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MASTER OF MILITARY STUDIES

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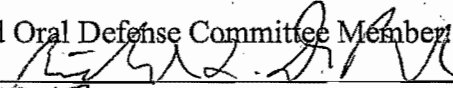
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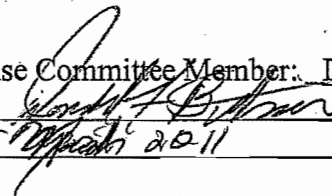
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PREFACE AND ACKNOWLEDGEMENTS

I assumed this topic for mostly personal reasons. Until my assignment to Command and Staff College, I never read a lot of military history. Over the last year, I have become more interested in historical accounts of the region I live in. My family and I have had a house in Williamsburg, Virginia for the last 5 years. I have used every opportunity to choose topics that offer a greater understanding of my local area. For example, my Joint Campaign Analysis topic focused on Yorktown and provided an excellent opportunity to learn more about a fascinating historical event. Last year, I chaperoned one of my daughters on a field trip to Richmond. While there, we visited a Civil War museum and we toured the Tredegar Iron Works. Both were extremely interesting and when the opportunity to take a closer look at the civil war presented itself, I could not pass it up. I have served as a Supply Clerk or Supply Officer in the Marine Corps for the last 16 years. I wanted to research a supply or logistical aspect of the civil war, but the area was just too broad. I decided to focus solely on the Confederacy's ability to provide weapons and ammunition to its forces. During my research, I did find many reasons why the Confederate South was not able to win the war, but at no time was it because they lacked the arms to fight. That alone speaks to the South's tremendous ability to mobilize an industrial capability.

That being said, my personal advancement on this subject was significantly assisted by an array of historical documents in official record that provided me with an important perspective.

To my wife, Lisa Ann, our beautiful girls, Karris, Isabella and Angelina, and our wonderful boys, Demetrio, Nico and Marco.

EXECUTIVE SUMMARY

Title: Mobilizing the Confederate Industrial Base for Total War

Thesis: This paper discusses how an agriculturally based confederate South was able to mobilize and industrial base capable of providing enough arms and munitions to wage war against the North. More specifically, the Confederacy's beliefs in States Rights and views on personal property rights created a lack of a useable transportation infrastructure and labor considerably hampered the war effort. These issues and not the lack of an industrial capability, knowledge or wherewithal rendered the Confederacy unable to harness raw materials and move them, as well as finished products, throughout the Confederate lines of communication.

Discussion: The outcome of the American Civil War is a repeatedly, and sometimes emotionally, discussed subject that has captivated historians for generations. Some reasons given for the South's defeat include the fact that the Confederacy employed faulty strategy, being defensive instead of offensive and at times confusing when they should be either. Another one is the separation between the states rights and decisions needed to be made to wage total war by Confederate President Jefferson Davis and a somewhat makeshift and inexperienced government. Historians often question the Confederacy's commitment to a cause many of them were indifferent to, some arguing that the South no longer had the will to fight long prior to the inevitability of defeat. The Union possessed many of these same characteristics, and they would have surely been attributed to them had they lost the war. More frequently, arguments are made that the greater amount of resources and manufacturing capability and capacity in the North was the largest factor in the South's demise.

Conclusion: The Confederate Congress established the Confederate War Department in order to provide administration for the basic agencies required for the conduct of war, the supply bureaus. Initially, there were four departments, the Inspector General, Quartermaster Department, Subsistence Department and the Medical Department. Later, the Ordnance Bureau would be created to specifically to deal with arming confederate forces. The Ordnance Bureau forged an unheralded chapter in U. S Civil War history. Charged with gathering the resources and manufacturing the arms and munitions for the Confederacy, the Ordnance Department was placed in the charge of a legendary chief, Josiah Gorgas. As the mission increased, the Niter and Mining Bureau became an independent agency under Isaac M. St. John, who led the agency until the closing days of the war. This thesis examines the Ordnance department's ability to keep Confederate forces in enough arms and ammunition to continuously wage war. This work focuses on the Ordnance Department's operations throughout the South, from harvesting valuable mineral resources to the manufacturing of finished arms and ammunition with a look into the distribution process outlined to get the arms and ammunition to the troops. The Ordnance Department used aggressive and innovative methods to achieve partial success, but was doomed to failure by labor and transportation problems.

INTRODUCTION

The Confederacy began the Civil War without a sufficient supply of guns and gunpowder. General George Washington Rains, commander of the Augusta Powder Works, asserted after the war that the “entire supply of gunpowder in the Confederacy at the beginning of the conflict, was scarcely sufficient for one month’s operations.”¹ Gunpowder was a precious resource, without which the Confederate government could not have pursued the war successfully. This work examines the Confederate War Department’s ability to provide Confederate Forces guns and ammunition and its efforts to manufacture them at the onset of the Civil War.

The Confederacy’s requirements were many and the resources seemingly few, but not as few as might be supposed. Its munitions industry consisted primarily of widely scattered small powder mills, mines, and mineral works. Most discussions of Civil War industry tend to focus on manufacturing, but making the guns and ammunition turned out to be easier than getting the required minerals together. Even though the Confederacy’s overall industrial capacity was meager, it boasted one of the largest foundries in the country, Richmond’s Tredegar Iron Works, and it built a state of the art gunpowder factory in Augusta, Georgia during the war.² Despite these obstacles, the South achieved greater industrial success than anyone had a right to expect. Indeed, over the course of the war, it supported itself better industrially than it did agriculturally.

While historians have discussed the industrial disparities between the North and South, few have examined the southern industrial base in depth. For the most part, Civil War literature focuses on strategy and tactics, paying little attention to the industrial processes that supported the war. This thesis will examine how the south was able mobilize an industrial base that would

provide enough essentials to wage the Civil War, but it was doomed to failure by labor and transportation problems.

SECTION 1: ESTABLISHMENT OF THE ORDNANCE DEPARTMENT

The establishment of a rudimentary Confederate constitution in the early spring of 1861, led to consolidating all of the war effort under President Jefferson Davis. Davis had many contacts created while he was serving as the U. S. Secretary of War that the Confederate Congress wanted to exploit. Davis and the Confederate congress quickly saw the need for a larger agency to administer the requirements of waging war and on February 26, 1861, Davis signed a bill creating the General Staff of the Regular Army.³ This act created the Adjutant and Inspector General's Department, the Quartermaster General's Department, the Subsistence Department and the Medical Department. The Quartermaster General's Department was responsible for the purchase and procurement of supplies other than food and the important duty of transporting raw materials and supplies to their final destination.

Early on, Abraham C. Myers, a secessionist from South Carolina, politicked to assume the job of Quartermaster General of the Army. Myers was a West Point graduate that served as the Quartermaster General of the Southern District for the United States, headquartered in New Orleans prior to the secession of the Confederate States. On January 28, 1861, he resigned his commission in the U. S. Army and turned over all of the government stores in his possession to the State of Louisiana.⁴ He would be placed in an acting role under General Order Number 1 on March 25, 1861.⁵ Early on, this would be the primary method for the Confederacy to acquire supplies.

The search for a Quartermaster General may have resolved itself quickly, but more work had to go into enlisting the services of a chief of Ordnance, the individual specifically

responsible for the procurement and purchase of arms and ammunition. The job would ultimately go to another West Point graduate that had served in the United States Ordnance Service, Josiah Gorgas. Special Orders Number 17, of April 8, 1861, assigned Major Josiah Gorgas to duties as the Chief of the Bureau of Ordnance.⁶ Gorgas was a Pennsylvania native who graduated with the West Point class of 1841; he then served in the Mexican War and spent the next 20 years in Ordnance assignments, commanding several Southern arsenals. Unlike the Quartermaster's Department and the Subsistence Department, no official Ordnance Department had been established and the powers to contract for Ordnance production still lay with President Davis.

Gorgas quickly realized the need to centralize production and distribution of arms and ammunition and demanded the creation of a de facto Ordnance Department. Gorgas was assigned to perform a quick inventory of Confederate munitions. In April 1861, he informed the Secretary of War that Confederate munitions consisted of 676 field pieces, naval guns, mortars, and howitzers, 27,518 artillery rounds, and a quantity of small arms (see Table I).

Small Arms Type	Quantity	Powder	Pounds
Muskets	84,490	Cannon	329,145
Rifles and Carbines	12,799	Musket	91,709
Pistols	2,876	Rifle	70,275
Totals	100,165		491,111

Table 1 – Small arms and powder initially available to the Confederacy.⁷

Nearly half a million pounds of powder seemed impressive, but it amounted to less than 500 pounds for each available gun. Furthermore, even if maximum efficiencies were realized, the small arms powder would have amounted to roughly 30 rounds per available weapon when the ordnance manual called for 200 rounds per man.⁸ There were no adequate production facilities then in place, but a large powder works was under construction in Augusta, Georgia. Gorgas realized, however, that the Confederacy's main problem was producing enough quality gunpowder and artillery pieces efficiently.

SECTION 2: EARLY PROCUREMENT OF ARMS AND AMMUNITION

Gorgas saw the critical need to begin production of new supplies as soon as possible, due to the small ordnance reserve on hand. The Confederate government took over the use of all former United States arsenals and depots, but their capacities were limited as the federal government was continually looking to limit the national military's role in the United States. "Only the Richmond Arsenal was equipped for the immediate production of small arms. Nashville, Baton Rouge, Montgomery, Mount Vernon, Charleston, Augusta and Savannah could only make cartridges if they were supplied the powder."⁹

"The Confederate government did not have facilities capable of making heavy ordnance, powder and small arms in the quantities needed."¹⁰ First, Gorgas would seek to contract private firms to manufacture these items. Second, agents would be sent overseas to contract and ship raw materials and finished goods from foreign sources. There were only two established facilities capable of manufacturing heavy ordnance, Tredegar Iron Works in Richmond and Etowah Works outside Atlanta.¹¹ April 16, 1861, Union President Abraham Lincoln banned trade with the south and subsequently established a blockade of Southern ports. The Tredegar Iron Works did not feel the effects of this restriction until several weeks into the war. Up until

this point, the predominant amount of strategic materials required to manufacture heavy ordnance came from the North. By May of 1861, they would run out of copper and shortly thereafter, lead and steel was no longer in supply.¹²

Tredegar also ran short of raw materials used to for daily operations. Firebrick was always in short supply and concerned Tredegar management throughout the war.¹³ Shipments of firebrick ordered just before the beginning of the war never arrived. Tredegar first attempted to manufacture firebrick then tried purchase from a producer in Georgia, but both endeavors proved unachievable.¹⁴ Anderson and Company finally turned to the Virginia porcelain industry for supplies.¹⁵ They would have to go so far as to take buy stock in companies and assist them in reorganizing their facilities to begin production. This effort did provide a supply of firebrick, but most was of poor quality that constantly hindered production during the war.¹⁶

Gun metal became another issue. Tredegar increasingly had to rely on substandard gun metal to produce heavy artillery.¹⁷ Guns built with this inferior metal would blow up during trials or in the field after limited used. After buying everything they could secure, Tredegar would have to rely on the Ordnance Bureau for raw materials.

For gunpowder, Gorgas arranged with any contractors he could find in the mineral rich areas of Tennessee, North Carolina, Louisiana and Alabama to provide the natural resources and the ability to manufacture. The gunpowder industry in the south peaked during the War of 1812 in and around Tennessee. The industry quickly declined because of the availability of cheaper saltpeter, a chief ingredient in the manufacture of gunpowder, from the North and from India. When the war began, most of the gunpowder-grade saltpeter came from India.¹⁸

Recognizing the magnitude of the ordnance dilemma, the Confederate Congress adopted a bill in January 1862 that provided incentives for private citizens to establish or enlarge

manufacturing operations for small arms, gunpowder, or saltpeter. While this appealed to patriotism, it also stimulated the profit motive. The government promised to advance contractors fifty percent of the construction or renovation cost, provided the individual contractors invested twenty-five percent in advance. A contractor had to first demonstrate the practicality of the venture and then to repay the advance once production began.¹⁹

President Jefferson Davis was wary of contractors and was concerned about the degree of control the government would have over them. He vetoed the initial version of the bill because it made no provision for reclaiming the advance if the contractor defaulted. More fundamentally, the Confederacy's existing gunpowder production capacity already exceeded the supply of raw materials available. Davis feared that the bill, written in haste to develop war materials quickly, would simply allow many contractors to get government money without giving the Confederacy what it needed.²⁰ Gorgas needed more raw materials, not manufacturing capability.

Caleb Huse would be charged with securing the second source of supplies, foreign imports. His efforts would not come to fruition for months. He was able to contract and ship some 120 tons of gunpowder.²¹ Despite these minimal successes, Gorgas intended to set up a Confederate ordnance works that would not have to rely on private contracts in order to supply the Army.²² The first step in making this happen would be creating the Niter and Mining Bureau.

In the spring of 1862, at the urging of Gorgas and the Secretary of War, Congress established the Niter and Mining Bureau (NMB).²³ The NMB's duties included the mining and production of niter, iron, copper, lead, and any other mineral necessary for making arms and munitions. The NMB had responsibility for both domestic production and foreign procurement. The bureau was empowered to purchase or impress mineral stocks as required.²⁴ The man

selected to run this new organization was a gifted young engineer from Georgia named Isaac Munroe St John.

Isaac M. St John was born in 1827 in Augusta, Georgia, but grew up in New York City and attended Yale University. St. John was a meticulous man who quickly earned the praise of his peers. He began building a solid reputation for quality job performance, a reputation he would keep for the rest of his life.

In February 1861, St John enlisted as a private in the South Carolina Fort Hill Guards. His experience as an engineer, however, ensured he would not remain long in the infantry. He was transferred to the engineers in the Army of the Peninsula, where General John B. Magruder recognized his talents. Magruder petitioned General Cooper, the Adjutant General, for a commission for St. John. In March 1862, Captain St. John became chief engineer of the Army. He designed the defenses along the Peninsula and eventually the whole of the defensive line south of the James River. He also impressed General George W. Randolph, future Secretary of War. When Gorgas petitioned Congress to develop a niter agency, Randolph knew just the man for the job. St. John went to Richmond in April 1862 to run the NMB.²⁵

St. John set to work immediately, organizing the NMB into ten administrative districts (plus the Trans-Mississippi Department), each responsible for the extraction of the mineral resources in its area. In each district a superintendent supervised operations and reported to St. John. Each superintendent had a small staff some larger districts had assistant superintendents. The bureau also employed a number of technical experts, chiefly chemists and miners.

Gorgas entrusted the NMB's manufacturing operations to fellow West Pointer George Washington Rains. Rains graduated in the class of 1842, a year behind Gorgas. After a year in the corps of engineers, Rains transferred to the artillery corps and returned to the academy as

assistant professor of chemistry, geology, and mineralogy.²⁶ After serving in the Mexican War and the Indian Wars in Florida, he resigned from the Army in 1856 to become president of two companies: Washington Iron Works and Highland Ironworks, both in Newburgh, New York just north of West Point.²⁷ When the Civil War came, President Davis filled key positions with officers he knew from his Mexican War days. He knew Rains' background and training, and with Gorgas' concurrence put him in charge of manufacturing gunpowder.²⁸ This assignment ensured that able leaders were in charge of all the critical ordnance organizations.

Josiah Gorgas had control of ordinance, gunpowder and ammunition production at a critical time. The nascent Confederacy's supply of these crucial items was woefully inadequate to sustain a war. There were sources available for the raw materials, and Gorgas' task was to establish a system to exploit them. He immediately pursued overseas purchases, but he also worked to stimulate domestic production. Having started the process, Gorgas hired Isaac M. St. John and George Washington Rains to key positions in the organization designed to produce and procure war minerals.

By the spring of 1862, the resources had been identified and the systems created to build crucial war materials. Throughout the war, the Ordnance Department and the NMB structure adapted to the requirements and added other supervisors as required. Both the Ordnance Department and the NMB developed an administrative structure to supervise a variety of operations spread throughout the Confederacy. Aply led, this structure remained in place throughout the war with only minor modifications.

SECTION 3: TRANSPORTATION ISSUES

Transportation proved to be one of the biggest problems the Confederacy faced. Given the geographic dispersion of the various components that made up the manufacturing of gun and

gunpowder industry, an efficient transportation system was critical. The first problem with railroads was control: each railroad operated independently from the others. There was no schedule coordination, no standard gauge across all the roads, and no system for sharing rolling stock. President Davis, though previously having favored centralization over states' rights in certain circumstances, hesitated to exercise any centralized control of the railroads.²⁹

The railroad owners had political influence. They were concerned about how the rolling stock would be maintained if the government or another railroad controlled it, and about their ability to remain financially solvent amid skyrocketing inflation. They were also concerned about shortages of critical materials, such as rails. The NMB had to compete for the same rail resources as the army and other bureaus, but it did enjoy a high priority for rail usage. The War Department issued a special order in April 1862 directing all quartermasters to give niter shipments precedence over all other supplies.³⁰ This priority extended even to impressing the railroads, but the Confederate Congress was divided over both the need for this and the terms under which it would be done.³¹ The government shied away from seizing railroads, adopting a policy of contracting for use whenever possible, and impressing only when absolutely necessary.³²

With these concerns in mind, in April 1863 the Secretary of War called a meeting in Richmond of the various railroad heads to address the problem and recommend a solution. Those chiefs made three recommendations to the Confederate Congress. First, they recommended organizing a railroad bureau under the War Department to oversee government requirements for rail transportation and to consolidate requisitions. The railroad bureau would coordinate freight rates with the railroads for government supplies, equipment, and soldiers. This bureau would also seek to supply essential materials (such as rails) to the roads. The railroad owners also

recommended that the War Department use inland waterways whenever possible to decrease rail traffic. Finally, they proposed importing workers from Europe to assist with operations.

In addition to these recommendations, the railroad heads asked for government assistance in daily operations. In particular, they wanted the government to provide storage areas for supplies at depots so that trains could be unloaded quickly, and they wanted local army commanders to be prevented from interfering in railroad operations.³³

A week after the meeting, Congress passed a bill that implemented some of the proposals. The law, approved in May 1863, put the Quartermaster General in charge of government transportation requirements and authorized him to impress railroads and their employees if required. It ordered the government to compensate private companies for the loss of impressed equipment.³⁴ Despite the law, Davis was hesitant to enforce it and place the railroads under government control. The states' rights doctrine so pervaded Confederate life that Davis was reluctant to push the issue.³⁵ Two years later, in February 1865, the Confederate Congress passed a stronger law authorizing the Secretary of War to seize the railroads, canals, and telegraph lines. The law came too late in the war, however, to effect the outcome.³⁶ There was never any firm centralized railroad control or coordination during the war.

A second problem with the railroads was their limited track mileage.³⁷ The South had less than half the track mileage of the North and it was generally in poorer condition. The railroads, developed to connect seaports with inland populations, had a primarily east-west orientation.³⁸ This often made it difficult to supply armies whose primary orientation was north-south. There were north-south lines in Mississippi and Tennessee, with a few in Georgia and Virginia, but the difficulty in connecting these lines with their different gauges, added to the other difficulties already inherent in the southern rail system, nearly outweighed the advantages of using the

system.³⁹ At this time, there was no standard railroad gauge, and railroads used the customary local gauge. Several in Virginia and the Carolinas used the four foot, eight and one-half inch gauge (modern standard) while others used five feet. Some short lines west of the Mississippi even adopted a five-foot, six-inch gauge, but this width never caught on in the East.⁴⁰

Rail lines into cities had a related problem. Many city governments prevented the rails from being extended through town. Augusta, Savannah, and Montgomery, for example, had rail stations on opposite sides of the city from each other, so cargo arriving on one line for trans-shipment on the other line had to be carted across the city. Rolling stock posed another problem. Even the larger roads did not have the equipment to handle the constant demands to move soldiers, equipment, and supplies for the Confederacy. The roadbeds, track, trestles, platforms, and stations quickly began to deteriorate under increased usage. For the most part, railroad construction practices had laid ties on level ground and affixed the rails with little, if any, roadbed preparations. Bridges and trestles were typically spindly wooden affairs.⁴¹ The railroads were somewhat successful at importing and recycling used rails, but the Confederacy was unable to produce any new rails. What iron the Confederacy mined went for navy ironclads.⁴²

SECTION 4: LABOR ISSUES

The Ordnance department and the NMB, though enjoying success on the organizational and technological levels, was beset by labor problems. Both agencies faced even greater difficulties in recruiting than did the rest of the Confederate Army. Both required a large number of skilled and unskilled workers. Both agencies operations included men exempt from conscription, men conscripted for the army and sent to work in the mines or factories, medically disabled soldiers, impressed free Negroes, prisoners of war, slaves, and work details from local military commands. Both would struggle to keep the ranks filled. They were hampered in this

task by the attitudes of people in some of the districts, by the competing requirements of the army, and the ignorance of some other government agencies.

A new conscription law created problems for the NMB. The April 1862 law required men between the ages of eighteen and thirty-five to serve at least three years.⁴³ The newly created Conscript Bureau oversaw this program. The law directed the Conscript Bureau to enroll every draft-eligible man in the country and to issue and honor valid exemptions under the conscription law. The Conscript Bureau was also charged with apprehending stragglers and deserters. Both the Ordnance Department and NMB pushed the War Department to exempt men in vital war industries — miners, iron furnace workers, and foundry workers, etc. — from conscription. In the fall of 1862, the War Department ordered the Conscript Bureau not to interfere with the workings of the niter caves, but the NMB continued to experience problems.⁴⁴ The Conscript Bureau's compliance helped, but many people resented the exemptions throughout the war.⁴⁵

In late 1862, St. John wrote a letter to the War Department asking for clarification of conscription rules and explaining the problem as he saw it. He recognized that some men were avoiding military service by volunteering for the mines. This was legal under the conscription law, but St. John was concerned about public resentment. He assured the new Secretary of War, James A. Seddon, that he was taking steps to combat the problem. He believed that part of the problem resulted from the constant turnover of local enrolling officers, who typically served for only a few months in one place and did not understand the law. With each turnover, the NMB superintendent in each district had to explain the importance of the NMB's exemption. St. John cited several examples of workers removed from caves by conscription officers, only to be returned when the facts were known.⁴⁶

Despite these measures, however, the Ordnance Bureau and the NMB's labor problems continued throughout the war. Local commanders continued to remove workers from the mines without the permission of either the NMB or the Conscript Bureau. The problem of filling the ranks of the confederacy were so ominous that General Braxton Bragg and seventeen other Generals of the Army of Tennessee implored the War Office to take the matter up with President Davis.⁴⁷ They believed there were enough able-bodied men to fill the ranks and still not damage those material interests of the country. Various problems with the Conscription system were raised, but the most criticized provision was the exemption bill.⁴⁸ In October, the Confederate Congress passed an amendatory act exempting new classes, but also, more importantly, made a true effort to curtail the abuses of the system that had often been practiced by shirkers.⁴⁹ The act required an Affidavit attesting to the facts of the employment, skill and the indispensability of the work being done by the person engaged in any of the industrial activities embraced by the act.

Despite the advantages of working for the NMB, desertion worsened as the war ground on. One group of deserters reached Union lines and reported that the recently destroyed saltpeter works near Gatewood, Virginia, had been reopened and was being worked with 100 slaves.⁵⁰ St. Johns greatest concern at the time was the large number of skilled workers who had gone over to the enemy because of interior pressure" caused by neighbors who were Union sympathizers. Desertion was a double-edged sword, because Union regiments in the area frequently suffered high desertion rates too. When these Union deserters were captured by Confederate forces, they could be used in NMB operations where required.⁵¹

The labor problem from the Conscription Bureau's point of view was somewhat different. Most of the NMB office workers were exempted from military service due to age or infirmity,

but most of the outside workers were healthy and of conscript age. Colonel John S Preston was responsible for ensuring that all eligible men were enrolled in the army, and for approving exceptions and providing work details. The difficulty came in making sure that everyone who claimed an exemption did so legally, and in making sure that those without valid exemptions were enrolled. Since his primary mission was to get men into the army, Preston was also hampered by the exemptions he had to grant and the number of conscripts he had to provide to outside agencies like the NMB. The NMB requested a large number of conscripts to support their operations, as did every other government agency.⁵²

St. John was reluctant to exercise his authority to impress slaves, but eventually did so. First, impressing slaves caused problems for the Confederacy because it usually took workers away from the agricultural base that fed the army and the population. Second, it would create discontent among the population impinging on private property rights of Southerners. Heeding eloquent appeals from Colonel Gorgas, the War Department recognized the need to assist the NMB.⁵³ In May 1862, the War Department ordered local army commanders to provide work details to nitro caves upon the request of any NMB officer. The NMB officer was required to report the status of their soldiers to local commanders monthly, and the local commander had to protect the nitro caves in his area.

The War Department also authorized the NMB to impress free Negroes, who would be paid and fed as NMB workers. The rules also specifically exempted NMB employees from the draft.⁵⁴ The authority to impress slaves did not necessarily help all locations, for example, only a small number of Tennessee's slaves lived in mineral rich East Tennessee. Most of the slaveholders in East Tennessee could not afford to own slaves or hire much outside help at all.⁵⁵ The relatively small number of slaves in East Tennessee reduced the labor pool for mineral

operations in the area. This problem could only become worse under Federal occupation when, in early 1864, able-bodied male slaves in East Tennessee were drafted into the Union Army.⁵⁶

As the government began to impress slaves for army service, slave owners got quotas for the number they were required to send. The slaves working on the railroads, in the quartermaster and commissary departments, Ordnance Department and the NMB were exempt from impressments, and their owners got credit for them on their quotas. Even as late as February 1865, this exemption remained in place.⁵⁷ As the war continued and labor shortages worsened, the officers of the Ordnance Department were asked to identify those workers who could be replaced by slave labor. The conscription act included free Negroes, but enrolling them was even more difficult than enrolling white men. All government agencies (including the Ordnance) wanted them, but they frequently fled to the Union lines. The Conscript Bureau tried to track them down and force them into the service, but this became impossible as the war went on.

Workers in most cases lived near the factories or mines they worked in every day. Because some locations were isolated, generally owners built houses close by for their workers. All dwelling houses were designed for multiple occupants, similar to bunk houses.⁵⁸ The expense of building quarters, while considerable, was probably outweighed by the advantages of having the work force nearby. Workers living on site did not have to be transported to and from homes elsewhere and could, theoretically, work longer and be more productive. Housing workers probably reduced desertion because the workers could be supervised continuously. It did not completely eliminate desertion, however, because most locations reported the loss of both white and black workers as late as July 1864. Workers who did not live nearby or were not billeted on site generally boarded locally.⁵⁹

Another critical problem at many of the operations, regardless of size or whether operated by private contractor or by the government, was feeding the workers. The government required the commissary department to provide food and forage and the quartermaster department to provide clothing to NMB workers. The commissary department had difficulty feeding all soldiers, and the NMB was no exception. Operators of some caves chose to purchase rations locally. The average ration for a worker depended on the availability of food. On the average, each worker received one-half pound of bacon, one and one-half pounds of meal, and occasionally a small amount of vegetables. Typical forage ration gave each animal twelve pounds of corn and fourteen pounds of hay per day.⁶⁰ This however, was reduced as the situation required, in one instance, the operators of Long Hollow Cave discontinued the use of their ox team because forage was scarce.⁶¹

By late 1864, the War Department needed all available soldiers in the lines, so it demanded that its bureaus reduce their use of conscripts and draft-eligible men wherever possible. As the war dragged on, the labor problem worsened and enemy operations stopped or disrupted many of the saltpeter mining operations, some more than once. The NMB continued to operate more or less uninterrupted until the watershed year 1863. As Confederate fortunes began to wane that summer, the NMB lost territory. First to fall to the Union Army of the Cumberland under Major General William S Rosecrans was Jackson County, Alabama, with its numerous caves. Rosecrans pushed southward out of Tennessee, crossing the Tennessee River at Chattanooga. He was delayed for a day in his eastward move into Georgia in preparation to attack Chattanooga, and he used the time to explore Hill's Cave (now called Long Island Cave), a saltpeter mining operation near Cave Spring.⁶²

In early 1864, The War Department authorized workmen to arm themselves for local defense and directed Army commanders to protect NMB operations in their areas. St. John sent instructions to his district superintendent to organize their workmen into units capable of repelling small “irregular” forces. This training and organization proved worthwhile, as St. John later wrote in his annual report for 1864. Workers in several districts in Virginia, Tennessee, and Alabama had successfully resisted incursions in their areas and had been mentioned favorably in army reports.⁶³

One of Confederacy’s biggest problems was dealing with Union partisans. When General Edmund Kirby Smith took command of the Department of East Tennessee in March 1862, he found the troubles inside his lines almost as great as those outside. The partisans were a constant harassment, and Kirby Smith quickly discovered that his forces were inadequate to keep the peace.⁶⁴ In April, he persuaded President Davis to declare martial law in East Tennessee against the Union raiders wreaking havoc throughout the region.⁶⁵ When Brigadier General D. S. Donelson replaced Kirby Smith in January 1863, he complained to Secretary Seddon about the difficulty in dealing with the disloyal citizens. The problems were so serious that Donelson stationed additional troops in East Tennessee to quell Unionist feelings and protect the Confederate infrastructure.⁶⁶ Some of the miners, having taken the exemption to avoid service to the Confederacy, continued to agitate and cause trouble at the mines. Secretary Seddon advised Donelson that he might use the conscript law to control problem workmen by enrolling them in the army. He cautioned, however, that because of the importance of the NMB mission, he would have to replace any of those men taken.⁶⁷

The Confederacy’s lack of manpower has long been a reasons cited for the Confederacy’s defeat. Because most of the natural resources were located in Southwest Virginia and Unionist

East Tennessee, finding willing workers was difficult. Their efforts to overcome enemy action, disloyal citizens, competing requirements, and bureaucratic problems were admirable but, in the end, ineffective. While the number of both whites and Negroes listed on the Ordnance department and NMB returns may have seemed impressive, they were in reality just a “snapshot” of one day’s personnel strength figures. These figures do not account for all the time lost when slaves, free Negroes, or Unionists escaped to the North or when men were falsely conscripted. As late as February 1865, Gorgas was asking for some 6,000 men to be attached to the ordnance department and “an adequate force” attached to the NMB.⁶⁸ Gorgas still clearly saw manpower as one of his critical problems in both organizations, even given the large numbers already assigned to the NMB.

SECTION 5: CONCLUSIONS

A progressively more serious problem was enemy action. Advancing Union armies regularly captured or destroyed the rolling stock, rails, trestles, depots, and platforms. Unionist partisans in upper East Tennessee conceived a plan to disrupt communications between Virginia and the rest of the Confederacy by simultaneously burning nine bridges on the Virginia and Tennessee railroad. In November 1861, a small band of Union sympathizers attacked the bridges, destroying five of them. The Confederate army quickly sent in troops to protect the remaining bridges, and the bridge burners were found, tried, and executed. The Confederate government began repair work immediately, but rail traffic was disrupted for a time and supplies had to be re-routed. This particular setback was only temporary but foreshadowed the difficulties encountered when East Tennessee fell to Federal forces two years later.

Transportation and labor problems hampered the work of the Ordnance Department and the NMB. Raw materials were located primarily in Southwest Virginia and East Tennessee, but

the powder mills ironworks work located further east in Richmond, Nashville, Atlanta and Augusta. Keeping those factories and mills running at full capacity required uninterrupted transportation. After Tennessee fell to the Union and fighting tore up the railroads, cargo shifted to a more circuitous routes that slowed an already ponderous journey, and the situation only worsened during the war.

The Confederacy never ran out of saltpeter during the war, but it also never reached self-sufficiency through domestic production. The three critical components of the weapons and ammunition industry, raw materials (NMB), manufacturing (ordnance department) and transportation (quartermaster department) formed a mutually supporting triad. The arms and gunpowder industries could not function at peak efficiency unless all three components operated reliably. Two of those, heavy ordnance production and gunpowder manufacturing, worked well despite challenges associated with identifying resources and setting up production facilities.

The Confederacy had much of the mineral wealth and manufacturing capability it required to pursue the war, yet it found itself hampered by the same problem that plagued production: labor, transportation, and defense. The iron industry experienced its own paradoxical situation as rails were being torn up on some lines to be re-cast into cannons, but the decrepit railroad transportation system could not afford to lose any rails. Ammunition shortages drove units to make their own ammunition and spurred unique methods of collecting lead to be recast.

The shortcomings of Confederate war industry resulted not from a lack of mineral resources or a manufacturing capability, but from an inability to move, man, and protect them. As the primary agency responsible for marshaling these resources, the NMB established and maintained a system to exploit them. Two factors prevented its complete success: inadequate transportation systems and personnel problems. Though the Civil War was notable for its first

use of railroads for military purposes, the South's rail transportation network was too inefficient and overworked to sustain the traffic required by the armies and developing industry.

Though it was an agrarian society, the antebellum South possessed substantial industrial resources. Despite initial government fumbling the Ordnance Department quickly identified its available resources and began to develop a system for extracting them. The methods the Ordnance Department and the NMB chose were both comprehensive and innovative. The Ordnance Department's goal (and later the Niter and Mining Bureau's goal) was to make the Confederacy self-sufficient in war material production. They were never able to do this, but the combination of domestic production and foreign procurement ensured that the Confederacy never ran out of arms and ammunition.

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