

"The Very Devil Was In the Elements": The American Civil War, Natural Awareness, and the  
Beginnings of the Forest Conservation Movement

Ryan William Updike

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Peter Wallenstein, Chair  
Mark V. Barrow, Jr.  
William C. Davis

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ABSTRACT

The American Civil War, natural awareness, and forests had a complex relationship. Through their mostly agrarian lifestyle, soldiers during the American Civil War demonstrated varying levels of natural awareness by writing in their diaries and letters about their daily interactions and observations of trees, agriculture, landscape, water, and destruction.

One of the greatest demonstrations of natural awareness by Civil War soldiers centered on their interactions with and observations of wood and wood products. Soldiers needed wood for fires, transportation, and fortifications. They hunted for it, and dealt with shortages of the product. By examining what diaries and letters revealed on wood, we get a better picture of the relationship between the war and the natural environment.

Besides using large amounts of wood, the Civil War also had an impact on conserving trees. The passage of the Morrill Land Grant act and the formation of a Department of Agriculture during the war helped the expansion of the Forest Conservation movement from 1865 to 1880.

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## DEDICATION

To Mom, Dad, and my Grandparents. They have represented a constant source of strength no matter the challenge. They are always there.

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## *Introduction*

More than a third of George Perkins Marsh's 1864 work, Man and Nature, discussed trees. He recommended practices aimed at cultivating trees not just for financial gain, but also for the benefit of man and nature. His landmark argument revolved around the environmental claim that man destroyed forests and that man must take measures to restore the disturbances he caused in terms of clear cutting and erosion. In other words, Marsh discussed a growing natural awareness of man's effect on nature.<sup>1</sup>

The diaries, letters, and papers of Civil War soldiers supply an opportunity to view their level of natural awareness as well as their relationship with trees and wood products. Historians have scampered around the periphery of the relationship between the history of the Civil War and the environment, but they have not crossed the bridges between the Civil War history and the environmental history that the diaries and letters written by Civil War soldiers provide.

Civil War soldiers observed and interacted with many different aspects of nature. The war consumed countless amounts of wood. Troops cut wood to feed fires for cooking and for fortifications. Railroads depended on wood supplies to keep moving. Soldiers also lived out in nature for the duration of their service. A need exists to place the war between the states and its environmental repercussions in the context of how soldiers were aware of nature, how the war used wood and wood products, and how the Civil War contributed to the growth of the forest conservation movement.

Historians have focused on ideas of supplies and Civil War agriculture but have largely neglected the Civil War's ties to forests, and nature. Jack Temple Kirby was one of the first historians to write about the Civil War in relation to the environment or nature. His article, "The American Civil War: An Environmental View," published on the National Humanities Website, argued that the Civil War and the environment remain two inseparable and interwoven topics. The importance of his work can be found in identifying a historical silence, and also his

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<sup>1</sup> Michael Williams, Americans and Their Forests: A Historical Geography (New York, 1989), 18, 370-71; George Perkins Marsh, Man and Nature; or, Physical Geography as Modified by Human Action (New York, 1864), 3-5, 257-59, 280.

acknowledgement of the war as an ecological disaster with multiple avenues of potential environmental study.<sup>2</sup>

Kirby's two studies of southern landscapes, Mockingbird Song and Poquosin: A Study of Rural Landscape & Society, provided a more modern prism through which to examine the importance of the war in environmental terms. Mockingbird Song offered the notion that the Southern environment and landscape suffered through the changes wrought by war and then recovered and endured. To Kirby, the conflict represented a four-year block of destruction.

Kirby also proposed that the Civil War must be connected with the emergence of modern nature protection in some way, but left the task of finding out exactly how and why to other scholars. "One must think then, that the Civil War is connected, causatively (within a larger context, to be sure) with the emergence of modern-nature protection."<sup>3</sup> Kirby continually pointed out that the American environment, especially the American South, warranted interest because it bore witness to one of the most damaging and destructive series of events on this continent and then managed to recover over time.<sup>4</sup>

Historians such as Kirby, J. R. McNeil, and Lisa M. Brady have provided different avenues to approach a future study of nature and the natural environment in regards to the Civil War. Kirby went to lengths to show how no one today can think of war without realizing how armed conflict contains environmental dangers and disasters.<sup>5</sup> McNeil's article "Observations On the Nature and Culture of Environmental History," echoed Kirby's plea, by looking at the discipline of environmental history and noting that environmental historians needed to expand into studies examining war and nature.<sup>6</sup>

Lisa M. Brady went into nature's relationship to the Civil War in greater detail. Her dissertation, "The Wilderness of War: Nature, Culture and the American Civil War," opened up the environmental history connection in military dimensions by examining how Union military strategy became tailored to overcoming nature over the course of the war and how the human relationship to nature played such a large part in the Union's strategy. Brady anchored her study to environmental history by arguing that in order to subdue the South; Union strategy

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<sup>2</sup> Jack Temple Kirby, "The American Civil War: An Environmental View," National Humanities Center Website, 2001, Accessed January 23, 2008, [www.nationalhumanitiescenter.org/tserve/nattrans/ntuseland/essays/amcwar.htm](http://www.nationalhumanitiescenter.org/tserve/nattrans/ntuseland/essays/amcwar.htm)

<sup>3</sup> Kirby, Part 4, 5.

<sup>4</sup> Kirby, Part 4, 1.

<sup>5</sup> Kirby, Part 1, 2.

<sup>6</sup> J. R. McNeil, "Observations on the Nature and Culture of Environmental History," History and Theory 42 (2003): 1-3.

transformed and controlled nature. This strategy brought desolation and played on fears of wilderness. Her examination of soldiers' letters and strategy transplanted Roderick Nash's assertions that Americans have always had an ingrained fear of wilderness directly into Union strategy in the Civil War era.<sup>7</sup>

Others such as Mark Fiege and Paul Wallace Gates have also examined how the natural world came into play in the Civil War. Gates' work Agriculture in the Civil War provided an interesting look at how previous generations tackled an environmental topic in Civil War history. Gates looked at the splintered halves of the Union and Confederacy and how their agrarian resources and lifestyle fared during the war. He examined not only how the Union and Confederacy fed themselves, but also discussed goods like firewood, corn production, and liquor supplies.<sup>8</sup> Gates' treatment of natural topics such as agriculture and firewood provided inspiration for later studies into lumber and forests.<sup>9</sup>

Mark Fiege's work, "Gettysburg and the Organic nature of the American Civil War," argued that the Civil War was an "organic struggle." He looked at the war in terms of supplies and food. More importantly, Fiege pointed out how an examination of the Civil War through a natural or an environmental lens helps to understand human natural relationships.<sup>10</sup>

Forestry sources also contain valuable material for this thesis. Michael Williams' Americans and Their Forests maintained that America had a changing, dynamic relationship with forests over time. He argued that as America approached the Civil War, a growing natural awareness led some Americans to reevaluate how they looked at forests. Concerns over forests turned from the economic to the environmental. He cited Marsh as an example of how this emerging natural awareness led some to prescribe ways to conserve forests to improve nature, not just to improve man's pocketbook.

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<sup>7</sup> Lisa M. Brady, "The Wilderness of War: Nature and Strategy in the American Civil War," Environmental History, 10: 3 (2005), 4-5; Lisa M. Brady, "War Upon the Land: Nature and Warfare in the American Civil War," Ph. D. dissertation, University of Kansas, 2003, 1-2.

<sup>8</sup> Paul W. Gates, Agriculture in the Civil War (New York, 1965), 14-18, 135-38.

<sup>9</sup> Williams, Americans and Their Forests, xviii.

<sup>10</sup> Mark Fiege, "Gettysburg and the Organic Nature of the American Civil War," Natural Enemy, Natural Ally: Toward an Environmental History of War (Corvallis, 2004), 94, 103. Fiege shows some of the different environmental or natural aspects of the Civil War while arguing that this conflict was conducted in the Environmental dimension. He also includes terrain and landscape as a part of this look at the organic or natural side of this fight. This study and Lisa Brady's work provide the inspiration for examining how related to nature this war really was. Once this point has been justified one can dig deeper into what the soldiers thought, wrote down, and what legacy this natural relationship had.

Harold Steen, in his work The U. S. Forest Service: A History, briefly discussed how the Civil War effected forests and land policy. Steen argued that the absence of Southern opposition in Congress led to the enactment of changes in terms of land grants and the public domain. The Morrill Land Grant Act, grants to railroads, and the establishment of the Department of Agriculture represented examples of the changes in land policy.<sup>11</sup>

Steen also devoted a few of his opening pages to the pioneers of forestry. Franklin Hough and John Warder were hailed as starters of the forest conservation movement. Steen provided a limited view into Franklin Hough's work in the movement via his personal diary that documented how forest conservation grew after the Civil War.<sup>12</sup>

Using these studies as a springboard, the boundaries of Civil War and environmental history can be expanded. This thesis tries to deepen our knowledge of the relationship between the Civil War and nature by tracing natural awareness, wood use, and forests through the Civil War, and then after the war, examining the war's effect on the beginnings of the forest conservation movement.

Chapter one touches briefly on the theme of natural awareness presented in the works of Marsh and Williams, and focuses on how Civil War soldiers manifested different forms of natural awareness in terms of agriculture, weather, landscape, water, and destruction. Soldiers interacted with nature in many ways. They were subject to weather conditions and depended on resources such as water. Soldiers also wrote about what they experienced and what they observed.

Chapter two discusses how wood represented an important resource during the war. The theme of usage occupies one section, and discusses how the Civil War required wood for bridges, firewood, and fortifications. This section looks at newspaper sources and soldiers' diaries to examine how the soldiers and communities in the Civil War depended on wood.

Soldiers' writings provide a window into their daily interactions with wood for this chapter. They documented hunting for wood as well as needing it for roads, huts, and construction purposes. Soldiers in pioneer and engineer units counted wood work as one of their primary tasks. Such units constantly felled trees, ran sawmills, constructed breastworks, and participated in the transportation of wood for various tasks.

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<sup>11</sup> Harold K. Steen, The U.S. Forest Service: A History (Durham, 1976), 5-6.

<sup>12</sup> Ibid., 9-14, 19.

The large demand the war placed on wood products also resulted in shortages. One section of chapter two examines the efforts of the Union and the Confederacy to deal with wood shortages. Diaries illustrated the importance of wood to the common soldier. Newspaper sources in the South documented how southern communities created wood associations or committees to try to provide an adequate supply of wood for families.

Chapter three argues that the Civil War is directly related to the beginnings of the forest conservation movement. The first part of this argument deals with the Civil War's high demand for wood products. That demand spurred strong growth in the lumber industry that continued beyond the war years, while speeding up deforestation in Northern states such as Pennsylvania, New York, and later Great Lake states such as Michigan.

The second section of this chapter deals with the formation of the Department of Agriculture and the passage of the Morrill Land Grant Act. These developments during the Civil War years both aided the growth of the forest conservation movement in America from 1860 to 1880. The Department of Agriculture helped early forest conservation activists like Franklin B. Hough gain access to government officials. The annual reports of the Commissioner of Agriculture shed additional light on the spread of forestry literature and the paths of action taken by the pioneers of the forest conservation movement.

The Morrill Land Grant act laid the groundwork for agricultural colleges that instituted the first forestry courses in America. This section shows how the acceptance of forest conservation literature by scholars at land grant schools provided another avenue of expansion for the forest conservation movement.

In the end, this thesis seeks to fill the need for further scholarship into the Civil War and environmental history. It attempts to blend the topics of the Civil War, nature, and forest conservation. The Civil War dealt with many different aspects of the natural world. Historians have to probe the relationship between the war and nature further, by tracing objects like trees and wood products through soldiers' diaries. This task is even more important because the war period offered the first signal warnings against overuse and overcutting of forests. Faced with the destruction of forests, the society that emerged from the Civil War yielded the first calls for conservation and protection. The Civil War, nature, and forest conservation are connected. The relationship needs to be deepened.

## Chapter 1: Man and Nature and Natural Awareness in the Civil War

In 1864, while serving as Ambassador to Italy, George Perkins Marsh published his landmark work, *Man and Nature*. Marsh tried to highlight man's destructive relationship with the natural world while prescribing practices to preserve, protect, and appreciate natural aspects dealing with vegetation, landscape, water, and woods. His work served as the foundation for future generations in the struggle to reevaluate the use of natural resources, especially trees.<sup>1</sup>

Perhaps Marsh's most important contribution centered on his overall treatment of a general spirit of natural awareness. He examined destructive practices by man that resulted in the destruction of forests among other things. Marsh, an environmental novice, wrote about his observations of water, landscape changes, and canal building. He gave detailed descriptions of how man should be more aware of the repercussions of his actions on the natural world, and how man should seek to mollify his more destructive processes.

In *Man and Nature*, Marsh built on his experiences and observations as a world traveler, farmer, and mill owner. He believed that man could gain a natural awareness through observation and research of the natural world. Through these observations and years of study, Marsh formed his ideas concerning a reevaluation of forest practices in America and the endless waste of natural resources.<sup>2</sup> Marsh sought a re-evaluation of man's relationship with nature. He wrote his aim for the book: "I address myself not to professed physicists, but to the general intelligence of educated, observing, and thinking men." His purpose, he said, was "to make practical suggestions."<sup>3</sup>

While Marsh authored his work on nature in Italy, the American Civil War raged. Some scholars recently have argued that nature constituted an important and active player in the war, and that the soldiers struggled, contested, and fought with nature in much the same way as the enemy.<sup>4</sup>

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<sup>1</sup> George Perkins Marsh, *Man and Nature* (Cambridge, 1864), 3-5; George Perkins Marsh, *So Great a Vision: The Conservation Writings of George Perkins Marsh* (Hanover, 2001), ix, 15-16; Michael Williams, *Americans and Their Forests: A Historical Geography* (New York, 1989), 144-5; John Ise, *The United States Forest Policy* (New Haven, 1920), 29.

<sup>2</sup> Marsh, *So Great a Vision*, 16.

<sup>3</sup> Marsh, *Man and Nature*, 4-5.

<sup>4</sup> Lisa M. Brady, "War Upon the Land: Nature and Warfare in the American Civil War," PhD diss., University of Kansas, 2003, 1-2; Lisa M. Brady, "The Wilderness of War: Nature and Strategy in the American Civil War,"

Over 31 million Americans lived during the Civil War.<sup>5</sup> More than half were involved in agriculture and farming.<sup>6</sup> Close to three million served in the military.<sup>7</sup> The majority of Civil War soldiers were from small towns and rural communities, and practiced an agrarian lifestyle that served as a forming point for natural awareness and an understanding of nature. These farm boys, shopkeepers, and laborers left the natural environment to which they had grown so accustomed and traveled across diverse landscapes and environments to live and fight under nature's gaze.

Like Marsh, Civil War soldiers were mostly natural novices. They commented on what they saw and experienced in regards to nature. Any studying of nature came through observation and experience. Civil War soldiers wrote about the natural world they observed along the way. Natural awareness for this study entails the written interactions and observations made by soldiers concerning aspects dealing with nature such as weather or landscape. By examining their diaries, this chapter argues that Civil War soldiers exhibited a sense of natural awareness in order to gather a better picture of what they were aware of in their environment, and how they manifested their natural awareness in terms of the subjects of weather, agriculture, landscape, water, and destruction.

### *Weather and Conditions*

Weather conditions represented a constant topic in the writings of Civil War soldiers, and represented a part of their natural awareness. Most diaries did not overlook cold, snow, heat, or the niceties of springtime weather, nor did they fail to observe the struggles that weather and conditions presented. Sam Watkins of the 1<sup>st</sup> Tennessee noted the weather a great deal:

The winter was the coldest that had been known for many years. The ground was frozen and rough and our soldiers were poorly clad, while many, yes,

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Environmental History, 10: 3 (2005), 4-5; Mark Fiege, "Gettysburg and the Organic Nature of the American Civil War," in Natural Enemy, Natural Ally: Toward an Environmental History of War (Corvallis, 2004), 94, 103; Jack Temple Kirby, "The American Civil War: An Environmental View," National Humanities Center Website, 2001, accessed January 23, 2008, [www.nationalhumanitiescenter.org/tserve/nattrans/ntuselnd/essays/amcwar.htm](http://www.nationalhumanitiescenter.org/tserve/nattrans/ntuselnd/essays/amcwar.htm)

<sup>5</sup> U.S. Census Office, Statistics of the United States, in 1860; Compiled from the Original Returns and Being the Final Exhibit of the Eighth Census (Washington, D. C., 1866), x. The 1860 census listed the total population at 31,443,321.

<sup>6</sup> Paul W. Gates, Agriculture and the Civil War (New York, 1965), vii.

<sup>7</sup> Peter Maslowski and Allan Millet, For the Common Defense: A Military History of the United States of America (New York, 1994), 163; James McPherson, Battle Cry of Freedom: The Civil War Era (New York, 1988), 306-7. Millet and Maslowski's work listed the total population in 1860 as 30 million, and they believed 2.75 million served in the army. McPherson's footnotes put the figure closer to three million.

very many, were entirely barefooted. Everything and nature, too seemed to be working against us. Even the keen, cutting air that whistled through our tattered clothes and over our poorly covered heads seemed to lash us in its fury.<sup>8</sup>

Some soldiers mentioned the weather in almost every entry of their diary. George Perkins of the 6<sup>th</sup> New York and John Hill Ferguson from the 10<sup>th</sup> Illinois rarely wrote in their diaries without commenting on the conditions and weather of the day, and they only veered from this procedure when some action had taken place. Ferguson even carried a thermometer with him in 1863 until it was stolen.<sup>9</sup>

Men on both sides dealt with the worst weather conditions nature threw at them. Alburtus Dunham, a Union soldier from Illinois, remarked: “A week ago last Sabbath-morning, woke up and found four inches of snow top of our blankets.”<sup>10</sup>

German immigrant Cornelius Knoebel noted the weather and conditions in the winter of 1862 and mentioned how bad weather made soldiers aware that they battled nature as well as the enemy. Knoebel wrote:

In the meantime we had to survive an equally difficult battle with nature and the weather. We had heavy continuous rain, sometimes snow, and bottomless muddy roads that hardly supported the foot soldiers, let alone the artillery. For a total of 68 days we slept without tents, out in the open with no shelter day and night, in the snow, rain, and storms. Drenched to the bone and completely frozen, exhausted from marching, we had to sleep sitting by the fire, and one time had to make do behind a wall of rock with 18 inches of snow on the ground.<sup>11</sup>

In April 1864, while stationed in Bridgeport, Alabama, August Horstmann, a Union soldier in the 45<sup>th</sup> New York wrote how he froze and baked in the quickly changing southern weather. He commented: “in April the southern sun burns us up during the day, and the nights leave us stiff with cold.”<sup>12</sup>

Confederate pioneer Hiram Williams noted the changing of the seasons. He told how the men were certain that spring would never come to their region. Once spring weather and spring

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<sup>8</sup> Samuel R. Watkins, *“Co. A ych”: A Side Show of the Big Show* (New York, 1962), 241.

<sup>9</sup> John Hill Ferguson, *On to Atlanta* (Lincoln, NE., 2001), xxvi, 1-3; George Perkins, *Three Years a Soldier: The Diary and Newspaper Correspondence of Private George Perkins, Sixth New York Independent Battery, 1861-1864* (Knoxville, 2006), 204-7.

<sup>10</sup> Alburtus Dunham, *Through the South with a Union Soldier* (Johnson City, Tenn., 1969), 32.

<sup>11</sup> Walter D. Kamphoefner and Wolfgang Helbich, eds., *Germans in the Civil War: The Letters They Wrote Home* (Chapel Hill, 2006), 147.

<sup>12</sup> Kamphoefner and Helbich, *Germans in the Civil War*, 127.

growth started to arrive, the company was ecstatic and excited. Then the joy was blasted away by the next day's cold and howling winds.<sup>13</sup> Williams wrote: "Just such a March day as I have seen in more Northern latitudes, while on Friday, we were again greeted with snow. All day long it rained by fits and starts. The snow disappearing and giving way to a worse evil, Mud."<sup>14</sup>

After the snow had finally gone and the spring had appeared for good, Williams broke into verse.

The song-birds with their matin lay  
The wild bee with its ceaseless hum  
Proclaim through all the live-long day  
The joyful tidings –"Spring had come."

I see her in the verdant fields  
With dainty step and graceful mien  
I see the scepter that she wields  
To clothe the wood in living green.

I pluck the violets on the banks  
Reclining on the velvet sod  
And humbly raise my silent thanks  
From Nature up to Nature's God.

The violets with merry glee  
From far off fountains gaily come  
Fit types of youth and liberty  
And join the chorus, "Spring has come!"

Oh glorious season for the free  
You find me bound with whose strong hard bands  
Would I could say that Peace thee  
Had come together hand and hand.

More glorious than the unclouded sun  
More lovely than the verdant field  
Brighten the works but just begun  
And with all the glories that you yield.

"grim visage war" with haughty frown  
Proclaims his stern imperious sway  
We have the flowers to weave the crown  
But not the lovely Queen of May.

Sweet Goddess of the flowery vale  
Sweet Spirit by the Zephyr's bourne  
We only hear the orphan's wail  
And her pale widows as they mourn.

The sweet-mouthed morning wakes  
And paler grows the myriad stars

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<sup>13</sup> Hiram Williams, This War So Horrible: The Civil War Diary of Hiram Smith Williams (Tuscaloosa, 1993), 40.

<sup>14</sup> Ibid.

The silence deep- mouthed cannon breaks  
Man's offering to the war God, Mars

Oh, Spring! With all your lovely train  
With song of birds and wild bees hum  
For joy to us, they sing in vain  
The glorious tidings, "Spring has Come."<sup>15</sup>

No matter the weather or time of year, soldiers lived, drilled, slept, and fought in adverse conditions. These conditions did not resemble home, and they were aware of the differences.<sup>16</sup> Hermon Clarke, a Federal soldier from New York, wrote: "I laugh sometimes when I think how I used to be troubled with rheumatism when I had a good bed and always dry clothes. Now I sleep in the open air in the mud and rain and sometimes don't have a dry thing on in 3 days, and I live on short rations of strong meat and wormyhardtack."<sup>17</sup>

### *Agriculture*

Farming and the selling of agricultural goods represented the job or the business that these former clerks and tillers of the land made their living on before the war. Civil War soldiers took their pre-war agricultural experiences and knowledge with them by commenting on agricultural matters while on campaign. As they marched through the South Union soldiers wrote of how the corn or hay looked, or if the peaches and apples were ripe. Likewise, they noticed differences between their agricultural practices and crops of their homes and the fields and products they encountered during the war. Growing of anything drew their attention, even something as small as flowers or saplings.

One Federal soldier, Thomas Watson of the 93<sup>rd</sup> Pennsylvania, observed in 1863: "The trees are green, peaches are half grown, cherries, plums are looking fine. The flowers are in full blume."<sup>18</sup> Watson also noticed different agricultural practices while on campaign. He wrote:

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<sup>15</sup> *Ibid.*, 53-54; Perkins, *Three Years a Soldier*, 207-08. Perkins mentioned how spring boosted the morale of the troops as well. Perkins wrote articles for the *Middlesex Journal*. The articles talked about camp life, but also devoted space to landscape descriptions as well as weather.

<sup>16</sup> John Bennitt, "I Hope to Do My Country Service": *The Civil War Letters of John Bennitt, M. D., Surgeon, 19<sup>th</sup> Michigan Infantry* (Detroit, 2005), 209.

<sup>17</sup> Hermon Clark, *Back Home in Oneida: Hermon Clarke and His Letters* (Syracuse, 1965), 101; Thomas Watson to brother, Apr. 17, 1864, Watson Letters, Special Collections, Virginia Polytechnic Institute and State University. Hereafter, cited as SC-VPISU. Watson's letters commented extensively on weather and nature.

<sup>18</sup> Thomas Watson to parents, Apr. 21, 1863, Watson Letters, SC-VPISU.

“The corn is not tended here like they do at home, the roes is hoen up high.”<sup>19</sup> In July, 1864, Watson commented: “The weat is all cut here, but very thin. It would not yeald over five bushels per acre.”<sup>20</sup>

Like Watson, John T. McMahon of the 136<sup>th</sup> New York wrote about the differences in the agricultural practices as his unit marched into Pennsylvania in June, 1863. McMahon remarked: “The country through here is the best I have ever seen. It will beat our land at home. There is a great deal of wheat growing here, more for the same amount of land than is raised at home.”<sup>21</sup>

Another Union soldier, Thomas Connolly, described the hay:

It appears rather strange to me coming as I do from a country where the hay crop is an important one to find that no hay at all is raised in this country. I havent seen a partickle of hay in this state The only long forage they have here for animals is blades as they call it which consists of corn leaves stripped from the stalk while green and carefully cured in the sun like hay then tied up in bundles as hay or wheat in the north and either stacked in the field or stored away in barns for winter feed.<sup>22</sup>

In 1861, One Confederate, Col. James Edmonson, voiced concern to his wife about the quality of grain and corn on their farm. He issued instructions to his wife: “I want my wheat ground and brought home and my corn sold, when the best selling time comes. Slough is to furnish me this fall 300 weight of pork in addition to a share of crop and the same quantity each and every fall until his times expires.”<sup>23</sup>

Even small excerpts of letters revealed a connection to growing things. In 1862, Mary C. Witt relayed to her husband serving in the Army of Northern Virginia in 1862 that his children wanted any beautiful plant he might see out on campaign. She wrote: "The children says if you see anything pretty growing about there that in at about there they want you send it to them in a letter.”<sup>24</sup>

Civil War diaries also noted prices of agricultural products. Countless soldiers had depended on the marketing and sale of agricultural products. As soldiers from Maine to Louisiana traveled to the fronts early in the war, they bought goods, products, and foodstuffs as

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<sup>19</sup> Thomas Watson to parents, Apr. 22, 1863, Watson Letters, SC-VPISU.

<sup>20</sup> Thomas Watson to parents, July 1, 1864, Watson Letters, SC-VPISU.

<sup>21</sup> John T. McMahon, *John T. McMahon's Diary of the 136<sup>th</sup> New York 1861-1864* (Shippensburg, Penn., 1993), 53.

<sup>22</sup> James A. Connolly, *Three Years in the Army of the Cumberland: The Letters and Diary of Major James A. Connolly* (Bloomington, 1959), 326.

<sup>23</sup> James K. Edmondson, *My Dear Emma* (Verona, Va., 1978), 54.

<sup>24</sup> Mary C. Witts to husband, Apr. 4, 1862, Amon W. Updike Letters, SC-VPISU.

required to complement their rations.<sup>25</sup> Foraging also served as a way to get food in times of need. Soldiers noted prices of eggs, chickens, butter, and beef and whether such products could be easily obtained.

Tally Simpson, a Confederate soldier from South Carolina, wrote in 1861: “I have to give very good prices for articles at that 37 1/4 cts for chickens, the same for a pound of butter, 25 cts for eggs, and so on.”<sup>26</sup> Likewise, William G. Vardell, a Confederate quartermaster, noted how difficult it was to find agricultural products such as eggs, vegetables, and chickens.<sup>27</sup>

Some diaries, mentioning timber and lumber as agricultural commodities, displayed an awareness of how a natural resource represented profit. Soldiers from New England or the Upper Midwest listed the type of trees they saw in the South. One Union soldier, Thomas Connolly, believed a good Yankee could make a lot of money in the South from timber: “The principal export of the county has always been lumber, but one enterprising Yankee up in Maine would export as much lumber from his own farm as they do from the whole county.”<sup>28</sup>

### *Landscape*

One of the more interesting themes soldiers mentioned were the different environments they encountered. Johnny Rebs and Billy Yanks had a dynamic relationship with landscape. Different landscapes had bearing on how these soldiers marched, lived, and felt on a campaign. Certain landscapes made excellent fortifications, while other landscapes such as swamps or mountains gained the notice of men in uniform. While armies on both sides contained engineers with topographical engineering training, the common soldiers had what could be termed an eye for good ground. Boys from all over America quickly recognize the different aspects of the foreign environments and new landscapes through which they campaigned. This display of spatial difference illustrated another aspect of how aware soldiers were of nature. A soldier’s

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<sup>25</sup> Kamphoefner and Helbich, *Germans in the Civil War*, 101-02, 112,139; Thomas Watson to parents, Dec. 2, 1862, Watson Letters, SC-VPISU.

<sup>26</sup> T. N. Simpson, “Far, Far from Home”: *The Wartime Letters of Dick and Tally Simpson, Third South Carolina Volunteers* (New York, 1994), 32.

<sup>27</sup> William G. Vardell to wife, Mar. 28, 1863. South Carolina Historical Society Letters. Cited hereafter as SCHSL after. Copies of the Vardell letters are at Virginia Tech.

<sup>28</sup> Connolly, *Three Years in the Army of the Cumberland*, 356-57; Thomas Watson to parents, Dec. 2, 1862, Jan. 9, 1865, Watson Letters, SC-VPISU; Theodore Upson, *With Sherman to the Sea; the Civil War Letters, Diaries & Reminiscences of Theodore F. Upson* (Bloomington, 1958), 131.

quick realization of any aspect of nature that differed showed just how grounded in nature and the natural environment these men were at the time.

The fighting masses walked across miles of different landscapes. Union soldier Alburtus Dunham of the 129<sup>th</sup> Illinois compared the differences he saw in other natural surroundings with that of home. Dunham commented: "I would not be oblige to live Ky. If thay would give me the best farm in it, it is all rocks and mountains."<sup>29</sup> Another Union soldier, Henry Stock, declared that, Northern Alabama's springtime landscape suited him fine. Stock wrote, "The birds is singing and the peach trees is all pout in blosom, and the ever green trees make it look a party place. I would like to live here, it is so pleasant."<sup>30</sup>

Mountainous landscapes intrigued Thomas Watson. In August, 1864 Watson wrote: "This is the most ruged part of the cuntry we have ever been in. We can see the tops of the Alilue Mountain in Alabama. They say they are over forty mils away from here."<sup>31</sup> During one rest from marching on a hilltop, Watson described the mountains to his brother: "Then we climbed upon one of these hills that is so plenty in this part of the south, the top so narrow that a man cant lay on it without tying himself."<sup>32</sup>

While on frontier duty in Texas, Confederate soldier William W. Heartsill commented on the landscapes through which his unit went while protecting the state from Indians. He wrote:

On the 20<sup>th</sup> inst we Camped on the trail, which lead in a North-west direction, over gigantic mountains, the face of the Earth being covered with rocks of every shape and size, sometimes compelled to trail through narrow passes, up mountains of nearly incredible height, and then decending over equally dangerous paths into deep ravines, almost secluded from the rays of the noon-days Sun; places which were never disgnated by the Creator for the habitation of civilized Man, but for the haunts of wild beasts, and the still more savage Indian.<sup>33</sup>

Heartsill, provided the novel viewpoint of a frontier Confederate contesting Indians, desert, and a nest of problems unknown to most Civil War soldiers. While traversing the terrain of Texas, he sat out most of the fighting. Yet nature and landscape were not lost on him. The long diary he kept illustrated a view away from the two major

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<sup>29</sup> Dunham, *Through the South*, 31-32.

<sup>30</sup> Henry Stock to cousins, Apr. 3, 1864, Watson Letters, SC-VPISU.

<sup>31</sup> Thomas Watson to brother, Aug. 12, 1864, Watson Letters, SC-VPISU.

<sup>32</sup> Thomas Watson to brother, Feb. 29, 1864, Watson Letters, SC-VPISU.

<sup>33</sup> William W. Heartsill, *Fourteen Hundred and 91 Days in the Confederate Army* (Wilmington, 1987), 32.

theaters of the war while displaying a frontier spirit that is watchful of nature and landscape.

Landscape represented much more than just a pure spectacle to these soldiers. The officer corps of the Civil War received training to use landscape in various ways, but the volunteer quickly recognized it for its protective purposes as well as its more deadly aspects.<sup>34</sup> The men appreciated the safety and advantages provided by landscape features such as an easily fortified ridge, an entrenchment of reinforced logs, a river barrier, and even something as small as a tree. Early in the war, diaries began noting how entrenchments grew and how landscape played a part in this. Geography and natural attributes such as forests came into play. “Forts have been built along the line, entrenchments dug, and whole forests cut down to prevent the rapid approach of the enemy,” one soldier wrote.<sup>35</sup> Confederate pioneer Hiram Williams stated during the Atlanta campaign: “Our men were so well protected by their strong natural positions, that our loss was small compared to that of the enemy.”<sup>36</sup>

Sam Watkins also wrote about the fortifications in the Atlanta campaign. He wished that Union forces would attack because the trenches carved out of the earth made of a hellish, tangled mess of wood and brush provided an impregnable position.<sup>37</sup> Both sides understood that attacking across some landscapes or into superior natural features or entrenched positions incurred a high risk.

Knowledge such as this was not lost on the common soldier. At Cold Harbor in June, 1864, Union soldiers pinned cards or pieces of paper with their names on them to their uniforms before the attack began.<sup>38</sup> The men knew that the assault could not be made successfully across the flat, open ground and into the heavily entrenched Confederate position. These fortifications were made of dirt and logs, items procured from the environment in positions determined by the lay of the land. Human efforts mixed with the natural aspects of terrain and topography improved fortifications to the point where they could be quite deadly if not impregnable.

An impassible swamp or a swollen river could be both a potential death knell for an army or a welcome protection. Henry Hitchcock, a member of General William T. Sherman’s

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<sup>34</sup> Harvey Meyerson, *Nature’s Army: When Soldiers Fought for Yosemite* (Lawrence, 2001), 20-23.

<sup>35</sup> Tally Simpson, “Far, Far from Home”: *The War Time Letters of Dick and Tally Simpson, Third South Carolina Volunteers* (New York, 1994), 114.

<sup>36</sup> Williams, *This War So Horrible*, 32; Bennett, “I Hope to Do My Country Service,” 58.

<sup>37</sup> Watkins, “Co. Aytch,” 162.

<sup>38</sup> Bruce Catton, *When Grant Takes Command: 1863-1865* (New York, 1969), 262.

staff, remarked on the swamps and makeup of Georgia's soil during the 1864 March to the Sea. Hitchcock remarked:

Roads today heavy sand and botch yesterday and today very bad at swampy places and creek crossings-same thing in fact, for all the creeks seem to spread into swamps. Peculiarity of this soil that has a sort of upper crust or layer, from four or five to twelve inches thick, beneath which when wagons have worked and cut through it, it is very deep, bad mud, quick like quicksand. The train of one division may get along pretty well over one of these places, but those of the next may (and probably will) cut through the "crust" and go in to the wheel hubs.<sup>39</sup>

Hitchcock later recounted a conversation with Sherman's Chief Engineer Capt. O. M. Poe about swamps. Poe served on General George McClellan's staff during the Peninsula campaign. Poe told Hitchcock that Georgia's swamps, "are ten-fold worse than the Chickahominy swamps, so much talked of."<sup>40</sup>

Rivers posed a problem as well. After the Gettysburg campaign, Robert E. Lee rushed to get his mangled army back over the Potomac. When the Union arms began pursuing Lee's forces, rains came. The Potomac spilled over its banks. Lee managed to get his army across the river to safety in Virginia. One Confederate soldier wrote of the rising waters: "As the bulk of the rearguard of the army safely passed over the shaky bridge as it swayed to and fro, lashed by the current, Lee uttered a sigh of relief, and a great weight seemed taken from his shoulders."<sup>41</sup>

Civil War soldiers also participated in several instances of landscape change. Rivers represented a part of nature, a landscape, that man tried to change for military benefit. Union forces tried digging canals numerous times throughout the war, to bypass strong Confederate positions.

At Young's Point, Louisiana, Schuyler Coe of the 1<sup>st</sup> Illinois Light Artillery documented the Union army's canal troubles, and gave them a scathing review. In April, 1863 Coe remarked:

Our people have just commenced digging another canal, in fact canal digging is getting to be a regular chronic disease with some of our Generals. The

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<sup>39</sup> Henry Hitchcock, *Marching With Sherman* (Lincoln, 1995), 176; George Nichols, *The Story of the Great March* (Williamstown, Mass., 1972), 73; Upson, *With Sherman to the Sea*, 139. Upson mentioned that Confederates cut levees in Georgia, and flooded otherwise swampy areas.

<sup>40</sup> Hitchcock, *Marching With Sherman*, 176.

<sup>41</sup> Quoted in Champ Clark, et al., *The Civil War: Gettysburg: The Confederate High Tide* (Alexandria, Va., 1985), 157.

new one is to cross the peninsula some miles above here, striking the river below Warrenton which is six miles below Vicksburg, I don't know what the merritts of this canal over and above the rest. Which have all turned out failures.<sup>42</sup>

Later, the levee holding the river water from of the canal ruptured and flooded Coe's camp. Coe exhibited his anger:

The canal at this place is a failure and has been abandoned. Our people are at work on another connects the river some four miles above here with a Bayou that opens into the Mississippi some twenty five miles below Vicksburgh it is thought it will prove a success. I have lost all faith in Canals. The levee along the old canal below us has broken away and flooded a large portion of the country about us. We have been obliged to move our camp twice lately on the account of high water. The last time we had to get out at 12 o'clock at night which was not pleasant or convenient. We have a very good camp now but the water come ups o close to our rear that a small rise will drive us out again.<sup>43</sup>

Coe had additional trouble finding shelter from the rising waters. He was flooded out again around April 19, and even mentioned bailing water from his nearly surrounded campsite. He summed up his feelings toward the Mississippi/Louisiana landscape: "Damn a country I say where the water is higher than the land and prevents the water from running over you. Don't think I meant to swear, mean dam the water of course."<sup>44</sup>

In Virginia, Yankee engineer John Westervelt commented on the digging of Dutch Gap Canal. In August, 1864, after giving a sketch of the canal area on the James River, Westervelt added: "The Bend is full of obstructions and the banks full of batterys, but if we can cut the canal through we can pass them all and capture their ironclads." He believed that the canal might help solve the general problems the Union army had in negotiating the landscape on the approaches to Richmond.<sup>45</sup>

By October, 1864, Dutch Gap resembled "a human bee hive." Work continued day and night. Yet, Westervelt's opinion of canals soured. He commented: "I have but a poor opinion of the project. I fear it will take to long to complete the work to be of any use. I think the obstructions might be removed cheaper and in less time." Westervelt was right for the most part.

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<sup>42</sup> Schuyler P. Coe to parents, Apr. 4, 1863, Civil War Miscellaneous Collection, United States Army Military History Institute; Owen Johnston Hopkins, Under the Flag of the Nation: Diaries and Letters of a Yankee Volunteer in the Civil War (Columbus, 1961), 49. Hereafter cited as CWMC and USAMHI.

<sup>43</sup> Schuyler Coe to nephew, Apr. 12, 1863, CWMC, USAMHI.

<sup>44</sup> Schuyler Coe to brother, Apr. 17, 1863, CWMC, USAMHI; New York Herald, Feb. 3, 1863; Farmer's Cabinet, Mar. 26, 1863; Macon Telegraph, Mar. 27, 1863.

<sup>45</sup> John Westervelt, Diary of a Yankee Engineer: The Civil War Story of John H. Westervelt, Engineer, 1<sup>st</sup> New York Volunteer Engineer Corps (New York, 1997), 158.

Newspapers from August to January touted the project's closeness to completion. The effort to change the landscape failed.<sup>46</sup>

### *Water*

The greatest need in terms of a single natural resource for soldiers in the Civil War was water. They were dependent on it and camp life required great quantities.<sup>47</sup> Soldiers washed and cooked in whatever water they discovered nearby. Battle conditions and situations likewise required lots of water. Most of the military campaigns took place in warmer temperatures during the war. During battle, water became essential to wounded men and soldiers exhausted from the fight.<sup>48</sup>

One of the first aspects the fighting men on both sides indicated was the scarcity of water and how far they had to go to procure it. Men like Fred Laubach of the 93<sup>rd</sup> Pennsylvania and Charles Law of the 148<sup>th</sup> Pennsylvania were among those who noted the scarcity of water. In September, 1864, from the Shenandoah Valley, Laubach wrote in his diary that, "good water is scarce through this part along the road."<sup>49</sup> Charles Law told his wife in September, 1863, that "the water is very carse thoug this country we have to get our water the puddle hoals or else catch rain water."<sup>50</sup>

A Confederate soldier from South Carolina, William G. Vardell, commented: "Water is very scarce through this country. I had to send two miles to get any fit to drink. I drank some today about the color of Greenville dust, wondered what you would say could you see me; resolved that would not do & sent out for some Cisterns are attached to each house here, the only good water in this country, occasionally you strike a good spring."<sup>51</sup>

Springs and wells offered good sources of "clean" water for marching armies. Men noted in their writings that finding an adequate spring became a highlight of the day. In February 1862, a Union soldier from Pennsylvania wrote:

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<sup>46</sup> *Ibid.*, 180-81; *Wisconsin Daily Patriot*, Sept. 6, 1864; *Philadelphia Inquirer*, Oct. 19, 1864; *The Sun*, Nov. 24, 1864; *San Francisco Bulletin*, Feb. 2, 1865; *Macon Telegraph*, Mar. 16, 1865.

<sup>47</sup> Bell I. Wiley, *The Life of Johnny Reb: The Common Soldier of the Confederacy* (Baton Rouge, 1978), 172.

<sup>48</sup> Daniel E. Sutherland, *Seasons of War: The Ordeal of a Confederate Community, 1861-1865* (New York, 1995), 146-47, 149.

<sup>49</sup> Fred R. Laubach diary, Sept. 1864, CWMC, USAMHI. The actual date was unreadable.

<sup>50</sup> Charles M. Law to wife, Sept. 20, 1863, Law Family Papers, CWMC, USAMHI; Sutherland, *Seasons of War*, 149.

<sup>51</sup> Vardell to wife, June 22, 1863. SCHSL; Kamphoefner and Helbich, *Germans in the Civil War*, 203.

On getting to camp although I feel very tried and weary with wading through the mud, (for the roads are awful muddy) it is necessary to have water to cook with as well as to quench thirst. I take a bucket and start to hunt water but have to go through the mud clear back into town, (near a mile) before I find any; we afterward find an excellent spring issuing from a cavernous rock recess, and forming quite a branch as it flows off. We take advantage of this spring this evening to take a general bathing, many washing their clothes. Although quite a distance from camp, it is a most beautiful place for washing, bathing, etc.<sup>52</sup>

Vardell's diary during the spring and summer of 1863 echoed McIlvaine's comments. This Confederate quartermaster hunted cistern water and good springs. The months of June and July presented hard times for Confederate forces in and around Vicksburg. He wrote:

To one accustomed to have an abundance of fine cool water, it looks so singular to see groups of men wandering hither & thither searching for water, a pool or rain water is hailed with delight a spring a great treasure. I drank a very little yesterday, for the water was very bad & almost black.<sup>53</sup>

John Vreeland, of the 19<sup>th</sup> Illinois commented on the clean water from springs near his encampment: "Our regiment is encamped in a valley surrounded on all sides by steep craggy mountains. As a consequent the water is excellent flowing from innumerable springs down the sides of the hills forming tiny bubbling brooks whose cool clear water is the best proof of the healthiness of this section of the country."<sup>54</sup> Too often, soldiers used water unfit for human consumption.

River and stream water resulted in thousands of unhealthy soldiers. Schuyler Coe of the 1<sup>st</sup> Illinois Light Artillery hated the swampy, water-logged area around Vicksburg. However, he wrote about using the same water in Louisiana for drinking and cooking.<sup>55</sup> A German immigrant, Carl Bernhardt, mentioned in his diary that water constituted a need while on campaign, but he was reluctant to use the water from swamps in operations around the Gulf of Mexico and Mobile. Another federal soldier remarked in his campaigns across swampy regions of the South, that drinking water came from where frogs, bugs, and other aquatic animals lived.<sup>56</sup>

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<sup>52</sup> Samuel McIlvaine, *By the Dim and Flaring Lamps* (Monroe, N.Y., 1990), 27; Kamphoefner and Helbich, *Germans in the Civil War*, 203.

<sup>53</sup> Vardell to wife, July 21, 1863, SCHSL.

<sup>54</sup> John Vreeland to parents, Aug. 21, 1861, Vreeland-Warden Papers, CWMC, USAMHI. Hereafter Vreeland-Warden Papers will be abbreviated VWP.

<sup>55</sup> Schuyler P. Coe to brother, Apr. 19, 1863, CWMC, USAMHI.

<sup>56</sup> Bernhardt diary, Mar. 16, 1865, BCFP, CWMC, USAMHI; Kamphoefner and Helbich, *Germans in the Civil War*, 187.

Different landscapes and environmental features had implications on the water resources these soldiers used. They traveled across geography and landscapes that contained many river systems and extensive watersheds. Swamp water in the bayous of Louisiana was just as bad an option for water as a stream in Virginia or even a creek in Tennessee. Regardless, the quality of this water hovered from bad to worse.<sup>57</sup>

Most soldiers used whatever water could be procured. William Pritchard of the 9<sup>th</sup> Pennsylvania Cavalry mentioned the color of water in South Carolina. He wrote: “the water is black as ink in color yet does not stain anything. The color comes from the cypress.”<sup>58</sup>

Another soldier believed that water could be ruined by so many using it. Shortly after the 1862 battle of Fredericksburg, this Union soldier Charles Law mentioned to his wife how bad the water tasted around Falmouth: “Another thing the water is very bad I never tasted such water in my life all the water we have here is what we get out of the run and when there is so many troops lying around.”<sup>59</sup>

Fredericksburg illustrated that, the longer periods of inactivity and idleness by these armies, the more difficult finding water and other natural resources became. After the battle, rains and melting snow turned everything to mud, increasing the difficulty of traveling to find needed supplies.<sup>60</sup> When water sources dwindled, thirsty men like Union soldier Robert Coburn had to search in an ever increasing arc around the campsite.<sup>61</sup>

As for pollution: soldiers recorded instances of knee-deep mud, torn-up crop fields, and untold numbers of men relying heavily on the nearest water source.<sup>62</sup> Some diaries yield interesting comments concerning polluted water. In February, 1862 John Vreeland claimed sabotage of water sources by Confederate troops near Bowling Green, Kentucky. He complained: “The Rebs used everything in their power to retard our movement, they filled all

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<sup>57</sup> Sutherland, *Seasons of War*, 149; Henry Hitchcock, *Marching With Sherman* (Lincoln, 1995), 110. Hitchcock mentioned using swamp water and river water on the Sherman’s march to the sea. He thought it was a clear and convenient water source.

<sup>58</sup> William P. Pritchard to parents, Jan. 28, 1865, CWMC, USAMHI.

<sup>59</sup> Charles M. Law to wife, Sept. 20, 1863, CWMC, USAMHI.

<sup>60</sup> James I. Robertson Jr., *Stonewall Jackson: the Man, the Soldier, the Legend* (New York, 1997), 674; Robert S. Coburn diary, Nov. 28, 1862, Civil War Times Illustrated Collection, USAMHI. Hereafter, Civil War Times Illustrated Collection will be designated CWTIC.

<sup>61</sup> Sutherland, *Seasons of War*, 149; Coburn diary, Nov. 28, 1862, CWTIC, USAMHI. Coburn mentioned leaving at daylight just to go for water.

<sup>62</sup> Wiley, *The Life of Johnny Reb*, 246.

the ponds on the road with dead animals, ponds being the only water between here and Green River; the people mostly using rain water.”<sup>63</sup>

While serving with in 1863 with Gen. William T. Sherman, Theodore Upson of the 100<sup>th</sup> Indiana also noted thirst and contamination of the water supply. Upson declared:

I never knew what it was to suffer with thirst till now, but on this trip water was very scarce and what there was not fit to use. Mostly pond water. The Johnny’s had killed hogs and cattle in the ponds and thrown dead dogs and cats in the cisterns and shallow wells, and I actualy saw men marching along through the aful dust with their toungues hanging out of their mouths.<sup>64</sup>

William G. Vardell’s letters provide a Confederate source for similar occurrences around Jackson, Mississippi. Vardell repeatedly mentioned scarce water and thirsty soldiers. He also highlighted Gen. Joseph Johnston’s orders that released water from all the dams in the area. At the same time, Vardell reported that men scurried to catch rainwater from cloud bursts and thunderstorms. Yet Vardell failed to mention Confederate forces actually polluting a water source.<sup>65</sup>

Henry Hitchcock and the Official Records of the War of Rebellion provide further credence to the claim of thirst impeding the Union army’s advance. After talking with Sherman during the 1864 Atlanta Campaign, Hitchcock wrote that Sherman mentioned breaking off the pursuit of Confederate forces on account of “want of water.” Hitchcock’s account mirrored Upson’s account that stated: “the rebels having spoiled all the ponds by driving cattle into them and shooting them there, and our men breaking down and giving out on the road from this cause and the summer heat.” Sherman’s own records to his subordinates mentioned scarcity of water as well.<sup>66</sup>

### *Destruction*

One of the most vivid pictures of the natural world in the Civil War concerned what soldiers wrote about destruction to the landscape, towns, and nature. Use and waste combined in these accounts with an awareness of how nature and landscape increasingly became casualties of

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<sup>63</sup> Vreeland to parents, Feb. 16, 1862, VWP, CWMC, USAMHI.

<sup>64</sup> Upson, With Sherman to the Sea, 65.

<sup>65</sup> Vardell to wife, July 21, 1863, SCHSL.

<sup>66</sup> Hitchcock, Marching With Sherman, 30; Official Records of the War of Rebellion, July 17, 1863, series 1, XXIV, part 3, 507-10, 517, 522, 528, 1013.

war. Anything that aided the Confederate cause became a target for destruction. Increasingly, aspects and objects related to nature drew the attention and the torch of Union soldiers. In particular, Sherman's March to the Sea targeted objects related to nature and landscape. Union cavalryman William Pritchard was shocked by what he saw in terms of destruction:

The rebels burn all the corn and the forage; we burn the cotton and the outhouses. The infantry coming in the rear burnt the houses, and there is nothing left. You cannot imagine all the destruction on all sides. There are four corps of infantry, each corps comprising three divisions, each division three or more brigades, each brigade three or more regiments, and each regiment has at least 500 men. When we march, when there is no enemy near at hand, each division takes a different parallel road, and when they all stretch out from right to left, it covers an extent of country ranging from 75 to 100 miles in width and everything - I say everything - I mean it is destroyed. Fences are set on fire; the fences here are more like ours, only of yellow pine timber, and a fire will burn fences for miles without going out. I have traveled all day, and my feet would keep warm all day from the fences on fire at each side of the road. The roads catch fire; the grass in the fields catches fire, and everything burns up. I have sometimes thought that the very Devil was in the elements. Even large trees catch on fire and burn down, making it unsafe to travel near woods. You cannot imagine it.<sup>67</sup>

The Union army fanned out and basically destroyed everything. Forests burned as a result of the numerous fires.<sup>68</sup> The South's transportation infrastructure, constructed of wood and iron, was wrecked, which caused more strain on natural resources after the war in the way of rebuilding and construction.

In soldiers' diaries, one sees how quickly the natural world got caught in the crossfire between Confederate and Union forces. "Our orders are to devastate the country and burn up every thing that helps enemy," Pritchard explained, "The South Carolinians, they say, are going to destroy it in advance of us and endeavor to starve us out."<sup>69</sup>

Other soldiers like Henry Hitchcock reasoned that the destruction remained a necessity for peace. Hitchcock opposed Sherman's directive that the soldiers "forage liberally."<sup>70</sup> The young, staff officer believed that the unfortunate and wasteful nature of this war and Sherman's army provided for a better peace after the war's end. Hitchcock failed to mention was the plows, cotton gins, mills, crops, and saw mills that fell victim to Yankee destruction, not to mention

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<sup>67</sup> Pritchard diary, Feb. 20, 1865, CWMC, USAMHI.

<sup>68</sup> Upson, *To the Sea with Sherman*, 91.

<sup>69</sup> Pritchard diary, Feb. 1, 1865, CWMC, USAMHI; Upson, *With Sherman to the Sea*, 123-23; Nichols, *The Story of the Great March*, 170.

<sup>70</sup> Hitchcock, *Marching with Sherman*, 69.

populations being placed in situations close to outright starvation.<sup>71</sup> The army destroyed the environment and resources around the area by just being there, and some soldiers realized it.

Some soldiers commented on the destruction. As early as 1862, Union soldier Alburtus Dunham wondered about the future of inhabitants of Kentucky and Tennessee. “If the army keeps passing through the country as it has done, I don’t see what the Inhabitants are a going to do, for I have seen a mile of rail fence destroyed in less than half of an hour....If the war should stop now the states of ky and tenn. Will not get over the effect of it whilst this generation lasts if it ever does.”<sup>72</sup>

Alburtus’s brother Charles exhibited the same kind of comments in his letters home. He declared that friends and family on the homefront knew nothing of the hardships that the armies caused. Charles wrote:

The people think they have hard times in Ill. But let them come down heare and it will cure them. Whareever the army goes they strip every thing. I have seen a mile of fence laid flat in 15 min. and on fire. Whare we campt at Crab Orchard thare was a farm of 900 acres well fenced and before we left tahre was not a rail left on the farm and corn and other things in proportion.<sup>73</sup>

An Alabama Confederate told his wife that this war had changed things for the worse. “But I am sure of one thing,” he stated , “and that is this that this war will bring about such a change that of one thing and that is this that this war will bring about such a change that I will never be able to furnish you all the necessaries of life as I did before this thing occurred.”<sup>74</sup>

A Union soldier experienced enough of hardships and destruction of war to know that the folks at home in the North remained lucky that the war had not visited their doorstep. John Vreeland wrote his aunt that he hoped war steered clear of his northern home. “The war in this as in all parts of dixie is being carried on on our part ‘without gloves.’ On our last trip we burned and destroyed everything on our route and brought in nearly a thousand contrabands, and some 500 horses and mules. Dear Aunt, the northern people know nothing about the horror of wor and god forbid that they ever will.”<sup>75</sup>

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<sup>71</sup> *Ibid.*, 57-58.

<sup>72</sup> Dunham, *Through the South with a Union Soldier*, 34, 45.

<sup>73</sup> *Ibid.*, 31.

<sup>74</sup> William Cole to wife, July 17, 1863, CWTIC, USAMHI.

<sup>75</sup> Vreeland to aunt, June 22, 1863, VWP, CWMC, USAMHI.

One of the most intimate accounts came from Union Capt. Thaddeus Minshall, who served in the 33<sup>rd</sup> Indiana. Like many others, he believed that “war is a terrible thing. In its tread it desolates the fair face of nature-all the works of husbandman, and tramples out all the divine parts of human nature.”<sup>76</sup> Minshall wrote how nature kept struggling ahead by way of the succession of the seasons and that this tough march ahead was found in the blooming of nearby fruit trees. He then wondered about the confrontation between man and nature. “I can but reflect how nature and man are at war . . . Nature is struggling to give every thing a renewed appearance, but the grim monster, war, stalks on in the same unvaried course of desolation and ruin.” Minshall illustrated that despite all the destroyed resources, some of the fighting men were of the environmental ramifications of their call to duty.<sup>77</sup>

### *Conclusion*

While George Perkins Marsh wrote about natural awareness in terms of water, vegetation, and landscape, Civil Wars soldiers lived in it and wrote about it as well. Some Civil War soldiers displayed variable amounts of natural awareness in their observations and experiences during the war. The majority of America lived in and had daily interactions with their natural environment. Civil War soldiers participated heavily in this relationship. So many farmers-turned-soldiers grew things to live, harvested crops, and consumed other natural resources, that it should seem natural that they would acknowledge different environmental features, agriculture practices, and the need for water while they fought and lived out in nature.

Men like Thomas Watson and John Westervelt were examples of how Civil War soldiers had a natural awareness. They interacted with landscape, water, and the effects of weather and climate. Men combated the cold, hunted for water, changed landscapes, and were shocked by the destruction. In some ways the Civil War highlighted their awareness by showcasing how man interacted with nature through digging canals, burning crops, and destroyed landscapes.

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<sup>76</sup> Quoted in Lisa Brady, “The Wilderness of War: Nature and Strategy in the American Civil War,” *Environmental History*, 10, no.3 (2005): 5-6.

<sup>77</sup> *Ibid.*

## Chapter 2: Wood and Trees in the Civil War

Trees and forests had a dynamic role in the Civil War. Soldiers relied on trees to provide lumber for transportation and wood for fires and cooking. Men searched and hunted for wood when it became scarce. Whole units spent their days cutting, sawing, and hauling logs to places of need.

On the other hand, trees and forest made for a dangerous place as well. The diaries and letters told of how soldiers were killed by falling trees and limbs. One Union soldier, John Ferguson, wrote about such an incident. "A private in co. E was killed this morning by a tree falling on him."<sup>1</sup>

Another dangerous incident could be found in a cashbook used by Confederate soldier Charles L. C. Minor and later diary of Union soldier E. P. Harmon displayed the dual nature of wood in the Civil War in the space of a few pages. Minor used the book for a ledger, and registered expenses for firewood in January of 1864. In early May, Harmon picked up the ledger and decided to use it for a diary. During the Battle of the Wilderness he wrote, "The woods got on fire and a great many of our wounded men have burnt to death. I have been putting the fire out — this is an awful time for the poor soldiers." In one of the darkest spectacles of the war men were burned alive amid the thick woods.<sup>2</sup>

As the war deepened wood shortages and use took up more space in the writings of soldiers. Shortages of wood made campaign life hard to bear, and both sides hurried to procure sources. Historians have examined food and rations as a way to relate nature's connection to the conflict. Yet food was not the only item in dire need. Soldiers in both armies depended on wood and wood products. Soldiers' writings and newspaper articles on wood illustrated not only how dependent soldiers were on this natural resource, but also how aware this overall society was in terms of usage of wood and trees. The war itself shed light on the awareness, dependency, and usage of forest resources. A lack of wood left men shivering in the cold or unable to cook food.

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<sup>1</sup> John Hill Ferguson, *On to Atlanta* (Lincoln, 2001), xxvi, 1-3; George Perkins, *Three Years a Soldier: The Diary and Newspaper Correspondence of Private George Perkins, Sixth New York Independent Battery, 1861-1864* (Knoxville, 2006), 27.

<sup>2</sup> E. P. Harmon, *E. P. Harmon Diary, Charles L. C. Minor Cash Book and Edward P. Harmon Civil War Diary Collection, Special Collections, Virginia Polytechnic Institute and State University*, 38-40. Hereafter cited as CLCM&EPH-CWDC and SC-VPISU.

Bridges could not be constructed, nor rivers crossed. Without wood, transportation options dwindled. Wagons, railroads, and boats all counted on wood as their fuel or material.

This chapter examines the diaries and letters from the fighting men of the war and newspaper sources showing how pivotal trees and wood were for this conflict. Usage became a theme, as the war gobbled up untold amounts of wood. Shortages of wood threatened to hold these armies and soldiers hostage, and the war caused serious repercussions for civilians away from the battlefield.

### *Usage of Wood*

Wood constituted arguably the second greatest natural resource need for Civil War soldiers and the war effort behind water. On campaign, soldiers and armies required huge amounts of wood. John Westervelt, of the 1<sup>st</sup> New York Engineers, wrote in his diary about cargos of lumber that arrived for bridging and building purposes near Bermuda Hundred, Virginia. One directive for wood to be cut to secure Union artillery numbered 18,000 board feet. The orders dictated that the wood be carted from saw mills on one side of the James River to battery emplacements on the other side. Such orders illustrated how much war efforts needed lumber and wood.<sup>3</sup>

Trees helped provide sense of security or protection as well. One Confederate pioneer, Hiram Johnson, told how a single tree provided a sense of security during a bombardment. He wrote: “Every one sought the friendly shelter of a tree, where I, not to be outdone by old veterans, listened to the bursting of shells in fancied security.”<sup>4</sup>

Many entrenchments in the Civil War included the removing of the tree line, felling trees for barriers on roadways, and using timber for abattis as shields from enemy fire.<sup>5</sup> A Tennessee soldier commented how much of a mangled mess these fortifications could be:

Previous to the day of attack, the soldiers had cut down all the trees in our immediate front, throwing the tops down hill and sharpening the limbs of the same, thus making, as we thought, an impenetrable abattis of vines and limbs locked together; but nothing stopped or could stop the advance of the Yankee line,

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<sup>3</sup> John Westervelt, Diary of a Yankee Engineer: The Civil War Story of John H. Westervelt, Engineer, 1<sup>st</sup> New York Volunteer Engineer Corps (New York, 1997), 161, 177, 191.

<sup>4</sup> Johnson, This War So Horrible, 29.

<sup>5</sup> Samuel R. Watkins, "Co. Aytch": A Side Show of the Big Show (New York, 1962), 162.

but the hot shot and cold steel that we poured into their faces from under our head-logs.<sup>6</sup>

The army not only relied on wood for cooking, keeping warm, and fortifications, but also for transportation and bridging. Operations in Virginia and Tennessee required wood bridging material and pontoons, thanks to the numerous creeks and rivers. Engineering units such as the 15<sup>th</sup> and 50<sup>th</sup> New York and pioneer units constantly built and rebuilt these structures.<sup>7</sup> High railroad bridges and heavy pontoons demanded huge supplies of wood cut from nearby forests.<sup>8</sup> A walkable bridge surface consisted of wooden planks at least ten feet in length that extended for the length of the waterway. Some of the larger structures supported lines of horses two abreast. One such bridge over the Chickahominy River in Virginia had a length of 1,240 feet in addition to the wooden corduroy approaches, which were 450 feet long. Another bridge across the James spanned 2100 feet.<sup>9</sup>

These bridges often required corduroy approaches built of wood. Corduroy approaches served to scale any embankment, wetland, or marshy area in a river.<sup>10</sup> These watershed areas usually included marshes and swamps.

Lumber and wood made corduroy roads for getting through these bogs. Soldiers placed the planks of wood or even logs or saplings above the water or mud. Nearby forests provided plenty of the needs for these hastily constructed roads. Sometimes these wooden roads were fitted with rails or poles to help getting across. These structures lifted the army out of marsh, and speeded up an advance or pursuit. Most corduroy roads had a flat surface of boards or logs, and dirt would be shoveled across the flat surface for a more level surface that benefited man and beast alike.<sup>11</sup>

While on the march in Kentucky in 1862, Union soldier Samuel McIlvaine wrote of the corduroy roads: "Continue our march today, passing over miles of recently constructed corduroy roads. These have been made of small trees cut and split, of pole, and occasionally of fence rails,

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<sup>6</sup> Ibid.

<sup>7</sup> Westervelt, Diary of a Yankee Engineer, 140- 2, 146; Hoffman, "My Brave Mechanics": The First Michigan Engineers and Their Civil War (Detroit, 2007), 155-57.

<sup>8</sup> Mark Hoffman, "My Brave Mechanics," 157, 162; New York Times, June 8, 1863, May 5, 1864.

<sup>9</sup> The Royal Engineers Journal, 52 (1938) 3: 452-54.

<sup>10</sup> Warren T. Hannum, "History of Engineer Troops in the U.S. Army," Occasional Papers, 37, Engineer School, USAMHI (1931): 12-14.

<sup>11</sup> Henry Hitchcock, Marching With Sherman (Lincoln, 1995), 255.

by Union soldiers; these road continue for miles, in some places, over hills and hollows alike where it would be impossible almost, to get through the soft miry clay without them.”<sup>12</sup>

Corduroy roads and bridges shed light on one group of soldiers in particular that spent the Civil War working with wood and trees. This little-known aspect of the human relationship with wood during this war revolved around what were called pioneer companies or corps in both the Union and Confederate armies. References to them can be found throughout the war and in both major theaters. The crews themselves operated like an extension of the Army Corps of Engineers and at other times resembled a Civilian Conservation Corps crew of the New Deal days. Pioneer corps represented a concrete example of how deeply connected the soldiers of this conflict were to nature and landscape.

Diaries and newspaper sources termed these bodies of men corps, but actually these groups resembled a special company made up a hundred or so men.<sup>13</sup> These groups roved ahead or behind of the armies. These soldiers turned lumberman, dam builders, fortification experts, and bridge specialists used and manipulated the different aspects of nature and landscape to fulfill orders from corps commanders.

“Pioneer men” interacted more with certain aspects of nature, especially trees. Some men had previous experience in lumber or engineering. Confederate soldier Hiram Williams mentioned how his mess leader had prior experience as a lumberman before the war. He wrote “a tall 6 foot 4 specimen of a piny woods genius from South Ala.”<sup>14</sup> Carl Bernhardt, with his previous experience with woodwork, judged his fellow pioneers on their skills with an ax.<sup>15</sup> Even the commanders of the pioneer units had previous experience as engineers. James St. Clair Morton, commander of the Pioneer Brigade of the Army of the Cumberland, was an engineer before the war.<sup>16</sup>

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<sup>12</sup> Samuel McIlvaine, *By the Dim and Flaring Lamps* (Monroe, N.Y., 1990), 28.

<sup>13</sup> Mark Hoffman, “My Brave Mechanics”: *The First Michigan Engineers and Their Civil War* (Detroit, 2007), 149. The Army of the Cumberland was an exception to this rule. General William Rosecrans authorized 1,000 man Pioneer battalions for each corps. Every regiment in the army detailed twenty men that were supposed to be mechanics or skilled laborers. The work of engineer units and pioneer units overlapped at times, and these units did not get along.

<sup>14</sup> Hiram Williams, *This War So Horrible: The Civil War Diary of Hiram Smith Williams* (Tuscaloosa, 1993), 47.

<sup>15</sup> Carl W. Bernhardt diary, Mar. 16, 1865, Mar. 25, 1865, Mar. 31, 1865, Bernhardt-Campbell Family Collection, United States Army Military History Institute. Hereafter cited as BCFC and USAMHI.

<sup>16</sup> Hoffman, “My Brave Mechanics,” 149-50.

These groups of soldiers blew up dams or bridges, buried the dead, or helped with building and maintain hospitals. They felled timber, cleared trees from roads, and cleared fields of fire for forts or entrenchments. During battles these duties were also performed at night.<sup>17</sup>

Union Staff Officers Henry Hitchcock and George Nichols noted the continued work of engineers and pioneers constructed corduroy roads and bridges over the numerous swamp obstacles during Union Gen. William T. Sherman's March to the Sea.<sup>18</sup> The New York Times illustrated additional evidence of this in February, 1865. The paper wrote: "Pioneer companies are increased from companies to regiments, and even to brigades, and bridges built for miles in extent, on which troops and wagons cross the perilous swamps with safety."<sup>19</sup>

In times of need Union pioneer units ran sawmills and served as lumber crews. After the Union retreated to Chattanooga in 1863, wood became scarce. Pioneer and engineer units hurried to build bridges and to supply the Union Army with crucial supplies of lumber. Both forces combined in cutting, hauling, and floating lumber to places of need along the Tennessee River. Once lumber supplies reached Chattanooga from the surrounding forests, these pioneer and engineer units operated at least two different mills around the city.<sup>20</sup>

While performing these valuable duties, pioneers could be called upon to work in the midst of the fighting or even pick up rifles if need be. In December, 1863, at the Battle of Stones River, the Army of the Cumberland's Pioneer Brigade under Gen. Morton filled a key gap in the line.<sup>21</sup>

Confederate pioneer soldier Hiram Williams repeatedly wrote how odd and dangerous it was repairing bridges, dams, or removing rocks in the heat of battle. In one case he mentioned being called to the front of the line during a battle to repair the trenches. Williams wrote: "It was not a very safe place, as the Minnie balls were flying about us pretty thick, and they caused us to pitch in with so much energy that we done the work in a short time, when we returned to camp."<sup>22</sup>

### *Shortages of Wood*

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<sup>17</sup> New York Times, Aug. 25, 1862, June 7, 1864.

<sup>18</sup> Hitchcock, Marching With Sherman, 152, 157; Nichols, The Story of the Great March, 52, 136-37; Hoffman, "My Brave Mechanics," 155, 169.

<sup>19</sup> New York Times, Feb. 17, 1865.

<sup>20</sup> Hoffman, "My Brave Mechanics," 170-71.

<sup>21</sup> Ibid., 150.

<sup>22</sup> Williams, This War So Horrible, 62.

Wood served its most essential role in everyday camp life. Soldiers needed wood for fires that provided warmth and cooking.<sup>23</sup> When armies went into winter quarters or entered siege operations, wood made for shelters or huts. Soldiers searched the landscape for trees and wood to fuel camp fires day after day for warmth and for cooking.<sup>24</sup> As soldiers and armies remained stationary in one place, the armies ate away at the wood supplies in an ever growing ring around their campsites.<sup>25</sup>

Civil War soldiers faced wood shortages during the war. Like water, some soldiers' diaries detailed how shortages required hunting for wood and the distance men traveled to get it. A South Carolina soldier in the trenches at Petersburg in February, 1865, wrote: "We suffered considerably on account of the scarcity of fire wood. We are compelled to go nearly a mile for it, in the rear of our camp, carrying it on our backs."<sup>26</sup>

Wood was less easy to replenish than water. Wood had to be procured from greater distances as an army frequented an area. In the colder months of 1862 and 1863, Robert Coburn of the 83<sup>rd</sup> New York Infantry wrote about wood constantly in his diary during his stay around Fredericksburg. From November to February, Coburn noted a constant need and hunt for firewood. Supplies seemed to be running and low and harder to find because of the army's idleness. Coburn told of dwindled supplies because of soldiers cooking, keeping warm, and building huts or shelters. He traveled over a mile numerous times. At one point wood supplies ran out in the dead of winter. His diary entry for January 28, 1862, expressed a simple but cold reality. "Wood run out, can't get none. Now the fire went out."<sup>27</sup>

Shortages of wood and lumber touched civilian life as well. As early as 1862 communities across the country both North and South began to show localized shortages. Prices for lumber and fuelwood went higher as the war continued. Lumber prices nearly quadrupled from 1860 to 1864 in the Chicago lumber market to highs around \$23 per thousand board feet in 1864.<sup>28</sup>

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<sup>23</sup> Daniel E. Sutherland, *Seasons of War: The Ordeal of a Confederate Community, 1861-1865* (New York, 1995), 324-25. Sutherland mentioned that just picket duty burnt a cord and a half of wood in cold weather, and that fires increased morale.

<sup>24</sup> Bell I. Wiley, *The Life of Johnny Reb: The Common Soldier of the Confederacy* (Baton Rouge, 1978), 59; James I. Robertson Jr., *Stonewall Jackson: The Man, the Soldier, the Legend* (New York, 1997), 674.

<sup>25</sup> Sutherland, *Seasons of War*, 192.

<sup>26</sup> John Coleman diary, Feb. 15, 1865, Civil War Times Illustrated Collection, USAMHI; Charles Minor, Minor Cash Book, CLCM&EPH-CWDC, SC-VPISU, 33. Hereafter cited as CWITC.

<sup>27</sup> Coburn diary, Jan. 28, 1863, CWITC, USAMHI.

<sup>28</sup> Richard Current, *Pine Logs and Politics: The Life of Philetus Sawyer 1816-1900* (Madison, 1950), 27; *Chicago Tribune*, June 6, 1864, June 28, 1864, Nov. 21, 1864.

Smaller locales like Macon, Georgia, showed prices rising, and almost doubling, in a short period in 1863. This triggered subsequent attempts to plan against foreseen upcoming shortages.

Larger cities like Richmond had larger problems. Rising demand, inflation, price-gouging, and the state of Confederate currency played into this equation. J. B. Jones, a war clerk, described the rise in wood prices in the city to \$40 and then as high as \$500 a cord once the canals froze and transportation options halted. Despite the price and currency problems, Richmonders had to go farther away to get wood. In the winter of 1865, the freezing of James Canal closed one avenue for wood transport for the Richmond area, effectively putting a stranglehold on supplies of lumber and wood. Instances such as this highlighted how the Confederacy failed to transport needed materials forward to the places of need. Jones ended up buying wood by the half cord at times and paying exorbitant prices.<sup>29</sup>

Newspaper articles at times called attention to wood supplies near the front lines around Petersburg and Chattanooga. Soldiers shredded wood supplies near the towns or places they occupied. Other locales sought to head off shortages in advance. One article in the Macon Telegraph warned residents to stock up in the fall of 1863: “Everything seems to indicate that there will be a scarcity in this article, and it behooves our citizens to commence immediately laying a supply for the approaching winter.”<sup>30</sup>

Another such article from the Memphis Appeal, but printed in the Macon Telegraph in October, 1863, told of how trees had disappeared around Chattanooga. The article, written by Quel Qu’un, mentioned the sound of the axes as both armies went to work cutting down the forest all around the city, and showed how the war was causing increased deforestation.<sup>31</sup>

This charge had drawbacks as well as interesting points. Clearing of forests for agriculture and farming in the decades before the Civil War was the greatest cause of deforestation. The war compounded and heightened previously created problems in terms of deforestation: “The woods are disappearing rapidly before the thousands of axes which even after night you hear resounding across the country, and in little while barren hillsides and denuded fields will greet the vision of the observer.” Yet the newspaper writer failed to note how past practices bore the responsibility of their current predicament, and that the war enflamed the problems because of massive

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<sup>29</sup> J.B. Jones, A Rebel War Clerk’s Diary at the Confederate States Capital (New York, 1935), 2: 118, 336, 408.

<sup>30</sup> Macon Telegraph, Sept. 12, 1863.

<sup>31</sup> Hoffman, “My Brave Mechanics,” 169; Macon Telegraph, Oct. 30, 1863.

amounts of use. The article asserted that a simple item as firewood could decide the 1863 campaign around Chattanooga.<sup>32</sup>

The army resembled a wild beast or “monster” that took huge quantities of lumber wherever it traveled, continued the article in the Macon Telegraph. The author wrote: “An army is a great gourmand, and wherever it rests the noblest forests and pastures soon fade from sight, in the capacious swallow of the monster.”<sup>33</sup>

Additionally, the article indicated that Union men were close to freezing on the other side of the river due to the lack of wood for fires to keep warm. The article declared: “A few weeks more, perhaps days, and the last vestige of the essential adjunct to a soldier’s life, wood, will have disappeared.”<sup>34</sup>

Here the newspaper erred. Wood remained pivotal in soldiers’ lives, but the situation concerning Union supplies failed to reach life-threatening levels. Union supply lines remained open along the river in places like Bridgeport, Alabama, despite the Confederate victory at Chickamauga. An article published in the New York Times shortly after the end of the Chattanooga Campaign detailed how the Union forces created a large supply depot in Bridgeport. The depot featured two newly constructed steam sawmills that fulfilled lumber needs for Yankee troops. The sawmills ran twenty four hours a day and built bridging material and boats. The article claimed: “No less than eight capacious steamers have been constructed here in the last eight months, and are now plying between here and Knoxville.”<sup>35</sup>

The war’s huge appetite for men and natural resources both North and South compounded other circumstances regarding dependency on wood. Shortages of wood remained magnified because of two factors that came together under the banner of the war. First, the labor force needed to harvest trees went to the army or was involved in the war effort. This became a problem for the North and the South. The farmer or logger who supplied wood to towns and cities in the North before the war for a small profit, now wore a uniform.<sup>36</sup> In the South black labor remained the only labor force left available and could not be organized to maintain a healthy supply of wood for the war effort plus the urban population. Some slave owners were reluctant to lend slaves to the army, and in some cases the labor was no longer available. The

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<sup>32</sup> Macon Telegraph, Oct. 30, 1863; New York Times, May 5, 1864.

<sup>33</sup> Macon Telegraph, Oct. 30, 1863.

<sup>34</sup> Ibid.

<sup>35</sup> New York Times, May 5, 1864.

<sup>36</sup> Paul W. Gates, Agriculture and the Civil War (New York, 1965), 82-84.

Macon Telegraph reported wood cutters and army agents seeking black slave labor for their cutting operations, by putting ads in the newspaper.<sup>37</sup>

Second, especially in the South, transportation and organization became factors. Where the supplies of trees existed in abundance, transportation efforts floundered because of the state of the railroads and Union domination of the waterways. Wood and lumber was not transported to areas of need in the form of towns or armies.

In the South, railroads were overloaded or destroyed. They simply could not keep pace with Northern lines. They also became targets of Federal forces. These factors combined with organization difficulties. Whereas the South failed to create an organized effort that maximized resources to harvest and transport materials for the war effort, the North rebounded quickly when supplies were needed. In the winter of 1864-1865, some New York railroads ran out of wood to fuel locomotives. Officials approached Canada for supplies, and the resulting purchases kept the railroads fueled across the central region.<sup>38</sup>

When Southern locales ran out of wood, they came up with different approaches to solve the shortages. In early 1865, Confederate officials published a want ad in the Richmond Enquirer that asked for lumber to be delivered along the James River canal or any railroad leading into the city. The lumber was to be addressed to the Major commanding the Confederate States Armory in Richmond.<sup>39</sup>

In the fall of 1864, the Petersburg city council petitioned Gen. Robert E. Lee for 1,000 cords of firewood. Lee could not fill the need, but he donated \$200 for the cause. By the end of the winter carts, bridges, and anything wooden in Petersburg had been put to use as fuel to keep warm.<sup>40</sup>

Lee's own efforts to gather wood for his soldiers that same winter fell to pieces. He tried to persuade local slave owners to help the cause. The owners failed to meet the army's need. Lee then petitioned Secretary of War J. A. Seddon to conscript slave labor to gather wood. Lee's

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<sup>37</sup> Macon Telegraph, Aug. 4, 1862, Oct. 28, 1863; Wiley, The Life of Johnny Reb, 59; Official Records of the War of Rebellion, Sept. 21, 1864, series 1, XLII, part 2, 1260-61.

<sup>38</sup> Gates, Agriculture and the Civil War, 137.

<sup>39</sup> Richmond Enquirer, Feb. 15, 1865.

<sup>40</sup> Noah Trudeau, The Last Citadel (Baton Rouge, 1991), 258. This information was quoted out of the Petersburg Express.

request to Seddon sought to free up white laborers devoted to cutting wood and to put them in the ranks while using slave labor for wood-cutting and work on Petersburg fortifications.<sup>41</sup>

However, Lee went into some detail over the wood shortage his army was facing. Lee highly valued the road work and wood supplies such a group could supply: “I shall require a large force to build roads, cut and transport wood, and make other preparations for the supply and comfort of the troops at this place during the winter months.”<sup>42</sup> Lee intimated that the year before along the Rapidan, soldiers were detailed from the lines to do such work. Yet, Lee believed that the situation at Petersburg negated this option.

Lastly, to show how these supply issues concerning wood were on Lee’s mind at the time, he offered a proposal: “Among other things that will have to be done in order to save our animals and procure adequate supplies of fuel, a short railroad will have to be constructed to connect us with suitable wood for fuel, the green pine around us being unfit for that purpose.”<sup>43</sup>

This may have been Lee’s attempt at getting around the contract and organization problems that plagued the Confederate army. It also might have stressed the seriousness of the compounding problems of supplies and men. Lee mentioned: “I think that the time has arrived when the public safety requires that we shall employ negro labor.” Wood that was promised may have never arrived or simply might not have been available.<sup>44</sup>

While the Confederacy had trouble securing wood supplies; the Union moved cargos and procured supplies of lumber as needed. The Pioneer corps and engineer units cut and sawed supplies as needed for the needs of the armies. The coordination and transportation of large shipments of wood represented a major feat for the Union war effort. Thousands of board feet of lumber dragged across untold miles to military theaters was quite an accomplishment for the Union war effort. Such coordination and organization in regards to wood could not be replicated by the Confederacy.<sup>45</sup>

Another example of Southern efforts came from Georgia. In 1863 the Macon Telegraph announced the formation of the Wood Supply Association in Augusta. This agency’s mission

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<sup>41</sup> Official Records of the War of Rebellion, Sept. 21, 1864, series 1, XLII, part 2, 1260-61.

<sup>42</sup> Ibid., 1261.

<sup>43</sup> Ibid.

<sup>44</sup> Ibid., 1260.

<sup>45</sup> Westervelt, Diary of a Yankee Engineer, 161, 177, 191; Hoffman, “My Brave Mechanics,” 160, 168. A similar account to Westervelt’s resided in Hoffman’s claim that the 1<sup>st</sup> Michigan Engineers produced and supplied 11,915 feet of twelve by twelve square timber, 2,910 feet of fifteen by fifteen timber, and almost 20,000 railroad ties during the month of August 1863 to railroads near Elk River on the Tennessee River.

centered around efforts to pool lumber and wood resources, secure contracts for wood supplies, and confront the pending shortage of wood in the upcoming winter by creating a stockpile that could satisfy needs of all the citizens, especially the poor. This association of citizens buying contracts represented some form of organization, but the success of such efforts remained unclear. Before the winter got underway, the newspaper authors exhibited negative outlooks on the Association providing all the town's needs. The paper believed that needs would far outweigh supplies: "We apprehend that the difficulty will be that the applicants will be more numerous than can be accommodated." At the time of the article in 1863 hellish war had not yet traveled to their doorstep.<sup>46</sup>

In the winter of 1864-1865 Petersburg formed a similar agency. Their Wood Committee ran \$35,000 in the red. Petersburg's citizens still suffered from a lack of fuel for heat, while the armies shredded forests and supplies of wood farther in a ring around the city.<sup>47</sup>

### *Conclusion*

The society that entered the Civil War demonstrated a slow growing awareness and dependency on wood through these soldiers' diaries, letters, and newspapers. Both war efforts relied on wood. Usage represented one constant theme or pathway in human relationship with nature during this time. This war consumed objects directly provided by nature on a grand scale. High quantities of food, water, and wood drove these war efforts.

The war's appetite for wood acted like a cancer, especially in the South. It emptied areas of crucial supplies and turned some landscapes into wastelands, which metastasized as the armies marched and the war spread into new places. Civilians and soldiers had to travel greater distances for wood. Forests were used up in an ever enlarging sphere around cities, railroads, and scenes of battle.

Both sides faced shortages of wood. The Confederacy failed to deliver adequate amounts of wood to areas of need during the war. The Union consumed large quantities of wood and lumber, and faced shortages as well. While the Confederacy suffered from the need for wood, the Union overcame shortages by finding new supplies and transporting wherever required. These instances signified the natural side of the Civil War.

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<sup>46</sup> Macon Telegraph, Oct. 23, 1863, Oct. 28, 1863, Dec. 14, 1863.

<sup>47</sup> Trudeau, The Last Citadel, 258.

Everyone had to have it. Soldiers acknowledged the hunt for and lack of firewood. They felt the cold when the supplies ran out. Southern communities exhibited a far-sighted awareness when cities like Petersburg, Augusta, and Macon resorted to planning and stockpiling wood supplies. The Union war effort devoted large efforts to gathering and moving wood products. Most importantly, both sides were aware of wood's important role in the Civil War.

### Chapter 3: The Civil War and the Beginnings of the Forest Conservation Movement

Around the first decade of the 20<sup>th</sup> century forest conservationists started to look back and take stock in what they had achieved over the last few decades. A movement had slogged through its beginnings. Defeats littered the road behind, but the work of the first foresters, pioneers of the forest conservation movement, had paid off. The federal government now sanctioned the cause of saving and planting trees, and set aside lands for the purpose of conserving a resource that had been destroyed by countless years of agricultural clearing and industrial cutting to satisfy an ever increasing demand for its products. Conserving America's forests had been hard work. In terms of the slow beginnings of the forest conservation movement, U. S. Forestry Chief Bernhard Fernow wrote: "It was a hard field to plow, grown up with the weed growth of prejudice and custom, and means and tools for the work were inadequate."<sup>1</sup>

Fernow correctly judged the movement, but failed to give credit to the movement's period of growth. Instances of forest conservation sentiment in America can be traced as far back as the 1600's. Even the original British colonies had localized measures aimed at curbing the cutting of trees, especially in New England.<sup>2</sup> These tidbits of natural awareness, where a community proposed legislation to regulate the usage of trees or how an individual like William Penn mandated that some acreage be retained for trees, represented how the colonies and later the nation slowly built up a natural awareness that evolved into the beginnings of a movement.<sup>3</sup> Between 1860 and 1880, the movement started to organize and grow like never before.

The forest conservation movement gained momentum alongside an increased usage of wood and lumber during the Civil War. Around 1860 several factors merged to jump start this movement. The pace of industrialization in America began to quicken particularly in the lumber industry.<sup>4</sup> Years of deforestation combined with an ever increasing industrial demand for lumber

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<sup>1</sup> Bernhard E. Fernow, A Brief History of Forestry: In Europe, the United States, and Other Countries (Toronto, 1907), 415.

<sup>2</sup> John Ise, The United States Forest Policy (New Haven, 1920), 20-21; Fernow, A Brief History of Forestry, 400-01.

<sup>3</sup> Michael Williams, Americans and Their Forests: A Historical Geography (New York, 1989), 144-45; Ise, The United States Forest Policy, 29.

<sup>4</sup> Williams, Americans and Their Forests, 146-47, 175-76; Thomas Cox, et al., This Well-Wooded Land: Americans and Their Forests from Colonial Times to the Present (Lincoln, 1985), 108, 116-19; Fernow, A Brief History of Forestry, 404.

taxed American forests more and more. Census data from 1860, 1870, and 1880 illustrated the explosion of harvesting of timber from the nation's forests during and after the Civil War.

At the same time, people across the country began to notice the disappearance of the nation's forests. Two hundred years of clearing land for farming had taught colonists, farmers, and immigrants how the land changed as result of cutting trees. This process slowly evolved into America's first understanding of natural awareness.<sup>5</sup> From these beginnings, the forest conservation movement developed over time. The years after the Civil War saw an outpouring of writings and advocacy that demonstrated that this period represented the beginnings of the forest conservation movement. This chapter's main argument trace the beginning of the forest conservation movement and how the Civil War's increased demand for lumber, the creation of the Department of Agriculture, and the Morrill Land Grant Act demonstrate the Civil War's place in the beginnings of the forest conservation movement.

### *Census Data and the Lumber Industry*

Consumption of wood and lumber soared during and after the Civil War. Lumber operations grew in total dollar output and in total number of establishments. Important changes in the lumber industry accompanied this growth.

Before the Civil War, many of the lumber operations in northern states like New York, Maine, and Pennsylvania had been small and numerous. Established years before the war, these small firms propelled states in New England and the Middle Atlantic regions to the lead in terms of dollar output in the lumber industry in 1860. Their way of business represented an older way of doing business in the lumber industry by the start of the war. Most of these firms in the industry dealt with more localized demand in the East and contained little of the large-scale business aspects that came after the Civil War in places like Michigan, Wisconsin, and Illinois. The levels of production and cutting associated with these small-time operations grew in the census data between 1850 and 1860, but at a very small rate. The data from 1850 and 1860 differed greatly with the census data for the 1870 and 1880 returns and showed increases in output, efficiency, and where the lumber industry was headed.<sup>6</sup>

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<sup>5</sup> Williams, *Americans and Their Forests*, 144-45.

<sup>6</sup> U. S. Census Office, *Manufactures of the United States in 1860: Compiled from the Original Returns of the Eighth Census Under the Direction of the Secretary of the Interior* (Washington, D.C., 1865), 275, 415, 541, 658; Williams, *Americans and Their Forests*, 161-63, 175-76. Williams pointed out how by mid century lumber had started to be

Table 1-1860 Census Data for Lumber,

<b>States</b>	<b>Number of Establishments</b>	<b>Dollar Value of products</b>
Pennsylvania	3,030	10,743,752
New York	2,765	9,710,945
Michigan	927	7,040,190
Maine	737	6,598,565
Ohio	1,862	5,158,076
Wisconsin	476	4,377,880
Indiana	1,277	4,271,605
California	279	3,943,881
Missouri	544	3,074,226
Illinois	445	2,543,985
Georgia	410	2,412,996
Virginia	779	2,201,187
Minnesota	158	1,234,203
North Carolina	330	1,074,003

Source: Data adapted from U. S. Census Office, *Manufactures in the United States in 1860 Compiled from the Original Returns of the Eighth Census Under the Direction of the Secretary of the Interior* (Washington, D.C., 1865), 35, 82, 113, 144, 218, 275, 284, 318, 415, 438, 486, 541, 639, 658.

Sawmills and logging businesses in the northern states experienced strong growth after 1860. States like Pennsylvania and New York, with entrenched lumber firms, tallied thousands of saw mills in the 9<sup>th</sup> and 10<sup>th</sup> censuses. Newcomer states like Michigan and Wisconsin signified how the lumber industry was moving West. These Great Lake States had half the number of establishments, but produced twice as much dollar value output as the older

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shipped across long distances. This system of transport became wide spread after the Civil War as lumber flowed out of places in Michigan, and Wisconsin, and Chicago down to the markets in the South and Plains regions. The growth of transportation in the 1840's and 1850's facilitated the lengthening of the reach of the lumber industry, but the system paid more dividends after the war concluded. The graph on 161 illustrated two important trends. The growth of lumber grew prior to 1860, but not at rate of post-1860. The curve was much steeper after 1860. The other trend revealed a lumber industry that no longer moved with the economy after 1860. The Panic of 1857 had sent the lumber industry lower in a move that paralleled the economy. After 1860, the lumber industry exploded upward, continuing even when the wartime boom ended in the early 1870's.

entrenched states. Production nearly tripled in some states. Michigan went from third on the list of total dollar output in 1860 to leading the industry in 1870.<sup>7</sup>

The 1860 census detailed 927 lumber mills in Michigan that yielded \$7 million in total production.<sup>8</sup> That same census showed how Pennsylvania exhibited the trend of small firms with 3,030 establishments and \$10.7 million worth of lumber.<sup>9</sup> Table 2 illustrated how Michigan claimed the top spot in total value. Michigan's tally grew to 1,571 sawmills, and generated \$31.9 million in value. These numbers surpassed the former leader, Pennsylvania, which counted 3,738 mills and sawed \$28.9 million worth of logs.<sup>10</sup> To put this growth in perspective, in 1860 plants averaged 50,000 feet a day. By 1870 that number increased to 200,000.<sup>11</sup>

Table 2-1870 Census Data for Lumber Sawed

<b>States</b>	<b>Number of Establishments</b>	<b>Lumber in thousands of feet</b>	<b>Dollar Value of products</b>
Michigan	1,571	2,251,613	31,946,396
Pennsylvania	3,739	1,629,631	28,938,985
New York	3,510	1,310,066	21,238,228
Wisconsin	720	806,807	15,130,719
Indiana	1,861	656,400	12,324,755
Maine	1,099	639,167	11,395,747
Ohio	2,230	557,237	10,235,180
Missouri	806	329,676	6,363,112
California	291	318,817	5,227,064
Illinois	511	245,910	4,546,769
Minnesota	207	242,390	4,299,162
Georgia	532	245,141	4,044,375
Virginia	605	144,225	2,111,055
North Carolina	523	124,938	2,000,243

<sup>7</sup> U. S. Census Office, *Manufactures of the United States in 1860*, 275; U.S. Census Office and Francis Walker, *A Compendium of the Ninth Census (June 1, 1870)* (Washington, D.C., 1872), 881.

<sup>8</sup> U. S. Census Office, *Manufactures of the United States in 1860*, 275.

<sup>9</sup> *Ibid.*, 541.

<sup>10</sup> U. S. Census Office and Francis Walker, *A Compendium of the Ninth Census*, 881.

<sup>11</sup> Ralph W. Hidy, Frank Ernest Hill, and Allan Nevins, *Timber and Men: The Weyerhaeuser Story* (New York, 1963), 29.

Source: Data adapted from U.S. Census Office and Francis Walker, A Compendium of the Ninth Census (June 1, 1870) (Washington, D.C., 1872), 881.

This surge in production took place in short time span with the war dominating the early 1860s. The shortage of labor created by the war held the market down, coupled with a time of very low prices in 1861 and 1862.<sup>12</sup> Michigan's lumber industry quadrupled between 1863 and 1869. Northeastern states like New York and Pennsylvania could not match Michigan's efficient firms.<sup>13</sup>

The 1880 census revealed the same kind of growth for the Great Lake states. Michigan counted 1,649 lumber operations. Michigan's total value produced came to \$52.4 million, while Wisconsin accounted for 704 sawmills with a product value of \$17.9 million. Table 3 showed how past leaders Pennsylvania and New York failed to keep up, and declined. Pennsylvania's totaled \$22.4 million and 2,827 mills, while New York chimed in with 2,822 establishments and \$13.2 million worth of sawed timber. Table 3 showed the decrease in number of establishments and value of products from 1870 to 1880.<sup>14</sup>

Table 3- 1880 Census Data for Lumber.

<b>States</b>	<b>Number of Establishments</b>	<b>Lumber in thousands of feet</b>	<b>Dollar Value of products</b>
Michigan	1,649	4,172,572	52,449,928
Pennsylvania	2,827	1,733,844	22,457,359
Wisconsin	704	1,542,021	17,952,347
New York	2,822	1,184,220	14,356,910
Indiana	2,022	915,943	14,260,830
Ohio	2,352	910,832	13,864,460
Maine	848	566,656	7,933,868
Minnesota	234	563,974	7,366,038
Georgia	655	451,788	4,875,310
Missouri	881	399,744	5,265,617
Illinois	640	334,244	5,063,037

<sup>12</sup> Richard Current, Pine Logs and Politics: The Life of Philetus Sawyer 1816-1900 (Madison, 1950), 27; Hidy, Hill, and Nevins, Timber and Men, 24.

<sup>13</sup> Williams, Americans and Their Forests, 167.

<sup>14</sup> U. S. Census Office, A Compendium of the Tenth Census (June 1, 1880) (Washington, D.C., 1888), 1162-63.

Virginia	907	315,939	3,434,163
California	251	304,795	4,428,950
North Carolina	776	241,822	2,672,796

Source: Data adapted from U. S. Census Office, A Compendium of the Tenth Census (June 1, 1880) (Washington D. C., 1888), 1162-63.

While increases in transportation, immigration, and westward expansion all deserve mention in this discussion, the war itself also had a place in the expansion of the lumber industry. The Civil War played a direct part in this lumber industry expansion for three reasons: wartime increases in demand, increases in the price of lumber, and the Union war machine’s utilization and expansion of railroads. The Union’s constant need for lumber during the war combined with price hikes that started with increased demand in late 1863 made for better profits in the industry.<sup>15</sup> This laid the groundwork for the industry to expand. More return likewise helped steer developments and focused the trends from the prewar period such as cheaper, more abundant transportation, growth of distribution centers, and improvements in technology such as steam mills.<sup>16</sup> These trends came together and furthered the explosion of lumber industry out of the war years. Table 1 and Table 2 illustrated the growth from 1860 to 1870.

The war increased the need for wood and thus the expansion of the industry. No one measured the endless cords of wood required to fuel the railroads that transported troops or the logs that fed the fires of the armies. Evidence remained hidden in wartime sources like John Westervelt’s diary, the newspapers articles concerning Bridgeport, Tennessee, and the soldiers who required wood. Forced to meet emergency needs quickly, works like Westervelt’s writings showed how the Union war machine transported material at will and in large numbers as the conflict dragged on into 1864 and 1865. This Union engineer mentioned the movement of thousands of board feet numerous times as a commonplace task for his engineer unit.<sup>17</sup>

Bridgeport’s sawmill illustrated the same thing. Distribution centers no longer had to be major cities. Instead of New York and Chicago lumber dealers, the war effort created mini

<sup>15</sup> Current, Pine Logs and Politics, 27; Chicago Tribune, June 6, 1864, June 28, 1864, Nov. 21, 1864; Hidy, Hill, and Nevins, Timber and Men, 25.

<sup>16</sup> Williams, Americans and Their Forests, 169, 175-77, 185.

<sup>17</sup> John Westervelt, Diary of a Yankee Engineer: The Civil War Story of John H. Westervelt, Engineer, 1<sup>st</sup> New York Volunteer Engineer Corps (New York, 1997), 161, 177, 191.

distribution centers like Bridgeport or City Point. According to the correspondent, the Union war machine transformed Bridgeport in a matter of months from a town with a couple houses into a small canvas city fitted with storehouses and sawmills. When lumber was required on the banks of the Tennessee River at Bridgeport, engineers built and operated a steam sawmill that ran around the clock. Output was emphasized. Needs were quickly fulfilled, and the product could be transported to required destinations.<sup>18</sup>

Another example of this resided in the railroads in New York. The prospect of no wood to fuel the locomotives sent federal agents into Canada to procure it.<sup>19</sup> They imported lumber. This source coincided with others that claimed that New York began to import its lumber needs starting around the early 1850s.<sup>20</sup>

One of the most revealing aspects of these feats, but also hardest to prove effectively, revolved around the fact that Westervelt treated these quickly setup sawmills and orders for large amounts of lumber as just another day on the job.<sup>21</sup> The setup of sawmills and procurement of wood was commonplace for these soldiers. The writer for the New York Times treated the Bridgeport sawmill as a spectacle, but not out of the ordinary. The 1<sup>st</sup> Michigan Engineers repeatedly hauled and sawed lumber under severe time constraints.<sup>22</sup> Westervelt's nonchalant attitude toward these lumber requests and quick work in the sawing and moving of lumber further illustrated how some aspects of the war served as a reminder of how factors concerning wood demand came together and then later on a larger scale.

The pre Civil War period had seen the foundations laid for the industrial machine that was to come after the war, but those prewar years failed to benefit from the combination of factors that the Civil War years had. Expediency, industrial efficiency, price, and demand all combined to create a favorable mixture for growth in the lumber industry. Factors like cheap transportation, higher prices, and steady demand failed to mix and then create the boom period that the war period succeeded in doing. The lack of industrial output and efficiency during the 1850s served as further evidence to this claim of the war years as being critical in the transformation of the industry. The war years had the correct mix of factors that the previous

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<sup>18</sup> New York Times, May 5, 1864.

<sup>19</sup> Paul W. Gates, Agriculture and the Civil War (New York, 1965), 82-84.

<sup>20</sup> Williams, Americans and Their Forests, 176-77.

<sup>21</sup> Westervelt, Diary of a Yankee Engineer, 161, 177, 191.

<sup>22</sup> Mark Hoffman, "My Brave Mechanics": The 1<sup>st</sup> Michigan Engineers and Their Civil War (Detroit, 2007), 160, 168, 170-71.

decade did not have. In fact the years around 1857 showed a lumber industry slowing up.<sup>23</sup> After 1860, the curve for the lumber industry headed upward much steeper and quicker than ever before. Something changed, and the Civil War played a part in that change.<sup>24</sup>

Lumber operations like Frederick Weyerhaeuser's provided an example of how the war years represented the turning point. Weyerhaeuser's firm in Wisconsin had moved products and materials through canals and the river systems prior to the war, but not with the total value and growth that the lumber industry averaged at the end of the 1860s.<sup>25</sup> Weyerhaeuser's business before the war in lumber had been small. During the war years Weyerhaeuser solidified his operations. The wartime upturn in lumber prices in 1863 and 1864 began the real increase in his business. During the same time span, the future business giant thought of enlisting in the war effort, but rising prices and his growing business gave him a reason to stay in Wisconsin and out of a uniform.<sup>26</sup> After the conflict ended, his business increased incredibly in value and output, which pointed to the war years as the turning point that combined the efforts of prewar industrialization with heightened demand.

In addition, the Table 1 demonstrated growing disparities in production and number of establishments that illustrated the changing state of forest reserves in the North. Older states entrenched in the lumbering industry had begun to reach limits in terms of forested lands and amount of trees left to cut. Clearing for agriculture claimed the most trees, but the need for wood cleared the eastern states such as Pennsylvania and New York of the prime woodlands left over. The thick valuable stands of white pine of forests had disappeared in the Middle Atlantic and New England states. Michigan, Wisconsin, the Pacific West, and the South had the best stands of timber left.

By the 1860s, Pennsylvania and New York had begun to feel the effects of over cutting. The 1870 census, the first to measure woodlands, showed Pennsylvania with less than 6 million acres of forests.<sup>27</sup> This estimate, if taken at face value, amounts to less than a fifth of the state's

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<sup>23</sup> Williams, *Americans and Their Forests*, 161, 185. These two graphs on these two pages showed the amount of lumber cut in America and receipts and shipments of lumber into Chicago. Both depicted 1860 as the turning point where the steep increases start to occur, not in the 1850's.

<sup>24</sup> Cox et al., *This Well Wooded Land*, 128-29.

<sup>25</sup> Hidy, Hill, and Nevins, *Timber and Men*, 28-30.

<sup>26</sup> *Ibid.*, 30.

<sup>27</sup> U. S. Census Office and Francis Walker, *A Compendium of the Ninth Census*, 881.

total land area.<sup>28</sup> Estimates such as this indicated forested lands dropping to emergency levels. Table 3 confirmed how bad the situation in Pennsylvania had become. Faced with a decreasing amount of trees, the number of lumber firms dropped significantly from 3,739 firms in 1870 to 2,827 in 1880, while the Great Lakes states continued to grow.<sup>29</sup>

This trend of depletion in the North had a geographic flip side to it as well, one that concerned the South and the future of America's forests. Following the war, depletion of northern supplies continued to rage east to west. Michigan, Minnesota, and Wisconsin also peaked and declined beyond 1900. Meanwhile, the Ninth and Tenth census records showed untapped forests resources in the South. States such as North Carolina, Georgia, and Virginia that bordered the Appalachians had large reserves, and began to compensate for the nation's depleting supply coming from the northern states. Table 3 began to show the South's rise in the lumber industry<sup>30</sup>

Nearing the turn of the century, forests in traditional lumber states like Michigan, Pennsylvania, and New York reached exhaustion. The South and the Pacific Northwest stepped in more and more to meet the nation's needs in terms of lumber. Ironically, the blue states that fueled the Union war effort could no longer bear the burden of the nation's appetite for trees and wood after the war's end. The Civil War's spirit of large amounts of sheer resource usage had bitter fruit to bear, and in turn the South became an unlikely savior by the turn of the century in terms of providing the nation's lumber needs.<sup>31</sup>

### *Federal and State Government Involvement in Forest Conservation*

After the Civil War as the lumber industry expanded and forests disappeared, the forest conservation movement began to grow. The Civil War promoted the spread of forest conservation sentiment via the creation of the Department of Agriculture, and sponsoring of the land grant agricultural schools. These two developments became two avenues that the forest conservation movement used to expand. A combination of congressional legislation and the

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<sup>28</sup> U. S. Forestry Service, Northern Research Station's Forest Inventory and Analysis, Pennsylvania's Forests 2004 (Newton Square, 2007), 5. NRS-FIA estimated that by 1900 Pennsylvania's forested acreage dipped to just about 30% from the 90% in 1630. Using the NRS-FIA's data on the Pennsylvania's total acreage the data from census can be analyzed in terms of total forested acreage for the 1870 census. Abbreviated as NRS-FIA in the future.

<sup>29</sup> U. S. Census Office, A Compendium of the Tenth Census, 1162-63.

<sup>30</sup> U. S. Census Office and Francis Walker, A Compendium of the Ninth Census, 881; Ronald D. Eller, Miners, Millhands, and Mountaineers: Industrialization of the American South, 1880 – 1930 (Knoxville, 1982), 86-87.

<sup>31</sup> Eller, Miners, Millhands, and Mountaineers, 87.

executive branch drew attention to forests concerns. The absence of southern senators from Congress helped lead to the creation of a Department of Agriculture in May, 1862, which proved to be a pivotal avenue of expansion for the forest conservation movement.<sup>32</sup>

President Abraham Lincoln thought of this department as one for the people. In his fourth annual address to Congress in December, 1864, Lincoln penned his beliefs “It is peculiarly the people’s Department, in which they feel more directly concerned than in any other.”<sup>33</sup> These remarks were fitting, concerning the Department’s future involvement with forests. Unlike a number of his successors, Lincoln never mentioned forests in any of his annual messages. Yet his creation later served as a vehicle for a movement sponsored at first by regular people, not professionals.<sup>34</sup> The movement picked up steam as the country navigated away from the Civil War, and federal involvement in agricultural matters became a way for forest concerns to filter throughout the government.

The Department of Agriculture served as a forum and a conduit for the spreading of materials and knowledge about the state of forests in America. The first such article found its way into these reports for 1864.<sup>35</sup> J. J. Thomas wrote about managing and propagating trees, and called attention to wreckage taking place in America’s woodlands. Frederick Starr’s report followed in 1865 and served as a watershed by calling for additional federal protection.

Rev. Frederick Starr’s report, entitled “American Forests: Their Destruction and Preservation,” warned that the American forest constituted a limited resource. Starr argued that the resource became a victim of human pursuits including the war, industrial interests, and agricultural pursuits. This report represented the first national article on forest destruction, one that fired an important early shot in a growing movement to preserve nature and natural resources.<sup>36</sup> Amid all the usage of nature and landscape that the war fostered, rumblings of forest conservation began to emerge.

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<sup>32</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1862 (Washington, D.C., 1863), 3-4; Harold K. Steen, The U. S. Forest Service: A History (Seattle, 2004), 5; Gates, Agriculture and the Civil War, 306-07.

<sup>33</sup> James D. Richardson, ed., A Compilation of the Messages and Papers of the Presidents (Washington, D.C., 1905), 5: 3452.

<sup>34</sup> Fernow, A Brief History of Forestry, 415-16.

<sup>35</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1864 (Washington, D.C., 1865), 43.

<sup>36</sup> Gates, Agriculture and the Civil War, 137-38.

The Civil War played heavily into Starr's article. He noted the rise in prices of wood and lumber sparked by the war as well as how the war affected forests. The work contained a section on "Destruction By War" devoted to forest destruction by both sides.<sup>37</sup> Starr believed that the war had caused "immense" destruction of the nation's forests.<sup>38</sup> Starr included all the ways forest and trees became a war resource. Military reasons, accidents, and downright destruction littered Starr's long list of forest resource usage by the war.

He saved his strongest language toward destruction for the construction and maintenance of railroads. He attacked the railroads for the extreme levels of usage of lumber and wood to build their lines and fuel their locomotives: "The railroads consume great quantities of wood, and exhaust the supply along their lines."<sup>39</sup>

Others followed in Starr's footsteps. The Commissioner's yearly reports contained the current forestry articles regarding that year, lectures or talks that treated forest concerns during the proceedings of the State Boards of Agriculture or any state Horticulture or Agriculture Society. For example, the 1868 report listed every notable work in America pertaining to agriculture.<sup>40</sup> Books on trees made this list. Excerpts from the proceedings of the Illinois State Horticultural Society and the report by the Nebraska State Board of Agriculture both contained reports on trees, forest culture, and forest conservation.<sup>41</sup>

These reports featured recently published articles such as Daniel Milliken's "An Essay on the Best Practical Means of Preserving and Restoring the Forests of Ohio." It steered Ohio to action.<sup>42</sup> Longtime advocates of forestry concerns such as Harvard botanist, George B. Emerson, and Dr. John A. Warder found their way into these volumes as well. Emerson, known for his 1846 work on trees, "Report on the Trees and Shrubs of Massachusetts," was included on the 1868 list of "American Works on Agriculture."<sup>43</sup> Yale Professor William Henry Brewer's

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<sup>37</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1865 (Washington, D.C., 1866), 215.

<sup>38</sup> Ibid.

<sup>39</sup> Ibid., 210.

<sup>40</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1868 (Washington, D.C., 1869), 579-81, 599, 601, 604, 607.

<sup>41</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1873 (Washington, D.C., 1873), 283-84, 384-86, 396, 399-400.

<sup>42</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1873, 315-16. Milliken also showed up in the 1875 volume.

<sup>43</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1868, 601.

reports and graphs from the 1870 census regarding forestry statistics appeared in these volumes as well.<sup>44</sup>

As the Department grew in responsibility and scope, the subject of the forests gained more press and more access to the powerful officials in government. The Commissioner of Agriculture became one of the first to inform Presidents about the state of forests in America. Frederick Watt initiated this trend in the early 1870s.<sup>45</sup> Watts warned the President that legislation from Congress was required to combat deforestation. In his fourth annual message in December, 1872, President Ulysses S. Grant relayed the pleas of his Commissioner of Agriculture to Congress: “The Commissioner makes one recommendation – that measures be taken by Congress to protect and induce the planting of forests – and suggests that no part of the public lands should be disposed of without the condition that one tenth of it should be reserved in timber where it exists, and where it does not exist inducements should be offered for planting it.”<sup>46</sup>

Watts facilitated things further after an 1873 conference of the nation’s top scientific scholars in Portland, Maine. Here applied science begins to run headlong into forest conservation.<sup>47</sup> The America Association for the Advancement of Science heard a paper from a New York historian, medical doctor, and former Civil War surgeon, Franklin B. Hough. The paper, “On the Duty of Governments in the Preservation of Forests,” argued for government involvement in forestry preservation and the formation of schools of forestry. This moved the

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<sup>44</sup> Department of Agriculture, *Report of the Commissioner of Agriculture for the Year 1875* (Washington, D.C., 1876), 244-351, 352-58. These page numbers represented two different sources. The first section had no author in the Agriculture report. Most likely Franklin B. Hough or William Henry Brewer wrote this long detailed work on forests in America. One source attributed the larger work to Brewer, but no other sources have confirmed this. Hough and Brewer both worked on the 1870 census, had access to the data, and were the only two men in America that were familiar with this range of information on forests at the time. The second section was definitely an excerpt from William Henry Brewer’s work. Forest Service historians attributed one small quote from this work to Frederick Watts. This was not the case. There remained no evidence of Watts ever writing on Botany, Horticulture, or Forestry in these works.

<sup>46</sup> Richardson, *A Compilation of Messages and Papers of the Presidents*, 6: 4158.

<sup>47</sup> Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement: 1890-1920* (Pittsburgh, 1959), 1-3. Hays believe that the through the political advocacy of applied science Conservation grew. He believed that the later conservationists argued for the proper, scientific management of trees through applied science not the Progressive ideal of crusading for redistribution of wealth. The early foresters exhibited the same tendencies. The advocacy of men like John Warder, Franklin B. Hough, and Joseph Rothrock gave further evidence to this claim.

conference to appoint a committee to write to Washington.<sup>48</sup> Two of the country's premier scholars, Asa Gray of Harvard and William Henry Brewer of Yale, joined Hough on the committee along with George B. Emerson and California geologist Josiah Whitney. Brewer had helped compile data on woodlands for the 1870 U. S. Census and according to U. S. Forest Service historians gave the first set of lectures on forestry in the nation's history at Yale University.<sup>49</sup> Together, these men petitioned Congress, and authorized Hough and Emerson to take the prestigious committee's recommendations dealing with Federal sanctioned protection of forests and sponsored forestry education to Congress in February of 1874. Hough and Emerson met with Frederick Watts, who in turn arranged a meeting with President Grant.<sup>50</sup>

Grant gave the men his support. With the weight of the Department of Agriculture behind these measures, Hough needed to garner the approval of the officials in the Department of the Interior as well. The Commissioner of the General Land Office, Willis Drummond, and Secretary of the Interior Columbus Delano, went on record supporting Hough and Emerson. They started the Department of the Interior interests in forest and forestry legislation in the public domain.<sup>51</sup> Drummond called Hough and the committee's recommendations "indispensably necessary."<sup>52</sup> Delano documented his proof of support in his annual department report.<sup>53</sup> Yet Grant's administration failed to extract any meaningful legislation from Congress on forest preservation or the explicit protection of public lands. The floundering economy coupled with the corruption of Grant's own administration drowned any chance of advancement. The resignation of Secretary Delano over corruption charges served as a further sign of hard times.<sup>54</sup>

The Grant administration played a part in two small but important victories for the forest conservation movement. One came from the meetings in 1873 and 1874 between Hough and members from the Department of Agriculture and the President. Those crucial meetings

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<sup>48</sup> Frank J. Harmon, "Remembering Franklin B. Hough," American Forests Magazine, (Jan. 1977), 1; John Ise, The United States Forest Policy (New York, 1920), 34-35; New Hampshire Patriot, Oct. 22, 1873; San Francisco Bulletin, Feb. 21, 1874.

<sup>49</sup> Harmon, "Remembering Franklin B. Hough," 1; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1875, 352-58; Williams, Americans and Their Forests, 375-76; Femow, A Brief History of Forestry, 408.

<sup>50</sup> Harmon, "Remembering Franklin B. Hough," 1; Ise, The United States Forest Policy, 34-35; San Francisco Bulletin, Feb. 21, 1874; Steen, The U. S. Forest Service, 9-10.

<sup>51</sup> Harmon, "Remembering Franklin B. Hough," 1; Ise, The United States Forest Policy, 35-38, 59.

<sup>52</sup> Quoted in Harmon, "Remembering Franklin B. Hough," 1-2.

<sup>53</sup> Cox et al., This Well Wooded Land, 177, 180.

<sup>54</sup> Philadelphia Inquirer, Apr. 21, 1875, Oct. 13, 1875; Steen, The U. S. Forest Service, 10-11.

signified how forest conservation ideas had been accepted and shouldered by scholarly professionals such as Gray and Brewer, as well as the highest levels of government and power. Trained scholars and more politicians took up the cause of forest conservation from here on out.

The other victory dealt with Grant's Department of Agriculture and what legislation these men actually pushed through Congress. Hough befriended a congressman from Wisconsin, Mark Dunnell, during this time of advocacy in Washington. Dunnell attached a rider to an appropriations bill concerning seeds that, when passed, authorized the creation of a Commissioner of Forestry post under the Department of Agriculture.<sup>55</sup> Frederick Watts quickly appointed Franklin B. Hough, who took over as the nation's first forestry agent in August, 1876.<sup>56</sup> These actions represented the first steps of the forest conservation cause into the halls of the federal government. The surge refused to end there.

The pinnacle of this early reach into the federal government from 1860 to 1880 occurred in the administration of Rutherford B. Hayes. Each of Hayes's annual messages to Congress contained references to trees and the forests cause. Starting with his first annual message to Congress in December, 1877, Hayes leveled a solid volley in terms of what he thought needed to be done in terms of forest legislation.

I invite the attention of Congress to the importance of the statements and suggestions made by the Secretary of the Interior concerning the depredations committed on the timber lands of the United States and the necessity for the preservation of forests. It is believed that the measures taken in pursuance of existing laws to arrest those depredations will be entirely successful if Congress, by an appropriation for that purpose renders their continued enforcement possible. The experience of other nations teaches us that a country can not be stripped of its forests with impunity, and we shall expose ourselves to the gravest consequences unless the wasteful and improvident manner in which the forests in the United States are destroyed be effectually checked. I earnestly recommend that the measures suggested by the Secretary of the Interior for the suppression of depredations on the public timber lands of the United States for the selling of timber from the public lands, and for the preservation of forests be embodied in a law, and that, considering the urgent necessity of enabling the people of certain States and Territories to purchase timber from the public lands in a legal manner, which at present they cannot do, such a law be passed without unavoidable delay.<sup>57</sup>

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<sup>55</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1876 (Washington, D.C., 1877), 8; Ise, The United States Forest Policy, 42; Philadelphia Inquirer, Nov. 11, 1876.

<sup>56</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1876, 8; Steen, The U. S. Forest Service, 11-13.

<sup>57</sup> Richardson, A Compilation of the Messages and Papers of the Presidents, 6: 4428.

Hayes's Secretary of the Interior, Carl Schurz, drew heavy fire for his advocacy of forest legislation and the measures he took to ensure it. He used the powers of his department to recommend a protection of public lands that entailed armed patrolman and the legal system as a way to rid the nation of lumbermen and lumber companies destroying a public resource.<sup>58</sup> This idea met failure thanks to the large land area and only a handful of agents to cover it. Schurz's policies met heavy opposition. He drew the ire of regular citizens, senators, and entrenched lumber interests, which together simply went around his regulations.<sup>59</sup> Hayes lauded this move as a success, but western congressmen and senators thought otherwise.<sup>60</sup> They passed the Free Timber Act in 1878 that allowed cutting on public lands.<sup>61</sup>

Where Schurz failed in his attempts to effect forest preservation legislation, he succeeded in creating a firestorm nationwide debate concerning forest conservation. Editorials and debate raged in the newspapers in New York, Salt Lake City, and Philadelphia. People across America now became familiar with forest conservation. On one side he was hailed as a hero for standing up to the lumber interests, who had profited off public resources. On the other Schurz became hated for his foreign heritage and his interference. The debate even spilled into Congress, where western senators blasted Secretary Schurz for being German and compared him to the devil.<sup>62</sup> One letter to the editor of the New Orleans Times, written by "Fair Play," attacked the paper for its stance toward the Department of the Interior. The editorial lashed out at the western senators attacking Schurz and declared, "...senators of the United States have aired their ignorance before the country and the world" in this matter pertaining to forests and public lands.<sup>63</sup>

While the debate raged, Hayes's second annual message pleaded again with Congress to do something. He declared, "The rapid destruction of our forests is an evil fraught with the gravest consequences especially in the mountainous districts where the rocky slopes once denuded of their tress will remain so forever."<sup>64</sup> With Congress inept and divided, the forestry

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<sup>58</sup> Williams, Americans and Their Forests, 397-98; Philadelphia Inquirer, Aug. 6, 1877, Mar. 15, 1878; New York Times, Aug 25, 1877.

<sup>59</sup> Inter Ocean, Apr. 12, 1878; Williams, Americans and Their Forests, 397-98.

<sup>60</sup> Richardson, A Compilation of the Messages and Papers of the Presidents, 6: 4530.

<sup>61</sup> Williams, Americans and Their Forests, 398.

<sup>62</sup> New York Times, Aug. 25, 1877; Macon Telegraph, Apr. 2, 1878; Summit County Beacon, Apr. 3, 1878; Inter Ocean, Apr. 12, 1878; New Orleans Times, Apr. 12, 1878; Salt Lake Tribune, May 31, 1879; Trenton State Gazette, Feb. 2, 1880; Ise, The United States Forest Policy, 369.

<sup>63</sup> New Orleans Times, Apr. 12, 1878.

<sup>64</sup> Richardson, A Compilation of the Messages and Papers of the Presidents, 6: 4456.

conservation movement met with its biggest failure. Those who argued for forest conservation struggled to find ways to bring political power to bear on the subject of forests and subvert Congressional lethargy to create meaningful legislation from 1860 to 1880. Where attempts by Hayes and Schurz failed to amount to much other than advocacy, they still illustrated the opening battles for this growing movement and it tried to effect change.

State governments showed interest in forestry legislation as well in the years after the Civil War. Papers and advocacy by pioneers of the forest conservation movement helped enlighten state governments. J.A. Warder's address on tree planting and forest culture before the Ohio State Horticultural Society and Ohio State Agriculture Society, and Dan Milliken's on the state of Ohio's forests resources, pushed Ohio to sanction the formation of a report and a committee on the state's forest resources.<sup>65</sup> Michigan, Wisconsin, and Maine also went down this path as early as the late 1860s.<sup>66</sup>

At the end of 1873, the Department of Agriculture reported that at least ten states faced the need to conserve forests. From these initial committees, states went in a number of different directions in support of forest conservation. In 1872, Nebraska created an official Arbor Day to promote the planting of trees.<sup>67</sup> Nine states passed laws permitting bounties for planting trees and tax exemptions.<sup>68</sup> Farmers who planted a certain acreage of trees received money from the state for this service. Iowa's State Agricultural Society even created a prize of \$1,000 for the best thousand acres of trees planted.<sup>69</sup>

Others states like Pennsylvania went through a slow process of advocacy and failed attempts at legislation. In the 1870s and 1880s Union Generals and Pennsylvania Governors James A. Beaver and John F. Hartranft brought forest legislation to the attention of the State Board of Agriculture and the General Assembly. In 1873, Hartranft implored the legislature in his annual address, but like Hough and the officials in the Grant administration he found it

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<sup>65</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1867 (Washington, D.C., 1868), 361; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1872 (Washington, D.C., 1873), 500-03; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1873, 315-16, 396; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1874 (Washington, D.C., 1875), 413.

<sup>66</sup> Ise, The United States Forest Policy, 29, 33.

<sup>67</sup> Philadelphia Inquirer, Sept. 24, 1874; Farmer's Cabinet, May 15, 1874; Fernow, A Brief History of Forestry, 410-11.

<sup>68</sup> Fernow, A Brief History of Forestry, 409.

<sup>69</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1872, 497.

impossible to push these measures through the legislature.<sup>70</sup> The governor's office instated an official Arbor Day in 1885 under Governor Robert Pattison as an effort to plant trees, thereby combating forest destruction and promoting forest conservation.<sup>71</sup> After Pattison, Beaver brought the issue to the attention of the legislature, had a commission formed, and also remained active in the American Forestry Congress.<sup>72</sup> The state refused to move on the issue of forests until well into the 1890s, when Pennsylvania created its own state forestry service.

In 1902 Joseph Rothrock noted the failure of Pennsylvania state action, and how Governors Beaver, Hartranft, and Pattison failed in trying to secure legislation that protected forests in his report on the workings of the Pennsylvania Forestry Service. Rothrock lived through opening failures of the forest conservation movement and came to see the later successes. His introduction in the Pennsylvania Department of Agriculture report discussed how this period of speeches, writings, and conferences yielded little or no binding legislation and how it served as an incubation period for the movement. In this report, Rothrock lamented the problem during Hartranft and Beaver's administrations: "Our earlier ideas upon the forestry problem were so crude that it is perhaps fortunate that the period of agitation continued so long, before actual restorative measures were commenced."<sup>73</sup>

### *Legislation, Education, and Forests*

The Civil War also helped to further the forest conservation movement with the passage of Morrill Land Grant Act and the federal government's support of agricultural education. This July 2, 1862, act provided funding for agricultural schools via the allotment of land to states by virtue of their total number of senators and congressman. Thirty thousand acres was given per federal representative to each state.<sup>74</sup> This act and subsequent funds given to states led to the founding of universities such as Ohio State and Virginia Tech. The Michigan Agricultural College and Pennsylvania Agricultural College, which started before the Morrill Land Grant act passed Congress, became the first two of these legislated agricultural schools.<sup>75</sup>

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<sup>70</sup> Pennsylvania Bureau of Forestry, Statement of Work Done by the Pennsylvania Department of Forestry: During 1901 and 1902 (1902), 11-12; Ise, The United States Forest Policy, 29.

<sup>71</sup> New York Times, Mar. 24, 1885; San Francisco Bulletin, Apr. 10, 1885.

<sup>72</sup> Quoted in Eleanor Maass, Forestry Pioneer: The Life of Joseph Trimble Rothrock (Lebanon, 2002), 64.

<sup>73</sup> Pennsylvania Bureau of Forestry, Statement of Work Done by the Pennsylvania Department of Forestry, 12.

<sup>74</sup> Edmund James, The Origin of the Land Grant Act of 1862 and Some Account of its Author Jonathan B. Turner (Urbana, Champaign, 1910), 8.

<sup>75</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1865, 165, 171.

By allowing states this acreage, the federal government brought forests into the discussion. This land called scrip or land scrip had a catch. Most of it had timber, or these schools sought to pick timber lands in other states which could be sold to the highest bidder to pad endowments. The land scrip acreage in some cases ended up back with timber and railroad companies. In the case of Cornell University, New York's Land Grant school, these lands brought in so much money eventually that the school one of the few private land grant schools.

Ezra Cornell and Andrew White founded Cornell College, and the University had land scrip that included prime timber land in Wisconsin in the same Chippewa River Valley where Frederick Weyerhaeuser built his lumber business, forever linking forests and education in America.<sup>76</sup> This proved ironic when compared with the fact that Cornell College opened one of the first forestry programs in America in 1898.<sup>77</sup> Senator Cornell even called his timber gold pot “a powerful pine land ring that exercised a fearful and terrible monopoly.”<sup>78</sup> The money from these lands plus Cornell's own personal fortune funded Cornell University and it became a private land grant university.<sup>79</sup>

These schools demonstrated how closely related agriculture, education, and forestry concerns became in the years after the war, a relationship that increased forest conservation interests. The federal government sponsored this close relationship with the Morrill Land Grant act, and the subsequent monitoring of these colleges through the Department of Agriculture and then the Department of Interior. Starting in 1865 the yearly Report of the Commissioner of Agriculture featured updates on the status of these institutions.<sup>80</sup>

During the Grant administration education, agriculture, and the forest became linked.<sup>81</sup> Grant's appointment of Frederick Watts as Commissioner of Agriculture boosted this

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<sup>76</sup> Williams, Americans and Their Forests, 217; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1869 (Washington, D.C., 1870), 470-71.

<sup>77</sup> Ise, The United States Forest Policy, 148.

<sup>78</sup> Quoted in Williams, Americans and Their Forests, 217.

<sup>79</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1873, 346-47; Michael L. Whalen, A Land Grant University (Ithaca, 2001), 7-9.

<sup>80</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1865, 137-86; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1869, 453-87.

<sup>81</sup> Richardson, Compilation of the Messages and Papers of the Presidents, 6: 4066. President Grant gave praise to level of education provided by the Agricultural schools associated with the Land Grant Act in his annual messages. Grant even treated them together as categories in his address, further illustrating how the two were related in the eyes of the government, when he mentioned both in his 1870 Annual Message to Congress. He believed “The subjects of

relationship. Watts doubled as President of the Board of Trustees at Penn State while he headed up the Department of Agriculture.<sup>82</sup> Watts' passion for agricultural education surfaced in the yearly reports he supervised. Each Commissioner added his own touch to the reports. Newton's reports displayed oddities at times. Watts' series of reports, starting in 1871, contained a plethora of information on the land grant universities. His reports broke down each school and gave information on faculty members, courses, enrollment, and women in the Land Grant schools. This information crossed over into other sections as faculty members consulted and lectured at State Boards of Agricultural and Horticultural and Agricultural societies, which presented overviews of their proceedings in sections in Watts' reports entitled "Digest of State Reports" and "Recent Rural Publications."<sup>83</sup>

A greater connection between agriculture, education, and forest conservation resided in the horticulture and botany classes offered by these newer institutions. These courses, mainstays in almost every land grant school's agricultural curriculum, were among the first classes in America that contained coursework and classes on trees and forestry. This trend can be traced to right after the Civil War. Horticultural and botany classes grew into forestry classes and forestry departments as time passed, and forest conservation and forestry sentiments spread. These agricultural schools, helped foster the beginning of this movement by providing instruction, lectures, and specific courses in forestry in their agricultural curriculums.<sup>84</sup>

American students got their first taste of forests and forestry education. According to Department of Agriculture reports, schools like the University of California at Berkeley, Iowa State Agricultural College, and Ohio Agricultural and Mechanical College became some of the first educational institutions in the nation to do so.<sup>85</sup> These newly created and government

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education and agriculture are of great interest to the success of our republican institutions, happiness, and grandeur as a nation."

<sup>82</sup> Pennsylvania Department of Agriculture, Report of the Transactions of the Pennsylvania State Agricultural Society: For the Years 1872-1873 (Harrisburg, 1874), 9: 217.

<sup>83</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1872, 442-42, 500-03; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1873, 321-63; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1874, 312-51; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1876, 326-62. These reports represented proof of how much attention the Department of Agriculture paid to these Agricultural schools on his watch. These sources contained references to when and where the first forestry courses started.

<sup>84</sup> Becky Jordan, email to Reference Specialist, Iowa State Special Collections, Feb. 23, 2005; Becky Jordan, email to Reference Specialist, Feb. 25, 2005; Earle Ross, A History of Iowa State College of Agriculture and Mechanic Arts (Ames, 1942), 126-27, 134.

<sup>85</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1873, 323, 338, 348; Department of Agriculture, Report of the Commissioner for the Year 1874, 315; Department of Agriculture, Report

sponsored schools closely rivaled the oldest schools in the nation such as Yale's Sheffield Scientific School, which led the way in this regard.<sup>86</sup>

Iowa State's records showed class in forestry and forest conservation sentiment early in the 1870's. Against the backdrop of a faculty feud, three professors including the head of the Department of Pomology, Professor James Matthews, were fired by the university. The Board of Trustees also cut Matthews' whole department. Matthews' department and classes prior to 1873 had forestry material.<sup>87</sup> The 1873 Agricultural report featured Matthews' work with Eastern Larches. This university in Ames had a Department of Horticulture and Forestry in 1873 headed by Professor Henry H. McAfee. The Sioux City Journal reported this change in the Agricultural Department in 1873. In the midst of these changes, the board created a Department of Horticulture and Forestry. McAfee became professor and head of the department.<sup>88</sup> In 1876, he was joined in this Department by Professor Joseph Budd.<sup>89</sup> Professor Budd "offered work relating to evergreens, forest trees, forest plantations, nursery work, and woods, in the horticulture and forestry courses he taught."<sup>90</sup>

The course description from Iowa State's archives for the 1878-1879 Biennial Report detailed how deep these early studies contained ideas concerning forest conservation. The class for the sophomore year went as follows: "During the second term of this year the course of study includes the propagation and field management of shrubs, evergreens, flowering plants, forestry trees, garden plants, etc. In the study of Forestry, Bryant's 'Forest Trees' will be used as a text-book."<sup>91</sup>

Another example came from the catalogue for 1880, which gave a clearer definition. Professor Budd's class description detailed forestry as being taught as a separate entity: "In the sophomore and junior years class instruction is only given to the students in the agricultural

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of the Commissioner of Agriculture for the Year 1867, 331; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1869, 453, 455, 469.

<sup>86</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1865, 182.

<sup>87</sup> Becky Jordan, email to Reference Specialist, Feb. 23, 2005.

<sup>88</sup> Sioux City Journal, Nov. 21, 1873.

<sup>89</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1878 (Washington, D.C., 1879), 32; Earle Ross, A History of Iowa State College of Agriculture and Mechanic Arts, 126-27, 134; Inter Ocean, Jan 22, 1876.

<sup>90</sup> Becky Jordan, email to Reference Specialist, Feb. 23, 2005; 1878-1879 Biennial Report of the Board of Trustees, (Ames, 1880).

<sup>91</sup> Becky Jordan, email to Reference Specialist, Feb. 25, 2005; 1878-1879 Biennial Report of the Board of Trustees, (Ames, 1880).

course. In the sophomore year forestry is first considered separately, the forest and ornamental trees are taken up, identified, and their relative growth, uses, and propagation discussed.”<sup>92</sup>

The records of land grant universities and the Department of Agriculture challenge the historical record in terms of where and when the first forestry class in America was given. Forest Service historians and the Forestry History Society believed that William Henry Brewer of Yale was the first instructor to give academic forestry lectures in 1873 at Yale, and future U. S. Forestry Chief B. E. Fernow became the first instructor of forestry courses at the University of Wisconsin.<sup>93</sup> However, the Department of Agriculture reports and course catalogues clearly show that agricultural schools in Wisconsin, Illinois, California, and Iowa already had forestry lectures or coursework with more regularity that started prior to the claims of the Forest Service historians.<sup>94</sup>

William Henry Brewer had a wide array of sources that showed his interests in trees and forestry. Brewer participated in the Geological Survey during the Civil War and taught at the University of California in 1863.<sup>95</sup> He took an interest in trees on his travels throughout the West throughout the 1860s while newspaper sources stated he wrote about and lectured on trees as early as 1868. The 1870 Federal Census featured Brewer’s work on forest statistics in America.<sup>96</sup> During the meeting of the National Academy of Science in Northampton, Massachusetts that year, Dr. Brewer gave a paper on “the forest vegetation west of the Rocky Mountains.”<sup>97</sup> Even while he taught at Yale, Brewer gave forestry lectures elsewhere. In April, 1875, the San Francisco Bulletin ran an article that detailed Brewer’s visit to California and his lectures on nature and trees at the University of California at Berkeley.<sup>98</sup>

In contrast to the claim that Brewer gave the first lectures on forestry, the Department of Agriculture reports and Iowa State sources revealed that Professor McAfee and later Budd taught solid forestry material as early as 1873; but because of their connection to horticulture, they

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<sup>92</sup> Becky Jordan, email to Reference Specialist, Feb. 25, 2005; 1878-1879 Biennial Report of the Board of Trustees, (Ames, 1880); Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1878, 32.

<sup>93</sup> Harmon, “Remembering Franklin B. Hough,” 1; Cheryl Oakes, email to the Librarian of The Forest History Society, Feb. 24, 2009; San Francisco Bulletin, Apr. 7, 1875, 3.

<sup>94</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1867, 323; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1869, 453; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1872, 308.

<sup>95</sup> San Francisco Bulletin, Mar. 31, 1862; Russell H. Chittenden, “Biographical Memoir William Henry Brewer,” National Academy of Sciences: Biographical Memoirs (1927), 12: 142-44, 151-52.

<sup>96</sup> Fernow, A Brief History of Forestry, 408.

<sup>97</sup> San Francisco Bulletin, Sept. 16, 1868.

<sup>98</sup> Ibid., Apr. 7, 1875, Apr. 10, 1875.

failed to gain recognition.<sup>99</sup> Professors Budd and McAfee had horticulture in their job and department titles, but they gave as serious an educational look at forestry and forest conservation as anyone of the leading figures in the movement until that point. In their defense, William Henry Brewer's research interests were very broad. McAfee and Budd specialized in trees and forestry whereas newspaper evidence illustrated the scattered nature of Brewer's lectures. He lectured on nature and scenery one day in during the Cal lectures, and the next day he devoted time to how whalers had rheumatism.<sup>100</sup>

Professor Budd's courses at Iowa State not only promoted work in the woods and nursery work planting trees, but also exposed students to the same kind of forest conservation literature that permeated the pages of the Department of Agricultural reports, and the larger movement toward Forest Conservation. Budd's textbook for the class, Forest Trees: For Shelter, Ornament, and Profit (1871) by Arthur Bryant Sr., read like a combination of the different views and literature surrounding the movement. The preface detailed Bryant's love of trees and forests since boyhood, along with the motivation for the book concerning the need for a work on forest culture. He credited his own observations and experience as part of that motivation.<sup>101</sup>

The first chapter of Bryant's work took a swing at the whole spectrum involving America's forests and attempts at conservation. Bryant described the evils of cutting too many trees. He declared, "The rapid destruction of our forests within the past few years is really appalling."<sup>102</sup>

Bryant used cutting estimates from the lumber industry to show how much land became deforested. He claimed that the total amount of lumber cut in the states of Michigan, Minnesota, and Wisconsin in 1869 numbered 3,311,372,255 board feet, and that to cut this amount, 883,032 acres (1,380 sq. miles) "were stripped of their trees." Like Starr, he attributed some of this cutting to railroads, who he blasted as a major cause for forest destruction via large demand.<sup>103</sup>

Finally, Bryant displayed several important conservationist aspects. His book contained many aspects related to applied science. The botanists, horticulturalists, and first foresters

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<sup>99</sup> Cheryl Oakes, email to the Librarian of The Forest History Society, Feb. 24, 2009. Mrs. Oakes mentioned that wording became important when evaluating which program was first, and because of that some were not recognized.

<sup>100</sup> San Francisco Bulletin, Mar. 18, 1875.

<sup>101</sup> Arthur Bryant Sr., Forest Trees: For Shelter, Ornament, and Profit (New York, 1871), 3.

<sup>102</sup> Ibid., 5.

<sup>103</sup> Ibid., 5-8.

practiced applied science in their pursuit of ways to grow trees and conserve the nation's forests. Bryant noted the country's increased demand for lumber, forest fires, and how some states like New York had exhausted resources to the point of having to import materials. This last charge represented one of the ways that, by 1871, Bryant believed that some states already experienced the problems associated with overcutting and overuse, all of this presented to the student reader in the first chapter. All of these claims and points were related to applied science.<sup>104</sup>

The other chapters previewed the future growth of the forestry conservation movement. The propagation and planting of trees as well as stands of timber garnered the most value. Ideas like pruning and thinning received a chapter of discussion. Bryant's work landed squarely on all the major themes of the conservation movement and provided an adequate text for American students to use at Iowa State.

Other agricultural colleges followed Iowa State's example and began courses of their own. At the Ohio Agriculture and Mechanical school forestry served as a course in their three year agriculture course group starting at least by 1873.<sup>105</sup> In 1881 Michigan State Agricultural College offered their first forestry class under Professor W. J. Beal.<sup>106</sup> Virginia Tech's course catalogues showed attention to forestry and timber in natural history classes along with botany classes in the 1870s and 1880s. Professor M. G. Ellzey, trained as medical doctor and chemist, taught a natural history class in the agricultural curriculum that listed woods and timber as a part of the course description.<sup>107</sup> Subsequent catalogues at the Virginia Agricultural and Mechanical College documented a heavy dosage of botany and horticulture and pomology classes in the agricultural curriculum that touched materials on trees.

By 1897, no less than twenty two land grant institutions offered some kind of forestry instruction or course material. Seven other states with agricultural schools or agricultural and mechanical schools such as Mississippi, Georgia, North Carolina, Maine, Colorado, Virginia, and Indiana offered materials on forests through botany and horticulture classes.<sup>108</sup>

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<sup>104</sup> *Ibid.*; Hays, Conservation and the Gospel of Efficiency, 2-3.

<sup>105</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1873, 348.

<sup>106</sup> Email with Main Library Reference, Michigan State University, Feb. 24, 2009.

<sup>107</sup> Catalogue of the Officers and Students of the Virginia Agricultural and Mechanical College, Third Session, 1874-1875 (Blacksburg, 1875), 18; James I. Robertson Jr., Stonewall Jackson: The Man, the Soldier, the Legend (New York, 1997), 820.

<sup>108</sup> Cheryl Oakes, email to the Librarian of The Forest History Society, Feb. 24, 2009; Ise, The United States Forest Policy, 147.

As the number of scholars and schools grew, more students versed in topics such as trees and forestry graduated from these programs and courses. Land Grant Colleges fostered a larger exchange of ideas in which conservationist sentiment grew as more colleges and students became involved in forestry. For example, the students and teachers at these universities in turn became figures in the forest conservation movement. Pennsylvania's "Father of Forestry," Joseph Rothrock, was wounded at Fredericksburg in December 1862, Rothrock finished his undergraduate degree in botany at Harvard in 1864. During his stay there he served in a volunteer company of Harvard faculty members as Dr. Asa Gray's substitute. He took a position at the Pennsylvania Agricultural College in 1868. While he held a faculty position at Penn State, Rothrock taught botany classes containing material dealing with forests and forestry. The forests around State College made suitable classrooms. During his tenure in State College, Rothrock noted the ability of one of his best botany students in his diary.<sup>109</sup> This student, William Buckout, in 1887 became the first professor to offer a forestry course or set of lectures at Penn State and later a member of the American Forestry Congress.<sup>110</sup>

Young students like Buckout left the land grant universities with knowledge about forestry, and symbolized an interesting transition. The spread of forestry and conservation into Land Grant institutions documented the development of an American forestry movement beyond just scattered writings and advocacy. The advent of forestry lectures and courses in the 1870s signaled the acceptance of the forest conservation cause by the nation's educators and scientists such as William Henry Brewer and Asa Gray. This acceptance demonstrated how the forest conservation movement entered a significant public arena besides politics as well as showing how the movement was based in science. Professors Budd, Rothrock, and McAfee all labored to help grow the forest conservation movement in the American Forestry Association and American Forestry Congress later in 1870's and 1880's.

A number of the first pioneers such as Hough, Rothrock, and John A. Warder received their education as medical doctors and a number sought jobs and received more education at Land Grant institutions. A medical degree was the only avenue for those wishing to pursue a graduate degree in America. No advanced degrees were offered in subjects like botany or

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<sup>109</sup> Maass, *Forestry Pioneer*, 15, 26-28.

<sup>110</sup> Helen Smith, email to Agricultural Sciences Librarian, Feb. 23, 2009; Henry Gerhold, *A Century of Forest Resources Education At Penn State: Serving Our Forests, Water, Wildlife, and Wood Industries* (University Park, 2007), 11-15.

forestry.<sup>111</sup> Some studied in Europe, like Professors Gray and Brewer, but these represented a very select few. Course catalogues and Department of Agriculture reports showed that many of the professors throughout the land grant system that specialized in botany or horticulture were physicians. Anyone with a life's passion dedicated to botany, horticulture, and forests had to go through the medical coursework, which included class work dealing with botany, chemistry, and zoology. These agricultural colleges and their limited course material on trees and forestry that grew out of the late 1860s and 1870s provided the first step for true professional foresters and forest schools in the United States.

### *The First Foresters, Pioneers of the Early Forest Conservation Movement*

Men like Franklin Hough, Joseph Rothrock, and John A. Warder added to the forest conservation movement despite not having Gifford Pinchot's education. They might not have been trained in European forestry, but they spent a great part of their lives studying the conditions of forests in America and Europe. These men were America's first foresters.<sup>112</sup> They educated themselves to a professional level, over time, by studying and lecturing on the different aspects dealing with the forests and how to conserve and preserve them. They practiced applied science, which historian Samuel P. Hayes argued was the basis for the growth of the Conservation movement.<sup>113</sup> Research and observation were the ways they gained interest and knowledge about forest.<sup>114</sup> Bryant and Marsh gave credit to learning this way building up an awareness of trees, their destruction, and the need to conserve them.<sup>115</sup>

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<sup>111</sup> Maass, *A Forestry Pioneer*, 23; Department of Agriculture, *Report of the Commissioner of Agriculture for the Year 1870* (Washington, D. C., 1871), 472; *Macon Telegraph*, Apr. 28, 1874; John A. Warder, *Hedges and Evergreens: A Complete Manual* (New York, 1858), i; Gerhold, *A Century of Forest Resources Education at Penn State*, 1, 10-11. The 1870 Agriculture report showed Warder's name as a lecturer at Illinois Industrial University at Urbana-Champaign. The rest have all been cited previously. All of these men taught at a Land Grant University at one point. Brewer taught at Cal, Rothrock at Penn State, Warder at Illinois, and Budd at Iowa State. These men taught on a variety of topics, but furthered interests in forests as time passed, and showed how connected agriculture, education, were to forest conservation concerns in the 1860's and 1870's.

<sup>112</sup> *Philadelphia Inquirer*, Sept. 3, 1884; *Times Picayune*, Aug. 9, 1883; Gerhold, *A Century of Forest Resources Education at Penn State*, 14. Gifford Pinchot called Rothrock "a forester" at a 1924 memorial dedication. Pinchot remarked that Rothrock "carried to the people of Pennsylvania the message of forest destruction and of the need for a rebirth of the forests of this Commonwealth." Warder, Hough, and Rothrock served in the Civil War.

<sup>113</sup> Hays, *Conservation and the Gospel of Efficiency*, 1-3. These men represented the first experts before Pinchot that would pave the way for the scientific forestry in the United States. They might not have had the degrees or the training, but they were a part of the applied science that Hays talks about.

<sup>114</sup> Harmon, "Remembering Franklin B. Hough," 1-3.

<sup>115</sup> Bryant, *Forest Trees*, 3; quoted in Williams, *Americans and Their Forests*, 145.

Hough's education as a physician and avocation as a historian has been noted. His studies on the state of forests and work with the census reflected his education despite not being trained as a forester or historian. Forest Service historians attributed Hough's professional-like status to his endless research. During trips to Washington D. C, in between meetings with Congressman and Senators, Hough spent a lot of his time studying forests in the Library of Congress, and then applying his knowledge to his persuasion of political figures and audiences across the country. His research in forestry led to more advocacy on forests and forest conservation.<sup>116</sup>

Warder, Hough, Rothrock, and others lectured, led discussions, presented papers, and reached different audiences across the country. This advocacy represented the largest and most important part of their contribution to the early forest conservation movement. These men embodied the mixture of early applied science and political advocacy that would later drive the Conservation movement in the 1900's.<sup>117</sup> While academics like Rothrock and William Henry Brewer lectured on forestry at colleges and universities, others used the numerous agricultural, horticultural, and pomological societies across the nation. These bodies offered opportunities for these men to discuss and present their ideas on forests in open forums. Papers and resolutions from these groups went from these smaller public forums to political ones.

John A. Warder had been active in agricultural matters before the Civil War as longtime head of the Cincinnati and Ohio Horticultural societies.<sup>118</sup> His 1858 work on natural hedges called for the rejection of wooden fences in favor of the use of shrubs and plants.<sup>119</sup> In the late 1860s after lecturing at Illinois, Warder used his position as President of the Ohio Horticultural Society to steer that body to discussions and material on forests and forest conservation. Resolutions produced from these discussions were being considered by Ohio's State Board of Agriculture as prospective legislation.<sup>120</sup>

Warder also exemplified how these men traveled around the country to lecture on the subjects of forest conservation and forestry. He delivered an address on forest tree culture to the Kansas legislature in 1874 and led a discussion on American forestry that same year at the

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<sup>116</sup> Harmon, "Remembering Franklin B. Hough," 1-3; Steen, The U. S. Forest Service, 14.

<sup>117</sup> Hays, Conservation and the Gospel of Efficiency, 3, 273.

<sup>118</sup> Inter Ocean, Sept. 11, 1875, Dec. 8, 1881; Burt Eardely Powell, Semi-centennial History of the University of Illinois: The Movement for Industrial University and the Establishment of the University 1840-1870 (Urbana-Champaign, 1918), 320.

<sup>119</sup> Warder, Hedges and Evergreens, i.

<sup>120</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1874, 413.

National Agriculture Congress in Atlanta.<sup>121</sup> In 1873, he traveled to Vienna International Exhibition as a member of the Scientific Commission of the United States, and reported on forestry material.<sup>122</sup>

Hough was another example of how these men traveled around to speak out on the science of trees and the state of forests in America. Hough read a paper at the American Health Association in Baltimore in 1875. The Philadelphia Inquirer reported that Hough's paper revolved around "public health interests concerned in the preservation of certain primeval forests, and in the cultivation of groves and trees." Dr. Hough went so far as to recommend certain trees be grown to facilitate health benefits.<sup>123</sup>

Another article catalogued Hough's views in a paper he gave on forestry education in Montreal, Canada. Hough presented the outlines one of his last papers, "The Future Policy of Forest Management in the United States." A large part of the talk he gave centered on America's need forestry education. He believed that every college should have at least twelve lectures devoted to forestry, and advocated teacher training for those courses. These students represented future experts to guide the nation's planning for forest resources.<sup>124</sup>

Traveling and lecturing remained only one form of Hough's advocacy of forest conservation. His main tool was writing. While serving as the nation's forestry agent, and then as the Federal Government's first Commissioner of Forestry, Hough wrote a four-volume report on America's forests. He traveled, gathered samples, and compiled data about the nation's forests to the highest degree of detail. They were the first scientists, experts, and professionals. The first volume was so detailed that the U. S. House of Representatives Committee receiving report cut it from 1,100 pages to 650.<sup>125</sup>

Even the frontier posts and their commanders heard from Hough during the course of his research. Hough asked fort commanders such as former Civil War General John Gibbon, then a Colonel, to provide facts concerning the forests near their respective installations.<sup>126</sup> He touched on the makeup of the American forests, advised legislation, European forestry and the history of forests across the globe. When this gargantuan compilation finally was published, it

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<sup>121</sup> Macon Telegraph, Apr. 28, 1874.

<sup>122</sup> John A. Warder, Report on Forests and Forestry (Washington, D.C., 1875), 10-12.

<sup>123</sup> Philadelphia Inquirer, Nov. 10, 1875.

<sup>124</sup> Ibid., Sept. 3, 1884; Hays, Conservation and the Gospel of Efficiency, 3, 268-69.

<sup>125</sup> Franklin B. Hough, Report Upon Forestry (Salem, 1878), 4-6; Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1878, 27-32; Harmon, "Remembering Franklin B. Hough," 4-5.

<sup>126</sup> Department of Agriculture, Report of the Commissioner of Agriculture for the Year 1878, 532.

was heralded for its correctness and detail. Trained European foresters and European journals remarked at how well a layman had grasped the wide ranging subject of forestry. The Journal of Forestry and Estate Management commented on Hough's work:

...the book is compiled in such a masterly manner that it forms the most complete and exhaustive treatise upon the subject that has yet appeared in English language. For the present we would recommend the careful study of it to all arborists, who will find in it a perfect mine of information calculated to instruct and interest all students of the science and art of forestry.<sup>127</sup>

One of the most important products of their advocacy of forest conservation came in the form of the American Forestry Association and later the American Forestry Congress. Chief of Forestry, Bernard Fernow, regarded this AFA as ineffectual and meaningless.<sup>128</sup> It was created during the meetings of the American Pomological Society at Chicago in 1875 and it represented the first nationally recognized forestry group. John A. Warder became the President of the Association. Hough was a member. At the second annual meeting at Philadelphia he gave one of the headlining speeches, "On the Duty of Governments in the Preservation of Forests."<sup>129</sup>

These associations signified how the movement to conserve forests and trees grew after the Civil War.<sup>130</sup> This group and the later American Forestry Congress provided a way for forest conservationists around the country to meet and exchange ideas. Later, the American Forestry Congress grew enough to actually have some power. Its These groups were successful for simply bringing all these advocates together, and providing the basis for organization for the first time.

More importantly, a glance at the list of members showcased a "who's who" of names associated with politics, land grant universities, and devotees to forest conservation, further illustrating the diffusion of education, agriculture, and forestry interests. Here we can see nationwide influence and the widespread exchange of ideas through this list of experts. The body combined professionals from the Department of Agriculture, Land Grant Colleges and others to provide for the first body of experts that could advocate for forest management practices. In 1876, the Philadelphia Inquirer listed Iowa State Professor H. H. McAfee as the

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<sup>127</sup> Ibid., 32; Harmon, "Remembering Franklin B. Hough," 5.

<sup>128</sup> Ise, The United States Forest Policy, 95; Fernow, A Brief History of Forestry, 413.

<sup>129</sup> Philadelphia Inquirer, Sept. 16, 1876.

<sup>130</sup> Inter Ocean, Sept. 11, 1875; Philadelphia Inquirer, Sept. 16, 1876.

elected secretary of the association.<sup>131</sup> Later reports on the meetings of this group, after the Association merged with the American Forestry Congress in 1882, listed Iowa State Professor Budd as a member of the Congress's executive committee. Former Commissioner of Agriculture George Loring served as President.<sup>132</sup> In the late 1880's the Congress counted James Beaver, Joseph Rothrock, and William Buckout as active members.<sup>133</sup>

### *Conclusion*

The Civil War period directly contributed to the future of the forest conservation movement with the passage of the Morrill Land Grant Act and the formation of a Department of Agriculture. Such actions served to increase concerns over trees and forests long after the Civil War years.

The Department of Agriculture served as a place for growth and then the federal mouthpiece for the early forest conservation movement. Agricultural reports spread information and awareness on forest destruction, while the Commissioner of Agriculture under President Grant, Frederick Watts, not only was involved in the opening of a land grant institution, but he also opened doors to the President for one of America's first foresters, Franklin B. Hough. Hough received the first forestry post under the Commissioner of Agriculture.

The Department of Agriculture also became the place in the federal government where ideas on forests mixed with ideas in agriculture and education. Agricultural education became a crossroads for the fledgling forest conservation movement, agricultural concerns, and the federal government. Mixing these interests garnered the forest conservation movement more exposure in the eyes of the federal government.

The years immediately after the Civil War saw the movement gain a voice and spread into the halls of education. The passage of the Morrill Land Grant act laid the foundations for land grant institutions such as Iowa State, Ohio State, and Penn State began to instruct students in forestry and forest concerns. Agriculture departments at these schools instituted forestry classes soon after the Civil War. The period from 1865 to 1880 represented the formative time for forestry in terms of American higher education.

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<sup>131</sup> Inter Ocean, Sept. 11, 1875, Jan. 22, 1876, Apr. 26, 1882.

<sup>132</sup> Philadelphia Inquirer, Aug. 9, 1883; Inter Ocean, Apr. 27, 1882.

<sup>133</sup> Philadelphia Inquirer, Aug. 9, 1883, Oct. 10 and 16, 1889; Inter Ocean, Aug. 15, 1887.

These developments combined with the overuse and over cutting of trees around the nation. Census data from 1860 and 1870 showed never before seen growth in product output, value, and cutting of trees. Tree cutting had moved away from small numerous firms in states like Pennsylvania and New York to larger, more efficient operations in states surrounding the Great Lakes. By 1880 the census data thoroughly portrayed how the older states to the east had effectively hit their limits in terms cutting trees. The stands of valuable trees had effectively disappeared, most everything had been cut while the alarming rate of cutting across the North started to send shock waves through the nation.

People began to speak out, research, lecture on conserving forests. The Civil War provided two important developments that expanded the forest conservation movement. The creation of a Department of Agriculture provided a forum for forest conservation ideas to spread and gain a voice in the federal government. While the creation of agricultural colleges via the Morrill Land Grant act provided the beginnings of the forestry courses with forest conservation material in American universities. Both creations helped forest conservation movement grow and its ideas spread.

The generations of that fought the Civil War and lived through also provided the first leaders for the forest conservation movement. Franklin Hough, John A. Warder, Joseph Rothrock, and others more obscure like Frederick Starr became the first true pioneers of the early forest conservation movement.

Many of the pioneers built or slowly accrued a natural awareness over time towards trees and forests. When the usage of trees and forests of their time had dire consequences and started to draw their attention, these men spoke out. They gave lectures, read papers, and traveled widely. Their advocacy and research pushed the forests and forest conservation into the mainstream, and most certainly into the halls of this country's colleges and government. All of this took place long before any one named Roosevelt or Pinchot came on the scene.

## Epilogue

In 1862, Joseph Rothrock wrote home after the battle of Antietam and told a family friend about his experience before entering a fight. As Rothrock's unit marched toward the battlefield, he noted that he had to discard his overcoat in order to carry his botany manual and still be able to fight properly. Rothrock obviously cared more about the botany book than getting cold or wet after the fight concluded.<sup>1</sup>

Examining the Civil War in terms of natural awareness, wood, and forest conservation has brought to light other ways to expand this study. The letters and diaries of Civil War soldiers provided an excellent window into the varying degrees of natural awareness of the time period. Soldiers wrote about everything from landscape to natural resources. Others never seemed to give an environmental damn. This thesis tried to show how some of these soldiers had a general natural awareness, one that could have provided a bridge to pursuits after the Civil War into biology, geography, and forestry. Many scholars noted that following the war, ideas concerning nature and forest became a focus point for reform and interest, but rarely have they illustrated the trends or reasons for the expansion of topics in nature. The Civil War might have played a part in this transition from natural awareness to downright advocacy. The topic of natural awareness could be probed deeper.

Another area of interest that stemmed from nature and forests in the Civil War revolved around the advent of the battlefield parks. Sites like Gettysburg and Antietam could be associated with land preservation and traced in terms of their value as national parks. Veterans sought to keep these parks as a monument to the sacrifices made during the war and also as a teaching vehicle for later generations. In recent years, public and private organizations have spent large sums of money to return the parks to the exact landscape at the time the battles occurred. Landscape-clearing became an issue of contention for these parks. Increase in the number of trees around these battlefields has led some like Gettysburg to cut down trees to return the battlefield to something resembling its original landscape. In turn, this cutting prompted protests from outside environmental groups and even vandalism in some cases. A study might examine and compare the sentiments of veterans and how they thought about preserving and maintain the Civil War's legacy in terms of the landscape of these battlefields with the thoughts

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<sup>1</sup> Quoted in Eleanor A. Maass, *Forestry Pioneer, The Life of Joseph Trimble Rothrock* (Lebanon, 2002), 13.

and actions of National Park Service (created in 1916), which has the job of preserving the battlefields today.

This thesis aimed to do two things. First, expand upon the relationship between the Civil War and nature by showing how soldiers dealt with aspects of nature such as water, landscape, and weather. The soldiers during the Civil War dealt with nature in different ways everyday out on campaign. The writings of Civil War soldiers provided a way to gauge how they viewed their interactions with the natural environment.

These written experiences showed on the differing levels of natural awareness during the Civil War, and then traced the subject of natural resources, trees, wood, and lumber through the war and after into the beginnings of the forest conservation movement via the conflict's contributions. The letters and diaries from the soldiers in this thesis illustrated how some of these soldiers had a bond with nature or what could be called a general awareness of nature. Weather, agriculture, landscape, and the aspects of nature that these soldiers needed or valued, gained their attention. The soldiers noted crops and agriculture while out on campaign. They commented on the features of land that hindered their movements or promised safety from shot and shell.

The greatest relationship between nature and the war revolved around resource usage and dependency. The war machines of both sides in the conflict required untold quantities of water and wood. The heart of this thesis concerned trees, forests, and wood during the Civil War and the rise of the forest conservation movement after.

Wartime conditions induced wood shortages in both the North and the South. Union and Confederacy faced the acknowledgement their dependency on wood. Wartime shortages demonstrated the degree of this dependency. Soldiers' writings contained references to the hunting and need for wood, while newspapers and civilian diaries illustrated how they coped with the lack of wood supplies. After water, wood became the war's most important resource.

The second aim of this thesis sought to connect the Civil War to the forest conservation movement and provide depth to the argument that the Civil War indeed had an impact on the growth of the conservation movement. After the war ended, the generations that lived through and fought it, helped construct the foundation of the forestry conservation movement in America. Hough, Warder, and Rothrock had served in the war and then spent the rest of their lives fighting to educate the country about forest resources and conservation. Theirs were the first outcries

against the depletion of the nation's forest resources, a more thoroughly developed sense of natural awareness. True pioneers like Frederick Starr, Dr. Franklin B. Hough, Dr. J. A. Warder, and George Perkins Marsh jumpstarted the nation's awareness of forests and published the first works in an outpouring of forestry or forest devastation material. They studied, lobbied, and wrote. Their work yielded more followers, a litany of writings, and more attempts at advocacy.

The period from 1860 to 1880 was one of agitation over the subject of what to do with the nation's forests. Efforts during this period ultimately failed in most regards to provide the necessary protective legislation. Action on the subjects of forests came later, but this period remained important in the scheme of forest conservation. The twenty years served as the foundation and opened many eyes to the conclusion that our forests were running out.

Government action needed to be taken.

The Civil War era not only provided the first foot soldiers of the forest conservation movement; the period also offered two important pieces of legislation that furthered the movement: the creation of the Department of Agriculture and the government sponsored land-grant schools representing the greatest contribution of this thesis to the body of work concerning conservation.

The Department of Agriculture provided an important conduit for the spreading of material on forests and forest conservation. It featured articles on forestry ideas and the state of forests in the United States. These types of writings brought attention to the movement and how others in the United States combated a growing national problem. The department eventually contained a Division of Forestry headed by one of the movement's pioneers, Franklin Hough, to effectively tackle issues dealing with forest destruction. This sector of government pushed ideas regarding this nation's forests to the forefront and forced everyone from farmers to congressmen and presidents to take notice.

Land-grant schools offered more ways for students to be educated and exposed to forest conservation. As early as 1866, American students at these agricultural colleges were essentially getting their first forestry education through an agricultural lens. Additional sections in the Department of Agriculture's yearly reports featured the land grant agricultural colleges and how their course offerings demonstrated the spread of forestry coursework throughout the land grant system.

The Civil War remained directly connected to nature and forest. Trees and wood played an important part in this war. Forests helped, hindered, and fueled the armies. After the fighting ended, the Civil War in turn aided the beginnings of the movement to preserve the very objects used so heavily during the conflict.

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### ***Digital Sources and Databases***

This thesis benefited greatly from access to different databases, electronic sources, and digitized information. The last section of this bibliography attempts to acknowledge these aspects of technology and electronic resources that played an important part in this thesis. Databases such as EBSCO, Readex's America's Historical Newspapers including Early American Newspapers Series 1-3, 1690-1922, Google Books, Google Scholar, Accessible Archives' Civil War Collection, and the New York Times archive from 1851 provided sources included in the bibliography.

Other websites such as Virginia Tech's Library Website have many databases and resources in one convenient place. For example, research for this thesis included visiting Virginia Tech's Special Collection website which provided digital sources in the form of Civil War letters and diaries as well as providing links to citation formats and databases like EBSCO and Readex's America's Historical Newspapers. Host sites such as the Library site and the Forest History Society's database provided opportunities to gather sources and strengthen the thesis.

### ***DATABASES***

Accessible Archives' Civil War Collection  
EBSCO  
Google Books  
Google Scholar  
History Cooperative  
New York Times Database from 1851  
Project Muse  
Proquest  
Readex's America's Historical Newspapers

### ***HOSTING SITES and OTHERS***

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[www.foresthistory.org/research/biblio.html](http://www.foresthistory.org/research/biblio.html)  
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