

**ANVIL OF CERES: THE FOUNDRY AT WALLER CREEK**

**THESIS**

**Presented to the Graduate Council of  
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**by**

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## PREFACE

My mom's people lived in Mississippi. After General Pemberton surrendered Vicksburg to General Grant on July 4, 1863, they simply refused to observe the Fourth--at least, until 1943. They knew how to hold a grudge. My kinfolk and their friends told me stories about those they knew who fought and lived through "the War." Their stories made our Civil War something "real" to a ten year old Southern boy. I heard those stories ninety years beyond the war's end, but it seemed only days away and in my own backyard. Part of it was my neighborhood, since Vicksburg was only an hour and a half east of us. I wanted to know more about my people, and those whom they fought, and why. Many years since then, I decided to return to school, to history, to find some answers.

This thesis took root, in part, because the Waller Creek foundry was practically in my own Texas backyard. Twenty minutes up I-35 from where I live was the site of a little-known enterprise, cobbled hastily together to fabricate cannon. By using the Waller Creek foundry as metaphor for the South, I thought it might be easier to understand how the failure Confederacy's agricultural-based society to conduct a modern war. The foundry was almost doomed from the

start. Unless it is the Hindenburg, the Titanic, or the Alamo, we tend to ignore failures. While some contemporary historians want to equate the Confederacy's defeat with America's repudiation of slavery, I believe it represents the demise of a culture whose time had passed. It took a war to purge the rural social order to make way for industrial America. The Confederacy failed to survive because its culture did not continue to evolve. I wanted a means to illustrate that point, and believe that the Waller Creek foundry does so.

From my time as a "old undergrad" to my more exalted "graduate student with experience" status, Dr. Everette Swinney was a constant source of encouragement. It was he who indulged my predilection for the military aspects of the Civil War during his undergraduate class. He piqued my interest about the many other facets of this conflict, and, instead of tackling a strict military topic, I found myself examining another aspect of "the War." My thanks to him for guiding me through this thesis and keeping me on track.

Dr. Mary Brennan and Dr. James Pohl served on this thesis committee. Under Dr. Pohl, I began to consider western theater of "the War" through my study of General Albert Sydney Johnston. Dr. Brennan's class was my first step toward understanding Viet Nam, the war that I saw firsthand. Both of these faculty have provided me a chance to grow intellectually. I am grateful to both for having given me that chance and for serving on my committee.

The faculty of the History department at Southwest Texas State University provided a kind of laboratory where I evaluated my American experience. From the Privy Councils of Tudor England to the Cold War in America, a whole picture developed of the society in which I grew up. However imperfect my application and understanding of those classes, I gained a deeper appreciation of what I have encountered in fifty-plus years. To the faculty, I offer my deepest thanks.

The staff at the Texas State Archives provided not only the documents I needed, but also their assistance to find that which was most helpful. A special thanks goes to them, especially Donaly Brice who set me off in the direction I needed.

During graduate school, I had the assistance of the finest excuse for an editor that anyone could ever have. Esther Callais became my closest friend, collaborator, critic, and, on occasion, cheerleader. She read over many papers, rescuing them from trespasses of questionable logic and punctuation. All this she did while pursuing her own master's degree. In large measure, this thesis came together because of her help. To you, Esther Louise, I can only say thank you for all you endured, and, "hugs."

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## INTRODUCTION

Invariably, studies of the American Civil War begin and linger in the eastern theater. Most historians frame the War's causes, its conflicts, and its aftermath in terms of the Cis-Mississippi theater. The West, the Trans-Mississippi, had no Antietams or Gettysburgs, and lacked the drama of large-scale battles. Like the South, the Trans-Mississippi had a predominantly rural culture and had not begun to develop an industrial base. Because of this, the Trans-Mississippi lacked sufficient means to wage the kind of war that developed between 1861 to 1865. Robert Kerby described the Confederacy as an eighteenth-century society attempting to support a nineteenth century army fighting a twentieth century war.<sup>1</sup>

While many Southerners eagerly wanted this conflict, their new country had not prepared adequately for it. Among other things, the Confederacy needed a strong industrial base and a transportation system to support it. Without industrial capability, the South had no means to provide sufficient quantities of uniforms, blankets, saddles, or other equipment for its military. With no industry, the Confederacy lacked the means to provide field and coastal artillery. The presence

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<sup>1</sup> Robert L. Kirby, *Smith's Confederacy: The Trans-Mississippi South 1863-1865*, (New York: Columbia University Press, 1972), 57.

(or absence) of artillery has broader meaning than an army's capability to wage war. The American Civil War brought large infantry units into conflict with each other. While the Confederacy conducted ranger-style raids, the War's outcome did not hinge on units such as those of John Singleton Mosby. Thousands of men maneuvered over open areas or attacked and defended fortified strategic points. Field artillery overwhelmed the enemy, or evened lopsided numerical advantages. The psychological effect, if not the actual combat toll, was significant. The effect of artillery on lines of battle or on fortifications provoked fear and confusion enough to carry the day for the army successfully employing its "long arm."

The South had three options to acquire artillery: capture, purchase, or manufacture. Only a Southern-controlled armaments industry could provide munitions for the Confederate armies, but the conversion from farm to factory was complex and difficult. The absence of an industrial infrastructure was fatal in the Confederacy's capacity to fight a modern war. The South had to fight at the same time it attempted to transform the very nature of its society. While the North already possessed the capacity to make weaponry on a grand scale, most of the South lacked the most basic mechanical knowledge to establish, let alone operate, a military-industrial arm. Texas fared no better than did the other ten member states, and had more problems than most of the others.

Many historians view it axiomatic that Texas had no means to provide any sort of artillery. Historian T. R. Fehrenbach (*Lone Star*), however, mentions an attempt made in Austin, at Waller Creek by a foundry established and directed by the state government.<sup>1</sup> The Waller Creek enterprise experienced the same problems not only of Texas but the entire South to develop an industrial base while opposing a well-equipped invading army. Financial records and correspondence from the State Archive collections in Austin reveal problems at the state's foundry with obtaining raw materials and experienced workers, the same kinds of problems that plagued Tredegar Iron Works in Richmond, Virginia, and Shelby Iron Works in Alabama. While Tredegar and Shelby foundries have received attention, we know little of Texas's only state-run foundry. Waller Creek is representative of the Trans-Mississippi's military-industrial condition. As a metaphor, this Austin-based enterprise reveals the means by which the frontier region of the Confederacy responded to the threat of major warfare. We know little about how Texas and the Trans-Mississippi prepared to build an army. It is necessary, however, before focusing on Texas, to begin in the east, where the War erupted.

Among single-volume histories of the Civil War, James McPherson's *Battlecry of Freedom* provides one of the better overall views of the nation.<sup>2</sup> McPherson's volume expands customary studies

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<sup>1</sup> McMillan Publishing Co., Inc, 1968; Collier Books, 1980, 357.

<sup>2</sup> New York: Ballantine Books and Oxford University Press, Inc., 1988.

of the Civil War with descriptions of nineteenth-century America's economics and social conditions. McPherson devotes little time to the western edge of the Confederacy, and *Battlecry* does have a slight Union bias. Shelby Foote's three volume history departs from more traditional histories of the Civil War, and incorporates a great deal of detailed information without losing the reader.<sup>3</sup> If McPherson has a slight Union bias, Foote leans slightly toward the Confederacy. Foote intentionally neglected to use footnotes, insisting that they detracted from the narrative flow. The lack of footnotes, however, does not detract from the value of his work, although specific sources of particular incidents would have been convenient. The more traditional style of scholarship lies in E. Merton Coulter's history of the South which focuses on industrial potential that lay the South's its eastern states.<sup>4</sup> Coulter discounts Texas's contribution to the Cis-Mississippi states after Vicksburg's loss and, therefore, cuts off any examination of the frontier regions after July 1863.

Several general background histories, including McPherson and Foote, include abbreviated descriptions of the South's diplomatic relations. In addition to achieving international recognition, the Confederacy had to buy war matériel, including artillery, from foreign suppliers. Frank L. Owsley supplemented the general examinations of

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<sup>3</sup> Shelby Foote, *The Civil War: A Narrative: Fort Sumter to Perryville*, (New York: Random House, 1958).

<sup>4</sup> E. Merton Coulter and Wendell H. Stephenson, ed, *A History of the South. Vol 7. The Confederate States of America 1861-1865*, by E. Merton Coulter, (Baton Rouge: Louisiana State University Press, 1950).

Confederate overtures to gain European allies in a 1931 study.<sup>5</sup>

Owsley maintains that cotton by itself could not maintain the South's leverage with world powers. The lack of diplomatic and battlefield victories handicapped the Confederacy's ability to buy weapons from international sources.

Nearly all munitions bought in Europe had to evade Union blockaders off the Southern coastline. Armaments arriving in Southern ports began their transfer in various foreign arsenals and other markets threatened by local government sanctions as well as competition among different buyers. Hamilton Cochran's *Blockade Runners of the Confederacy* describes the building the cargo vessels and the runs from Europe to various ports on the eastern coastline.<sup>6</sup> Owsley's *Diplomacy* incorporated material about the arms deals and diplomatic entanglements. James Bulloch acted as a civilian agent on behalf of the South in Europe to obtain supplies and vessels. His memoirs provide one of the best first-hand accounts of the problems in finding both blockade runners and munitions.<sup>7</sup>

A thoughtful examination of the Trans-Mississippi requires good general background reading. *The Civil War in the Western Territories*, by Ray Colton, and *The Civil War in the American West*, by Alvin

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<sup>5</sup> Frank L. Owsley, *King Cotton Diplomacy: Foreign Relations of the Confederate States of America*, (Chicago: University of Chicago Press, 1931).

<sup>6</sup> New York: The Bobbs-Merrill Company Inc., 1958.

<sup>7</sup> James D. Bulloch, *The Secret Service of the Confederate States, or, How the Confederate Cruisers Were Equipped*, (New York: Sagamore Press, 1959).

Josephy sketch the background into which Texas fit during this period.<sup>8</sup> Josephy's volume, the more recent of these two, offers several reasons for western support of secession. The connection between Texas and Richmond during this period was primarily a military bond. To understand the concerns of the Richmond government and its difficult relationship with its westernmost commanders, Steven Woodworth's *Jefferson Davis and His Generals* is useful.<sup>9</sup> Of particular interest, however, to understanding the Trans-Mississippi formed by the Confederate states west of the Mississippi River, is Robert Kerby's *Kirby Smith's Confederacy*, cited above. This volume provides the best insight into the conditions of the Trans-Mississippi. Kerby's narrative examines Texas's geography and people, analyzing the state's assets and liabilities to pursue secession. Florence Holladay's study expanded enlarges Kerby's history with an analysis of Smith's command structure and his relationship with civilian authorities throughout the Department.<sup>10</sup>

Two major figures dominate any study of artillery, especially in context of the Cis-Mississippi. Josiah Gorgas commanded the Confederacy's Ordnance Bureau, and accomplished miracles in providing arms to the Confederate army. Frank Vandiver's biography,

<sup>8</sup> Alvin M. Josephy, Jr., *The Civil War in the American West*, (New York: Alfred A. Knopf, 1991); Ray C. Colton, *The Civil War in the Western Territories*, (Norman: The University of Oklahoma Press, 1959).

<sup>9</sup> Lawrence: The University of Kansas Press, 1990.

<sup>10</sup> Florence Elizabeth Holladay, "The Powers of the Commander of the Confederate Trans-Mississippi Department I," *The Southwest Historical Quarterly* 21, (January 1918): 279-298.

*Ploughshares Into Swords*, focuses on Gorgas's leadership and the results he achieved during his tenure at the Bureau.<sup>11</sup> Former Southwest Texas State University graduate student, Steven Collins, focused on Gorgas's role to rush armaments into the ranks of an infant military in his graduate thesis, *From Pikes to Gunpowder: The Arming of an Agrarian Nation*.<sup>12</sup> This thesis also includes a valuable bibliography. Frank Vandiver had a more broad view of Gorgas's task to provide military equipment to Confederate armies, but his conclusion, as Collins's, was that Gorgas accomplished that job in a master fashion.<sup>13</sup>

The other major figure is a corporate one, the Tredegar Iron Works in Richmond, Virginia. A larger, more successful venture than the Waller Creek foundry, the Tredegar Iron Works, under the direction of Joseph Anderson, produced almost half of the South's manufactured cannon. Charles Dew's *Ironmaker To The Confederacy* is a detailed history of Tredegar during the Civil War, relying extensively on primary source collections.<sup>14</sup> *Ironmaker* stands as a major work on Confederate industry in general and munitions production in particular.

Alabama's Shelby Iron Works falls between the accomplishments of Tredegar and the limited achievement of Waller Creek. In 1948,

<sup>11</sup> Austin: The University of Texas Press, 1952.

<sup>12</sup> Steven G. Collins, "From Pikes to Gunpowder: Josiah Gorgas and the Arming of an Agrarian Nation," (MA thesis, Southwest Texas State University, 1992).

<sup>13</sup> Frank E. Vandiver, "Makeshifts of Confederate Ordnance," *The Journal of Southern History* 17 (May 1951): 180-193.

<sup>14</sup> New Haven: Yale University Press, 1966.

Frank Vandiver documented his examination of that industrial firm's experience with central and local Confederate governments. The evidence gathered by Vandiver seems to indicate that, while Shelby managed to fulfill most of its government contracts, it managed to do so in spite of considerable regional and legal problems, including inadequate railroads and crippling conscription laws.<sup>15</sup>

The two most helpful encyclopedic reference works were the *Historical Times Illustrated Encyclopedia of the Civil War*, edited by Patricia Faust, and the four volume *Encyclopedia of the Confederacy*, edited by Richard Current.<sup>16</sup> Both are comprehensive works, scholarly in their content, and include articles from respected authorities. The *Encyclopedia of the Confederacy* covers more topics but the *Historical Times Illustrated Encyclopedia of the Civil War* is more convenient. While this kind of tool provides good summary overviews, be cautious in their use. Some entries in a 1997 Civil War encyclopedia proved materially inaccurate when contrasted to other sources.

*War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies* is a mainstay reference work for almost every Civil War scholar and student. In one hundred twenty-

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<sup>15</sup> Frank E. Vandiver, "Shelby Iron Company In the Civil War: A Study of Confederate Industry." *The Alabama Review* 1 (January 1948): 12-26; Idem, "Shelby Iron Company In the Civil War: A Study of Confederate Industry." *The Alabama Review* 1 (April 1948): 111-127; Idem, "Shelby Iron Company In the Civil War: A Study of Confederate Industry." *The Alabama Review* 1 (July 1948): 203-217.

<sup>16</sup> Patricia L. Faust, ed., *Historical Times Illustrated Encyclopedia of the Civil War*, (New York: Harper and Row, Publishers, 1986); Richard N. Current, ed, *Encyclopedia of the Confederacy*, (New York: Simon and Schuster, 1993).

seven books, atlas, and index appear battle orders, after-action reports, correspondence, and a wealth of primary source material. Searching through *Official Records* meant beginning with the index and slowly working toward a specific volume. The Guild Press of Indiana has cut the researcher's time in locating and reading this material with its *Civil War CD-ROM*, which allows search definitions that produce every location containing the name of the search target. This electronic capability reduces search time materially and is a superior alternative to the physical volumes.<sup>17</sup>

Technology has provided several internet sites on Civil War subjects. Like the encyclopedic sources, these sites require assessment for accuracy and content. Frequently, aficionados who "fight the war" cloud legitimate information with rhetoric. Select sites provided useful information about Civil War artillery and its accouterments. Other traditional sources of scholarly information now appear on the web (such as the *Texas Handbook* and the *United States Historical Census Browser*). With internet use becoming more universal, the researcher should locate general sites appropriate for his/her field, and expand to specialized sites.<sup>18</sup>

Without the concern for developing its industrial capability as it did its agricultural strength, the South entered the Civil War without a

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<sup>17</sup> Washington, D.C.: 1880-1901; reissue, *The Civil War CD-ROM*. (Carmel, Indiana: Guild Press of Indiana, Inc., 1997).

<sup>18</sup> *The Handbook of Texas Online*, <<http://www.tsha.utexas.edu/handbook/online/index>>; *United States Historical Census Browser*, 1860 Census, <http://fisher.lib.Virginia.EDU/cgi-local/censusbin/census/cen.pl>.

base from which to expand. States rights, competition for resources, and conflicting priorities stifled industrial development. While Northern industry had continued to emerge and develop from the time of the American Revolution, Southern industry failed to make significant progress in the Confederacy's rural culture. Instead of allowing market forces to shape manufacturing policy, the Confederate government made half-hearted attempts to direct industrial expansion. Charles Ramsdell, former faculty member of the History department at the University of Texas at Austin, examined the Confederacy's attempts to control production to the point of almost creating an American socialist government.<sup>19</sup> Inadequate Southern railroads had significant impact on Confederate production, another Ramsdell subject.<sup>20</sup>

Texas fared little better than the South with its own industrial situation. Vera Dugas alludes to the lack of significant industrial development by the outbreak of the Civil War's. Mere cottage industries in Texas reflected its frontier character and did not reflect a serious growth trend in 1860.<sup>21</sup> Kerby has much to say about the modest rail system in Texas and the implications of its limited reach. E. T. Miller's study suggests that the financial strength on which any

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<sup>19</sup> Charles W. Ramsdell, "Confederate Control of Manufacturing," *The Mississippi Valley Historical Review* (December 1921): 232-249.

<sup>20</sup> Charles W. Ramsdell, "The Confederate Government and the Railroads," *The American Historical Review* 22 (July 1917): 794-810.

<sup>21</sup> Vera Lea Dugas, "Texas Industry, 1860-1880," *The Southwest Historical Quarterly* 59 (October 1955): 151-183.

industrial growth depends did not exist, even before the War broke out.<sup>22</sup> Recognizing the handicap, however, of its limited production ability, the Trans-Mississippi attempted a combination of market and industrial solutions to furnish armaments and supplies that had limited success.<sup>23</sup>

In the absence of more descriptive records from William Carton or Ralph Hooker, the foundry's two supervisors, I relied on Captain John Gibbon's 1860 book, *The Artillerist's Manual*.<sup>24</sup> Gibbon accumulated into one volume the most current techniques and technical knowledge of artillery science utilized by the United States military. Inasmuch as both sides depended on textbooks from authorities such as Gibbon, for artillery, and William Hardee, for tactics, it is not unreasonable to believe that Carton and Hooker may have been familiar with Gibbon's *Manual*.

The search for primary material began with Fehrenbach's reference to the Austin foundry. The Waller Creek foundry, along with the state percussion cap factory and the cotton board, came under legal authority of the Texas State Military Board, which is best chronicled in Charles Ramsdell's "The Texas State Military Board,

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<sup>22</sup> E. T. Miller, "The State Finances of Texas During the Civil War," *Texas Historical Association Quarterly* 14 (July 1914): 1-23.

<sup>23</sup> William T. Windham, "The Problem of Supply in the Trans-Mississippi Confederacy" *The Journal of Southern History* 27 (May 1961): 149-168.

<sup>24</sup> John Gibbon, *The Artillerist's Manual*, (New York: D. Van Nostrand, 1860. Reprint, Westport, Connecticut: Greenwood Press, 1971).

1862-1865" (*Southwest Historical Quarterly*).<sup>25</sup>

The archive collection consists of several files which include correspondence, financial material, and legislative reports.<sup>26</sup> Examining this quasi-commercial enterprise through its financial fingerprints seemed the best strategy, and the most complete record existed in day book number ninety-eight, which covers the year 1863, the only year that the foundry at Waller Creek conducted operations entirely under state supervision. The day book is a financial record, kept in chronological order, on much the same basis as a business general journal. Day Book Ninety-Eight contains six projects: fabrication of a battery of cannon, foundry tool production, percussion cap factory support, agricultural projects (also called "special projects"), the "Magruder" project, and the "Tornado Cannon" project. Daily entries record the investment of labor and raw materials on the left (or debit) side. The right or credit side records either direct cash payments or cash revenues. Other foundry charges, such as minor general supplies and weekly payrolls appear in cash blotters not included in this study because the day book captures the same information related to war production. By "following the money," a silhouette of Texas war time industry faintly appears, and its shape provides clues to the reasons for Texas's and the South's inability to fabricate their own munitions. Although the state failed to produce ordnance at the foundry and had

<sup>25</sup> Charles W. Ramsdell, "The Texas State Military Board, 1862-1865," *The Southwest Historical Quarterly* (April 1924): 253-275.

<sup>26</sup> Texas State Foundry Collection 1863-1865, Texas State Archives, Austin.

to turn, finally, to a private company to succeed, the foundry's history provides a unique chance to analyze one of the reasons for the failure of the Trans-Mississippi Department and the Confederacy that led to the surrender at Appomattox.

## CHAPTER 1

### IN SEARCH OF VULCAN: BRINGING ARTILLERY TO THE CONFEDERACY

In Charleston, South Carolina, at 4:30 Friday morning, April 12, 1861, Edmund Ruffin pulled the lanyard on the cannon firing the first shot of the American Civil War. Forty-seven howitzers and mortars joined in the bombardment from Cummins Point on James Island just below Ft. Sumter. None of Confederate General P. G. T. Beauregard's ordnance came from the seventy-one pieces captured when the South Carolina state troops occupied the forts and arsenals around Charleston in December 1860. War preparations had begun a decade before. Wary of encroachment against its sovereignty by the federal government, the South Carolina legislature passed the Defense Act of 1850, which authorized a sizable militia and a State Ordnance Department. The legislature appropriated \$300,000 in defense against possible invasion by the North. In 1851, State Ordnance Officer, Major James H. Trapier, placed an order for howitzers, mortars, and cannon from Joseph R. Anderson and Company (later to become the Tredegar Iron Works). Ammunition came from the Charleston firm of J. M.

Eason, and a Connecticut firm secured a contract for eighty thousand pounds of cannon powder.<sup>1</sup>

By 1860, artillery had become an essential component of credible armies. Artillery science benefited from innovations in improved gunpowder, better metallurgy, and revised tactical employment. The Union's most formidable military asset was its artillery which grew out of the North's industrial might. The Confederacy's reliance on its agricultural economy placed it at a disadvantage for equipping its armies with cannon. Over the four-year conflict, Southern artillery production never overcame the North's advantage in numbers and quality.

The Confederacy had only three options for acquiring ordnance: capture on the battlefield, procurement from sources outside the Confederate states, and domestic production. To realize success from this narrow spectrum of choices, Confederate President Jefferson Davis selected Josiah Gorgas, a Northern-born former U. S. Army Ordnance Corps officer who had come highly recommended by General Beauregard.<sup>2</sup>

Gorgas, who graduated from West Point, sixth in his class of fifty-two cadets, had spent his military career in arsenals and depots. His marriage to an Alabama woman and his aversion to Union

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<sup>1</sup>Ashley Jr. Halsey, "South Carolina Began Preparing For War in 1851," *Civil War Times Illustrated*, October 1963, 8-10.

<sup>2</sup>Stanley L. Falk, "Jefferson Davis and Josiah Gorgas, An Appointment of Necessity," *The Journal of Southern History* 28, (February 1962): 86.

extremists caused him to offer his services to the Confederacy.<sup>3</sup> Bolstered by the support of General Beauregard, Gorgas accepted Davis's offer to the post of Chief of Ordnance and resigned his commission in the United States Army. On April 8, 1861, he assumed command of the Ordnance Bureau and began to assess the condition of military supplies throughout the South.

Although South Carolina had already acquired sixty-four pieces of ordnance from the Tredegar Iron Works by 1861, the rest of the Confederacy had not prepared adequately for war.<sup>4</sup> Most Southern states did not have serviceable artillery or ammunition. Arsenals within the South had been only depots during the war with Mexico. None of them, with the exception of the arsenal at Fayetteville, North Carolina, and Harper's Ferry, Virginia, had machinery beyond a foot lathe.<sup>5</sup> State arsenals held guns mounted on carriages dating from the War of 1812. Powder on hand dated from the Mexican War. The Confederacy had only a small number of iron twelve-pounder howitzers in storage. At the beginning of 1861, unfilled contracts with Northern foundries could deliver an additional 135 six-pounder carriages and caissons, 131 three-inch rifled guns, and more than a hundred other guns of various sizes, from twelve- to twenty-four-pounders. Some

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<sup>3</sup>Emory M. Thomas, "Gorgas, Josiah," in *Historical Times Illustrated Encyclopedia of the Civil War*, ed. Patricia L. Faust, (New York: Harper and Row, Publishers, 1986), 316.

<sup>4</sup>Charles B. Dew, *Ironmaker to the Confederacy*, (New Haven: Yale University Press, 1966), 13.

<sup>5</sup>Jefferson Davis, *The Rise and Fall of the Confederate Government*, (New York: D. Appleton and Company, 1881), vol. I, 472.

local artillery units had working guns, but they lacked harnesses, saddles, bridles, and the other equipment necessary for field assignment. The Confederacy had only 429 heavy guns, 375 of them in the area around Charleston, South Carolina.<sup>6</sup>

Concerned about these meager regional inventories, Gorgas realized that the Confederacy would have to safeguard all state-owned ordnance and distribute it carefully among the anxious field and coastal artillery units. It would require considerable diplomacy to negotiate with the various governors to relinquish state-held ordnance for defense beyond their individual borders. The Provisional Congress had authorized President Davis to receive all arms and equipment from the several states. To convince individual governors to comply, Gorgas would have to prevail against the prerogatives of states' rights.<sup>7</sup>

The approaching war would require more artillery than the South's inventory could supply. The reality of warfare meant replacing pieces destroyed in combat. Gorgas believed that domestic production provided the most secure resupply, but domestic production required long-term commitments. The Confederacy needed to buy the time for local manufacturing to produce results.<sup>8</sup> There remained two

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<sup>6</sup>Jennings C. Wise, *The Long Arm of Lee*, (New York: Oxford University Press, 1959), 37, 41; Frank E. Vandiver, "Makeshifts of Confederate Ordnance," *The Journal of Southern History* 17 (May 1951): 181.

<sup>7</sup>Wise, *Long Arm*, 85-86; Frank C. Vandiver, *Ploughshares Into Swords* (Austin: The University of Texas Press, 1952), 57.

<sup>8</sup>Vandiver, *Makeshifts*, 181.

immediate solutions for securing ordnance. The South could enter the international arms markets in Europe, and it could wrest guns from the enemy.

Of the Confederacy's reliance on captured Union artillery, historian Jennings Wise wrote, "Seldom has one belligerent so extensively equipped itself with arms and munitions of war at the expense of its adversary."<sup>9</sup> Abandoned guns and battlefield prizes provided opportune sources of field and defensive weapons. The Charleston area forts abandoned by the departing Union army held mostly heavy seacoast ordnance in the form of columbiads.<sup>10</sup> When the federals left the Gosport Navy Yard at Norfolk, Virginia, on April 21, 1861, they relinquished 1,202 pieces, ammunition, gun carriages, and other implements as well as over two hundred thousand pounds of gunpowder. Beyond the early "inheritances," the Confederate army expanded their artillery parks with Union bronze Napoleons and cast iron Parrott rifles captured in battle.<sup>11</sup>

The chance to seize ordnance occasionally influenced a campaign beyond strategic concerns. Confederate officers might take greater

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<sup>9</sup>Wise, *Long Arm*, 59.

<sup>10</sup>The columbiad was a smoothbore heavy artillery piece that fired projectiles at a high degree of elevation. Used for harbor and channel defense, the columbiad was a mainstay in U. S. coastal fortifications.

<sup>11</sup>The Napoleon cannon was one of the most popular smoothbore guns in either army. Named for its designer, French emperor Napoleon III, this gun fired a twelve-pound shell and had a range of 800 yards. The Parrott rifle was an American-designed weapon and could fire shells as heavy as thirty pounds up to a range of 2,500 yards.

risks when they had the potential for capturing new armaments.<sup>12</sup> At First Manassas, the Southern forces took twenty-eight cannon on the battlefield. General Robert E. Lee captured fifty-two pieces during the Seven Days campaign, and General Braxton Bragg's forces seized eighty-one during Bragg's 1862 Kentucky campaign. By the end of 1862, the South had increased its artillery count by 250 battlefield acquisitions, but losses the next year at Vicksburg and Chattanooga counter-balanced these gains.<sup>13</sup>

At best, combat seizures were only incidental and erratic. Confederate state governments began to scramble after weapons on domestic and international arms markets, inflating the prices of available inventories.<sup>14</sup> In 1861, several Confederate states independently sent their own agents north to purchase weapons and machinery. The central government appointed Raphael Semmes its agent for entering contracts to secure as much war matériel as possible before the commercial supply lines leading south withered away. With Davis's assistance, Semmes completed arrangements with third party intermediaries in New York for delivery of gun powder and other supplies, but the attack on Ft. Sumter effectively halted any

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<sup>12</sup>Wise, *Long Arm*, 59.

<sup>13</sup>Bell I. Wiley, *The Life of Johnny Reb* (New York: Book of the Month Club, 1994 [New York: Bobbs-Merrill Company, 1944]), 297-298.

<sup>14</sup>Steven G. Collins, "From Pikes to Gunpowder: Josiah Gorgas and the Arming of an Agrarian Nation" (MA thesis, Southwest Texas State University, 1992), 24.

further efforts by Semmes.<sup>15</sup> A *New York Times* editorial in August 1860 ridiculed the Confederacy's plight:

The South is thus demonstrated to be so poorly prepared for the dangerous experiment of independence, that not only does it lack the ordinary machinery of pacific progress but that even the immediate means of asserting its political individuality must be obtained from the contemptuous commercial enterprise of its rivals.<sup>16</sup>

Of war-time commerce, Confederate War Department Clerk John B. Jones noted, "The New England manufacturers are furnishing us, with whom they are at war, with arms to fight with, provided we agree to pay them a higher price than is offered by their own government!"<sup>17</sup>

Before the Lincoln administration enforced restrictions on Northern trade with Southern states, the Confederacy sent agents to Europe to secure all manner of matériel. Among the best representatives was Caleb Huse, a Massachusetts native and West Point graduate. In April 1861, Confederate Secretary of War Leroy Walker empowered Huse to go to Europe on behalf of the new government to purchase arms and military supplies, including twelve thousand rifles, a battery of field artillery, and one or two large-caliber

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<sup>15</sup>Wiley, *Johnny Reb*, 286; Collins, *Pikes*, 30-31. Raphael Semmes's contribution to the Confederacy did not stop with the end of his career as a government purchasing agent. From 1862-1864, Semmes commanded the Confederate raider *C.S.S. Alabama*, which captured or sank fifty-five prizes, more than any other Confederate raider of the war.

<sup>16</sup>Dew, *Ironmaker*, 53.

<sup>17</sup>J. B. Jones, *A Rebel War Clerk's Diary* (New York: Old Hickory Bookshop, 1935), 78.

guns to become models for local production.<sup>18</sup> Upon arriving in England, Huse began immediately to buy rifles and high quality Austrian artillery on the strength of credit secured by the South's cotton reserves. By April 1863, Huse had shipped to the Southern states an impressive inventory of 139 cannon, including fifty-four smooth bore bronze guns, six rifled Blakely cannon, and thirty-two Austrian rifled steel guns. In addition, he signed contracts to deliver ammunition, powder, and metal for fabrication. By February 1863, his shipments to the Confederacy included 484,500 pounds of gunpowder and 89,900 friction tubes (firing devices).<sup>19</sup>

Huse often faced competition for European arms. In May 1861, he attempted to secure the entire output of the London Armoury, but as he entered the superintendent's office, he met W. F. McFarland, an agent for the state of Massachusetts, who had just contracted to buy one hundred rifles a week for the next three months. Huse did not give up. When he returned a week later, he was told that the British government had placed restrictions on the balance of the Armoury's production. Despite this setback, Huse made alternate arrangements through brokers whose efforts, according to Colonel Schulyer, principal Union purchasing agent, had nearly garnered all available arms from the

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<sup>18</sup>Henry I. Kurtz, "Arms for the South," *Civil War Times Illustrated*, April 1967, 13-14; Peggy Robbins, "Caleb Huse, Confederate Agent," *Civil War Times Illustrated*, August 1978, 32.

<sup>19</sup>William Diamond, "Imports of the Confederate Government from Europe and Mexico," *The Journal of Southern History* 6 (November 1940), 479-480. Diamond and Wise differed by eight guns in their tally of Huse's procurement. Diamond's count includes two rifled iron howitzers and six 12-pounder rifled iron guns that Wise fails to mention.

British market.<sup>20</sup>

Further complications in munitions procurement resulted because agents from the separate Southern states bought armaments of various makes and calibers. In the rush for weapons the South sacrificed the advantage of standard calibers. Gorgas finally overcame the problem in 1862 when he established the .577 caliber as the regular Confederate issue.<sup>21</sup>

Huse also managed to get plans critical for making modern artillery from ordnance contracts he had signed in his capacity as an agent for the Confederate government. From Sir William Armstrong, he received detailed drawings of the Armstrong cannon. On another occasion, Huse and a colleague gained entrance to the French Museum of Artillery, where Huse slipped into a restricted area, a large artillery park containing several guns kept from public view. When challenged by a sentry, Huse managed to escape while his colleague (who had arranged the visit) had to face angry French guards. The embarrassed friend escaped with only a warning. Huse, in the meantime, made a drawing of the gun carriage to send back to the Confederacy.<sup>22</sup>

Huse delivered a significant quantity of artillery to the South. James Bulloch, civilian agent for the Confederate Navy, worked with

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<sup>20</sup>Kurtz, "Arms for the South," 14.

<sup>21</sup>Collins, *Pikes*, 35; Vandiver, "Makeshifts," 187.

<sup>22</sup>Robbins, "Caleb Huse, Confederate Agent," 34-35, 37. The Armstrong cannon was sought for its long range and accuracy, although the South never used many of this model weapon. It remained, however, in the British arsenal until 1900.

Huse in Europe. Of Huse, Bulloch wrote that the artillery Huse sent had a key role in the battles of Seven Pines and the Chickahominy, contributing significantly to Lee's Peninsula campaign. Huse succeeded in making successful large contracts for ordnance, Bulloch commented, even during times when there were no Confederate States funds in England.<sup>23</sup>

Delivery to the Confederacy of weapons procured by Huse and other agents proved no easy task. In April 1861, Lincoln proclaimed a blockade of the 3,549 miles of Southern coastline in an attempt to stop resupply of the Confederate war machine. To check the flow of contraband from neutral countries to blockade-runner bases in Bermuda and the Bahamas, the United States Navy enforced the doctrine of continuous voyage, confiscating cargoes intended for the Confederacy.<sup>24</sup> However, blockade running became a lucrative occupation for privateers and a lifeline for the Confederacy. Officially neutral countries shipped contraband across the Atlantic to blockade runner bases, then transferred the cargo to smaller, faster vessels bound for Southern ports. The lure of profits attracted so many European and even Northern merchants that highly profitable luxury

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<sup>23</sup>James D. Bulloch, *The Secret Service of the Confederate States, or, How the Confederate Cruisers Were Equipped* (New York: Sagamore Press, 1959), 53

<sup>24</sup>During the Napoleonic wars, the British navy seized U. S. ships with cargoes bound for neutral ports intent on carrying the cargo from the neutral sites into France. The British courts established the "doctrine of continuous voyage" as legal grounds for intercepting contraband even if the shipment went through a neutral port. During the American Civil War, the Union and British governments argued positions opposite their 1803-1815 assertions. Also see Stephen R. Wise, *Lifeline of the Confederacy: Blockade Running During the Civil War* (Columbia: The University of South Carolina Press, 1988), for additional background.

goods began to displace critical items including armaments. With so many government and private agents buying goods in Europe to send through the blockade, the Confederate Ordnance Bureau could not coordinate the priorities. Blockade runners brought the Blakely guns, Whitworth rifled cannon, and Napoleons to Southern ports. They also brought luxuries such as silk cloth, buttons, and shirts. It took until March 1864 before Gorgas brought order out of chaos by appointing Major T. L. Bayne to head the new Bureau of Foreign Supplies. From that point, the Confederacy imported only “articles of necessity and common use.”<sup>25</sup>

On November 12, 1861, the *Fingal* became the first blockade runner to reach a Southern port with cargo solely for the Confederate Bureau. With the *Fingal* came a “quantity of artillery.”<sup>26</sup> More artillery arrived in small numbers over time. In 1863, 129 field pieces arrived from Bermuda alone.<sup>27</sup> From November 1, 1863, to December 8, 1864, forty-three cannon came through the ports of Wilmington and Charleston. Records of transshipments from Europe to the Bahamas and from there into the Confederacy make it difficult to calculate the number of weapons that actually came into the Confederacy from Europe. However, the Bureau of Foreign Supplies appeared to work to

<sup>25</sup>Warren W. Hassler, “How the Confederates Controlled Blockade Running,” *Civil War Times Illustrated*, October 1963, 45, 47; Collins, “Pikes to Gunpowder,” 39, 42.

<sup>26</sup>Hassler, “How the Confederates Controlled Blockade Running,” 44. James Bulloch had bought the *Fingal* for the Confederacy. The *Fingal* set the record for the amount of war supplies successfully carried by a single blockade runner.

<sup>27</sup>Ibid, 48-49.

Gorgas's satisfaction.<sup>28</sup> In August 1863, Gorgas confided in his diary, "Our freight steamers continue to run . . . This is our chief source of supply for arms."<sup>29</sup> Union blockaders intercepted an estimated one in nine blockade runners in 1861. By 1863, however, the blockade cut the odds to one in four. In 1864, one in three runs succeeded.<sup>30</sup> Losses of key ports intensified the blockade's effect. In 1861, Port Royal fell, and in 1862, the Union captured Savannah, New Orleans, and Pensacola.<sup>31</sup> Davis wrote, "To us, who had to rely on foreign products and the open market, this was the equivalent to no security at all."<sup>32</sup> By the end of 1863, the South had little choice but to rely on its own resources to resupply its ordnance.

Cannon production required industrial means, and Confederate industry was not prepared for war. Industrial manufacturing produced armaments, and the North dominated the South in manufacturing. There were nearly five factories in the North for every factory in the South. The North possessed the advantage in industrial investment capital. Northern banks held \$4.02 for every \$1.00 in Southern bank deposits, and the North possessed \$1.66 in specie (that is, coined currency) for every \$1.00 of specie held in the South. Per capita

<sup>28</sup>Diamond, "European Imports," 471, 480.

<sup>29</sup>Josiah Gorgas, *The Civil War Diary of General Josiah Gorgas*, ed. Frank E. Vandiver (Tuscaloosa: University of Alabama Press, 1947), 57.

<sup>30</sup>Vandiver, *Ploughshares*, 103-104.

<sup>31</sup>Hassler, "How the Confederates Controlled Blockade Running," 49.

<sup>32</sup>Davis, *Rise and Fall*, 475.

investment grew almost equally in both regions during the 1850's, but the addition of more free states diluted the South's percent of national manufacturing from 18 percent in 1850 to 16 percent in 1860. Moreover, nearly half of the South's industrial capacity existed in the four border states, which were the most vulnerable to Union capture.<sup>33</sup>

The South had never encouraged industrial development. Cotton represented more than the region's wealth. It embodied a way of life which relied on slave labor for manual work. Slaves substituted for payroll employees, and the absence of wage workers failed to promote manufacturing interests. Southerners, moreover, held a passion for individualism. They recoiled at factory-shop hierarchy. Yet, between 1840 and 1860, many Southerners began to realize that their economy must adapt to compete.<sup>34</sup> "Our whole commerce except a small faction is in the hands of Northern men," complained one Alabamian.<sup>35</sup>

The Confederacy barely had the industrial resources to produce the cannon for its army. Only Tredegar Iron Works in Richmond, Virginia, and the nearby Bellona Foundry, had the capacity for significant ordnance production. However, Georgia had two smaller

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<sup>33</sup>James M. McPherson, *Battle Cry Of Freedom* (New York: Ballantine Books and Oxford University Press, Inc., 1988), 91, 94-95; Richard E. Ketchum, ed., *The Civil War* (New York: American Heritage Publishing Co, Inc., 1960), 78-79.

<sup>34</sup>Frank E. Vandiver, "Shelby Iron Company In the Civil War: A Study of Confederate Industry," *The Alabama Review* 1 (January 1948): 12.

<sup>35</sup>Joseph W. Lesesne to John C. Calhoun, September 12, 1847, in McPherson, *Battle Cry*, 92.

production facilities in Atlanta (Gate City Mill) and in Cartersville (Etowah Iron Works). Shelby Mill in Alabama and Cumberland Mill in Fort Donelson, Tennessee, also had potential to produce ordnance. Some foundries converted from peace-time production and attempted to manufacture ordnance. Quinby and Robinson in Memphis, Tennessee; Street, Hungerford, and Company also in Memphis; and Noble Brothers and Company of Rome, Georgia, fabricated guns under government contracts in lieu of antebellum production. Smaller foundries across the South had the capability to produce bar iron for local projects; but, without the border states' industries, the Confederacy lacked significant resources to provide heavy ordnance for its army and navy.<sup>36</sup>

The Confederate government did little to expand the South's industrial base even after hostilities began at Fort Sumter. The Davis administration adopted a paternalistic stance toward the establishment of industry. Very little government-owned production occurred because it lacked both investment capital and the capacity to make production machinery. Instead, the Confederate government contracted with several small businesses scattered among small towns and villages across the South. The War Department needed a central authority to coordinate production. Until the appointment of Josiah Gorgas as Chief of the Ordnance Bureau, the Confederacy had no single

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<sup>36</sup>Dew, *Ironmaker*, 87-89; Larry J. Daniel, "Manufacturing Cannon in the Confederacy," *Civil War Times Illustrated*, November 1973, 9-10.

local provider for cannon, mortars, and artillery equipment. Most foundries (Tredegar and Bellona being notable exceptions) lacked drawings, specifications, and expertise to cast ordnance. The situation yielded uneven output.<sup>37</sup>

Domestic production appeared the only secure means to supply the military. Gorgas wanted to concentrate production in a few central locations to promote efficiency. However, the deteriorated state of rail transportation compelled him to decentralize; and, in September 1861, he authorized depots and arsenal commanders to contract for small arms, cavalry equipment, and artillery. While Gorgas's concession to decentralize production expanded the South's industrial potential, it complicated distribution.<sup>38</sup>

As the highways for industry, railroads provided critical support to the foundries. In 1840, the South had 44 percent of the nation's railroad track, but vigorous construction in the North reduced the Southern share to 26 percent by 1850. Although the South would triple its rail mileage during the 1850's, the South's share increased only to 35 percent, still less than the North's 44 percent it had in the 1840's. Southern railroads suffered when the war began. As the government reduced cotton exports, traffic to and from the coast dwindled and revenues decreased. The blockade and military actions

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<sup>37</sup>Diamond, "European Imports," 484; Wise, *Long Arm*, 76; Daniel, "Manufacturing Cannon," 9.

<sup>38</sup>Vandiver, *Makeshifts*, 181, 184; idem, *Ploughshares Into Swords*, 80.

disrupted commerce. Railroads cut costs, including the salaries of skilled workers. The Confederate government conscripted many experienced railway workers, creating a shortage of veteran personnel. Railroad maintenance also suffered. During the war, many companies lacked sufficient engines and cars, and the rolling stock in service began carrying volumes heavier than their design capacity. Continuous use without sufficient maintenance gradually weakened the condition of rolling stock and roadbeds.<sup>39</sup>

In addition to falling revenues and dwindling assets, poor rail line conditions threatened timely shipment. Southern rail lines were short haul systems that did not link regions as the lines did in the North. Railroad lines in the South did not always connect with each other, even in towns where several lines terminated. Carriers had to unload freight, haul it across town, and reload it onto cars of the next carrier. The military complicated transfers if it impressed rail cars for wartime purposes. The Atlanta and West Point Railroad, which carried for the Shelby Iron Works in Shelby, Alabama, yielded to frequent government impressment and carried only government freight when drafted. Without the ability to bring in raw materials and ship out iron, the Shelby Iron plant found itself handicapped by decisions of the very government that it was trying to keep alive. By the end of 1863, government freight dominated rail traffic and paid the lowest rates.

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<sup>39</sup>McPherson, *Battle Cry*, 78-79; Charles W. Ramsdell, "The Confederate Government and the Railroads," *The American Historical Review* 22 (July 1917): 795, 797-798.

Despite the government monopoly on rail traffic, the Davis administration tried to avoid taking direct control of the rail system. Although state ownership in some railroads occurred, corporate-owned railroads could set priorities independent of the central government, claiming privilege under states' rights. In such cases, Confederate authorities declined to override state authority.<sup>40</sup>

Railroads had some leverage to resist national control, but industries did not. With few developed sources of raw materials such as lead, iron ore, and nitre, manufacturing enterprises scrambled to stockpile provisions sufficient to fill contract demands. Some amounts came through the blockade, but as the blockade tightened, local sources became more important. Civilian and military purchasers competed for the limited stocks of minerals and ores. The Ordnance Bureau recommended that the government confiscate inventories of raw materials. Requisitioning basic components occurred under both military orders and public law and grew out of desperation. The Nitre and Mining Bureau opened mines and developed, through contractors, its own furnaces and mills to produce large quantities of iron. The Nitre Bureau representative to the Shelby Iron Company had a dictatorial hold on bulk iron and complicated production because of his difficult personality. Through its control of raw materials, the

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<sup>40</sup>Ibid, 797, 806-807; Vandiver, "Shelby Iron" 1, 20. See also Robert C. Black III, *The Railroads of the Confederacy* (Chapel Hill: The University of North Carolina Press, 1952).

government exerted considerable influence on foundry output.<sup>41</sup>

Finding, employing, and keeping skilled workers presented the most difficult problem for Southern industry. Acknowledging the need for trained laborers in the foundries and furnaces, the government tried to recruit mechanics and technical experts from Europe, but its attempts failed to attract many workers. Shops and foundries relied on experienced men to train the unskilled. Military needs, however, took precedence, and the army could draft men from every occupation to fill the ranks. Conscription laws between 1862 and 1864 gradually narrowed the exemptions from military service. In response to Gorgas's plea for additional qualified workers, the army surveyed its ranks for trained mechanics and allowed their transfer for ordnance work if they could prove their skill. The power of the government through conscription, which provided or denied skilled workers, gave the War Department substantial leverage with manufacturers.<sup>42</sup>

The Confederacy built a near-social state that threatened the availability of raw materials and work force. The government never designed a bureau for controlling and regulating businesses providing armaments, although it could assert its will through its hold on

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<sup>41</sup>Ralph W. Donnelly, "Local Defense in the Confederate Munitions Area," *Military Affairs* 18, (Autumn 1954): 118; Vandiver, *Ploughshares Into Swords*, 147; idem, "Makeshifts," 183; John W. Mallet, "Work of the Ordnance Bureau," *Southern Historical Papers* 37, 37 (1909); quoted in William Albaugh, *Confederate Arms* (New York: Bonanza Books, 1957), 152; Vandiver, "Shelby Iron," 1:122 .

<sup>42</sup>Charles W. Ramsdell, "Confederate Control of Manufacturing," *The Mississippi Valley Historical Review* 8 (December 1921): 234-237; Albaugh, *Confederate Arms*, 152; Diamond, "European Imports," 485.

essential elements of production. Southerners resisted permanent changes that allowed government interference with individual and states' rights. Many civilians believed that the war would end quickly. In the wake of war's end, they did not want a rigid system that interfered with their personal rights. Southerners entered the war, sustained with passion but hobbled by states rights.<sup>43</sup>

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<sup>43</sup>Ramsdell, "Confederate Control of Manufacturing," 249. See also E. Merton Coulter *The Confederate States of America, 1861-1865* (Baton Rouge: Louisiana State University Press, 1950) and Clement Eaton *A History of the Southern Confederacy* (New York: Macmillan Company, 1956).

## CHAPTER 2

### NECESSITY OF THE STATE: THE TRANS-MISSISSIPPI AND TEXAS

The eastern seaboard contained Northern industry, Southern farmland, and the capitals of both the Union and the Confederacy. Not surprisingly, military strategy had, primarily, an eastern focus. Across the Mississippi River lay six hundred thousand square miles of Confederate territory that held 14 percent of the United States population. President Jefferson Davis intended to hold every bit of Southern land on both sides of the Mississippi. In order to prove its legitimacy before the world, the Confederacy would not allow its sovereign territory to be overrun by an invader. The war about to envelope the north American continent would involve larger armies than any others brought to bear by any American government, and these armies would require vast amounts of supplies. The more territory lost by the Confederacy, the less land it would have to provision its military forces.<sup>1</sup>

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<sup>1</sup> Robert L. Kerby, *Kirby Smith's Confederacy: The Trans-Mississippi South 1863-1865* (New York: Columbia University Press, 1972), 2; Alvin M. Josephy, Jr., *The Civil War in the American West* (New York: Alfred A. Knopf, 1991), 7, 10; Steven E. Woodworth, *Jefferson Davis and His Generals* (Lawrence: The University of Kansas Press, 1990), 18-19.

Agriculture dominated the Trans-Mississippi region. This area never suffered a shortage of beeves, domestic fowl, and other livestock. Gradually, many Western farmers shifted from cotton production to provide wheat, corn, oats, barley, and other grain crops for troops in the West as well as the East. Inadequate transportation facilities worked against the Confederacy; most of the West's produce never crossed the Mississippi, especially after the loss of Vicksburg. Cotton remained the primary medium of exchange to buy war matériel from overseas. The West's cotton output remained high even though the Confederate Congress passed resolutions calling for a reduction of cotton production as a means to raise the value of that staple on international markets. The West had the only unblockaded border in the entire Confederacy. Large quantities of cotton bales left through Matamoros to pay for large amounts of powder, sulfur, lead, cloth, and other goods. International trade provided more than one hundred thousand dollars annually to Mexican authorities controlling the border, as well as generous profits to shippers and planters.<sup>2</sup>

Defiance of cotton export resolutions manifested a sense of independence felt by many Westerners. In a vast, sparsely populated, frontier environment, separated from their central government by geographic distance and boundaries, Westerners could not rely on the Richmond authorities to provide much in the way of military supplies or

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<sup>2</sup> Kerby, *Smith's Confederacy*, 77-78; E. Merton Coulter and Wendell H. Stephenson, ed., *A History of the South. Vol 7. The Confederate States of America 1861-1865*, by E. Merton Coulter (Baton Rouge: Louisiana State University Press, 1950), 197.

guidance. However, Richmond looked to the West to provide beef, wheat, wool, and cotton beyond the arms that came through Western and Mexican ports. Distracted by the immediate military threat in the East, the Davis government allowed the Western theater substantial autonomy while relying on the West to contribute to the common war effort.<sup>3</sup>

The Confederate government created the Trans-Mississippi Department in May 1862 to consolidate the several military departments lying west of the Mississippi. Arkansas, all of Louisiana west of the Mississippi, Texas, Missouri, the territory of New Mexico, and parts of the Indian territory comprised this Confederate department. However, in the first two years of warfare, Union troops had seized New Orleans and much of coastal Louisiana. The Union had taken control of the Mississippi River in Arkansas. The Confederate government of Missouri was in exile. By May 1863, many Westerners held little hope for the Southern cause.<sup>4</sup>

After the loss of New Orleans, morale plummeted. With some areas of the department under illegal martial law and other parts in near anarchy, department organization proved weak and useless.

Disturbed by the probable interruption of contact across the

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<sup>3</sup> William T. Windham, "The Problem of Supply in the Trans-Mississippi Confederacy," *The Journal of Southern History* 27 (May 1961): 150.

<sup>4</sup> Florence Elizabeth Holladay, "The Powers of the Commander of the Confederate Trans-Mississippi Department, 1863-1865," *The Southwestern Historical Quarterly* 21 (April 1918): 279-280; Dean E. Smith, "Trans-Mississippi, Confederate Department and Army of the," in *Historical Times Illustrated Encyclopedia of the Civil War*, ed. Patricia L. Faust, (New York: Harper and Row, Publishers, 1986): 370; Kerby, *Smith's Confederacy*, 12-13.

Mississippi, the four Trans-Mississippi governors advised President Davis that the West would need more dynamic leadership to salvage what would remain of the Department should the Union army split the South in half along the Mississippi. Effective March 7, 1863, Lieutenant General Kirby Smith assumed command of the Trans-Mississippi Department, with his headquarters in Shreveport, Louisiana.<sup>5</sup>

The Trans-Mississippi was largely a frontier area with a population of 2,639,150 in 1860. Military-age men (between eighteen and forty-five) numbered about 450,000, with about half of that number from Missouri. Only two cities were exceptions to the Department's overwhelmingly rural character: New Orleans and St. Louis, 168,675 people and 160,773 people respectively. Across the rest of the Trans-Mississippi, few places even came close to that number. Shreveport, the Department headquarters, had 2,109. Only two towns in Arkansas had a population between 1,000 and 2,000; only four in Louisiana had similar populations. This rural population could produce sufficient cotton and foodstuffs for the Department's needs, but it lacked a mature economy to sustain the all-out war. The Department, even more than the rest of the South, lacked significant

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<sup>5</sup> Holladay, "Powers of the Commander," 281; Kerby, *Smith's Confederacy*, 2, 52-53.

industrial capacity.<sup>6</sup>

Like the Cis-Mississippi Confederacy, the Trans-Mississippi Department and state governments encouraged new industry but achieved limited success. While New York and Pennsylvania each had more than 22,000 manufacturing establishments, in the entire Trans-Mississippi, there were only 6,884. Most of the industry in the Department was too small to produce heavy machinery. None of the plants, for instance, could produce and assemble a complete railroad locomotive. The West's 8,000 blacksmiths repaired and renovated farm equipment. Capital investment was meager. Only 4 percent of property investment went into business endeavors in Missouri, 1 percent in Louisiana, less than 1 percent in Texas, and less than .5 percent in Arkansas. The West held vast mineral resources but distances and limited transportation made exploitation impractical.<sup>7</sup>

While the Department enjoyed a surplus of textiles, leather, and most grain crops, many soldiers lacked uniforms, blankets, shoes and boots, and food. The most common factor for the shortages was the Department's weak transportation system. Like the South, the Department lacked railroads to link the broad distances and provide

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<sup>6</sup> Kerby, *Smith's Confederacy*, 2-4. Robert Kerby summarizes so effectively the South's problem: "The Confederacy was an eighteenth-century country trying to support a nineteenth-century army in an effort to win the first twentieth-century war. Its ambition outstripped its capacities." (Kerby, *Smith's Confederacy*, 57).

<sup>7</sup> Ibid, 4-5. Kerby lists 3,157 factories in Missouri, 1,744 in Louisiana, 983 in Texas, 518 in Arkansas, and 82 in the New Mexico territory; Ray C. Colton, *The Civil War in the Western Territories* (Norman: The University of Oklahoma Press, 1959), 4.

industrial support. As United States Secretary of War, Jefferson Davis had worked for a southern route of the transcontinental railroad, but the coming of the war forever ended the South's bid. As Kirby Smith took command in 1863, the Trans-Mississippi had only fifteen railroads, ten of which were in Texas. Much of the rail system included small, fragmented lines of different gauge rails. Most of the rail lines in the Trans-Mississippi had no practical use. The Vicksburg, Shreveport, and Texas line connecting Vicksburg to Monroe, Louisiana, lost much of its track to spring floods in 1862. The eastern and western ends of the Memphis and Little Rock railroad in Arkansas terminated in a no-man's land. The Confederates used the western portion and the Union used the eastern portion. Neither side tried to complete the connection across the disputed zone between the two sides.<sup>8</sup>

Other complications plagued the Trans-Mississippi's rail systems. Some experienced severe financial difficulties and at least one was in the hands of a receivership. Rail companies could not obtain spare parts, much less replace their dilapidated rolling stock. Poor maintenance resulted in settling roadbeds and crumbling ties. Single-tracked lines used as many as four different gauges which required time consuming transfers of cargo from one rail line to another, if the lines met at all. The combination of these circumstances forced overland freight hauling onto the region's unpaved roads which also

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<sup>8</sup> Kerby, *Smith's Confederacy*, 79-84; Josephy, *American West*, 11.

lacked any cohesive network. Upkeep on the overland roadways belonged to individual counties and parishes, which meant many of the roadways remained mere pathways. Many of the roads lacked clear marking and several led from one water hole to the next. Overland roads were not meant for the heavy traffic brought on by war exigencies. They were inadequate alternatives for moving commercial and military inventories.<sup>9</sup>

The surrender of Vicksburg left the Trans-Mississippi Department cut off from the central government. On July 28, 1863, General Kirby Smith wrote to Adjutant General Samuel Cooper, "Communication is now extremely difficult with Richmond; in a few days it will be entirely closed. The department will be thrown entirely on its own resources." President Davis responded six days later, declaring his confidence in Smith, and declining to offer advice. Kirby Smith would assume duties as broad in scope as a combination of both president and cabinet of the Confederacy. Davis indicated that he intended to assist the Trans-Mississippi through an influx of cash sent via Havana through Matamoros, but the enemy's control of the Mississippi River made further assistance difficult. Davis complained to Smith, "Since the fall of Vicksburg the enemy have commenced using the river for trade, and do this with the greatest possible ostentation. . . . [I]t becomes of great importance that the river should be effectually closed . . . by the use of field artillery along the

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<sup>9</sup> Ibid, 83-84

banks, which must be accessible for hundreds of miles. You could not direct your efforts to a more important service.”<sup>10</sup>

Artillery was one item Smith did not have. The Trans-Mississippi held no important ordnance stockpiles. Confederate troops found only eighteen light cannon among the various isolated garrisons within the Department. The Confederate Ordnance Bureau in Richmond, Virginia, supplied a few cannon to units in Missouri, Arkansas, and the Indian Territory. Confederate troops managed to capture a few pieces at battles in Missouri and Louisiana. On his own authority, Smith sent agents to Mexico and Europe to buy ordnance. The trade with Mexico already provided clothing, medicines, raw materials, and ammunition. Although field guns had high priority among war materials, records do not indicate that a significant number came into the Department from Mexico. After the collapse of Vicksburg, supplies of guns from the East stopped. Mainstays of ordnance production remained in the east. The closest major foundries to the Trans-Mississippi, Leeds and Company, and Bennett and Surges, both in New Orleans, produced columbiads for the navy with only limited success before the fall of New Orleans in April 1862.<sup>11</sup>

Under Major Thomas Rhett, Chief of Ordnance for the Trans-

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<sup>10</sup> Florence E. Holladay, “The Powers of the Commander of the Confederate Trans-Mississippi Department 1863-1865,” *Southwestern Historical Quarterly* 21 (January 1918): 279-280; *War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies*, Washington, D.C.: 1880-1901, Series 1, Volume 22, part 2, 949; *Official Records*, Series 1, Volume 22, part 2, 953; .

<sup>11</sup> Dew, *Ironmaker*, 86; Diamond, “Imports,” 500, 498; Windham, “The Problem of Supply,” 165.

Mississippi, the number of small foundries and laboratories in Louisiana and Texas began to increase. Cannon repair and ammunition production began at arsenals in Arkansas at Little Rock, Camden, and Arkadelphia, and, in Texas, at San Antonio. Iron remained in short supply throughout the Department. Local foundries and forges gathered their own raw material by scrounging scrap iron. Located north of Marshall, Texas, Nash's Iron Works was the only factory in the Department capable of producing acceptable quality pig iron, the basic raw material in cannon production. Nash's iron went to foundries in Houston, Austin, Shreveport, and Camden. These foundries, in turn, reprocessed the pig iron into bar iron for arsenals that included the repair facility in San Antonio and a foundry in Austin. In Shreveport, T. W. Jones, a foundry owner, contracted to cast cannon and produce artillery ammunition but ran into competition with the foundry in Camden over access to iron ore. The Ordnance Department in Richmond resolved the issue in favor of the Shreveport location and dispatched an officer to the iron ore mines with instructions to pay for the raw materials and carry the ore to Jones. The iron ore in dispute came from Jefferson, Texas.<sup>12</sup>

Jefferson was in Marion county, one of 152 counties comprising a frontier state that had joined the union in December 1845. In 1860, over 604,500 people, free and enslaved, lived in Texas, a state that

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<sup>12</sup>Holladay, "The Powers of the Commander," 335; Alwyn Barr, "Confederate Artillery in the Trans-Mississippi," *Military Affairs* 27, (March 1963): 76-78; Windham, "The Problem of Supply," 165; Kerby, *Smith's Confederacy*, 70-71.

encompassed over 237,000 square miles, giving Texas a population density of just over 2.5 people per square mile. Most of the settlements in Texas lay east of the one hundredth meridian where the land produced one to three bales of cotton per acre or a bounty of cereal and vegetable crops. Texas's major population centers were modest in size. Houston, the center of the Texas railroad system, had 4,845 and Galveston, the major port west of New Orleans, had 7,307. Ninety percent of Texas residents came originally from the old South, making Texas an agricultural, slave-holding society. Texas had more in common with its Southern neighbors politically and economically, and had become the fastest growing Southern state up to 1860. In a referendum of February 23, 1861, Texans voted to secede, 46,129 to 12,697 and by March 2, 1861, the Confederacy assumed control of military operations in Texas.<sup>13</sup>

The 1860 census listed over one hundred occupations held by Texans, including wheelwrights, blacksmiths, masons, and carpenters. Over 59,000 Texans reported themselves as free farmers, and other Texans reported crafts that they combined with farming, bolstering the state's rural profile. Texas had only 983 industrial enterprises that, on the average, employed four people each, so that approximately 3,744 people worked at some kind of manufacturing

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<sup>13</sup> T. R. Fehrenbach, *Lone Star* (New York: Macmillan Publishing Co., Inc., 1968; Collier Books, 1980), 279, 281; Kerby, *Smith's Confederacy*, 2-6; Howard C. Westwood, "President Lincoln's Overture to Sam Houston," *Southwestern Historical Quarterly* 88 (October 1984), 128-129.

livelihood. The United State Census Bureau defined a “factory” as an establishment that produced at least five hundred dollars of manufactured goods during the census year. Only 40 percent of Texans qualified under the Bureau’s definition. Most “industries” were local small shops providing a variety of products including bread, bricks, and furniture. In an attempt to encourage businesses to meet demands of the war effort, Texas offered land bonuses to entrepreneurs but even such incentives could not overcome two basic problems. First, industry needed new machinery and machine parts, many of which came through the blockade. Foundries that might produce replacement parts had obligations to the Confederate government or to the state, and could not accept other contracts or orders. Second, conscript officers had taken the skilled laborers who could work the machines, the foundries, and manufacturing jobs. Since the state already had few skilled workers for industrial production, their loss to military service materially handicapped Texas’s ability to develop its industrial potential during the war.<sup>14</sup>

Overall, both the Trans-Mississippi Department and Texas failed to industrialize on a level sufficient to meet the demands imposed by war. Local blacksmiths and businesses could satisfy the modest peacetime industrial needs of Texas’s rural economy. However, their wide dispersal throughout the frontier put coordination of these

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<sup>14</sup>Ibid, 322; Vera Lea Dugas, “Texas Industry, 1860-1880,” *Southwest Historical Quarterly* 59 (October 1955), 152-155, 157-158; Kerby, *Smith’s Confederacy*, 5.

cottage industries at the mercy of Texas's overland roads and railways. Roads were often nothing more than prominent routes between points, and individual overland travel was mostly by horseback due to the lack of passenger railroads. Texas's rivers flowed toward the Gulf of Mexico and did not link with each other, which meant that rivers served less as navigable routes than barriers to land travel. County commissions had responsibility for road maintenance but lack of interest and funds stalled improvements. Long-haul freight usually went by sturdy wagons drawn by six to ten draft animals averaging about five miles a day which meant that teamsters would take from six to eight weeks on the haul between San Antonio and the Rio Grande. Transportation costs could equal half the value of freight itself.<sup>15</sup>

Texas's rail systems were significantly inferior to Northern rail systems. There were no significant intrastate connections, unlike the North which had both critical interstate and intrastate links. The major network of rail traffic (345 miles of track) ran from Houston like wagon spokes, linking Houston with several other towns including Galveston and Brenham, the closest terminus to the state capital in Austin. The overland freight route between the capital and Brenham was another eighty miles. The only rail line west of Houston consisted of a twenty-seven mile stretch linking Port Lavaca to Victoria. The other lines ran short distances into agricultural country, following the

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<sup>15</sup> Fehrenbach, *Lone Star*, 319; Kerby, *Smith's Confederacy*, 80-81; Windham, "The Problem of Supply," 162.

plantations. No railroads led to the Rio Grande where contraband entered ports at Matamoros and Brownsville. The Memphis, El Paso, and Pacific line in northeast Texas consisted of only five miles of track connecting Swanson's Landing (on the Red River) to Shreveport by way of Marshall, and that line used two different gauges of track. Like many Southern railroads, Texas's railroads suffered the effects of devalued Confederate currency, lack of replacement parts and equipment, and a dearth of capital investment.<sup>16</sup>

The dilapidated transportation infrastructure and absence of meaningful capital investment relegated the state's industrial potential secondary to its dominant agriculture trade. Texas could have fed the entire Confederacy had there been a sound logistical system to distribute supplies. By July 1863, however, the fall of Vicksburg threatened the very existence of Texas and the Trans-Mississippi Department. Building an adequate defense required the Department to industrialize on a scale for which it was not prepared. Despite the Department's limitations, Jefferson Davis and Kirby Smith were about to embark on an experiment to bring the the isolated Confederacy to a wartime footing.

On July 14, 1863, ten days after the loss of Gettysburg, Davis (with, perhaps, the benefit of hindsight) wrote "I have long seen the importance of establishing manufactures of all munitions of war in the

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<sup>16</sup>Fehrenbach, *Lone Star*, 319; Llerena B. Friend, "The Texan of 1860," *The Southwest Historical Quarterly* 62 (July 1958): 5; Windham, "Problem of Supply", 150, 162; Kirby, Smith's Confederacy, 81-82; Ramsdell, "Confederate Government and Railroads," 803.

Trans-Mississippi Department. . . . A foundry and rolling-mill should be located where iron is cheapest and best, and where the works would be least likely to interruption from hostile invasion. . . . My information is quite too limited to justify the expression of an opinion as to the best place for a foundry.” Concerned about the Department’s course, Kirby Smith sent a circular letter to governors of the four states asking that they meet him in Marshall, Texas, on August 15, 1863. Smith wanted to rally the people through their elected leadership and build their confidence so they might feel the government remaining could respond to their wants and needs. At the first meeting of the conference, General Smith presented six questions for the delegates to consider. The first question asked the conference subcommittee to consider, “the condition of the States since the fall of Vicksburg; the temper of the people; the resources and ability of each State to contribute to the cause and the defense of the department, and the best means of bringing into use the whole population for the protection of their homes.”<sup>17</sup>

This query drew a strong response. From the beginning of the war, the Trans-Mississippi “received but a meager share of the limited supply of arms and munitions of war under control of the Government at Richmond.” With the Mississippi in enemy hands, Missouri overrun by Union forces, and the blockade effectively squeezing off further

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<sup>17</sup> *Official Records*, Series 1, Volume 53, 880; *Ibid*, Series 1, Volume 22, part 2, 1005; Holladay, “The Powers of the Commander,” (April 1918), 282-283, 288.

supply, the Department must “entirely rely upon our resources.”

Texas responded with a commitment to provide as many as twenty thousand infantry and cavalry troops along with provisions sufficient for both soldiers and civilians for two years. With a sense of bravado, the committee membership claimed that Texas “has metal (copper and tin) to make one hundred cannon, and gun wagons for like number completed and in course of construction.” Following all the committee reports, the membership passed a resolution expressing confidence in General Smith and the decisions reached on behalf of the Department. The public statement summarizing the Marshall conference accomplishments, however, contained language that disguised the reservations of the participants for the success of the plans they had devised.<sup>18</sup>

Texas had managed to secure only a few pieces of ordnance for its defense. In 1861, Confederate forces seized Union forts and took the heavy guns which became the backbone of shore batteries located at Galveston, Matagorda Bay, Velasco, Corpus Christi, and Sabine Pass. In addition to the captured ordnance, a citizens’ committee approached Josiah Gorgas in 1861 for guns to defend Galveston. He offered eight columbiads of various sizes plus some 32-pounders from the depot in New Orleans. Problems caused by poor railroads and wet trails delayed the guns’ arrival until early 1862. Galveston later received guns taken from a Union warship sunk during the battle to recapture the port in

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<sup>18</sup> *Official Records*, Series 1, Volume 22, part 2, 1005.

January 1863.<sup>19</sup>

To supplement the limited inventory of field and coastal artillery, the state would need the plant facilities, raw materials, and experienced manpower as had Richmond's Tredegar Iron Works. The state lacked any facility, public or private, to compare to the Tredegar foundry. Building a suitable forge and hiring qualified men to produce artillery batteries would cost the state beyond its low peacetime budget. The tax system had not provided sufficient funds before secession and the state treasury incurred an \$800,000 deficit. Texas would have to assume the cost of defending the frontier now that United States troops had left the state. The cost of placing and equipping a defensive force on Texas's westernmost line was estimated at \$1.5 million. Although the Confederacy had placed Texas under its military control, Richmond, as the Marshall convention noted, had not provided meaningful assistance. Against mounting demands and insufficient revenues, the state turned to a key asset.<sup>20</sup>

As part of the 1850 boundary compromise, Texas received 634 United States indemnity bonds valued at \$1,000 each. The bonds had comprised part of the common school fund and had not entirely disappeared because allies of the educational fund had guarded them. In December 1861, Confederate Secretary of War Judah P. Benjamin made arrangements for Texas to acquire military supplies in

<sup>19</sup>Barr, "Confederate Artillery/Trans-Mississippi," 81.

<sup>20</sup> Charles W. Ramsdell, "The Texas State Military Board," *The Southwestern Historical Quarterly*, 27 (April 1924): 253-259.

Matamoros using the indemnity bonds. In the face of certain opposition, the legislature created the Military Board to attend the defense of the state, which quietly replaced the indemnity bonds with Confederate bonds.<sup>21</sup>

The Military Board of Texas became the only new governmental agency charged specifically with providing for the state's wartime defense. The Ninth Texas Legislature established the Military Board of Texas on January 11, 1862. Governor Francis R. Lubbock, Comptroller C. R. Johns, and Treasurer C. H. Randolph comprised the three-member board. Section one of the act gave \$500,000 in bonds to the Board for procuring and manufacturing arms and ordnance in defense of the state. Section five of the act charged the Board to ". . . establish a foundry for the manufacture of ordnance . . . at such place or places as said Board may select."<sup>22</sup>

The Board chose Austin, the state capital, to locate the state foundry where they intended to manufacture ordnance. Austin was located in Travis county, predominantly an agricultural-based economy like so much of the rest of the state. In Travis county, 393 farms covered 96 percent of the county's 1,297,313 acres. The farms in the area carried the state's fifth highest total value of farm

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<sup>21</sup> Ramsdell, "Military Board," 257; E. T. Miller, "The State Finances of Texas During the Civil War," *Texas Historical Association Quarterly*, 14 (July 1910): 5.

<sup>22</sup> Act of January 11, 1862, "Legislation," box 2-10/306, Texas State Foundry Collection 1863-1865, Texas State Archives, Austin; Julia L. Vivian, "Military Board of Texas," *The Handbook of Texas Online*, <<http://www.tsha.utexas.edu/handbook/online/articles/view/GG/dlgl.html>>.

implements (\$154,085) and the second highest value of unimproved land on farms (\$1,318,947). Combined with the livestock value (\$1,071,036), and the value of improved land (\$44,609), Travis county's agricultural investment (\$2,588,677) underlined the rural nature of the area. The \$2.6 million agricultural commitment produced 137,700 bushels of corn in 1860 and 27,900 bushels of wheat. Livestock included 58,000 cattle and 11,800 sheep. The contrast to manufacturing commitment was pronounced. The Board might have selected a location with relatively stronger industrial experience, such as Galveston, but they decided to thrust the state's experiment with cannon production into a decided rural culture.<sup>23</sup>

Austin had become the capital city in 1839. In 1860, the city's population numbered 3,494. Few of its residents were native Texans. The largest proportion was of German heritage, and most of the American-born came from Alabama. State business offices clustered around the state capitol and along Congress avenue, the central artery for the town. Austin attracted a variety of light commerce, drawn by government business. The Alhambra building, south of the capitol, included a hotel on the top two floors. Just across the street stood the Last Chance Southern Confederate Restaurant and the Kirchberg Saloon. Deffau's Drug Store carried pharmaceuticals as well as books

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<sup>23</sup> Francis R. Lubbock, *Six Decades in Texas* (Austin: Ben C. Jones, 1900), 363; *United States Historical Census Browser*, 1860 Census, <http://fisher.lib.Virginia.EDU/cgi-local/censusbin/census/cen.pl>; Vivian Elizabeth Smyrl, "Travis County," *The Handbook of Texas Online*, <<http://www.tsha.utexas.edu/handbook/online/articles/view/TT/hct8.html>>

and stationery before the blockade interrupted shipments from Galveston. Austin's Hook and Ladder Fire Company met in the Old Land Office Building on Seventh street. Surrounding businesses included an undertaker, a grocer, and a jeweler. Sixteen lawyers, along with three doctors and two dentists advertised in one of Austin's papers, the *Texas State Gazette* (whose editor, John Marshall, joined Hood's Texas brigade and died at Gaines Mill). A livery stable located at the south end of Congress rented and kept horses. Farmers bought heavy implements from B. C. Nett and Company.<sup>24</sup>

Austin had hoped for railroad connections to New York and San Francisco before the war. The Washington County Railroad was one of Austin's most important Texas rail-service providers in 1861, running from Brenham to Hempsted. Commercial supplies came into Austin through ports at Lavaca and Indianola where they went by rail to Victoria and then to Austin by overland freight, which took almost two and a half weeks on the trail.<sup>25</sup>

Contrasted to the predominance of agriculture, light to moderate commerce, and state government business, commercial manufacturing ranked low. Only fifteen manufacturing enterprises existed in all of Travis county (and only seven in Williamson county just north of Travis). These businesses employed eighty-four men and attracted

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<sup>24</sup> Larry Jay Gage, "The City of Austin on the Eve of the Civil War," *Southwestern Historical Quarterly*, 63 (January 1960):426-438.

<sup>25</sup> Ibid.

\$63,200 of capital investment. By 1850, Austin's small industrial community included a wagon factory, tin and sheet metal works, and leather goods including a saddler.<sup>26</sup>

The Board, "convinced of the necessity of the State being supplied with cannon," decided to locate its foundry in one of the state's more rural agricultural environments. Where farm investment exceeded industrial capital investment \$2,588,677 to \$63,200, the project would require strict attention from experienced industrialists, gun makers, and foundry crews. Texas sorely lacked the resources for such a venture, but the Legislature felt convinced that Texas could not rely on shipments of ordnance sufficient for the state's defense. Although an arsenal in San Antonio had facilities to repair individual small arms and effect some repair to ordnance, the Board decided to locate the foundry close by. On block 183 in Austin, where Waller Creek emptied into the Colorado River the Board authorized the establishment of a foundry to produce ordnance for the state and the new country it had recently joined.<sup>27</sup>

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<sup>26</sup> *U. S. Census Browser*, 1860; Clara H. Lewis and John R. Stockton, "Manufacturing Industries," *The Handbook of Texas Online*, <<http://www.tsha.utexas.edu/handbook/online/articlesview/MM/dzm1.html>>.

<sup>27</sup> Report of the Military Board of Texas to the Ninth Legislature, "Military Board Reports," Box 2-10/306, Texas State Archives; Mary Starr Barkley, *A History of Travis County and Austin* (Austin: The Steck Company, 1967).

## CHAPTER 3

### THE IRON MEN

The conference at Marshall, Texas, began on Saturday, August 15, 1863. There, following the loss of Vicksburg and the entire Mississippi River, the Trans-Mississippi states met to take stock. Having determined that “we . . . must abandon all hope . . . and entirely rely upon our resources,” the Texas delegation to the convention declared their resolve to provide one hundred cannon with all accouterments. They committed to an ambitious project, one which had begun over a year before with the Texas legislature’s initiative to begin making ordnance.<sup>1</sup>

The Marshall conference bolstered military preparations in Texas. Determined to provide ordnance for the Trans-Mississippi, Texas began its project through the Texas Military Board which encountered the same kinds of difficulties providing ordnance as did rudimentary foundries in the Cis-Mississippi. Like the rest of the South, Texas was not an industrial society and had to scramble to

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<sup>1</sup>*Official Records*, Series I, Volume 33, p.1006

collect forge equipment. Texas also had to find experienced men to produce the weaponry, and, once they had begun to work, keep them in the forges and out of army units. The human factor that erupted in contests of will or turf complicated the task further. The Mississippi River split the Confederacy, but the Trans-Mississippi Department, and the Texas Military Board in particular, had the same kinds of problems with industrial preparation and production as did the Cis-Mississippi South.

Records do not indicate why the Military Board selected Austin over Galveston, where Ebenezer Nichols had already established a foundry and had provided a home to General John Bankhead Magruder, the commander of the Department of Texas. If Governor Lubbock and the other Board members felt that ordnance production was a function of the state, then locating the facility in the state capital on state land made sense. However, since the foundry's operating capital came at the same time the Texas legislature attempted to dispose of the state's United States indemnity bonds, it is possible Lubbock intended to keep the foundry close to the Board to deflect any questions about the foundry's financial support. Whatever the Board's reasons, by the beginning of the summer 1862, it selected its first agent and put him to work. To acquire the foundry's tools and machinery, the Board secured the release of William Carton from military service in July 1862, stating that he "is in the employ of the Board as the

superintendent of the State Foundry.”<sup>2</sup>

Acting on instructions sent to him in June 1862, Carton began to marshal equipment for the Waller Creek facility. Austin was not a manufacturing center. The capital city had a saddlery, a wagon factory, tin and sheet metal works, and some other light industry, but no industry that could fabricate ordnance. Cannon production required heavy machinery the likes of which did not exist in Austin. Beyond the intricate business of casting molten metal, the state foundry would need steam-powered lathes and drill presses, as well as experienced men who knew how to use them. Probably because Carton knew that Galveston had at least one enterprise making steam engines and boilers, he left Austin for the Gulf Coast. In early July, Carton reported the first installment toward equipment dedicated to heavy weapons production. From the Star Foundry Company he acquired a steam engine, a drill press, three pulleys, and an iron flask (a device for securing molds used in metal casting), paying \$3,151. Carton arranged through the Galveston Provost Marshal for the heavy machinery's consignment to L. C. Cunningham and Co., a freight company, for delivery to Austin since no railway line reached all the way into Austin. To augment this capital inventory, Carton called on Hiram Close, a Galveston industrialist, who sold Carton three lathes and eight-hundred thirty-five pounds of two and a half inch round iron for \$2,125. During

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<sup>2</sup>P. de Cordova on behalf of the Texas Military Board dated July 31, 1862, Box 2-10/304, "Foundry," Texas State Archives, Austin.

this same trip, Carton bought additional pulleys and casings from a Mr. Cershmen in Houston for \$550, leaving instructions with Cershmen and the Houston Provost Marshall to have these items in Austin no later than July 21. Adding miscellaneous expenses of \$876 (probably freight and Carton's travel expenses), the initial capital acquisitions cost the Board \$6,702. By the end of July 1862, the Waller Creek foundry had acquired its first major capital inventory.<sup>3</sup>

Recruiting skilled mechanics proved as difficult as locating and acquiring the foundry's machinery. To provide the military with line soldiers while retaining the services of critical mechanics, the Confederacy passed the first of three conscription laws in April 1862. This first law contained no specific exemptions, however, and had to be amended by a separate exclusions act. Not until September 1862, would provisions of the second Conscription Act exclude wagonmakers, mechanics, and other selected occupations. Even in June 1862, finding experienced foundry workers proved difficult because the military had recruited many of them for service in local units.<sup>4</sup>

In Texas, the manpower situation resembled that in the Cis-Mississippi theater. While anti-secessionists avoided military service,

<sup>3</sup>Clara H. Lewis and John R. Stockton, "Manufacturing Industries," *The Handbook of Texas Online* (Austin: The University of Texas, 2000), <http://www.tsha.utexas.edu/handbook/online/articles/view/MM/dzm1.html>; William Carton to the Texas Military Board dated July 8, 1862, Box 2-10/304, "Foundry," Texas State Archives, Austin.

<sup>4</sup>Ramsdell, "Confederate Control of Manufacturing," 234-235. The Shelby Iron Works in Alabama experienced significant problems with obtaining manpower sufficient for operating its iron production facilities. To understand the manpower issues faced by Confederate military contractors in the eastern theater, see Frank E. Vandiver's three part examination, "The Shelby Iron Company In the Civil War: A Study of Confederate Industry," *The Alabama Review*, Volume 1, January 1948 (part 1), April 1948 (part 2), and July 1948 (part 3).

as many as 25,000 Texans had joined the military by the end of 1861. However, as enthusiasm for the war faded, recruiting became more difficult. Conscription laws prompted some volunteering among men from all backgrounds and trades, which may account for some rural Texans's complaints about the shortage of blacksmiths. Domestic hardships occasionally supplied skilled workers. In late 1862, Governor Lubbock received an appeal from James A. Butler, assigned to DeBrays's Regiment in Liberty County. Butler had credentials and references as a "moulder by trade," with five to six years experience. Due to the loss of his only child, Butler appealed to the Military Board for furlough to the Waller Creek foundry, having worked "on all kinds of castings." Men of Butler's credentials, however, were not easily found, and Carton was on his own not only to equip the state foundry but also to recruit the men who would fashion ordnance.<sup>5</sup>

The effect of conscription laws must have been on Carton's mind during his search for equipment and machinery. On his coastal trip, he began looking for his "iron men" who could fashion Texas's artillery. From Houston, Carton appealed to the Board, asking its assistance to secure the furloughs of three men who would be "of use in this business as in the army." Two of the men, E. Perry and R. A. Miller,

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<sup>5</sup> Ralph A. Wooster, "Civil War," *The Handbook of Texas Online*, <<http://www.tsha.utexas.edu/handbook/online/articles/view/CC/qdc2.html>>; James A. Butler to the Texas Military Board dated December 2, 1862, Box 2-10/304, "Foundry," Texas State Archives, Austin. From Governor Lubbock's memoirs, we know names of some foundry managers. Carson became superintendent, and Roessler became the chief draftsman. There was a wood department, headed by James Brown. The turning and finishing department had two foremen, E. Perry and R. A. Miller. Thomas Randolph was the foreman of the foundry, and Joseph Marstella was foreman of the blacksmith shop. See Lubbock, *Six Decades*, 368-369.

belonged to DeBray's regiment (as had James A. Butler) and A. W. Geoblein served in a coastal defense company. They, along with two other men from the Twenty-Sixth Cavalry regiment had experience and interest in foundry work and merited Carton's attention in his rush to bring the foundry from legislation into reality. The correspondence indicates that Carton had followed accepted protocol and worked through regional enrolling officers, but shrewdly capitalized on his affiliation with the Board by asking for its assistance in conjunction with the local bureaucracy. Intervention from the central executive body allowed the enrolling officer to meet his quota while appeasing the local constituency by releasing men to legitimate and critical civilian duty.<sup>6</sup>

On January 9, 1863, Carton reported to the Travis County enrolling officer a total of nineteen men (including Carton himself) employed "for manufacturing arms." The typical factory in Texas consisted of an owner and four hired employees. Though dwarfed by the nine hundred workers employed by Virginia's Tredegar Iron Works or the four hundred and fifty workers at Alabama's Shelby Iron Works, the Texas State Foundry employed a sizable number of men considering the region and its frontier environment. The variety of comments in Carton's letter suggests that he was answering specific inquiries from the conscription authorities. His response gives an

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<sup>6</sup>Dugas, "Texas Industry," 153; William Carton to the Texas Military Board dated July 4, 1862, Box 2-10/304, "Foundry," Texas State Archives, Austin.

interesting profile of the iron men. Eight of them, including Carton, were furloughed from active military units to the State Foundry. Two of the men, J. M. Bennet and A. R. Roessler, were exempt from military service because of disability. Two men came from Carter's Regiment, one of them "detailed for duty" and the other "discharged for disability." Two of the foundry crew, John Simpson and J. A. Anderson, each appeared as "an alien and has papers." Three of the men were under forty years of age (significant, perhaps, since the first conscription act applied to men between the ages of eighteen and thirty-five).<sup>7</sup>

One name especially on Carton's roster is worth noting because of the role he would have in the State Foundry. A. R. Roessler, born in Hungary, educated in Vienna, and exempt from service by disability, made his home in Austin and became a Confederate sympathizer. As early as September 1862, he indicated an interest in joining the attempts to manufacture armaments when he provided the Board a

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<sup>7</sup>William Carton to the Texas Military Board dated January 9, 1863, Box 2-10/304, "Foundry," Texas State Archives, Austin; Patricia L. Faust, "Conscription," in *Historical Times Illustrated Encyclopedia of the Civil War*, 161. In November, 1863, the Board received notice from the foundry superintendent Ralph Hooker that he had employed a paroled prisoner of war taken at the fall of Vicksburg. Using men who were released on their word of honor not to assist in their country's war effort until properly exchanged always created a certain level of mistrust that led eventually to the interruption of paroles. The Board had to determine that such work met the conditions of current parole agreements and then notify the appropriate enemy parole officer; see Ralph Hooker to the Military Board, letter dated November 20, 1863, Box 2-10/304, "Foundry," Texas State Archives, Austin. Hooker's personnel recruiting appears to have had a certain level of initiative that would put him at odds with the superintendent of the State Cap Factory. In December, 1863, Hooker petitioned the Board to release from the Cap Factory a machinist named "E. B. Kittredge" for making tools to bore cannon barrels. The Texas State Foundry, like all other defense operations, needed trained workers. The demand pitted defense industries against each other as well as against the military enrolling officers and private contractors; see Ralph Hooker to the Military Board, letter dated December 5, 1863, Box 2-10/304, "Foundry," Texas State Archives, Austin.

detailed analysis of metallurgy for bronze and its components.

Roessler became chief draftsman for the foundry and occasionally assisted with recruiting contractors such as teamsters for the foundry. As in the North and the Cis-Mississippi South, the Trans-Mississippi's manpower needs drew no distinction between native-born and naturalized Confederates.<sup>8</sup>

In Virginia, wages for skilled workers rose proportionally to the demand for their services, 80 percent over antebellum rates. At the Tredegar Iron Works, compensation for mechanics including molders, machinists, and pattern makers rose from \$2.50 to \$3.00 per day following a strike in September 1861. In July 1862, their pay increased to \$4 a day. Not only severe inflation but marketplace dynamics drove up the cost of labor. Government contractors bid against each other in an attempt to attract industrial talent. Workers in lower paying shops complained loudly or left to work for a competitor firm. The level of pay at the Waller Creek facility drew the attention of Texas Department commander General Magruder. Captain C. G. Mason, assistant adjutant general, contacted the Board in August 1862. News of the Tredegar strike may have prompted General Magruder's concern or the timing may have been coincidental. Without prefacing his remarks, Mason came bluntly to the point. Did those men furloughed

<sup>8</sup>A. R. Roessler to the Texas Military Board dated September 20, 1862, Box 2-10/304, "Ordnance Metals," Texas State Archives, Austin; Ralph Hooker to the Texas Military Board dated July 8, 1863, Box 2-10/304, "Foundry," Texas State Archives; Keith Young, "Anton R. Roessler," *The Handbook of Texas Online*, <<http://www.tsha.utexas.edu/handbook/online/articles/view/RR/fro56.html>>; A. R. Roessler to the P. de Cordova undated, Box 2-10/304, "State Armoury," Texas State Archives, Austin.

to the State Foundry “receive the government pay of \$11 per month only, or the regular wages due to their respective branches of trade?” Reflecting concerns about potential labor problems, Mason tempered patriotic sacrifice with cold economics and the possibility that those same men could earn more by leaving the foundry and taking their expertise into the market. Having given up their trade for their country’s welfare, he wrote, and been detailed from the ranks where their skills “can be made more available,” the party (that is, the foundry), should “properly reimburse them.” This practice, said Mason, was “the course pursued by the government in similar operations on the Atlantic coast.” The foundry management must have taken such concerns seriously. Labor costs exceeded raw materials and fuel. Although the foundry did consolidate its total daily labor expenses, the total daily salaries for blacksmiths, molders, carpenters, and carriagemakers indicates that Trans-Mississippi industrial workers drew reasonable pay.<sup>9</sup>

Men and machinery began to gather on the banks of Waller Creek for the express purpose of producing guns. From July 1862, to September 1862, agents for the state and contractors acquired and hauled in stone bricks, lime, lumber, nails, and shingles to erect the foundry building. One Austin resident recalled the structure as a large

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<sup>9</sup> Dew, *Ironmaker to the Confederacy*, 239; Frank E. Vandiver, “The Shelby Iron Company In the Civil War: A Study of Confederate Industry,” *The Alabama Review*, April 1948 (part 2), 115; C. G. Mason to P. DeCordova, letter dated August 2, 1862, Box 2-10/304, “State Armoury,” Texas State Archives, Austin. Calculations based on wages reflected in the foundry daybook dated March, 1863 indicate that blacksmiths earned \$4 a day.

wood building located mid-block between Trinity and Neches. The property included a one hundred fifty-five foot lightning rod and a walled well, probably for convenience notwithstanding the proximity of Waller Creek itself. The \$14,115.25 of capital equipment brought in and installed probably included the steam engine and other machinery purchased by Carton. The foundry began to amass its inventory of metals during this time which included 83,424 pounds of copper and an unspecified quantity of iron and old castings. Although the foundry probably acquired much of its pig iron from Nash's Iron Works in Jefferson, the distance and poor transportation system forced some industries including the foundry to scrounge for scrap metal for recycling into hinges, bracings, nails, and other such uses. Odd lots of iron could be had from the surrounding area such as the village of Prairie Lea, but those sources were sporadic. During this time the foundry also amassed uncut timber and wood parts such as wheel spokes. Industrial tools, lubricants, and fuel in the form of coal and wood comprised the consumable manufacturing inventory accumulated during the first few months of operation. Slaves may have built the structure and sunk the well because the state paid for "board of negroes," but the records do not indicate who provided the slave labor.<sup>10</sup>

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<sup>10</sup> Data and description from undated accounting work papers, Box 2-10/304, "Foundry," Texas State Archives, Austin; Joseph Jones, *Life on Waller Creek*, (Austin: M. R. Tantlus, Inc, 1982), 60; Kerby, *Smith's Confederacy*, 70.

As the construction of the building was completed, a daily routine began that included mundane transactions that sustained commercial activity. Roessler, working out of the foundry office, advised the Board that a Galveston contractor had failed to provide necessary parts for one of the foundry's steam engines. The contractor had already collected payment for the missing condenser castings and pipes. Roessler does not indicate that the engine's use had halted because of the missing parts, but he advised the Board either to demand immediate shipment or a refund of the payment.<sup>11</sup>

Foundry work consumed inventories of raw materials which required replacing the initial stocks. Supplies of iron across the Confederacy were scarce, and factories were always looking for opportunities to acquire sorely needed components for production. Roessler's contacts in Austin and surrounding counties must have been extensive and his position as foundry clerk must have been well known throughout the area. In Caldwell county, Roessler located "several thousand lbs rodition [sic] of the size needed in the foundry." At the price of twelve and a half cents per pound, the iron was a bargain and half the price paid by the foundry (from indications of foundry day book entries). Accordingly, Roessler alerted the Board to take immediate advantage of the price or authorize Roessler to make the purchase himself.<sup>12</sup>

<sup>11</sup> A. R. Roessler to the Texas Military Board, letter dated April 10, 1863 Box 2-10/304 "Foundry," Texas State Archives, Austin.

<sup>12</sup>ibid

As currency lost value due to inflation and scarcity of specie, many areas of the Confederacy resorted to a barter system. Most of the state foundry expenditures appear in the day book expressed in terms of dollars and cents. On certain occasions, however, superintendent Ralph Hooker accepted other arrangements in lieu of cash payment and turned to the Board for assistance in the disposition of the goods. In October 1863, the foundry undertook a project from Mr. G. Finnin from Bastrop to make general repairs on a thresher and making some castings for a gristmill. Finnin paid for the work with 1,125 pounds of flour. At the end of the month, Hooker asked the Board for instructions regarding its disposition. Apparently, the Board allowed Hooker to sell the flour to foundry employees at fifteen cents per pound. Hooker sold all but twenty pounds, collecting \$165.75 for the work. The foundry received flour on other occasions as well as bushels of oats and charcoal which the foundry sold and credited to its income.<sup>13</sup>

The Confederacy's dominant commodity in the barter system was its major cash crop, cotton. Cotton had become a safe and reliable commodity with which to obtain all manner of defense materials for the government, and impressment acts had authorized the use of cotton for military necessity. While the Texas hill country did not produce significant cotton crops, east Texas plantations did;

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<sup>13</sup> Ralph Hooker to the Board letter dated October 12, 1863, Box 2-10/304 "Foundry," Texas State Archives, Austin; Journal of the State Foundry, Day Book #98 (January 1863 to February 1864), Box 2-10/304 "Foundry," Texas State Archives, Austin, 165.

and the government had access to the crop to underwrite defense projects. Some vendors were willing to accept payment in cotton in hopes of turning a higher profit in exchange for gold when the highly-prized staple arrived at Mexican ports. One such vendor was John James from San Antonio. In June 1862, he offered the Board 125,000 pounds of copper, “suitable for making cannon,” and 21,000 pounds of lead. Copper was the more valuable resource, offered at three pounds of cotton for one pound of copper. Lead came at one and a half pounds of cotton for one of lead (“good & suitable for rifle bullets”). James could provide immediate delivery to the foundry, and he was amenable to waiting for his payment of cotton as late as July.<sup>14</sup>

Serious copper mining would not occur in Texas until 1864. Nevertheless, the foundry needed copper in order to produce bronze gun tubes for field howitzers. Roessler advised the Board that an ideal copper alloy would consist of “90 parts of copper and 10 of tin” with a slight variation of tin in the alloy. Both elements had to be imported into the state. One vendor willing to supply refined copper to the foundry was John Simpson. In March 1863, Simpson and his partner, George Todd, offered to “refine the state’s copper at 10 cents per pound.” Simpson and Todd may have had stockpiles of Mexican copper ore at a location close to Austin. They were near enough that they

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<sup>14</sup> Florence Elizabeth Holladay, “The Powers of the Commander of the Confederate Trans-Mississippi Department I,” 287. Cotton was the basis of the Department’s wealth, and the Texas legislature authorized its use as currency. The impressment acts made cotton’s value the legitimate expression of Confederate wealth; Kerby, *Smith’s Confederacy*, 6; John James to the Texas Military Board letter dated June 11, 1862, Box 2-10/304, “Ordnance Metals,” Texas State Archives, Austin.

could “furnish our own furnace, wood, & etc.” The project included casting two bars, or “pigs,” of copper, their worst effort and their best effort, and submit the bars for analysis.<sup>15</sup>

On April 8, Simpson began refining the copper but ran into technical problems with the furnace. Uneven heating caused the molten substance to run out of the bottom of the furnace where the damp earth beneath cooled it immediately. Realizing the first attempt meant he had to readjust his furnace and technique, Simpson tried again on the next day and this time, gradually increased the temperature. For four days, Simpson tended his furnace until it began to draw properly with “a perfect white heat” and the copper ore began to liquefy. Only the top of the batch proved satisfactory. “Below,” Simpson noted, “it was perfectly chilled.” Concluding that the process would fail to yield any more copper than that which was already produced, Simpson placed the raw copper ore into a cupola where the refining process would be completed. On April 20, Roessler submitted to the Board the copper samples and Simpson’s report which indicated that only 1.5 percent of the copper ore had been lost in the processing (3,107 pounds of copper from 3,155 pounds of ore). The outcome appeared successful, and Simpson was ready to begin using the refined

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<sup>15</sup> A. R. Roessler to the Board, letter dated September 20, 1862, Box 2-10/304, “Ordnance Metals,” Texas State Archives, Austin; Geo. H. Todd and John Simpson to the Board, letter dated March 23, 1863 Box 2-10/304, “Ordnance Metals,” Texas State Archives, Austin.

metal for cannon production.<sup>16</sup>

Simpson might have used state foundry equipment to produce this small amount of ore. Some of his correspondence with the Board contained suggestions for adjusting the furnace to improve its efficiency, something he would have accomplished had he used his own furnace. The problem with Simpson's efforts so far was the amount of copper produced in the four day period. A twelve-pound Napoleon barrel (the designation referring to the approximate weight of the projectile) weighed approximately twelve hundred pounds, finished. Over a four day period, the entire resources of the state brought to bear on cannon production had produced enough metal to provide ninety percent (at nine to one, copper to tin) of two bronze guns. If no other problems with the furnace developed, and if the casting process proceeded with no interruptions, production would still be agonizingly slow and would probably not keep pace with the demands of the war that was about to cut Texas and the Trans-Mississippi off from the rest of the Confederacy.

Over the next two weeks (from April 14, 1863), Simpson intended to cast one gun in order to test the quality of his work. On April 18, he contacted the Board, good to his word, with results that indicated several problems.

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<sup>16</sup> A. R. Roessler to the Board, letter dated April 8, Box 2-10/304, "Foundry," Texas State Archives, Austin; John Simpson to the Board, letter dated April 14, 1863 Box 2-10/304, "Ordnance Metals," Texas State Archives, Austin; A. R. Roessler to the Board, letter dated April 20, 1863, Box 2-10/304, "Foundry," Texas State Archives, Austin; John Simpson to the Board, letter dated April 20, 1863, Box 2-10/304, "Ordnance Metals," Texas State Archives, Austin.

Having refined the copper, Simpson made a solid casting of a gun barrel and probably mounted the barrel on a gun carriage for tests. The gun failed under testing conducted by William De Ryee, superintendent of the cap factory in Austin. Simpson remained convinced that his methods had succeeded and that De Ryee had sabotaged the gun: “. . . Mr. De Ryee bursted [sic] and I have no doubt but it was done by unfair means.” Bitter at De Ryee’s actual or supposed interference with the gun tests, Simpson lashed out, critical of De Ryee’s plans to refine copper on a smaller scale. Simpson appealed to the Board to allow him to modify the furnace and permit him to cast a second gun. By altering the furnace and using a different fuel in the cupola, Simpson believed the state could produce the armaments it intended to put into the field. “I honestly believe,” Simpson wrote the Board, “that if there is a good gun made here it will be me that will make it. . . .” At this point, the state’s technology failed to produce a weapon. A debate had begun among the foundry’s gun makers over methods and designs. Problems with the furnace or with the casting may have resulted in a gun tube too weak to withstand the punishment of gunpowder. Personality conflicts may have interfered with objective testing. Without better leadership, Texas would not send any guns to its artillery units before the war moved dangerously close to Texas’s interior.<sup>17</sup>

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<sup>17</sup> John Simpson to the Board, letter dated April 28, 1863 Box 2-10/304, “Ordnance Metals,” Texas State Archives, Austin.

On May 18, 1863. John Simpson left the foundry. William De Ryee continued as cap factory supervisor, however. De Ryee came from Bavaria, a political refugee, to the United States in 1856. Well educated, De Ryee had made his living in geologic exploration and photography. The state had used his photographic process to print Texas's cotton bonds. Because De Ryee was the only chemist in Texas who knew how to make fulminate of mercury, he was appointed state chemist and given charge of the state's cap factory, another agency that came under the wing of the the Military Board. From his office in the Old Land Building (located on the east side of Congress Avenue, between what are now Eighth and Ninth streets), De Ryee ran an efficient enterprise and played an active role in its operations. He personally analyzed samples of copper slated for use to make percussion caps by the women and girls employed by the factory. De Ryee faced some of the same kinds of problems as did the state foundry. In need of experienced mechanics for more exacting tasks, De Ryee appealed directly to the Board for details of men, giving their names, units, and specific skills required. To provide heavy machined parts for the factory equipment, De Ryee turned to the foundry via the Board. The cap factory needed iron components such as furnace doors, grate bars, and smokestack anchors. Under the best of conditions, in the face of a common enemy, the cap factory and the state foundry ought to have worked together, but such was not the

case.<sup>18</sup>

Disputes between the foundry and De Ryee reveal conflicts over priorities and, probably, personalities. As in the Cis-Mississippi, equipment was hard to acquire and, when available, was jealously guarded. In one instance, Roessler complained to the Board that the foundry had suspended machining of gun barrels and carriages for lack of a lathe. Without at least one of two lathes, "both of which are constantly employed by Mr De Ryee," Roessler grumbled, "orders for private work must be necessarily rejected. . . ." De Ryee penned a curt response on Roessler's letter. "The right hand lathe has been mostly used for purposes of the foundry the statement of Mr A R Roessler notwithstanding."<sup>19</sup>

A more serious dispute erupted in October through November 1863, when De Ryee and foundry superintendent Ralph Hooker clashed over orders De Ryee placed with the foundry to complete components for the cap factory's refining furnace. The Board ordered Hooker to provide certain parts and assistance in response to complaints lodged by De Ryee. Ralph Hooker responded in October, angry at De Ryee's

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<sup>18</sup> A. R. Roessler to the Board, letter dated May 18, 1863, Box 2-10/304, "Foundry," Texas State Archives, Austin. On the same day, Roessler resigned his position as draftsman; Frank Wagner, "William Deryee," *The Handbook of Texas Online*, <<http://www.tsha.utexas.edu/handbook/online/articles/view/DD/fde44.html>>; Larry Jay Gage, "The City of Austin on the Eve of the Civil War," *The Southwest Historical Quarterly* 63 (January 1960): 431-432; William De Ryee to the Board, worksheet analyses dated September 18, 1862 and September 22, 1862, Box 2-10/304, "Ordnance Metals," Texas State Archives, Austin; William De Ryee to the Board, letter dated October 13, 1863 Box 2-10/304, "Foundry," Texas State Archives, Austin.

<sup>19</sup> A. R. Roessler to the Board, letter dated April 16, 1863 Box 2-10/304, "Foundry," Texas State Archives, Austin.

interference and innuendoes against the foundry in general and Ralph Hooker in particular. Stating that De Ryee had never ordered the parts in question, Hooker insisted that the foundry had complied and had made foundry machinery available to factory employees. Furthermore, he insisted, De Ryee's attention had been devoted only to "preparation of a small furnace for the percussion cap factory which is now nearly completed," and not, by implication, with the refining furnace. Hooker bowed to pressure from the Board, promising to commit the necessary labor to prepare De Ryee's orders. Washing his hands of the affair, and perhaps to avoid any confrontation with De Ryee who had won this dispute, Hooker informed the board that "mechanics will proceed . . . under the supervision of W<sup>m</sup> De Ryee himself."<sup>20</sup>

Somehow, De Ryee got a copy of Hooker's response to the Board. Although, by Hooker's own admission, De Ryee had his own way with the Board and the foundry, De Ryee would not allow Hooker's allegations to remain undisputed and De Ryee answered Hooker's arguments point by point. He claimed to have made his requests to Hooker two months prior to De Ryee's complaint to the Board, but Hooker had ignored De Ryee and had instructed foundry employees not to accept any work on behalf of the cap factory. Moreover, De Ryee accused Hooker (and, by association, Roessler, in his capacity as clerk), of authorizing "more than just portion of the labor and materials used . . . against the

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<sup>20</sup> William De Ryee to the Board, letter dated November 20, 1863 Box 2-10/304, "Foundry," Texas State Archives, Austin.

Percussion Cap Factory.” It had taken De Ryee’s scrounging a metal door from “the misconstructured drying room” to complete a furnace at the factory site. In the meantime, the lime required by the masonry workers was spoiling. Lacking patterns and castings from the foundry as well as the lime, stone masons could not finish the furnace smokestack and would be leaving De Ryee’s employment.<sup>21</sup>

De Ryee could not have the use of pattern makers, he argued, because of Hooker’s insistence to continue his “pet idea to cast cannon with the cupola with unrefined copper.” By Hooker’s own admission, he had subordinated De Ryee’s requests to Hooker’s cannon production. From the tone, De Ryee had misgivings and contempt about the project’s success, especially when it interfered with the cap factory’s progress. De Ryee chose not to attack this project outright, admitting that the Board had ordered cannon production; but he hinted that the cap factory suffered unnecessarily at the expense of a task that Hooker mismanaged. After a confrontation with Hooker, De Ryee withdrew from further work on his furnace, not wishing “to be duped any longer by Mr. Hooker.”<sup>22</sup>

The dispute had, without doubt, personal overtones. De Ryee’s perseverance had a certain contempt, even arrogance. Without knowing more about Ralph Hooker, it is difficult to determine if this was a bureaucratic turf battle, a resentment against foreign-born

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<sup>21</sup> Ibid.

<sup>22</sup> Ibid.

people, or a dispute between two men of probably different educational backgrounds. This conflict does illustrate, however, a widespread problem across the Confederacy. All components of the Southern community competed for resources, including wage labor, scrap iron, and raw materials. Percussion cap production depended on machinery unavailable through the blockade, at least unavailable quickly and cheaply. Factory parts that could not be imported through the blockade had to be made locally. The foundry's Austin location placed it too close to a directorship that lacked the determination to proceed without distractions or interruptions. Conflicting priorities shackled the foundry. While the legislature intended industrial focus on artillery, the Board broadened the charge, thereby straining resources of men and metal. As the foundry accepted (or relented under pressure) work unrelated to its original purpose, it failed to gain the necessary experience to produce successfully field ordnance.

Waller Creek foundry grew out of Texas's resolve to develop its own ordnance. From July to December 1862, the state marshaled equipment and men, naively confident in its determination to cobble together a few iron guns. As 1863 opened, the first attempts began in earnest.

## CHAPTER 4

### THE ANVIL OF CERES

Although Tredegar Iron Works produced nearly 50 percent of the Confederacy's cannon, several foundries across the South contributed artillery to local units. Due to the lack of any government facilities, many of these foundries converted from private manufacturing to cannon production. Quinby & Robinson, in Memphis, Tennessee, specialized in steam engines, plows, and saw mills; but in the summer of 1861, it began production on several field pieces. In Rome, Georgia, the Noble Brothers & Company converted from engines, grates, and pipes to production of three gun batteries. Most of the smaller firms lacked an experienced work force with which to cast the guns. Almost no drawings or specifications for artillery existed, which resulted in uneven quality. These factors, plus the South's inadequate transportation system, would significantly hamper the South's potential to provide its own munitions beyond the blockade imports.<sup>1</sup>

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<sup>1</sup> Larry J. Daniel, "Manufacturing Cannon In The Confederacy." *Civil War Times Illustrated*, November 1973, 4, 9; Vandiver, *Ploughshares Into Swords*, 62.

Gun production occurred in several stages, beginning with the creation of the mold. Carpenters formed the shape of the gun tube out of hardwood in either one or two separate pieces. The model exceeded the actual length of the gun by a length of superfluous metal called a sprue head. The weight of the sprue head made the casting more dense as it began to shrink during cooling and strengthened the breech through additional pressure. They also carved the breech and cascabel (the handling knob behind the gun breech), as well as trunnions (the cylinder projections on opposite sides of the barrel on which the gun is elevated and depressed).<sup>2</sup>

When carpenters finished the model, molders prepared a mixture of wet sand and clay. Placing the model head-down, they enclosed it in a series of metal jackets fastened by iron bolts. After adjusting the model so that its long axis and the axis of the jackets coincided, the molders filled each jacket to the top with the mixture of wet sand and clay. They leveled off the top of each jacket, sprinkling it with dry sand to prevent sticking, and continued until they completed the entire model. The molders removed the jackets from the model, repairing any damage to the sand-clay mold, then covered its interior with a cokewash (a mixture of water and coke) in order to make a smooth surface and to prevent the molten metal from sticking to the mold.

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<sup>2</sup> John Gibbon, *The Artillerist's Manual* (New York: D. Van Nostrand, 1860. Reprint, Westport, Connecticut: Greenwood Press, 1971), 69-75 (page citations are to the reprint edition.). Captain John Gibbon was a thirty-three year old artillery officer when he wrote this standard military reference work. In 1862, he became commander of the Union's renowned Iron Brigade.

Following the wash application, they placed it into an oven and baked it hard.<sup>3</sup>

When the mold was ready, it was placed it into into a pit, breech down, the sprue head just slightly below the surface of the pit. A tap from the furnace released molten metal into a trough that allowed the metal to run into the mold as quickly as possible. As the metal rose, a worker stirred the metal with a pine stick to keep the scoria or impurities in the middle of the mold and to prevent it from entering the trunnion molds. When the metal reached the top of the sprue, the workers added charcoal to the top to absorb gases and to prevent oxidation. Then, they left the cast tube to cool for several days.<sup>4</sup>

The gun tube cooled from the outside in, in layers, contracting as it cooled. The molten mass in the center provided metal during the contraction, causing metal to flow from the sprue downward to fill the vacancy. The additional pressure from the sprue's weight compacted the metal at the breech. When the tube cooled sufficiently, the workers removed the gun barrel from its mold. After cleaning the sand from the barrel, they placed the barrel on machinery that slowly turned the gun on its axis. They cut the sprue from the end of the barrel, then carefully adjusted the bore-cutters to fashion the bore. During that time, other cutting devices cut the exterior to proper size. Later in the process, workers bored the vent and finished the

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<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

trunnions. Various physical inspections assessed the gun's condition after each phase. If the piece appeared suitable, the foundry test-fired the gun, and if the gun met standards, the foundry released it to the military. A large gun produced at the Tredegar Iron Works took about four hundred hours of work, roughly one month of difficult labor. By 1863, Tredegar had twenty years' experience; however, in 1863, Waller Creek foundry had just begun to cast its first cannon.<sup>5</sup>

The Waller Creek foundry tried both iron and bronze for cannon barrels. Gibbon recommended bronze over iron, and bronze Napoleons achieved great popularity among artillerists North and South. As early as July 1862, the Waller Creek foundry had more than eighty-three thousand pounds of copper, presumably garnered for the business of making bronze from which to fashion ordnance. Bronze, composed of copper and tin in a ratio approximately nine to one, resisted corrosion and pressure from the expanding gases produced during firing. While eastern foundries suffered copper shortages, the Waller Creek facility apparently had large supplies of the metal. John Simpson's experience with the cupola furnace illustrates the foundry's reasons for using iron. The fledgling establishment lacked the experienced workers and the physical plant to produce the more precise casting temperatures

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<sup>5</sup> Ibid. This was the American method of casting. Some European armaments manufacturers allowed the molten metal to fall in from the top, believing that the weight of the falling metal prevented air bubbles from forming. In the Cis-Mississippi, another technique, the Rodman method, required a different method of introducing molten metal which allowed the gun tube to cool from the inside out. The Rodman technique was more effective for casting guns of calibers much than heavier those attempted at the Waller Creek facility; Dew, *Ironmaker to the Confederacy*, 111.

required for refining copper to produce bronze.<sup>6</sup>

Some of the cannon iron may have come from Nash Iron Works in Marshall. Waller Creek agents scoured Travis county and parts of surrounding counties for scrap iron. Foundry agents rented horses from John Briredin to ride into the country to locate and buy old metal for use in the foundry. Iron came in not only from Austin, but also from the surrounding central Texas area. In the spring of 1863, the foundry had agents as far out as Bastrop and Caldwell counties. Roessler found several thousand pounds of rod iron in Prairie Lea for twelve and a half cents per pound and encouraged the Board to take advantage of the price. Considering that the foundry charged out iron at twenty-five cents per pound in April, the Prairie Lea trove was a bargain.<sup>7</sup>

By January 1863, four months after the buildings at Waller Creek went up, the foundry had begun incurring costs for “one field battery consisting in [sic] 6 guns, 6 gun carriages, 12 limbers, 6 caissons, 1 forge and 1 battery wagon.” In late January, the foundry committed 1,500 pounds of cast iron, probably enough metal for casting two six-pounders or one twelve-pound Napoleon-styled cannon. Foundry records do not indicate who gave the order for one battery, or

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<sup>6</sup> Gibbon, *Artillerist's Manual*, 108-109; Stanley L. Falk, “How The Napoleon Came To America,” *Civil War History* 10 (March 1964): 154; copper inventory from undated accounting work papers, Box 2-10/304, “Foundry,” Texas State Archives, Austin.

<sup>7</sup> Ralph Hooker to the Board letter dated May 25, 1863, Box 2-10/304 “Foundry,” Texas State Archives, Austin; A. R. Roessler to the Board letter dated April 10, 1863, Box 2-10/304 “Foundry,” Texas State Archives, Austin.

what the caliber the battery was to have been. From January 1863, the state foundry at Waller Creek had a crew of at least six men scheduled for completion of the battery and its components.

Depending on the work that day, a crew could number as many as fifteen, counting helpers. Almost every day, at least one blacksmith, one to two carpenters, a molder, and two helpers (either apprentices or unskilled labor) worked on the gun battery.<sup>8</sup>

The foundry drew odd lots of cast iron and rod iron nearly every day, materials probably used for axles, iron strapping and fastenings such as the lunette (the iron ring by which the gun carriage held to its limber) and pointing rings. Metal prices held steady for the first three months in 1863. Rod iron charged out at twenty-five cents per pound through March 1863. In April, the price increased by twenty percent, to thirty cents per pound, and then rose as high as forty cents in the same month. The increased price of rod iron may indicate pressure to realize a higher profit. While the book value rose, the foundry still paid twenty-five cents per pound from sources in and around Austin. Cast iron prices held steady, at three cents per pound. Steel was the most expensive metal, costing one dollar per pound through December

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<sup>8</sup> Journal of the State Foundry, Day Book #98 (January 1863 to February 1864), Box 2-10/304 "Foundry," Texas State Archives, Austin, 36. Conjecture regarding the type of gun is based on barrel weights listed in several texts and web sites. The most helpful overall site is the Civil War Artillery Page (<http://www.cwartillery.org/aguns.html>) which includes several different kinds of tubes by caliber and foundry. Charles Dew tells us that it took 19,000 pounds of molten metal to cast a ten-inch columbiad whose barrel weight was 15,050 pounds. Shrinkage and trimming of the sprue cost about twenty-five percent of the original molten weight. This seems to be consistent with other guns without material variance.

1863.<sup>9</sup>

After July 1863, there is almost no indication of metal purchases in the foundry's day book toward the gun battery project. There is no mention of bronze or its components, copper and tin, during the first attempt to complete a six-gun field battery. The Board may have intended on using gun barrels run through the Union blockade instead of trying to produce those barrels at the foundry. In the east in 1862, six out of seven blockade runners successfully evaded the Union fleet off Southern shores. By the end of 1863, the chances of success dropped to one in four. The consistent appearance of machinists and carpenters on the battery project may indicate either that the foundry had acquired cannon barrels through the blockade or had produced them on its own. Machinists operated the hoists and boring devices. Fewer helpers appear on the payroll after August 1863. If the foundry used more experienced men from August to December 1863, then Waller Creek took approximately seven months to produce one or more metal barrels and another five months to finish them, about three times as long as Tredegar Iron Works needed to manufacture similar pieces.<sup>10</sup>

The work concentrated, at first, on the carriages, limbers, caissons, forges, and battery wagons. Lumber arrived from Cameron, approximately sixty miles northeast of Austin. Gibbon recommended

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<sup>9</sup> Ibid.

<sup>10</sup> Frank E. Vandiver, *Ploughshares Into Swords*, 99.

white oak overall for the various battery components such as the caisson and limber; but with the variety of oak trees in central Texas, it is likely that contractors from Cameron and other sources used native post oak and live oak. Each wheel of the gun carriage, limber, and the other horse-drawn wagons had fourteen spokes that dished slightly inward to allow flexibility across rough ground. Carpenters had to shape each spoke and set it into the wheel. Blacksmiths tapered the axle downward to accommodate this angle. In one battery alone there were around nine hundred and sixty spokes to set. Such intricacies meant that building even the gun limbers required careful attention from experienced workers who were in short supply because of military conscription.<sup>11</sup>

Work continued on the battery six days a week, Sundays usually being a day off from the project. On only one Sunday in April 1863, for instance, did any work occur, which appears to have been building one of the gun carriages or limbers. On the day before, the foundry had committed one hundred thirty-three pounds of rod iron for axletrees, indicating a sense of urgency to complete some of these units. Wages do not reflect overtime for the men who worked on Sundays.

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<sup>11</sup> Gun carriages supported the bronze or iron gun barrel, and served not only as the gun platform but also the maneuvering component. Limbers were a two-wheeled cart, an axle with wheels on a framework supporting an ammunition chest and were used to pull the gun carriage. Limbers also attached to a caisson, which looked similar to a limber, except that it held two ammunition chests and a spare wheel. In addition to the gun carriage, the limber, and the caisson, a complete battery had at least one battery wagon which carried tools, spare parts, and rough materials (bar iron, for instance) to make replacement parts, and a traveling forge wagon which contained an anvil and blacksmith tools. Gibbon, *Artillerist's Manual*, 113. *The Civil War Artillery Page, The Equipment*, <http://www.cwartillery.org/artequip.html>.

Blacksmiths and carpenters earned five dollars for a full day, and slave owners received one dollar a day for their slave's labor.<sup>12</sup>

The initial work to construct weaponry probably originated with the Board, consistent with the enabling legislation to "manufacture of arms and ordnance for the military defense of the state." Roessler, still a draftsman with the foundry, petitioned the Board to allow him to attempt to complete a battery of field pieces in April 1863. The foundry was searching for a new supervisor, but Roessler made it clear, "I am no candidate for Supervisor of the foundry." Roessler proposed completing a battery consisting of four six-pound guns and two twelve-pound howitzers. Although the foundry had already committed enough iron toward making gun tubes, Roessler assured the board that his guns could be made of the copper inventory on hand ("I will have copper properly refined"), and he could use the equipment already at the foundry. The Board allowed Roessler to proceed.<sup>13</sup>

On April 22, 1863, Roessler sent the Board a miniature cannon, one inch to eight inch scale, cast of a copper and iron alloy. Admitting that the alloy lacked tin, which would improve the gun's quality, Roessler touted the gun's strength with the iron traces and sought the Board's approval to continue the project. Like Simpson, Roessler faced opposition from De Ryee who had disparaged Roessler's qualifications

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<sup>12</sup> Journal of the State Foundry, Day Book #98 (January 1863 to February 1864), Box 2-10/304 "Foundry," Texas State Archives, Austin, 44.

<sup>13</sup> Act of January 11, 1862, Section 1, "Legislation," Box 2-10/306, Texas State Foundry Collection 1863-1865, Texas State Archives, Austin; A. R. Roessler to the Board, letter dated April 6, 1863, Box 2-10/304, "Foundry," Texas State Archives, Austin.

to the Board. An infuriated Roessler complained to the Board about De Ryee's slanderous remarks and expressed contempt for a "small gun" designed by De Ryee. Forwarding testimonials of his credentials from men known and respected by the Board, Roessler reminded them of his own service in the Austrian Artillery which made him eminently qualified in this field. Almost a week following Roessler's rebuttal, Simpson complained to the Board about De Ryee's alleged interference with Simpson's own gun casting--perhaps the same as Roessler's gun, since the two men worked together on the copper refining process. The Board had few qualified men in the state who could produce cannon. Among the best minds Texas could bring to bear on the project, there was now a dispute that the Board had to settle.<sup>14</sup>

While Roessler had not asked for the superintendency, the Board entrusted him with its overall operations, and the responsibility ran him afoul of the Travis county conscription authorities. Phineas DeCordova, the Military Board's secretary, impressed a foundry slave who ran the steam engine at the foundry. De Cordova sent the slave to work in DeCordova's fields, and Roessler searched immediately for a replacement to avoid shutting down foundry operations for lack of an "engineer." Roessler found an experienced man and secured the his furlough by leveraging the foundry's close ties to the Military Board. The Travis county assistant enrolling officer, Captain Holman, was

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<sup>14</sup> A. R. Roessler to the Board, letter dated April 22, 1863, Box 2-10/304, "Foundry," Texas State Archives, Austin; A. R. Roessler to the Board, letter dated May 14, 1863, Box 2-10/304, "Foundry," Texas State Archives, Austin.

furious and threatened Roessler with four years imprisonment, although the real violation is not clear. Roessler assured Governor Lubbock, head of the Military Board, that Roessler had acted only as his predecessor, William Carton, had told him he had authority to do, but promised not to repeat this act in the future without the Board's approval. However, bitterness over this and other incidents apparently took their toll, and Roessler resigned about two weeks after this incident.<sup>15</sup>

A sidebar to cannon production involved a special order from the Richmond government in the person of Captain Robert Creuzbaur. In August 1863, Captain Creuzbaur received an appointment to General Kirby Smith's department from the Engineer Bureau in Richmond, Virginia. Creuzbaur would form an engineer company to develop and employ "torpedoes," a nineteenth century term for mines. In two letters to the Board, Creuzbaur asked for permission to employ the foundry for making three "torpedo-cannon" of his design, under his direction and a bronze cannon "of about two ins. [sic] bore." From November 23, 1863, to March 15, 1864, the foundry allocated blacksmiths, carpenters, and machinists for the "bronze gun." In the

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<sup>15</sup> A. R. Roessler to F. R. Lubbock, letter dated May 26, 1863, Box 2-10/304, "Foundry," Texas State Archives, Austin; A. R. Roessler to the Board, letter dated May 18, 1863, Box 2-10/304, "Foundry," Texas State Archives, Austin. In his subsequent letter to the Board settling his accounts, Roessler indicates what the foundry had accomplished during his tenure. Among the things for which Roessler took credit was that the foundry had use of a crane built for the molders, had made iron and wood components for field batteries, made machinery to bore out cannon, made shells and canister for howitzers, made patterns for twelve-pound howitzers (but no actual guns were mentioned). The next supervisor, Ralph Hooker, persuaded him to return and detailed Roessler as clerk in July, 1863.

first two months of production, the foundry incurred \$1,686 of the \$5,264 it would cost to finish the project. Creuzbaur and his assistant, Captain Littlepage, apparently knew their business well. On November 9, the foundry poured two hundred forty pounds of bronze for making two cannon and, on November 17, workers had begun to turn the barrels. Apparently, the foundry completed only one “torpedo-cannon” and that occurred in February 1864. Molders finished their work by January 26, drying the mold for the experimental cannon which they cast on February 24, using four hundred thirty-four pounds of bronze. By February 29, the foundry had turned and bored the gun and Captain Creuzbaur departed the foundry, taking with him what was the only ordnance produced by Waller Creek while it was under state control.<sup>16</sup>

Struggles over cannon production became embroiled in personality conflicts and lack of experienced workers. The foundry’s financial records show, however, that from January 1863 to December 1863, it was not prepared to produce ordnance. Like the rest of the South, Texas lacked significant industrial capacity. Its people had little

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<sup>16</sup> A. L. Rives to Kirby Smith, letter dated August 20, 1863, *Official Records*, Series 1, Volume 22, Part 2, 973; Robert Creuzbaur to the Board, undated letter and letter dated November 16, 1863, Box 2-10/304, “Foundry,” Texas State Archives, Austin. Creuzbaur also offered, on behalf of the Confederate government, to buy the foundry, asking for an inventory and a purchase price. The Board responded on October 13, 1863, expressing its willingness to lend foundry resources to Creuzbaur, but he would have to recruit his own crew and provide some of his own supplies. He could not interrupt normal foundry duties, and he would work under the direction of Ralph Hooker. Creuzbaur accepted, traveled to Austin and supervised the fabrication of his “torpedo-cannon,” listed in the day book as “tornado-cannon.” *Journal of the State Foundry*, Day Book #98 (January 1863 to February 1864), Box 2-10/304 “Foundry,” Texas State Archives, Austin, 403-405.

background for that kind of venture, and the physical plant was almost nonexistent. The Waller Creek foundry grew out of a void. The Military Board hammered it into existence in a little over six months, beginning with William Carton's initial trip to the coast in search of heavy machinery and completed with the erection of the wood buildings at the mouth of Waller Creek. While the legislature naively imagined Texas's capacity to become self-sufficient for its military wants, the first real year's operations reveal that cannon production, measured in financial terms, were only 17 percent of its total costs. Just over half of the foundry's costs in 1863, 51 percent, were incurred to provide the foundry with tools and build its capacity to accomplish what factories across the North had been doing routinely for several years prior to the War's outbreak.<sup>17</sup>

The foundry's accounting methods centralized costs in tool manufacturing that might have been distributed to other projects, including cannon production. Slave housing and feeding, night watchmen's salary and superintendent's salary comprise some of the costs allocated to the foundry tools project that do not appear among the foundry's other projects for 1863. However, concurrent with cannon production, the foundry employed blacksmiths, carpenters, molders, and an engineer to maintain and expand foundry operations. Different quantities of metal reflect smaller scale projects, probably

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<sup>17</sup> From January 1863 to December 1863, the foundry incurred \$9,462 in costs toward cannon production and \$23,329 in tools/maintenance costs. Total foundry costs for this same period were \$53,329.

small tool production, such as sledge hammers, chisels, and heavy wrenches. During 1863, the foundry brought in more than 39,600 feet of lumber used for building maintenance, scaffolding, molds, and other purposes not specifically identified. The foundry brought in over 25,800 feet of this lumber in early January 1863, suggesting that the physical plant may have been expanded from its original size during January or some time soon after.<sup>18</sup>

Between May and the end of June, the foundry undertook two manufacturing projects affecting production. Two carpenters and one carriagemaker, supervising a slave gang, spent thirty-five days constructing a “morticing machine,” presumably for use on battery support vehicles and other projects anticipated by the Board. Almost concurrent with this project, the foundry undertook the installation of a cupola furnace, following the Simpson recommendations, although the records do not indicate any direct relationship. The cupola project required the use of block and tackle rented from James Brown of Austin. Together, both projects consumed approximately six hundred feet of lumber, four hundred pounds of rod iron, and fifty pounds of steel, one of the foundry’s most expensive commodities. In addition to the labor customarily found in the foundry work crews, at least two African Americans drew independent wages for the cupola furnace installation. “Blackboy Bob White” drew three days’ wages for general

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<sup>18</sup> Journal of the State Foundry, Day Book #98 (January 1863 to February 1864), Box 2-10/304 “Foundry,” Texas State Archives, Austin, 72-98 and 200-212.

labor, and “blackboy Tom Hill” drew four days’ pay as a stonemason.<sup>19</sup>

The combined cannon and tool production projects comprised 68 percent of foundry expenses. Well over half of the expenses incurred focused on preparation, maintenance, and ordnance production. Beyond these two projects, an additional 17 percent of the foundry’s 1863 expenses provided assistance for another wartime industry, De Ryee’s cap factory located in the old land office building in Austin, just off Congress Avenue between Eighth and Ninth streets. To manufacture the ignition device in the cap and ball weaponry predominant in this war, the foundry had fabricated a percussion cap machine during the last three months of 1862. The project may have had the effect of entangling the affairs of the two war industries so that they competed with each other for both men and resources. Before Hooker and De Ryee traded accusations, Roessler complained to the Board that the foundry had encountered difficulties with special orders due to the cap factory’s monopolizing a certain lathe in the foundry. De Ryee coolly denied the allegation, informing the Board that “the subject lathe has been mostly used for purposes of the foundry, the statement of Mr. A. R. Roessler notwithstanding.” In spite of the squabbling between De Ryee and Roessler and De Ryee and Hooker, the foundry provided industrial support to Austin’s munition factory.<sup>20</sup>

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<sup>19</sup> Ibid, 85-86.

<sup>20</sup> Ibid, 99-121; Gage, “The City of Austin on the Eve,” 432; A. R. Roessler to the Board, letter dated April 19, 1863, Box 2-10/304, “Foundry,” Texas State Archives, Austin. De Ryee’s reply is written on Roessler’s letter.

The crews allocated to cap factory projects usually numbered three: a machinist, a carpenter, and a draftsman. Occasionally, the crew would expand with the addition of an engineer or an extra carpenter. The projects included machine production or repair, with some occasional small tool, such as a vice, crafted for use in the cap factory. During March 1863, the foundry built a rolling machine for use in the cap factory which consumed twenty-seven and a half pounds of valuable steel as well as several pounds of rod iron and cast iron. In May 1863, the foundry made a cap filling machine. This twenty-eight day project required two hundred feet of lumber and twenty-five pounds of steel as well as the efforts of blacksmiths, patternmakers, machinists, and helpers. Total costs allocated to the cap factory grew from \$191.75 in January to a cumulative \$9,332 by the end of December, evidence that the Waller Creek enterprise had spent as much time on defense industry support as it had devoted to actual defense production.<sup>21</sup>

In September 1863, the Board had to concede its failure to produce ordnance. Ironically, however, the foundry's good name rested on its accomplishments that accounted for only 7 percent (\$3,954) of its 1863 operations. In a report to the legislature, the Board stated, "The foundry has however been of great use to the farmers. . . . The necessity of saving the grain crop where ever [sic] grown caused the

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<sup>21</sup> Cannon production and cap factory support totaled \$18,795 in 1863. This combined total is less than the tools/maintenance expense figure of \$28,329.

issuing of the necessary orders to the Superintendent to have the repair of the agricultural implements attended to. Repairs have been done for citizens distant over 100 miles from Austin.” Both Carton and Hooker received infrequent requests through the Board to assist various farmers in the vicinity. While the occasional civilian projects did not appear to conflict materially with the major business at hand, the work appears to have been well received.<sup>22</sup>

Archives probably do not contain all of the requests that arrived at the Board, but several different letters have survived requesting spare parts or repairs from the foundry. A typical request came from L. N. May and N. R. Land, addressed to DeCordova, asking that the foundry cast “two cast iron cog wheels about 8 inches in diameter.” Faced with a wheat crop ready for harvest, the men sought the kind of repairs customarily provided by local blacksmiths, some of whom worked at the foundry.<sup>23</sup>

Agriculture produced the only income among all the projects documented in the foundry day book. Hooker reported \$833.70 income from August 2 to September 28, although the foundry had spent somewhat more than \$1,300.00 in manpower and supplies. Payments arrived in cash and barter, not surprising in a frontier and agricultural economy. In return for repairs (patterns for wheels and pinions, as

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<sup>22</sup> “Report of the Acts of the Military Board,” September 30, 1863 draft report, Box 2-10/306, “Military Board Reports,” Texas State Archives, Austin.

<sup>23</sup> Journal of the State Foundry, Day Book #98 (January 1863 to February 1864), Box 2-10/304 “Foundry,” Texas State Archives, Austin, 151-167; L. N. May and N. R. Land to DeCordova, letter dated April 22, 1863, Box 2-10/304, “Foundry,” Texas State Archives, Austin.

well as actual fabrication), William McKaughan paid the foundry in scrap iron and cash. One individual paid a five dollar wheel repair with ten bushels of corn. In October, the foundry took in 1,105 pounds of flour in return for casting a shaft for a gristmill, and sold the flour for fifteen cents a pound. The foundry conducted most of its business in cash; however, and jobs ranged from a five dollar wheel repair to a hundred and forty-three dollars to cast and replace roller wheels on a threshing machine.<sup>24</sup>

Agriculture projects followed the growing season. The most common request during the peak season was thresher and reaper repair. The cost elements increased to \$440 in May, almost twice the April level, and decreased in September. In May alone, the foundry recorded twenty-four entries documenting the production of mold patterns, casting iron, and fitting replacement parts for various farm implements. These projects did not appear daily, even during the busier period between May and September. In June, there were eleven days between thresher repairs, and in July, there was a two week gap from the end of one implement repair until the beginning of the next. Machinists and blacksmiths had to fashion gear wheels, pinions, rollers, and other components from the inventory of scrap iron and rod iron gleaned from the surrounding area. As with the other projects, the crews worked every available day except Sunday.<sup>25</sup>

<sup>24</sup> Journal of the State Foundry, Day Book #98 (January 1863 to February 1864), Box 2-10/304 "Foundry," Texas State Archives, Austin, 164, 165.

<sup>25</sup> Ibid.

The extent to which agricultural support competed with the other projects is not readily clear. On Friday, May 1, the foundry had a blacksmith crew working in cannon production, foundry tools, and cap factory support, as well as fabricating parts for G. H. Banks's threshers. Of the nineteen different days in May during which the foundry recorded expenses for farm equipment repairs, there were projects in the other three areas on only two of those dates (May 1 and May 4). On May 8, only two other projects (cannon production and tool manufacturing) had activity in addition to the agriculture business. During the other days occupied with farm equipment repairs, only the artillery battery recorded expenses. Whether this reflects an intentional scheduling of workers and resources, lack of adequate manpower, feuding with De Ryee, or micro-management from the Board through DeCordova is difficult to say. If Hooker found this aspect of foundry business troubling, he never expressed it in any reports of this to the Board. What is significant is that the Board touted its role in grain harvesting and farm support to defend the foundry's inability to fulfill its original purpose. The anvil of Mars was, instead, the anvil of Ceres.<sup>26</sup>

Waller Creek foundry evolved from a society unprepared for a modern war. Texas, and the nation to which it belonged, plunged into

<sup>26</sup> Ibid. The farmers were not the only ones who benefited from the foundry's talents. In May, 1863, the Board received a request from W. B Pearce for "a small amount of castings" for doors and a furnace which he intended to use to bake "hard bread" (probably hardtack) for the army. In December, the foundry credited \$303.50 in payment of this order. On December 16, 1863, Phineas DeCordova, Board secretary, delivered three yoke of oxen valued at \$750 in payment for one wagon made for him at the foundry.

warfare conducted not by guerrilla fighting or ranger-style attacks, but by large-scale armies for which the South in general, and Texas in particular, had little experience. In the nineteenth century, large armies required small arms and artillery. In the Cis-Mississippi, only a few states had even minimum levels of ordnance for their newly organized armies. Texas, like Virginia and South Carolina, had only that which it seized from federal troops stationed within its borders, but that artillery was already dated, and it was not enough for an extended war.

Like the rest of the South, Texas had practically no industrial experience or infrastructure. Its rail and overland roads lacked the capacity to carry industrial materials, assuming that Texas had industrial traffic at all. While Pennsylvania mined and produced metals for Union cannon production, the Waller Creek foundry scrounged scrap metal from central Texas ranches. As across the rest of the Confederacy, Texas encountered difficulty finding and keeping experienced men for wartime industry. Competition with the military for men through conscript laws and competition with other industries plagued rudimentary enterprises such as the Waller Creek foundry. The lack of skilled managers also crippled Confederate industry. The Military Board's intervention into foundry management complicated affairs that needed time for resolution which Texas did not have.

Waller Creek foundry emerged from a wooded site in only four

months. At the beginning of 1863, it attempted to fulfill the public trust to provide Southern armies with modern weapons. The state's foundry was not ready for that task. In its first year, cannon production and cap factory machinery accounted for only one-third of the foundry's output measured in dollars. Making its own specialized tools and rebuilding some of its capital equipment, such as the cupola furnace, consumed just over half of the foundry's production costs. Until November 1863, the foundry had made no significant progress to complete either six-pounders or twelve-pounders for state artillery units. While the foundry had hoped to complete its first battery by mid-year, faulty equipment, inexperienced workers, and internal bickering made it possible for an easterner to produce the state foundry's only guns.

Perhaps the best assessment of the Waller Creek enterprise came from George R. Clarke of Houston. Invited by the Board to Austin, either as an advisor toward completion of cannon, or as a candidate for supervisor, Clarke declined but gave the Board certain advice regarding metals and the value of experienced craftsmen over theorists:

Just as the blacksmith knows from the appearance of his iron . . . this knowledge can . . . only be obtained by actual experience. This difficulty of finding that kind of a workman in an agricultural state like ours is the reason why I have feared a failure in your enterprise. . . . I believe that with the energy and perseverance known to be possessed by the members of the board, by the resources placed at

their disposal, that they will eventually succeed but whether in time to benefit the country in the present unhappy state of affairs is for yourselves to decide.<sup>27</sup>

In November 1864, the legislature abandoned attempts to fabricate cannon. The foundry passed from state control to private supervision when W. S. Reed and Company received a contract to produce five batteries of six guns each for eight hundred dollars a gun, using the state facility at Waller Creek. The following April, Lee surrendered. On July 25, 1865, Union troops entered Austin. Robert Elgin inventoried the foundry. There he found the fifteen-horsepower steam engine brought to Austin by William Carton. Foundry implements included an assortment of pulleys, drills, fans, cupboards, benches, furnaces, anvils, and other equipment. The inventory also included military ordnance: two twelve-pounder howitzers, eight six-pound guns, twelve caissons, ten gun carriages, and twenty-two limbers, all mute and defiant proof that the foundry did, in the end, accomplish its purpose, albeit too late to affect the fighting. Shortly after the war, fire destroyed the foundry buildings and Texas's military park was gone.<sup>28</sup>

On December 9, 1955, the State Auditor's office released a

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<sup>27</sup> George R. Clarke to the Military Board, letter dated May 4, 1863, Box 2-10/304, "Ordnance Materials," Texas State Archives, Austin.

<sup>28</sup> Report to the Honorable H. S. Stockdale, dated November, 1864, Box 2-10/306, Military Board Reports," Texas State Archives, Austin; Robert M. Elgin to the Texas Military Board, letter and inventory dated July 25, 1865, Box 2-10/306, "Texas Military Board," Texas State Archives, Austin; Joseph Jones, *Life on Waller Creek*, (Austin: M. R. Tantius, Inc, 1982), 61.

report on the Military Board's use of cotton bond proceeds to determine whether or not the Board used the proceeds in rebellion against the United States. Bond revenues provided the financial means to acquire uniforms, medicines, and implements of war. The auditors made a detailed listing of bonds and proceeds, recording the dedicated use of each public obligation. Cotton bonds authorized by the 1861 legislature provided nearly \$43,000 to the state foundry. Because the Waller Creek foundry had used bond revenues in support of the rebellion against the United States, Texas repudiated the public obligation since their purpose did not represent "usual and proper governmental activities."<sup>29</sup>

Ninety-three years after the foundry's struggles began, the state of Texas closed the doors on the furnaces and cannons at Waller Creek.

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<sup>29</sup> Report of the State Auditor dated December 9, 1955, Box 2-10/298, "State Audit Report," Texas State Archives, Austin, 15.

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## VITA

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