," *Defense Management Journal*, 12, no. 3, July 1976, 27-29). The Joint Logistics manual, JP 4-0, also defines something called Core Logistic Capabilities. These capabilities are supply, maintenance operations, deployment and distribution, health service support, engineering, logistic services, and operational contract support (Joint Chiefs of Staff, *Joint Logistics*, I-10). Within each of these capabilities there is an array of functional competencies. While the modern concepts did not apply during the Civil War, they may still be useful analytical tools. That said, no previous war involved the use of railroads as a vital resource for serving the needs of the army in the field. Engineering, in terms of railroad building, repairing, and bridge building, proved singularly important to the Union Army.

³⁶ Joint Chiefs of Staff, *Joint Logistics*, xvi-xvii.

³⁷ Joint Chiefs of Staff, *Joint Logistics*, xvi-xvii.

³⁸ Mark Adkin, *The Gettysburg Companion* (Mechanicsburg, PA: Stackpole Books, 2008), 217.

³⁹ Unknown. "The Quartermaster's Department, 1861-1864," *Quartermaster Review*, September-October 1928, 4-5. http://www.qmfound.com/quartermaster_1861-63.htm.

⁴⁰ *O.R.* series 1, vol. 27, pt. 3, 212-213. The report actually contains information from units separated by a large period of time. The dates of reporting from subordinate units ranged from May 1st (8 units) to June 1st (4 units).

⁴¹ *O.R.* series 1, vol. 27, pt. 1, 151.

⁴² Adkin, 225.

⁴³ *O.R.* series 1, vol. 25, pt. 2, 544, 547-562.

⁴⁴ "The Quartermaster's Department, 1861-1864," 2. The other half of the wagons were required for baggage (tents, equipment, cooking utensils, etc), pioneering kits (i.e. entrenching tools, etc), armorer's equipment, hospital supplies and ordnance supplies (small arms and artillery wagons).

Endnotes

The days of subsistence number is derived from the following (horses & mules used synonymously):

$(51,120 \times 22\text{lbs}) / 2,000 = 562.32$ rounded up to 563 short tons (ST).

563 ST (animals) + 218 ST (humans) = 781 ST total subsistence per day.

2,500 lbs per wagon / 2,000 lbs per ST = 1.25 ST per wagon.

781 ST subsistence / 1.25 ST per wagon = 624.8 wagons per one day of subsistence.

2,151 wagons for subsistence / 624.8 wagons per day = 3.44 days of subsistence in the Army of the Potomac

⁴⁵ Edward Hagerman, "The Reorganization of the Field Transportation and Field Supply in the Army of the Potomac, 1863: The Flying Column and Strategic Mobility," *Military Affairs*, 44, no. 4, December 1980, 185.

⁴⁶ This number is derived from the following (horses & mules used synonymously):

4,302 regular wagons x 6 horses each = 25,812 horses

928 ambulances x 2 horses each = 1,856 horses

89 two horse wagons = 178 horses

25,812 (regular wagons) + 1,856 (ambulances) + 178 (two horse wagons) + 13,313 (cavalry horses) + 7,074 (artillery horses) = 48,233 horses required

51,120 horses – 48,233 horses used = 2,887 horses available as pack animals

$(2,887 \text{ pack horses} \times 200 \text{ lbs each}) / 2000 \text{ lbs per ST} = 288.7 \text{ ST on pack animals}$

$288.7 \text{ ST} / 734 \text{ ST required per day} = 0.39 \text{ days of subsistence}$

⁴⁷ O.R. series 1, vol. 19, pt. 1, 96.

⁴⁸ Hagerman, 183.

⁴⁹ Hagerman, 184.

⁵⁰ O.R. series 1, vol. 27, pt. 3, 101.

⁵¹ O.R. series 1, vol. 27, pt. 3, 93.

⁵² O.R. series 1, vol. 27, pt. 3, 93-94.

⁵³ O.R. series 1, vol. 27, pt. 3, 94.

⁵⁴ O.R. series 1, vol. 27, pt. 3, 110.

⁵⁵ O.R. series 1, vol. 27, pt. 3, 111.

⁵⁶ O.R. series 1, vol. 27, pt. 3, 136-137.

⁵⁷ Weigley, 275.

⁵⁸ Weigley, 275.

Endnotes

⁵⁹ *O.R.* series 1, vol. 27, pt. 3, 145.

⁶⁰ Weber, 162. Haupt, 196.

⁶¹ A search through the Official Records does not clearly explain who actually ordered what and where for the movement of trains. Corps moves are clearly listed either in orders directing their moves or in their commanders' reports of marches. One may safely assume that the trains followed their corps as that was the logistics system in place. However, where the trains are resupplied is more problematic. There are several messages from one commander to another instructing the second to refill trains at a particular place. (Examples of these messages are found in *O.R.* series 1, vol. 27, pt. 3, 116-117, 146.) Ingalls own report of the campaign completed September 28, 1863 does not explain this at all. He simply notes that the places of supply were the same as in the previous campaign and, in this, he is referring to the major supply points not the small forward ones resupplying corps on the move. A review of the Antietam Campaign's after action report does not clearly state the resupply points either. In that report, Ingalls talked about supply depots at Frederick and Hagerstown but that is all. *O.R.* series 1, vol. 19, pt. 1, 99-106.

⁶² quoted in Weber, 127. This order by Meigs followed a congressional act passed on January 31, 1862. This act allowed the military to take possession of railroads for military purposes if the rail companies did not cooperate to support the military's requirements. While this threat was held over the railroads, it was only exercised once and that was during the Gettysburg Campaign over the short railroads near the city of Gettysburg.

⁶³ *O.R.* series 1, vol. 27, pt. 3, 427, 474. Haupt, 211-212. Scott had scouts observing and securing the railroads in the region. Some of these scouts reported Lee's army in retreat. This meeting with Scott led to Haupt's realization that Lee's forces were no longer threatening Harrisburg but moving back to concentrate near Chambersburg. Haupt immediately dispatched a message to Major General Robert Schenck commanding the defenses of Baltimore with this information and requesting Schenck to inform Meade as communications from Harrisburg to the AoP were cut. A short time later and after receiving additional reports of Lee's army, Haupt sent a similar message to Halleck informing him that Gettysburg was the point of concentration.

⁶⁴ Weber, 163-164. Haupt, 213.

⁶⁵ Weber, 164. Haupt, 236.

⁶⁶ *O.R.* series 1, vol. 27, pt. 3, 511. Weber, 52, 165. Haupt, 216.

⁶⁷ John Laird Wilson, *The Pictorial History of the Great Civil War: Its Causes, Origin, Conduct, and Results* (Pittsburgh, PA: E. Gately & Co., 1881), 533-534.

⁶⁸ Weigley, 282. Miller, 201.

⁶⁹ Weigley, 282. Miller, 203.

Endnotes

⁷⁰ *O.R.* series 1, vol. 27, pt. 2, 1088-1089. Unbeknownst to Haupt, Meade had already ordered General French to seize the South Mountain Pass.

⁷¹ *O.R.* series 1, vol. 27, pt. 1, 25-28

⁷² Italics in original. John G. Moore, "Mobility and Strategy in the Civil War," *Military Affairs*, 24, no. 2, 1960, 77. This analysis was specifically directed to analyze an army living off the Confederate countryside. Given that there is no evidence in the *Official Records* that the Union Army believed it would require smaller wagon trains as it moved north and dropped the excess off in a depot along the way, this study can be reasonably extended to the Army while operating in the North.

⁷³ The examples of Civil War armies able to operate significantly faster than their opponent successfully are those that cut themselves off from their supply chain. Stonewall Jackson in the Valley in 1862, Ulysses S. Grant in the Vicksburg Campaign in 1863, and William T. Sherman in the Atlanta Campaign in 1864 all cut themselves off from their support base in order to gain mobility.

⁷⁴ *O.R.* series 1, vol. 27, pt. 1, 916-917. This analysis is largely based on Pleasonton's final report of the campaign on August 31, 1863. There is no copy of the actual order which Meade issued to the cavalry contained in the *Official Records*. Pleasonton wrote, "orders were given for the cavalry to gain his rear and line of communication, and harass and annoy him as much as possible in his retreat," (*O.R.* series 1, vol. 27, pt. 1, 916). As written, "to gain his rear and line of communication" means to follow along and attack the rear guard. There is no mention of any instructions to get ahead of the ANV at a choke point to halt the retreat. Meade's final report does not suggest such an intention either. He ordered French to seize the South Mountain passes and reoccupy Harpers Ferry (*O.R.* series 1, vol. 27, pt. 3, 517-518). The seizing South Mountain passes portion of this order was soon countermanded to a more generic form of follow the previous order to reoccupy Harpers Ferry and make "your movements contingent upon those of the enemy." Brigadier General John Buford began the 1st Cavalry Division's pursuit from covering the trains around Westminster. He stated that his orders were "to destroy the enemy's trains" (*O.R.* series 1, vol. 27, pt. 1, 928). The 2nd Cavalry Division Commander, Brigadier General David McMurtree Gregg, did not explain his task at all (*O.R.* series 1, vol. 27, pt. 1, 958-960). The 3rd Cavalry Division Commander, Brigadier General Judson Kilpatrick, wrote that he had orders to destroy a heavy train "and operate on the enemy's rear and flanks" (*O.R.* series 1, vol. 27, pt. 1, 993.)

⁷⁵ Center of Military History, *American Military History*, Army Historical Series (Washington: Government Printing Office, 1969; Washington: Government Printing Office, 1989), 253 and *O.R.* series 1, vol. 27, pt. 1, 117-118.

⁷⁶ E.J. Stackpole, "Generalship in the Civil War," *Military Affairs*, 24, no. 2, 1960, 57-67.

Endnotes

⁷⁷ Quartermaster Historian's Office. *Quartermaster Support of the Army: A History of the Corps, 1775-1939*, by Erna Risch. Washington, DC: Office of the Quartermaster General, 1962, 439.

⁷⁸ quoted in Gary W. Gallagher, ed., *The First Day at Gettysburg: Essays on Confederate and Union Leadership* (Kent, OH: The Kent State University Press, 1992), vii-viii.

⁷⁹ Portion of Appleton's Railway Map of the Southern States.
<http://www.libs.uga.edu/darchive/hargrett/maps/1865a6.jpg>

⁸⁰ O.R. series 1, vol. 27, pt. 3, 212-213.

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