AGRARIANISM, INDUSTRY, THE ENVIRONMENT, AND CHANGE: GOLD MINING IN ANTEBELLUM NORTH CAROLINA, 1799-1860

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JASON LINWOOD HAUSER

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ABSTRACT

AGRARIANISM, INDUSTRY, THE ENVIRONMENT, AND CHANGE: GOLD MINING IN ANTEBELLUM NORTH CAROLINA, 1799-1860, December 2012

Jason Linwood Hauser, B.A., Appalachian State University

M.A., Appalachian State University

Chairperson: Timothy Silver

The first recorded discovery of domestic gold in the United States occurred in 1799, when a young child unearthed a seventeen pound nugget in Cabarrus County, North Carolina. After news of the find spread, mining slowly grew as a seasonal business conducted by farmers. Early miners concerned themselves primarily with surface deposits and used simple machinery. As alluvial gold became increasingly scarce, capitalists, wage-laborers, and mining engineers used more advanced and invasive technologies to conduct deep vein, underground, and hydraulic mining. Though the industry waned and waxed, it presented a viable commercial opportunity for residents of the southern Piedmont and western half of the state until mining operations ceased in response to the sectional crisis of 1860.

Using personal correspondence, geological surveys, travelers' accounts, and tools and methodologies borrowed from other studies of mineral extraction, this thesis argues that gold mining in North Carolina was an important aspect of southern antebellum industry. It traces the development of the industry from the agrarian, subsistence-agriculture based society that characterized the western and

southern Piedmont counties of the state into the increasingly mechanized, modernized, and economically stratified society of the late antebellum period.

The economic changes that the state underwent during the first half of the nineteenth century occurred alongside significant environmental alterations. Because these economic and environmental changes were intimately linked, this thesis argues that agrarians and industrialists had differing views of the environment. Cataloguing the environmental consequences of the gold mining industry presents a fuller understanding of the process of economic change and sheds light on the complex and vacillating relationship between people and the environment.

DEDICATION

Dedicated to my mother, Kim Holland Hauser, a generous patron of academia

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I would like to thank a handful of people for their help in completing this project. First and foremost, I must express my sincerest gratitude to my chairperson, Dr. Timothy Silver. In addition to introducing me to the rich field of environmental history, he has been an incredible writing coach, a thoughtful reader and editor, and an incredibly patient chair. Without his help and encouragement, this project would have never come to fruition.

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INTRODUCTION

GOLD MINING IN ANTEBELLUM NORTH CAROLINA

On a warm Sunday morning in 1799, twelve-year-old Conrad Reed made the first authenticated discovery of gold in the United States. As the story goes, Conrad stayed home from church services to bow-fish in a stream on the family farm in Cabarrus, North Carolina. Peering into the creek for prey, the boy noticed an odd shimmer. He waded into the water to investigate the source and unearthed a seventeen-pound gold nugget.

Initially, the monumental discovery had little effect on the Reed family. Though Conrad eagerly showed the find to his father, both John Reed and a local jeweler displayed little interest. Unfortunately, they failed to identify the rock as gold. Reed recognized the stone as unique but certainly not lucrative. It was oddly colored, interestingly shaped (it resembled a small smoothing iron), and slightly malleable. These interesting properties convinced Reed to keep the rock, and he employed it as a doorstop in the family cabin.

For two years, the find continued to arouse interest. Reed probably showed it to a number of friends and family, each admitting that it was strange without realizing its worth. It was not until 1801, when a traveling salesman from Fayetteville correctly identified the rock as gold, that Reed realized any profit from his son's discovery. The jeweler asked Reed to name his price for the stone, and Reed requested $3.50 for a nugget worth more than $3,600.

The jeweler gladly paid Reed the requested sum and went on his way. Reed took his newfound wealth to a local store and purchased a number of luxury goods, among them coffee beans. This South American export was new to the Reeds, and they failed to understand how to prepare it properly. Sarah Reed threw the exotic beans away once they failed to make an adequate stew.

This story is common to nearly all histories of gold mining in North Carolina.[1] Colonel George Barnhardt, a prominent miner in the early days of gold, furnished the story to North Carolina state treasurer John Wheeler in 1851, more than a half-century after the initial discovery. Barnhardt likely romanticized the story and embellished portions of the anecdote. If the story contained any exaggerations, they did little more than evidence the vast difference between turn of the nineteenth century North Carolina and the economically diverse North Carolina of mid-century.[2]

Historians have not contradicted the basic facts of the narrative. John Reed was a planter in Cabarrus County, North Carolina. He came to the United States as a Hessian soldier fighting for the British in the Revolutionary War. After deserting his regiment in Savannah, Georgia, he made his way north. The southern Piedmont offered cheap land and contained a growing Germanic population, so he chose Cabarrus County to settle, build a farm, and start a family. He married Sarah Kaiser, likely also of German descent, and her

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[1] Richard Knapp and Brent D. Glass, *Gold Mining in North Carolina: A Bicentennial History* (Raleigh, NC: Division of Archives and History, State Historical Association, 1999) and Jeffrey Paul Forret, *'...Promises to be Very Rich': The Development of the Gold Mining Industry in the Agrarian Society of Western North Carolina, 1825-1837*. (Masters' Thesis, University of North Carolina at Charlotte, 1998) both use this standard story.
[2] John H. Wheeler, *Historical Sketches of North Carolina, 1584-1851* (Baltimore, MD: Regional Publishing Company, 1961), 63.

father provided John with a plot of land alongside Little Meadow Creek in the heart of what would become the gold fields of North Carolina.[3]

The principal gold region of the state existed in four overlapping belts. The Carolina Slate and Charlotte Belts began in the southern Piedmont and extended northeast towards Virginia. The richest areas were located in Rowan, Cabarrus, Mecklenburg, Stanly, Montgomery, Randolph, Davidson, and Guilford counties. Two adjacent belts, the Blue Ridge and the South Mountain, resided west of these Piedmont counties, and included Burke, McDowell, and Rutherford Counties. Together, these areas constituted the gold fields of North Carolina and were home to the vast majority of mineral extraction.[4]

The gold fields were located in the southern Piedmont and western portions of the state, where subsistence agriculture dominated. In many ways, John Reed typified the early nineteenth-century farmer in the area. He practiced diversified subsistence agriculture alongside staple crop production of corn and cotton. Never bothering to learn how to read or write, Reed epitomized the independent yeoman, a shining example of Jeffersonian agrarianism. Though he likely traded with his neighbors and at market, Reed, like the majority of southern Piedmont planters, trusted his own productive capabilities and resisted reliance on market connections. Unlike the large plantations and mono-crop agriculture that typified much of the South, smaller farmers like John Reed represented the vast majority of southern Piedmont and western inhabitants. It was from this subsistence-based agrarian society that the gold mining industry developed.[5]

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[3] Knapp and Glass, 48.

[4] Additional finds occurred in the eastern counties of Warren and Halifax, but limited yields generally placed them outside of the traditionally defined "gold fields" as described by Knapp and Glass in *Gold Mining in North Carolina: A Bicentennial History.*

[5] Many texts mention the subsistence-based agrarianism of the southern Piedmont and western portion of the state. For overviews, see Harry Watson, *An Independent People: The Way We Lived In North Carolina, 1770-*

To study gold mining is to study the fundamental transition from an agrarian to an increasingly industrial state that occurred from 1799 to 1860. During this time, the most drastic alterations to the state occurred on environmental and economic levels. As the industry grew, the environmental consequences became more pronounced. Gold mining eroded subsistence agriculture in favor of industry and replaced an agrarian land ethic with a more industrial relationship between humans and the land.

Environmental historian J.R. McNeill has stated that "the modern ecological history of the planet and the socioeconomical history of humanity make full sense only if seen together."[6] This is certainly the case with antebellum gold mining in North Carolina. Only by studying the two intimately related and complementary histories together does an accurate history of the industry emerge. Understanding the economic and environmental aspects sheds light on the nature of industry and people during transformative periods and yields insight into the complex relationship between humans and the environment.

The first two chapters of this study chart the development of gold mining throughout the first half of the nineteenth century. Chapter one discusses the nature of early extraction. Initially, the majority of miners were farmers who searched for gold after their crops had been planted or harvested. However, some agrarians initially resisted the market-oriented pursuit, favoring agriculture. The majority of early-national North Carolinians practiced subsistence agriculture, described by Bill Cecil-Fronsman as being a situation in which

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1829 (Chapel Hill, NC: University of North Carolina Press, 1983), Hugh Talmage Lefler and Albert Ray Newsome, *North Carolina: The History of a Southern State* (Chapel Hill, NC: University of North Carolina Press, 1954), William A. Link, *North Carolina Through Four Centuries* (Wheeling, IL: Harlan Davidson, Inc., 2009).

[6] J. R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth Century World* (New York: W.W. Norton and Company, 2000), xxii.

farmers, "spent only a small portion of their time and effort producing marketable" goods.[7] Because planters placed little importance on marketable items, many agrarians feared the effect mining would have on their independence.[8]

However, some farmers came to embraced mining as a facet of agriculture, after which (almost paradoxically) mining began to constitute a separate profession. Early machinery, being largely handmade, required little capital, but land rental fees consolidated wealth and helped create socioeconomic divisions. Gold mining aided in establishing early instances of wage labor and provided an impetus to abandon small-scale subsistence farming for a market economy.

Several historians have studied this transformative era in North Carolina history, though textbook histories of North Carolina generally under-appreciate the transformative role gold mining played in the state. Historians Lefler and Newsome mention the mineral only in passing. They describe early-national North Carolina as a bastion of backwardness, articulating the Rip Van Winkle perspective that the state slept through the modernization process. They argue that a lack of inland roads, navigable waterways, and government support for internal development retarded the intellectual and economic growth of the state. In addition to impeding progress, these features also created a sharp division between the mono-crop plantations of the eastern portion of the state and the subsistence-based agriculture of the Piedmont and western counties.[9]

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[7] Bill Cecil-Fronsmen, *Common Whites: Class and Culture in Antebellum North Carolina* (University of Kentucky Press, 1992), 99. He bases his characterization of North Carolina as largely semisubsistence based on population, stating that in 1850, nearly 60 percent of the population were farmers, and another 20 percent were likely agricultural laborers. He concludes that as many as three out of every four North Carolinians earned their livelihood directly from the land.

[8] Cecil-Fronsman, 98-102.

[9] Lefler and Newsome, 339-403.

Constitutional reform that balanced east/west interests and the rise of the internal-improvement oriented Whig party in the 1830s created an age of economic prosperity for North Carolinians that extended to antebellum industry. Newsome and Lefler address gold mining alongside the growth of cotton and textile manufacturing in the southern Piedmont to evidence the success of political reforms. In doing so, they remove all agency from gold itself and fail to note that North Carolina's mineral industry helped inspire internal improvement rather than simply being an effect of political reform. Additionally, they place the establishment of early industry in 1850, nearly two decades after industrial gold mining and milling machinery came to the state.[10]

William A. Link also addressed gold mining in his textbook, *North Carolina through Four Centuries*. Rather than focus on east/west divisions or the growth of the Whig party, he aptly mentions gold mining as an early industry of North Carolina. He credits gold with establishing Charlotte and Morgantown and assigns gold the appropriate agency in transitioning the southern Piedmont and western portion of the state from a household to a marketplace economy. However, he describes the growth of the railroad as being the transformative factor in the mineral industry. Again, he fails to note that gold mining and related economic activity created an impetus for internal improvements. He displays gold as a result, rather than a cause, of economic modernization. [11]

Others studied the expanding markets associated with gold production. John C. Inscoe devotes a section of his work, *Mountain Masters: Slavery and the Sectional Crisis in North Carolina,* to antebellum commercial centers. Attempting to undermine notions of exceptionalism and regional essentialism, Inscoe uses the gold mining industry to illustrate

[10] *Ibid.*
[11] William A. Link, *North Carolina Through Four Centuries* (Wheeling, IL: Harlan Davidson, Inc., 2009).

that commercial ties existed between the western portion of North Carolina and outside markets. In doing so, he argues against the idea that geographical isolation retarded economic development in western North Carolina. However, his particular geographical focus hinders his ability to investigate the growth of mineral extraction in the southern Piedmont, and as a result, does not catalogue the agrarian origins of the industry.[12]

Richard Knapp and Brent D. Glass provide an excellent overview of early industry in the first chapters of their work, *Gold Mining in North Carolina: A Bicentennial History*. They illustrate how the industry grew slowly until the 1828 discovery of alluvial gold in Burke County. They detail early machinery, showing the connections between agriculture and mining. However, they do not engage the debate between planting and farming that characterized the first three decades of extraction. Without examining the agrarian impediments to early mineral extraction, they fail to relate a full picture of the society in which gold mining developed.[13]

Jeffrey P. Forret, however, did chart the origins of the industry. In his work, "'…Promises to be Very Rich': The Development of the Gold Mining Industry in the Agrarian Society of Western North Carolina, 1825-1837," Forret emphasizes the moral debate surrounding mining. His detailed study accurately describes the moralists' outrage as a facet of agrarian ideology, but his periodization and geographical focus do not allow him to fully investigate how these arguments changed and were countered by boosters in the following decades.[14] After alluvial deposits became increasingly scarce, more intrusive

[12] John C. Inscoe, *Mountain Masters: Slavery and the Sectional Crisis in Western North Carolina* (Knoxville: University of Tennessee Press, 1989).
[13] Knapp and Glass.
[14] Forret.

machinery was needed to continue the hunt for gold, and economic boosters had their own view of the developing industry.

The second chapter describes the transition to deep vein and industrial placer mining. These new forms of extraction demanded more sophisticated machinery and increased amounts of capital. Industrial mining furthered the changes earlier operations began by solidifying economic classes. Slaves, wage laborers, foreign experts and investors all contributed to this increasingly stratified society. This chapter addresses the role each played in industrial operations as well as social effects of labor reorganization. Deep vein and industrial placer mining created a more pronounced break from agrarian ideologies, and this chapter charts these changes. Gold mining, alongside other industries, aided in creating a more industrialized North Carolina.

In investigating the industrialization of North Carolina, many scholars gravitate towards other antebellum industries. Billy Yeargin credits tobacco with being a major economic force in his work, *North Carolina Tobacco: A History*. Yeargin argues that tobacco, which had long been a staple of agricultural production in North Carolina and Virginia since pre-revolutionary America, expanded in North Carolina after the discovery of the "bright leaf" curing method. He offers that many towns, including Winston-Salem and Durham, owe their early commercial and growth to the plant. He also states that tobacco, like gold, provided an impetus to adopt internal improvements. But tobacco cultivation failed to extend far west into the state, and actually may have contributed to the east/west division that Lefler and Newsome described. Furthermore, the tobacco industry was labor intensive, and largely only plantations could produce enough to be commercially viable. Without industrial

machinery, the extent to which these plantations could be described as industrial is questionable.[15]

Robert Outland III addresses the relationship between agriculture and industry when examining another instance of antebellum economic achievement in his work, *Tapping the Pines: The Naval Stores Industry in the American South*. Weaving together the economic aspects of business and labor alongside environmental elements such as resource distribution, he argues that the naval store industry became an important part of the state's economy despite blurring the division between being agriculture and industry. Though he begins his examination well before the Civil War, he ultimately argues that true industrial growth, evidenced by a large manufacturing sector and population density, did not occur until the post-reconstruction New South because of furniture production.[16]

Both Yeargin and Outland address industries largely centered in eastern North Carolina. Bess Beatty, in *Alamance: The Holt Family and Industrialization in a North Carolina County, 1837-1900*, focuses on an industry that had origins in the Piedmont. Cotton production, while agricultural, became an industrial pursuit in 1837 when Edwin Holt borrowed capital to invest in a spinning mill in Alamance County. Beatty argues that her work studies an overlooked antebellum industry, and as such, informs the ongoing debates concerning the economic orientation of the South and the continuity between the Old and New South. Her study, while detailed, is too specific to address larger issues of economic

[15] Billy Yeargin, *North Carolina Tobacco: A History* (Charleston, SC: The History Press, 2008).
[16] Robert Outland III, *Tapping the Pines: The Naval Stores Industry of the American South* (Baton Rouge, LA: Louisiana State University Press, 2004). As for the problem in identifying the naval stores industry as being industrial or agriculture, he offers that the confusion comes because industrial extraction mirrored agriculture rhythms. Additionally, the production of turpentine, tar, and pitch were most certainly industrial operations, but extracting pine wood was decidedly agricultural.

growth throughout the state. However, she does make a convincing case for the importance of the establishment of a manufacturing industry in North Carolina.[17]

However, some scholars have studied the social and economic effects that occurred as a result of the industrialization of gold mining operations. Deep vein mining had the capacity to be labor intensive, and slave labor certainly contributed to the state's mineral production. Jeffrey P. Forret investigates the role of slavery in mining operations in his aforementioned work. His thesis details the role of indentured servitude in mining and argued that mining undermined the slave/master social dynamic. Though increased autonomy challenged antebellum power relations, he concludes that mining failed to erode the existing power structures.[18]

Industrial extraction was also possible because of a foreign workforce educated in deep mining. Elizabeth Hines, a geographical historian from Greensboro, wrote several articles focusing on the influence of Cornish miners and machinery. Providing examples of immigration into the state for a period generally acknowledged for its amount of emigration out of the area, Hines' essays deepened the understanding of foreign influence in mining labor and technology.[19]

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[17] Bess Beatty, *Alamance: The Holt Family and Industrialization in a North Carolina County, 1837-1900* (Baton Rouge, LA: Louisiana State University Press, 1999). For the economic orientation of the South, she engages Eugene Genovese, *The Political Economy of Slavery: Studies in the Economy and Society of the Old South* (New York, 1961), arguing that the Holt family evidenced a staunchly capitalistic South. On the debate regarding the continuity between the Old and New South, she takes issue with Dwight Billings, *Planters and the Making of the New South: Class, Politics, and Development in North Carolina, 1865-1900* (Chapel Hill, NC: University of North Carolina Press, 1979), arguing that a decided break did occur between the Old and New South. Essentially, she disagrees with Billings' assertion that industrial labor adhered to plantation norms.

[18] Forret.

[19] Elizabeth Hines, "McCullough's Rock Engine House: An Antebellum Cornish-style Gold Ore Mill near Jamestown, North Carolina," *Material Culture* 27(1995), 1-28); Elizabeth Hines, "Cousin Jacks and the Tarheel Gold Boom: Cornish Miners in North Carolina," *North Carolina Geographer 5* (winter, 1997;, 1-10; and Elizabeth Hines,"Kernow Comes to Carolina: Cornish Miners in North Carolina's Gold Rush, 1830-1888," *Gold in History, Geology, and Culture: Collected Essays,* edited by Richard F. Knapp and Robert M. Tompkins (Raleigh: Division of Archives and History, Department of Cultural Resources, 1999), 131-147.

These studies of gold mining in North Carolina offer a great overview of the industry. Forret's focus on the agrarian origins of industry and labor in the mines suited his study well. Knapp and Glass's expansive study similarly highlights the important aspects of the industry. In particular, their periodization accurately describes the growth and change of the industry. Similarly, more focused studies, like Elizabeth Hines' work, offer great details about important facets of gold mining. All of these aforementioned works are well-researched and accurate portrayals of the gold mining industry. However, they do not address the inherently and intimately related environmental cost of the growing industry.

The third chapter attempts to chart changes in economics alongside alterations to the earth by addressing the environmental impact gold mining had on the landscape of North Carolina. To date, no work has attempted to catalogue the environmental consequences of gold mining anywhere on the east coast of North America. A possible explanation for this oversight may be environmental history's tendency to offer declension narratives. These histories argue that a linear progression of degradation occurred in the industrial world contrary to the progress driven model of the enlightenment. Increased environmental devastation challenged notions of scientific progress, complicating positivist interpretations.[20]

The tendency of the field to gravitate towards declension narratives creates a predilection to study unspoiled nature and pristine landscapes. This, in turn, invites studies of the American West. Both the field of environmental history as a whole, and gold mining in particular, contain a disproportionate amount of western United States studies. The

[20] The declension narrative, essentially arguing that increased technology wreaks proportionally increased environmental degradation, is found in many environmental histories. This is perhaps most prominent in Carolyn Merchant, *Death of Nature: Women, Progress, and the Scientific Revolution* (New York, NY: HarperOne Publishers, 1980). For other examples of the declension narrative, see Warren Dean, *With Broadaxe and Firebrand* (Berkley: University of California Press, 1995) and Callum Roberts, *The Unnatural History of the Sea* (Washington, D.C.: Island Press, 2007).

previously unspoiled landscapes, existing in sharp contrast to the long settled (and altered) environments of the eastern and southern United States, provide a perfect opportunity to examine environmental degradation.

Another explanation may be the size and sources related to southeastern mining. Gold mining occurred on a much larger scale in California and Colorado. As a result, the damage was more significant and recordable. Some operations, such as in the Klondike, occurred later and left much more reliable data. The environmental effects of Western and northern mining are simply easier to catalogue.

Chapter three addresses this imbalance in environmental history. Literally working from the ground up, this chapter seeks to examine how, and to what extent, gold mining altered the landscape of North Carolina. Charting these changes requires investigation into the evolution of resource extraction itself, as well as examinations of deforestation, air and water pollution, and aquatic alterations. And because miners both affected and were affected by their environment, this chapter also includes a discussion on the changing view of nature in antebellum North Carolina.

The methodology employed in western and northern mining projects proves invaluable in understanding these environmental alterations. *A Golden State*, edited by James J. Rawles and Richard J. Orsi, contains several essays that offer helpful methodologies of examining environmental change. Raymond F. Dasmann's "Environmental Changes before and after the Gold Rush," proposes people, not intrusive technology, posed the biggest environmental threats. By requiring living quarters and food, miners themselves caused more damage to the landscapes than mining technologies. Though mass migrations were few in North Carolina, boomtowns did exist in the western portion of the state. Dasmann's

observation that environmental change occurred outside the mines themselves constitutes a useful insight.[21]

Similarly, Andrew C. Isenberg's *Mining California* applies ecological models to environmental change. Refusing to see mining as a singular event, he traces alterations through food chains, food webs, and ecological systems to demonstrate the connectivity and depth of physical alteration. Additionally, he makes light of the difference between systemized, industrial extraction and early haphazard mining, arguing that developers had to make the land ready for industry by organizing and systemizing the landscape.[22] These insights can be readily applied to mining in North Carolina to illustrate the effect of extraction on the physical landscape of the state. However, gold mining in North Carolina provides an opportunity to extend the ecosystem into a more metaphorical, theoretical tool that demands the inclusion of human beings; not only do people affect the landscape, they are also affected by it.

By providing an environmental history of gold mining in North Carolina, this study examines the alterations to the environment wrought by the advent of industry. Similarly, it explores the cultural aspects of gold mining by asking the important question of how nineteenth-century peoples viewed the North Carolina environment. Taken together, these elements provide a cultural and material account of how gold altered the people and the landscape of nineteenth-century North Carolina.

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[21] Richard F. Dasmann, "Environmental Changes Before and After the Gold Rush," *A Golden State: Mining and Economic Development in Gold Rush California,* edited by James J. Rawles and Richard J. Orsi (Berkley: University of California Press, 1999).

[22] Andrew C. Isenberg, *Mining California: An Ecological History* (New York: Hill and Wang, 2005).

CHAPTER ONE

PLACER MINING

In North Carolina, mining began shortly after the Fayetteville jeweler recognized Reed's rock as gold. The first organized gold mining effort occurred in 1803 when John Reed and three friends partnered to form a small mining venture to complement their seasonal planting. From there, mineral extraction spread slowly over the next two and half decades, growing as a seasonal and amateurish pursuit conducted largely by farmers. In 1828, gold hunters discovered new deposits in Burke County. Blue Ridge belt discoveries incited fervor, and operations expanded quickly into the western portions of the state.[23]

From 1801 until the late 1820s, placer extraction characterized the majority of mining in the area. Named for the Spanish *placer,* meaning sandbank, placer mining capitalized on alluvial deposits at or near the earth's surface.[24] These deposits, created by the natural process of erosion, occurred in the beds of both ancient and existing waterways. Rivers, creeks, and streams eroded the earth, exposing gold veins. The density and malleability of gold made it resistant to erosion, and as moving water separated the metal from the surrounding rock, the

[23] For a detailed case study of John Reed, see Richard Knapp and Brent Glass, *Gold Mining in North Carolina: A Bicentennial History* (Raleigh Division of Archives and History, Department of Cultural Resources, 1999). For a closer study of the Burke County rush, see John C. Inscoe, *Mountain Masters: Slavery and the Sectional Crisis in Western North Carolina* (Knoxville: University of Tennessee Press, 1996).

[24] Ronald Eisler, *Biochemical, Health, and Ecotoxicoligcal Perspectives on Gold and Gold Mining* (Laurel, MD: CRC Press, 2004).

weight of gold forced it quickly to the bottom. The processes of erosion, disassociation, and dissemination were slow, occurring in a geological time span. They littered ancient and existing stream beds with surface deposits of gold over tens of thousands of years. Because of the relatively-shallow nature of the deposits, the technology of placer mining was rather simple, and the extractive processes were minimally intrusive. [25]

Placer deposits, exposed by natural hydraulic forces, occurred as one of two types depending on the location of the deposits relative to their source. Residual deposits occurred near the original ore. In smaller creeks and streams, weak currents slowly exposed and dissociated gold over the course of geological ages. Because of the limited force of the waterways, the gold remained close to its original source. The second type, sorted placers, occurred more commonly. Quicker and more powerful hydraulic forces disassociated the mineral and carried the gold farther from the original vein. [26]

Early miners made no distinction between the forms. Without realizing that two distinct types of placers existed, they were unable to trace gold to its source.[27] As a result, vein-oriented deep mining did not begin until the 1825 discovery of an intact, gold-bearing quartz vein, though even after this placer mining continued to characterize the majority of mineral extraction.[28]

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[25] For more on the creation, distribution, and geological properties of gold, see Byron R. Berger, "World Gold Exploration: Discovering Earth's Gold Factories," *Gold in History, Geology, and Culture: Collected Essays,* edited by Richard F. Knapp and Robert M. Tompkins (Raleigh, NC: Division of Archives and History, North Carolina Department of Cultural Resources, 2001).
[26] William O. Vanderburg, *Placer Mining in Nevada* (Reno: University of Nevada Press, 1936), 10.
[27] *Ibid*.
[28] Knapp and Glass, 13.

Tools Of Extraction

In 1828, Saxony born mineralogist Charles E. Rothe commented that "To work the alluvial spots in the common way requires no capital. A few dollars worth of tools, is all that is necessary; each day pays its own expenses, and leaves a profit."[29] Traveler Anne Newport Royall commented that the mines outside of Greensboro employed technology that "looked as though it had been made by children, with a pen-knife."[30] Because of the simple technology associated with placer mining, most ventures were small-scale and non-industrial. Capital was largely unnecessary, and most operations utilized only a handful of workers. Early mining investor William Thornton noted that "no expense but the occasional labor of men and boys is encountered; no [heavy] machinery is requisite, no blasting is necessary."[31] Even as late as 1825, the *Philadelphia Colombia Observer* commented that "There are, as of yet, no persons of capital embarked in this search."[32]

Pans represented the most basic technology of early placer mining. Panning required no digging and little effort, and the practice capitalized on the specific gravity of gold. Miners swirled earth and water around in a pan until the mud and clay became suspended in the water, causing gold to sink to the bottom. As one expert explained, "There may be gold enclosed in clay or cemented in sand," he cautioned, "therefore, to loosen the adhering gold, the material is soaked. To hasten the loosening of the gold, the contents of the pan are stirred slowly with the hand,

[29] Charles Rothe, "Remarks on the Gold Mines of North Carolina," *American Journal of Science 13*, (1828), 212.
[30] Anne Newport Royall, *Mrs. Royall's Southern Tour, Or, Second Series of the Black Book*, (Washington, D.C.: the author, 1830), 129.
[31] William Thornton, *North Carolina Gold-Mine Company* (Washington, DC: 1806), 2-3.
[32] *Philadelphia Columbian Observer*, February 14, 1850.

which allows the slimes loosened to rise above the pan and float away." [33] Panning only yielded small amounts of gold, and the process had limited capabilities. As such, the process best suited individual miners working in, rather than alongside, a stream. Though prospectors eagerly searched for gold nuggets, they generally panned to test for gold rather than actively extract it. This highly inefficient process wasted more gold than it collected, and failed to yield gold contained within rocky matter.

After pans, rockers represented the most rudimentary mining machinery. Rothe described the rockers he encountered in North Carolina as being "simple machines" and remarked that "a common barrel…bisected…would, in form, make two rockers, though these would be rather smaller than is common."[34] A rocker rested on "two poles, laid on the ground parallel to each other, but crosswise to the rocker, one near each end so as to make it rock easily and regularly."[35] Miners loaded rockers with earth and water and stirred the mixture together with a "common hoe," then rocked the device back and forth "like a cradle."[36] In order to separate gold from the earth, the "cradle was rocked rapidly" and "water [was] thrown overboard, loaded with as much mud as it is capable of suspending."[37] Rocking allowed more land to be worked in less time, but required more labor. One

[33] Eugene Benjamin Wilson, *Hydraulic and Placer Mining* (New York, NY: John Wiley and Sons, 1897), 22.
[34] Rothe, 208.
[35] *Ibid*.
[36] *Ibid.*
[37] Denison Olmsted, "On the Gold Regions of North Carolina," *Philisophical Magazine, Vol. 65* (1825): 378.

mining technology journal noted that "A rocker always furnishes work for at least two men".[38]

Along with the increase in labor, rockers also demanded increased amounts of water. "The rocker requires a large supply of water, which should be supplied by a little brook" advised one journal. Only the combination of rocking and washing would yield gold. "The rocker would do no good without water, and water would do little good without rocking."[39] The quality of the earth dictated the amount of water. The heavy clays prominent in a good deal of the southern Piedmont required more water than soils heavy in sand and gravel. In 1832, the *Carolina Watchman* noted that a mine near the Virginia border had limited returns because, "The amount gathered depends upon the quantity of earth washed per day, which must necessarily be limited, on account of the inconsiderable supply of water furnished by the small stream...which is only sufficient to keep two cradles in operation at a time."[40]

Sluices, another homemade device, also capitalized on the specific gravity of gold. Sluices were long channels, anywhere from ten to 400 feet in length, in which miners placed a series of rifles, or filters. Miners constructed the sluices out of wood, each one being roughly a foot and a half in width. Miners loaded earth into the sluices, and a constant supply of water recreated the natural processes of erosion and dissemination. Sluices, however, were not widely used in the southern piedmont until the arrival of steam-powered water pumps. The soil of the area

[38] John S. Hitell, *Mining in the Pacific States of North America* (San Francisco: H.H. Bancroft and Company, 1861), 131.
[39] Ibid., 131.
[40] *Carolina Watchman,* August 4, 1832.

required too much time and water to fully erode the earth and often formed "sluice robbers," which were "small clay balls in the sluices, which in rolling, pickup fine particles of gold and carry them off." Period journals noted their prevalence, and described them as being "A very common source of loss and annoyance."[41] Unlike the rocker, which required periodic filings, sluices required a constant flow. The combination of soil and hydraulic supply made sluices a costly and impractical technology until the use of steam-powered pumps.[42]

Miners used quicksilver, or mercury, extensively in placer mining operations. Mercury acted as an amalgam, capturing the gold without attracting sand or earth. Evidence exists that miners used quicksilver as early as 1803 to increase yields. William Thornton, of the North Carolina Gold-Mine Company, mentioned the use of quicksilver in 1806 to profit from gold dust in addition to large nuggets.[43] Often, miners inserted mercury into sluices or rockers to catch the gold during the final phases of filtering. In other instances, miners used quicksilver to collect the gold dust at the bottom of a pan or rocker when all else had been emptied. After collecting gold dust, diggers burned the mixture, evaporating the mercury and leaving the metal. Traveler and writer Anne Newport Royall noticed miners using the amalgam, and commented on the rudimentary nature of the smelting process. "Instead of furnaces, or *kilns* rather, it is thrown into common log-heaps, rain or shine, without shelter."[44]

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[41] Henry B. Nitze and Hannah, George B., "Gold Deposits of North Carolina" *Bulletin, Issue 3*, *North Carolina Geological Survey* (Winston: M.I. and J.C. Stewart, 1896), 171.
[42] *Ibid*.
[43] Thornton, 3.
[44] Royall, 128.

Homemade equipment requiring little capital investment characterized placer mining machinery. These rudimentary devices and limited resources proved effective but returned small yields. But as mineral extraction slowly grew, some farmers objected to the early industry.

Reactions to Mining

Unlike subsequent discoveries in British Columbia, California, and the Klondike, the initial discovery of gold in North Carolina failed to incite an immediate rush. From 1801 until the late 1820s, farmers only gradually came to embrace mining as a profitable and worthwhile enterprise. The subsistence-based agrarian ideologies of North Carolina conflated planting with independence, and as such, made some farmers reluctant to embrace any industry that potentially interfered with agriculture. [45]

Local periodicals articulated agrarian ideology. The Charlotte-based *Miners' and Farmers' Journal* reprinted an article from the Maryland Agricultural Society pontificating on the importance of agriculture. The article praised farming as the source of absolute sovereignty, stating that "The American farmer is the exclusive, absolute, uncontrolled proprietor of the soil. His tenure is not from the Government; the government derives its power from him." It went on to suggest that planting was the source of national wealth and prosperity, stating that "All national aggrandizement, power, and wealth may be traced to agriculture, its ultimate source." [46]

[45] This period does include an isolated rush that occurred in Burke County beginning in 1828, but this one instance notwithstanding the development of mining continued to grow slowly.
[46] *Miners' and Farmers' Journal*, September 27, 1830.

According to the article, agriculture promoted not only prosperity, but also morality. That author stated that, "We consider agriculture as every way subsidiary not only to abundance, industry, comfort and health, but to good morals, and ultimately even to religion."[47] Similarly, it offered that "The real benefactors of mankind…are those who cause two blades…to mature where one did before," and concluded that "The fields ought to be the morning and evening theme of Americans who love their country."[48] Because of the emphasis placed on agriculture, some farmers viewed mining and planting as mutually exclusive. In 1825, the *Raleigh Register* noted that Mr. Troutman of Montgomery County had "lately found gold on his land; and has discovered such indications of there being more… has determined to abandon the plough and the hoe, and shoulder the mattock and frying-pan, and dig and wash the earth for its mineral riches, rather than cultivate it for its *vegetable* bounties."[49] Because of this perceived tension, farmers feared that mining would impede agriculture. The *Miners' and Farmers' Journal* addressed the popularly held notion that the mines may "in the localities where they exist… prostrate…or interfere with the pursuits of agriculture," noting that many papers "indulged the idea." Some planters worried that gold mining pulled farmers away from their staple crops and, as a result, undermined their independence. [50]

A handful of North Carolinians prioritized reliable agriculture over speculative, more market-oriented pursuits. Because mining was risky business, some farmers tended to favor subsistence agriculture over mineral extraction.

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[47] *Ibid*
[48] *Ibid*
[49] *Raleigh Register,* April 15, 1825. Emphasis in the original.
[50] *Miners' and Farmers' Journal,* March 17, 1831.

Colonel Isaac T. Avery, of Burke County, expressed his wariness of mining. "The gold is here," he thought, but "if we can make more by digging potatoes, they are the surest business."[51] In 1829, the *Raleigh Register* ran an article expressing the fears of some planters. Many "have heard of individuals digging for Gold, but they have taken up the impression that the same amount of labor, directed with the same zeal to cultivation of the soil, would create a quantity of produce of greater value in the market."[52]

William Thornton also addressed the hesitancy of farmers. In 1806, Thornton incorporated the second-ever gold mining company in the state, aptly named the North Carolina Gold-Mining Company. In his letters of incorporation, he admitted that "Mining is considered generally, and with great reason…very dangerous employment," saying that "The immense profits of some production tempt in other cases to great exertion and expense, too frequently ruinous to the undertakers." He continued that only through careful examination would mining constitute a profitable business. [53]

Some farmers also objected to mining on moral grounds, fearing both violence and corruption, and local papers indulged both fears. An 1830 edition of the *Western Carolinian* reported that "gold diggers" in the Cherokee Nation mines of Georgia violently clashed over mineral rights. "A group of fifty or sixty Carolinians assailed a group of twenty Georgians, for the purpose of driving them from the

[51] Isaac T. Avery to William B. Lenoir, February 22, 1829, Lenoir Family Papers, Southern Historical Collection, University of North Carolina at Chapel Hill.
[52] *Raleigh Register,* May 5, 1829.
[53] Thornton, 2.

branch in which they were digging." Despite superior numbers, the Georgians drove back the interlopers, leaving one Carolinian mortally wounded.[54]

Some farmers saw the transformative capacity of gold not to be its incentive to modernize the economy, but rather its ability to corrupt farmers. An 1843 article from the *Fayetteville Observer* retold a prominent cautionary tale. The paper reminded their readers that "The person who found that largest lump of gold ever discovered, died a bankrupt, and all who have been in the neighborhood of one on the mines, will admit, that instances of poverty and dissipation abound there." Though, "A few individuals…have good sense to profit by the discovery…the great majority of gold hunters would be much more profitably and respectfully employed, in digging their corn and cotton fields, even at present low prices."[55]

The story of gold mining in North Carolina is a tale of conflicting ideologies. Though some North Carolina farmers expressed hesitancy, other figures felt that mining invigorated the local economy. Though some North Carolina agrarians thought mining presented a danger to agriculture, geologists saw agriculture as an impediment to mining. Saxony-born mineralogist and mining engineer Charles E. Rothe faulted the rampant agrarianism for contributing to what he considered a lack of progress. Rothe noted that cotton cultivation prevented mining from receiving due attention and exclaimed that "It is unfortunate for the gold mines of North Carolina, that they are situated in a part of the country where cotton is the leading staple of production." He explained that "The cultivation of this article, has

[54] *Western Carolinian,* May 25, 1830.
[55] *Fayetteville Observer,* March 8, 1843.

heretofore made labor high and provisions scarce." Cotton drew labor away from the more formal, scientific pursuit of mining. [56]

Additionally, Rothe felt that planters failed to embrace new forms of extraction because "The proprietors of the mines, as yet discovered, generally are persons not well informed on the advantages of a different method."[57] The proprietors he referred to were less miners and more planters. At most, they rented out their land to free labor during summer months. But because these planters favored growing over mining, they perceived no need to attempt to extract "even more gold on any new plan." Because farmers prioritized traditional methods of planting over mining, outsiders such as Rothe critically viewed the perceived lack of development on the land. [58]

Mining and Agriculture

Though some viewed mining and agriculture as mutually exclusive, others accepted the addition of mining to supplement their agricultural pursuits. As farmers found increasing amounts of gold, they came to realize the advantage of reaping both mineral and agricultural bounties. Though Col. Avery initially resisted the temptation of gold extraction in favor of more reliable tubers, he later reported to a friend that he had been infected by the "disease called Gold Fever."[59] And in 1832, The House of Representatives, in investigating the practicality of building a branch of the United States Mint in the region, noted that "agriculture has not been

[56] Rothe, 211-212.
[57] *Ibid.*, 210.
[58] *Ibid.*
[59] Isaac T. Avery to William B. Lenoir, February 22, 1829, Lenoir Family Papers, Southern Historical Collection, University of North Carolina at Chapel Hill.

neglected in the workings of the mines, but more earnestly attended to." The report reasoned that mining stimulated and improved agriculture by creating an increased demand for cereal crops. In addition, the report found that it employed the "surplus labor in the country." [60]

William Thornton noted the mutually beneficial aspects of the combination. Before he began actual extraction and encountered any agrarian opposition, he naturally assumed that agriculture would augment mining operations on his recently purchased land. He planned to employ "a certain number of…people to clear the grounds, raise provisions, cotton, stock for consumption of the workmen, and supply such articles as may be requisite." Additionally, he drew attention to the possibility of cotton producing "as high as two thousand pounds weight in the seed" with "one hand cultivating four acres." His exaggerations aside, the idea that he planned to shore up mining investments with cotton production speaks to the increasingly common conflation of mining and agriculture. [61]

At times, the pursuits became essentially one and the same. Rothe noted that miners "consist mostly of the less wealthy farmers of the neighboring country around; who seize on spare times from their regular pursuits to work at the mines." Farmers conducted mining operations in accordance with agricultural cycles. Rothe went on to say that most work is done "a week or two after their crops are put in, and before they require much attention," and again "after their harvest is gone and

[60] United States Congress, House of Representatives, *Assay Offices, Gold Districts N. Carolina and Georgia.* February 15, 1831 Report (Washington [H. Rept 82, 21st Cong., 2d Sess.] 1831.
[61] Thornton, 10.

their corn laid [sic] by."[62] Generally, these lapses in farming activity occurred during dry periods, which favored mining. "During the dry season, when the greatest part of the [water] level…is left bare, and the creek sinks to a small rivulet…the workers…commence digging."[63].

Farmers also found that the increasingly related pursuits faced similar environmental hazards. Because sorting and milling technologies demanded water for operation, the lack thereof affected both mining and farming. The planting season of 1830 experienced a drought that threatened the cotton crops of the southern Piedmont, and both miners and farmers felt the effect. The *Miners' and Farmers' Journal* noted that crops were damaged and the operations of the mines were delayed for "want of water."[64]

Digging and planting also employed similar methods of extraction, and placer mining techniques often directly mirrored agricultural practices. Both mining and farming employed exhaustion-style extraction with little regard to an organized system. Mining engineer Stephen Leeds, in discussing the southern Piedmont gold region, stated that "many portions of this…soil are very productive, and with careful and tedious management, might be rendered highly so…but under the lax system of agriculture pursued in this portion of the state, their lands are cleared and worked for some three to five years without any attempt at invigoration or restoration," after which they are "deserted for more recent clearings."[65] Other speculators

[62] Rothe, 208.
[63] Olmsted, 307.
[64] *Miners' and Farmers' Journal,* October 18, 1830.
[65] Stephen P. Leeds, "Notes on the Gold Regions of North and South Carolina," *Mining Magazine, 2* (1854), 30.

commented that "the business of searching for gold is conducted under numerous disadvantages, without the least regard to system and machinery," and accused the miners of simply "pick[ing] a spot at random."[66] Stephen Leeds reported that "Under an improved system of cultivation, these now barren wastes might be rendered productive, and be made to fill the barns and storehouses of the planters to overflowing. Much of the land on the mining properties, is in this condition. A little work, a little care, and the change would appear almost magical."[67] Miners and farmers both worked the land until it was exhausted and then moved on to richer fields. They believed that the riches of the soil, both agricultural and mineral, were "not likely to be exhausted by the skill and industry of man."[68]

Booster-driven government programs and the changes that gold mining itself wrought on the state's economy aided in growing the early industry. State geological surveys, beginning in 1824, represented the forerunners of government conservation agencies which sought to catalogue the natural resources of a state with an eye toward eventual exploitation. These surveys began with Denison Olmsted, a Yale-educated geologist who projected his own Puritan view of nature onto the landscape. He described the area as being a wasteland "singularly endowed by nature," saying that "the soil is barren, and the people generally ignorant."[69] Subsequent geologists adhered to this notion, and portrayed the area as an agrarian

[66] Olmsted, 378.
[67] Leeds, 29.
[68] *Miners' and Farmers' Journal,* September 27, 1830.
[69] Olmsted, 376.

hold-out devoid of enlightenment. Such publications offered that capital, science, and system are all that were wanting for profitable mineral extraction. [70]

Similarly, magazines like the *Miners' and Farmers' Journal* inspired change. By promoting scientific farming, systemized agriculture, and conflating the separate pursuits into one occupation, they advanced mining in the area. However, the degree to which such pamphlets and newsletters were effective is debatable. By printing articles about agriculture and early industry alongside philosophical investigations into the nature of morality and tedious examinations of world events (common topics included political unrest in Brussels and pending revolution in France), their target audience was akin to what Charles Postel described as being almost an agricultural intelligentsia.[71] Booster-driven studies often fail to account for the role of the standard farmer, tending instead to emphasize the contributions of the elite and heads of local farming cooperative bodies. Indeed, John Reed could not read or write in English and signed his name with a variety of different spellings. *The Miners' and Farmers' Journal* likely had little influence on Reed and similar planters.[72]

More directly, mining promoted itself by creating a self-perpetuating cycle of wage-labor. Many poor whites, lacking their own property, participated in a system akin to sharecropping to or tenant farming, whereby they worked the land of other farmers in exchange for a rented homestead. Frank Owsley was one of the first

[70] Elisha Mitchell and Ebenezer Emmons, both of New England, conducted other surveys between 1828 and 1897.
[71] Charles Postel, *The Populist Vision* (New York, NY: Oxford Publishing, 2007).
[72] Knapp and Glass, 47.

historians to examine the lives of poor whites in the South, and he generally presented the group as respectable yeoman.[73]

However, more recent scholarship suggest that the economic group was much more diverse, and perhaps numerous, than initial studies suggest. Poor whites that owned little or no property and worked as wage-labor became increasingly common as the nineteenth century progressed. By some estimates, as many as one-hundred thousand itinerant, poor whites occupied the slave South by 1850. These whites survived on the margins of the economy by providing day labor for other whites (and, in one documented but rare case, a free black). Rather than cultivate subsistence crops on rented land, these non-landed whites may have seen mining as a favorable economic opportunity. [74]

In some ways, Edward Isham epitomized this class of people. Researching a doctoral dissertation in the 1990s, Charles C. Bolton stumbled upon a biography of Isham, aka Hardaway Bone, who was hanged for murder in Catawba County in 1860. Isham's life sheds light on the role of the poor white in the antebellum South. Most accounts list the man as earning money by "mining and an assortment of other jobs." In addition to being a miner himself, he grew up in a gold mining community in North Georgia where his father worked gold mines for daily wages. Isham and other poor whites became wage-laborers out of necessity, and mining provided increasingly reliable work in North Carolina. [75]

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[73] Frank Owsley, *Plain Folk of the Old South* (Vanderbilt University Press, 1949).
[74] For more on tenant farming and poor whites, see Charles C. Bolton, *Poor Whites of the Antebellum South: Tenants and Laborers in Central North Carolina and Northeast Mississippi* (Durham, NC: Duke University Press, 1994).
[75] Charles C. Bolton and Scott P. Culclasure eds., *The Confessions of Edward Isham,* (Athens, GA: University of Georgia Press,1998), 20.

Landed whites employed these day-laborers by renting out land on which to mine. When Olmsted toured the area in 1824, he noted the prevalent economic scheme of gold mining. The richness of the field determined the rental fee, and he stated that "some of the miners rent for a fourth of the gold found, others for a third, and others claim half."[76] The land rental system of placer mining continued into the early 1830s. An 1832 edition of the *Carolina Watchman* noted that recent discoveries in Franklin County inspired two men to "rent the land of Mr. Porter the proprietor…under a contract that they should incur all incidental expenses of the mining and allow him one third of the proceeds." They worked the land with the "rude machinery" common to placer operations and netted roughly $5,000-$6,000 in their first month alone.[77]

These rental agreements utilized workers earning a common hourly wage. At the aforementioned Franklin County mine, the renters "employed…about 32 men, and 2 or 3 boys," with the men earning "amounts to exceed $12 per day."[78] Wage labor inspired the growth of local market economies with gold being the common currency. Olmsted noted that, "almost every man carries about with him a goose quill or two of [gold/gold dust], and a small pair of scales in a box like a spectacle case." These laborers used gold to pay for all manner of items, including whiskey, which went for "three and a half grams."[79] Wage labor further entrenched itself as it removed small farmers from their land, resulting in an increased dependency on a wage-labor economy. Olmsted noted that the "gold hunter" was "one of an order of

[76] Olmsted, 382.
[77] *Carolina Watchman*, August 4, 1832.
[78] *Ibid.*
[79] Olmsted, 382.

people that already began to be accounted a distinct race." Simultaneously, larger farmers received profit without working by owning the modes of production. [80]

Because of the favorable economic circumstances mining provided, the industry grew quickly. Nowhere was this more evident than in the gold rush to Burke County in 1828. Gold discoveries at the beginning of the twentieth century failed to incite a true gold rush, or massive influx of people and capital into an area within a relatively short time. In 1824, a quarter century after the initial discovery, Denison Olmsted noted that there were only "three principal mines" in the goldfields of North Carolina, and all operated on the land-rent system using primitive technologies.[81] However, by the end of the 1820s, the farmer/miner dynamic was well-established, and as a result, gold mining became an increasingly speculative activity. When farmers began finding placer deposits in the streams and creeks of Burke County in 1828, the state had become well-adjusted to the practice of mining and a true rush ensued. [82]

Akin to Reed's discovery in Cabarrus County, Appalachian mining began with an accidental find. A traveler from Connecticut stopped at a Burke County cobbler for a quick shoe repair and noticed flakes of gold in the mud caked on the side of the cabin. The New England man and local shoe-smith immediately entered into a partnership and panned for gold together for six months. Each making a handsome sum, they went their separate ways, but not before word of the placer deposits

[80] *Ibid,* 377.
[81] *Ibid.*
[82] John C. Inscoe, *Mountain Masters: Slavery and the Sectional Crisis in Western North Carolina* (Knoxville: University of Tennessee Press, 1989), 72-73.

spread beyond the county. By 1829, farmers and prospectors swarmed into the county to make their fortunes exploiting the placer deposits.[83]

Historian John Inscoe described the flood of people and labor to the North Carolina mountains in his work *Mountain Masters.* He notes that slave owners from eastern Carolina and Virginia partnered with western land and slave owners to effectively work the new mines, and that because of mining, the slave population of Burke County nearly doubled between 1828 and 1833. The influx of slave labor, capital, and people to Burke County in 1828 was the result of the agrarian and mining collaboration in North Carolina as a whole. The un-landed, free-white miners that wage-labor in the Piedmont helped create were accustomed to the nomadic lifestyle of placer hunting, and the promise of new discoveries in Burke County drew them to the creeks and streams as well. And, of course, the reason for any investment in either labor or capital was the direct result of nearly three decades of increasingly profitable mining in the Piedmont. In many ways, Burke County's 1828 rush evidences the growing success of older, southern Piedmont operations.[84]

The amount of reported gold production in North Carolina illustrated this upward trend. Between 1803 and 1824 miners/famers assayed only 2,277 troy ounces totaling $47,000. However, that same amount was nearly accrued by the subsequent three years alone, with production between 1824 and 1826 totaling $42,000. In 1828, the year of the Burke rush, annual totals reached $46,000 and

[83] Knapp and Glass, 16.
[84] Inscoe, 72.

tripled the following year. A combination of new discoveries and ready capital accounted for this massive upswing in gold production.[85]

[85] Knapp and Glass, 43.

CHAPTER TWO

INDUSTRIAL EXTRACTION

As the nineteenth century progressed, mining became increasingly widespread in North Carolina. Soon, limited, small-scale placer extraction gave way to larger, more industrial operations. As this transition occurred, the agrarian foundations and influences that characterized earlier mineral extraction faded, and an industrial ethos characterized by new labor relations, machinery, and foreign influences supplanted the farmer/miner dynamic established in the first three decades of the nineteenth century.

Industrial mining was represented by a combination of factors. Changes in capital, labor, and technology all played integral roles in separating industrial mining from previous extraction. While nearly all mining operations adopted industrial techniques, they did so at different times. There was no single narrative confined to a single period. Some areas embraced industrial techniques as early as 1825; however, other operations only slowly came to view industrial mining as a worthwhile enterprise. The agrarianism of the state continued to play an important role in impeding industrial progress, but by and large, North Carolina was home to a notable mineral industry before the Civil War.[86]

[86] For more on industrialization of machinery, see Richard Knapp and Brent D. Glass, *Gold Mining in North Carolina: A Bicentennial History* (Raleigh, NC: Office of Archives and History, Department of Cultural Resources, 1999), 23-28, 57-62, and 73-100.

The transition to industrial gold mining resulted from the economic changes wrought by earlier gold extraction. The establishment of wage labor, the increased amount of currency in the form of gold nuggets and dust, and the related growth of a market economy all paved the way for deep vein and hydraulic gold mining operations. In many ways, it seems natural that industrial extraction would follow non-industrial mining techniques. It seemed logical that miners developed new, more intrusive technologies to continue to wrestle wealth from the soil. However, industrialization went against agrarian logic. Soil exhaustion and field rotation were features of antebellum North Carolina agriculture; farmers worked a plot of land until it became unproductive, then simply moved on to more fertile soil. Not only was exhaustion a central feature of the state's agrarianism, it was also an effective means of extraction. Abundant land allowed this practice to be viable, and letting earth rest between plantings naturally reinvigorated the soil. If left to the state's agrarians, then, mining would have never developed industrially; although limited in scale, exhaustion proved an effective means of extraction. [87]

Transition and Opposition to Deep Vein Mining

Industrial mining in North Carolina took two forms. In the Appalachian foothills, miners participated in hydraulic mining. In the Piedmont, gold hunters dug deep into the earth. The event that inspired the industrial, deep-vein mining of the Piedmont was the discovery of gold-bearing quartz . Because of its atomic properties, gold chemically bonded with quartz, which was dispersed throughout

[87] For more on soil exhaustion in North Carolina, see Timothy Silver, *A New Face on the Countryside: Indians, Colonists, and Slaves in the South Atlantic Forests, 1500-1800* (New York: Cambridge, 1990), 139-186.

the earth's crust in veins. In 1825, Mathias Baringer discovered the first gold-bearing quartz vein while searching for gold in a creek near John Reed's farm. Baringer spent a long day searching the creek, looking for the tell-tale sparkle of gold through the water with little success. Growing frustrated, he began looking in increasingly unlikely places. In examining a part of the creek that flowed directly adjacent to a hillside, he noticed a fleck of gold contained in a milky-white rock. He tried to dig the rock out, only to discover that it was not a single flake, but a vein of quartz extending deep into the earth. His discovery prompted the advent of deep mining and inspired the host of changes associated with it.[88]

Deep vein mining encountered the same moral objections as earlier placer extraction. As the industry became more widespread and displaced more small farmers, agrarians voiced increasing distrust and disapproval of the highly risky and morally unsound endeavor. In 1825, the *Observer* noted that capital-heavy mining enterprises were inevitable, but that it would be "an event which… is a matter rather of regret than congratulations," because of the detrimental effects mining had on the moral fiber and cleanliness of the community. George Featherstonhaugh's 1834 travelogue illustrates the conflation of mining with filth, ignorance, and immorality. He spoke of the poor, white miners of the Brindletown community as being, "altogether illiterate, not knowing even their letters, and with very few exceptions, the children received no education whatsoever." Their lodgings he described as

[88] This anecdote is told in nearly every study of gold mining in North Carolina, but examples can be found in Knapp and Glass and several geological and agricultural surveys that include sections on the history of the industry. The discovery incited so much excitement that papers inaccurately reported larger amounts of gold than were actually found. The *Raleigh Register,* April 5, 1825 edition of the paper printed a retraction, saying that only, "$8,000 worth – and no more – had been found."

huts, saying that "it would be difficult to think of anything more rude or dirty." Finally, he remarked that, "they crawl through life without either religious or moral instruction."[89]

Papers often cited the story of James Capps as a cautionary tale. Capps lived outside of Charlotte, North Carolina, and for years attempted to plant untenable soil. The *Raleigh Register* described Capps as "a poor man: though he possessed a freehold; but the poverty of the surface (or soil) of his land, yielded a miserable return for the labour bestowed in its cultivation." After the discovery of gold bearing "fissures," Capps realized that his "once sterile acres have proven so rich in their bowels" that he was immediately met with offers to purchase his land, which he declined in favor or working the veins himself.[90]

Within a year, Capps was found dead at his residence in Mecklenburg County. The *Register* reported that his newfound wealth had corrupted his morality, and he succumbed to dangerous temptations. "No sooner was the old man's pockets well lined with cash…that himself & family plunged into extravagance and excess; and the BOTTLE, that too common resort of those whom affliction has cast down." Readers feared the "magical effect" gold had on the poor but honest farmers of the state, and pitied the "wo-begone condition of the family." That "his gold mine was his grave" spoke to the corrupting influence of quick and easy wealth. [91]

Additionally, some objected to the gold-mining industry citing economic concerns. The *Raleigh Register* reported that, "From the great interest taken by the

[89] George William Featherstonhaugh, "A Canoe Voyage Up The Minnay Sotor" (London: Richard Bently, 1847), 333.
[90] *Raleigh Register,* April 24, 1827.
[91] *Ibid*.

people of Georgia in their new search after gold, we should fear that much labor and capital will be wastefully employed." The author believed, "The history of gold mining in Virginia presents a gloomy picture. Like many other bubbles, it has created false hopes, abstracted money, mind and labor, from useful objects, and finally it has burst and scattered ruin among its deluded victims."[92]

Boosters responded to these objections by suggesting that increased capital and technology would allow the industry to avoid both economic and moral poverty. The *Raleigh Register* printed an article voicing the common sentiment among boosters that, "Nothing is wanting to develop the mineral wealth than science and perseverance."[93] Boosters believed that better machinery would allow miners to realize the whole of their lands' mineral wealth, and local papers indulged the idea. Reporting on Porter's recent discovery, the *Carolina Watchman* stated that an "El Dorado in North America" loomed on the horizon pending only the "introduction of proper machinery." "It would be surprising to calculate," the article continued, "the revenue that might accrue from an improvement in those means which are now used in collecting the ore."[94]

Other papers admired technological innovation while simultaneously looking to the future. "It is true, the great desideration of labor-saving machinery has been but recently put into successful operation," the *Raleigh Register* reported. "But preparations are making for that of steam, also, which will greatly facilitate the

[92] *Raleigh Register,* June 24, 1842.
[93] *Raleigh Register,* November 19, 1841.
[94] *Ibid.*

process of obtaining the Gold, and enhance its profits."[95] An edition of the same paper later that summer noted that, "new deposits, and new veins of this valuable metal, are almost daily discovered in Rowan County," and that, "Nothing but capital, skill, and enterprize[sic] are wanting, to render the Gold Mines of North-Carolina a source of wealth and prosperity."[96] An 1829 article reporting a company incorporated for $100,000 begged Carolinians to "Wake up, ye slumbering indolences," and stated that systemized, mechanical extraction was surely "better than digging potatoes."[97]

National government agencies, intent on exploiting the wealth of the southeastern gold fields, argued that more capital heavy and industrial mining operations also avoided moral degradation. An 1832 examination of the gold area revealed that though "Moralists have ranked it among the corruptors of our species," degradation of human virtue can be avoided with an application of system and science.[98] The article claimed that the lack of morality was an effect of alluvial, haphazard extraction because of its close association with gambling. Placer extraction was "in truth, a lottery, in which the larger prizes are few but rich, and where the smaller do not refund the original cost of chance." However, if miners employed "scientific knowledge and practical skill" and furnished "definite capital to be invested," then "the workings of the mines of the metal would be of…a moral

[95] *Raleigh Register,* May 5, 1829.
[96] *Raleigh Register,* August 24, 1829.
[97] *Greensborough Patriot,* June 13, 1829.
[98] G. C. Verplank, "Report of the Select Committee for the Purpose of Inquiring into the Expediency of Establishing an Assay Office Within the Gold Districts of North and South Carolina and Georgia," *American Quarterly Review, Vol XI* (1832).

point of view" as beneficial as "any other legitimate branch of industry."[99] Another paper reported that "science and skill have been put in requisition, and…a system has been adopted for working the Mines, which ensures regular profits, and renders them extensively productive" was morally beneficial.[100] Yet another paper noted that because miners "work[ed] the mines on their grounds on a small scale, not being able to encounter the expense of much machinery," that "the morals of these miners is deplorably bad." The author continued that, "I can hardly conceive of a more immoral community than exists around these mines. Drunkenesss, gambling, fighting, lewdness, and every other vice, exist here to an awful extent."[101]

However, other papers denied outright the moral degradation that some associated with the mineral. In 1829, a paper announced that they were, "happy to state, that the report as to the evil effects produced by them on the community is without foundation and on the contrary, it has given a new spring to exertion and frugality." It continued, "People are generally disposed to labor when they see that their toils will be recompensed and to be economical when they have something worth saving."[102] Another article in the same edition argued that the *Charleston Courier* was mistaken in reporting that, "'business is neglected through the week, and even the Churches deserted on the Sabbath, to search for the *corrupting treasure.'"* They stated that "The vivifying influence of the gold found among us is already felt, in the appreciation of our currency, in the new animation infused into most kinds of business, &c. &.c." It continued that, "Public morals were perhaps

[99] *Ibid.*, 69.
[100] *Raleigh Register,* May 5, 1829.
[101] *Niles Weekly Register,* May 21, 1831.
[102] *Raleigh Register,* August 10, 1829.

never at a higher standard among us, than at this time." And, in addressing the tragic demise of James Capps, reported that, "At the Capps' Mine…not a drop of spirits has been used for many months" under the new proprietor.[103]

Additionally, boosters argued that mining was not only an individual compliment to planting, but created more wealth for farmers and merchants. In 1829, the *Hillsborough Recorder* reported that "at least a million of dollars will be realized during this year from the various gold mines of the State." This new wealth, the paper argued, would "extend to every branch of industry. The farmer will find a ready and good market for his produce; the merchant will find an increase both in the number and ability of his customers, and in fine every one who labors at all will find a greater demand and a higher price for his labour."[104] Another writer commented that, despite associations with the "debased Spain" (another gold-mining area thought to have succumbed to immoral behavior as a result of their newfound wealth), that in North Carolina it had not "loosen[ed] their morals or repressed their patriotism," but instead given "a new impulse to industry and enterprise, much must eventually have the happiest effects in ameliorating the condition of the county and people."[105]

State aggrandizement was a common theme in gold mining articles. A piece published in the *Greensborough Patriot* in 1829 offered that, "Our brethren of the Type in New York and Charleston, may scatter their envious tauntings abroad in the world, but we'll show e'm what it is to employ our idle forces in digging gold enough

[103] *Raleigh Register,* August 10, 1829.
[104] *Ibid.,* July 5, 1830.
[105] *Greensborough Patriot,* August 8, 1829.

to pay our debts, educate our por[sic] children improve our state, subscribe for the *Greensborough Patriot,* and lend them a little gold too – reckon we can brag some then."[106]

In contrast to the tragic Capps' tale, the *Carolina Watchman* told the tale of Mr. Porter of Franklin County. Mr. Porter was a "plain, worthy citizen, who [had] spent all his life between the humble occupations of shoe-making and delving the unfertile surface of [his] soil." After his discovery, Mr. Porter planned to continue his cobbling and stated that, "I have all my life worn shoes made on one last; but not I shall be able to have a last to fit each foot." His newfound wealth failed to corrupt his moral character, and the paper reported that "after all, wealth is a relative thing, since he that has little and wants less, is richer than he that has much and wants more."[107]

Agrarians resisted industrial extraction on moral grounds, citing evidence of corruption, violence, poverty, and the filth. In short, the profession was seen in stark contrast to the morality and national aggrandizement inherent in planting. But boosters countered with their own moral ideology, one that believed systemized and scientific extraction would avoid the moral degradation present in mining.

Labor in the Mines

One of the fundamental changes associated with industrial mining occurred in the social relations of labor. Deep vein mining in the southern Piedmont created new economic classifications based on wage-labor while simultaneously blurring racial distinctions by creating a work space co-inhabited by free whites and slaves.

[106] *Ibid.,* October 3, 1829.
[107] *Carolina Watchman,* August 4, 1832.

Foreign investors, free white laborers, slaves, and English mining experts created new social and economic classes in the southern Piedmont.

Renting slaves to miners was a common practice during the antebellum development of the industry. Colonel Isaac T. Avery, of Burke County, noted that "numbers of our most intelligent, wealthy, and enterprising citizens from the eastern and middle counties of the State, after personal examination, are withdrawing their slaves entirely from the cultivation of cotton and tobacco, and removing them to the deposit mines in this county."[108] The English mining engineer John Penman actively recruited slaves; in 1835, he placed an ad requesting "15 to 25 NEGROES, to be employed in the Gold Mines near Charlotte."[109]

At an early Gold Hill operation, one observer noted that "69 miners paid by the month and 39 negroes hired by the year" constituted the labor force. Some scholars, Brent D. Glass among them, offer that no more than one third of the laborers were slaves. Because they represented a minority of laborers in industrial mining enterprises, they worked side by side with paid, free-white laborers, blurring the racial division of labor in the southern Piedmont.[110] An 1852 government-funded study into the mineral resources of the southern and western states noted that the division of labor at Gold Hill was between skilled and unskilled

[108] Isaac Avery Letters, Lenoir Family Papers, Southern Historical Collection, UNC.
[109] *Charlotte Journal,* September 25, 1835.
[110] Knapp and Glass, Though the book is co-authored, Glass's focus in other articles ("Gold Mining in North Carolina, 1840-1915") and his dissertation (*Midas and Old Rip: The Gold Hill Mining District of North Carolina*) point to him being the primary contributor the relevant information. Most likely, this figure came from The North Carolina Geological Survey of 1894, which included extensive historical notes on previous operations in the area.

rather than only by race.[111] A travel narrative from the period notes that Burke County mining operations employed mixed labor, with the washing being done by, "both white and black men."[112]

In addition to creating a workspace cohabited by free whites and slaves, mining afforded a plethora of opportunities for slaves to defy their masters. Local newspapers often commented on runaway slaves from mining communities, and at times slaves attempted to steal small nuggets or fine particles of gold.[113] George Featherstonhaugh, after visiting a Burke County placer operation, noted that though the slaves "appeared to be submissive in their manners and to work very hard," the white supervisors still had to watch to closely to prevent, "any secreting of gold they may find." But the most famous and potentially troublesome event occurred in Rutherford County in 1831.[114]

In the wake of the Nat Turner rebellion, southerners began to see insurrection everywhere. The mines, being given to lax supervision and shared labor between whites and blacks, presented what some considered an ideal setting for a slave revolt. On October 1, 1831, the *Carolina Spectator and Western Advertiser* reported that insurrection was brewing. The paper stated that "The development of an intended Insurrection, among the Slaves working at some of the Gold Mines in this County…appears to call for prompt, efficient, and uniform exertions to be adopted…to put down this insurrectionary spirit." The article played on the fears of

[111] J.D.B. De Bow, *The Industrial Resources, Etc.,of the Southern and Western States, Vol. II* (New York, Office of De Bow's Review, 1852), 185.
[112] Featherstonhaugh,333.
[113] *Western Carolinian*, February 14, 1831 and *Carolina Watchman,* February 23, 1833 provide two examples of slaves running away from prominent North Carolina mines.
[114] Featherstonhaugh, 333.

its readers, claiming that "the plot is much more extensive than has yet been brought to light." Gold mining not only provided an apt setting, but the rental of bad slaves prompted this issue. It blamed the "introduction to this County of negroes of bad, doubtful, or suspicious character" for the sinister plot.[115]

The following week, the *Spectator* recanted the story. After a town meeting, it came to light that the supposed rebellion was an invention of "rumor, with her hundred tongues." The paper advised its readers to keep a close eye on potential problems, but also to avoid the, "terror and alarm consequent on false rumors and mischievous fabrications." It concluded that, "Although we believe, if there has been danger, that the time is now past, yet we advise that the fable of the boy and wolves should not be forgotten." Though the insurrection never occurred, the citizens of Rutherford County viewed the mines as the hotbed of potential rebellion because of foreign influence and increased autonomy.[116]

In addition to poor whites and slaves, a plethora of immigrants contributed to the unskilled labor at the mines. Germans, Swiss, Swedes, Spaniards, and Scotch miners all came to North Carolina during the height of underground mining. One article stated that, "There are no less than *thirteen* different languages spoken at the mines in [North Carolina]!" Though likely an exaggeration, the observation speaks to the employment opportunities mining provided to poorer, non-landed laborers and the growing diversity of the Piedmont.[117]

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[115] *Carolina Spectator and Western Advisor*, October 1, 1831. For more on this potential insurrection, see Jeffrey Paul Forret, "…Promises to be very Rich": The Development of the Gold Mining Industry in North Carolina, 1825-1837" (Master's Thesis: University of North Carolina at Charlotte, 1998).
[116] *Carolina Spectator and Western Advisor,* October 8, 1831.
[117] *Niles Weekly Register*, June 21, 1831.

Unskilled laborers primarily worked topside at the mines, with their main duties being sorting, washing, and the ever-necessary hauling of ore. A North Carolina Geological Survey noted that "the ore was raised by horse-whim and hand windlass, or even by baskets carried on the backs of miners." Horse-powered whims, and eventually steam pumps, were commonplace in the Gold Hill mines, but smaller operations lacked even these essential technologies. The output of industrial operations was prolific, whim after whim rose all day, requiring a constant amount of hauling and sorting. [118]

In deep vein extraction, miners used sluices as a preliminary sorting method. Rather than separate gold from mud, clay, and sand, industrial sluices sorted gold-bearing quartz rocks from other hard rock and soil. As such, laborers spent hours bent over troughs, hand separating the sluice particulate. Laborers discarded heavy stones piles adjacent to the sluices, while the quartz rocks were loaded into baskets. Workers carried the baskets to nearby milling stations, and then returned to repeat the process. After milling the ore, unskilled laborers would re-sort the refuse. The time and labor intensive milling and hauling only expedited the natural processes of erosion, and laborers finally returned the milled products back to vastly improved rockers. [119]

The Burke County rocker, as it came to be called, was a rocker modified to accommodate industrial output. Rather than a lone barrel, this new invention linked several rockers together via horizontal planks. Rocking one, then, invariably rocked

[118] *United States Geology Survey* (Washington, D.C.: 1894), 30.
[119] *Ibid.*

the others.[120] At the Gold Hill mines, this process was ongoing, occupying all twenty four hours of the day. Ebenezer Emmons, of the 1856 survey, reckoned that three crews working eight hour shifts supplied the necessary labor for twenty-four hour operation. Stamp mills, drag mills, and Chilean mills operated constantly, so the pre and post sorting of ore occurred constantly.[121]

Unskilled topside laborer also attended to the daily need of raw timber. Timber served several essential purposes at the deep vein mines, the most important of which was construction of shaft supports. As mines protruded deeper and deeper into the earth, increasingly elaborate shaft construction was necessary. Cave-ins proved a constant hazard at the mines, and unlike the small intrusions into the earth that characterized placer mining, owners and engineers needed to construct strong, stable shafts that could withstand the test of time. Deep vein mines were rarely completely worked for a while and then abandoned. Instead, miners followed veins downward into the earth, sometimes reaching depths of up to 340 feet.[122] Operations also required timber to stoke the fires and furnaces that smelted the ore and burned off excess quicksilver. As industrial operation increased raw ore, more and more fires were necessary to continue the smelting processes. Just as mills operated twenty-four hours a day, so too did the fires. Finally, some of the pumping equipment demanded timber to stoke fires. Supplying the necessary

[120] *United States Geological Survey* (Washington, D.C.: 1894), 34
[121] *United States Geological Survey* (Washington, D.C.: 1856), 161.
[122] This depth represents one of the more intrusive operations; more commonly, shafts extended between ninety to 300 feet into the earth.

timber was likely a full-time occupation, and free whites, blacks, and immigrants shared the responsibility.[123]

The unskilled labor that occurred topside was hard, strenuous, and constant work. But the underground labor proved equally demanding. Farmers and local land owners lacked the necessary skill to undertake deep vein mining and looked to countries abroad to offer help, support, and experience. In 1832, an assay office report noted "[deep mining] is almost unknown among us, and the skill it demands lies almost wholly in the hands of a few intelligent foreigners, either graduates of the European schools of mines, or [those that] have attained their skill in the mines of Mexico."[124]

One such expert was Italian aristocrat Count Vincent de Rivafinoli. The Count was an affluent mining engineer who had experience in South America, and British companies held the man in high regard. He made his first visit to the gold regions of North Carolina in 1830, and the mineral wealth of the state impressed him. The *Western Carolinian* stated that, "[Rivafinoli] speaks very favorably of the North Carolina mines; he says that appearances are better than in South America." Furthermore, he confirmed the presence of "gold ore…at a depth of 200 or 300 feet."[125] By 1831, Rivafinoli was well known in not only mining circles, but popular culture. Papers referred to the man by name with no introduction when reporting on his technological innovations to the mining process.[126] Within two years,

[123] For more on the labor at the mines, see *United States Geological Survey* (Washington, D.C.: 1894). This bulletin included a historical section that detailed antebellum sorting and milling operations.
[124] Verplank, 74-75.
[125] *Western Carolinian*, May 25, 1830.
[126] *Raleigh Register,* August 11, 1831.

Congress granted Rivafinoli a patent for his improvements of mining technologies in the area.[127]

Charles E. Rothe, a mineralogist from Saxony, also came to be associated with deep mining in the state. Rothe came to America to explore the southeastern gold fields, and from 1824 to 1828 assisted both Denison Olmsted and Elisha Mitchell in their geological surveys of the area. Rothe became synonymous with promoting scientific, well planned extraction. Shortly after the discovery of quartz bearing veins, a newly-formed company immediately "procured a practical miner from Europe, a Mr. Rothe" for "the purpose of working these mines systematically."[128] Similarly, Englishmen John E. Penman came to the country to lend his experience and capital to mining enterprises. Both Rothe and Penman contrasted sharply with the local residents of the southern Piedmont and Appalachian foothills. Rothe amused locals by donning his European miners' uniform, and Penman reportedly funded a banquet in his own honor at which his sixty miners paraded into Charlotte accompanied by drums and fifes. Both of these miners lent an expertise to mining that had not been present in earlier surface extraction. [129]

These engineers helped organize the labor and business of mining, but the skilled labor in the pits was largely left to a mixture of whites and Cornish immigrants. County Cornwall, in southwestern England, had long been a mining community. Paralleling the development of Piedmont mining, the Cornish people worked alluvial and surface deposits of tin and copper since antiquity. Historians

[127] 21st congress, 1st session, xxxvii (Washington, D.C.: 1830).
[128] *Niles Weekly Register,* December 3, 1825.
[129] Knapp and Glass, 22-23.

even note the existence of gold, though instances of the mineral were decidedly rarer than in North Carolina.[130] As in North Carolina, mining provided an example of early industry in a largely agrarian region. In the late seventeenth century, mining opportunities began to erode subsistence pursuits (farming, pastoralism, and fishing) in favor of a wage-labor economy. Paradoxically enough, historian Elizabeth Hines contends that the push for Cornish immigration came from a boom in the copper industry. Because of a hike in copper prices worldwide, industrialists and capitalists poured money into the area, drawing more farmers from the fields and further devastating the local agricultural economy. This, in turn, made the local economy dangerously susceptible to famine and crop failure, which began occurring in on a large scale in 1812. The Cornish people looked to America as an opportunity to continue in the work they knew so well, and began immigrating to North Carolina's gold fields in the 1820s.[131]

Engineer-managers Rothe, Penman, and Ravafinoli actively recruited the skilled Cornish labor for the North Carolina mines. An 1853 issue of *The Mining Magazine* noted the necessity of Cornish miners, saying that, "to secure success in a mining enterprise, it is essential that a Cornish miner be hired to take charge of the mine."[132] They helped establish a middle class in the state; the magazine continued that they should be provided with, "as much pay, and little labor as possible." Cornish mining experts constituted skilled labor and created a class of middle-

[130] Elizabeth Hines, "Kernow Comes to Carolina: Cornish Miners in North Carolina's Gold Rush, 1830-1888," Richard F. Knapp and Robert M. Tompkins, editors, *Gold in History, Geology, and Culture: Collected Essays,* (Raleigh: Division of Archives and History, Department of Cultural Resources, 1999), 134.
[131] Hines, 137.
[132] *Mining Magazine, Vol. I* (July to December, 1853), 24.

managers in the mining communities. Perhaps this is no better typified than in the person of John Gluyas. [133]

Gluyas and his family immigrated to the United States from Cornwall in the mid-1830s. He worked in the copper and tin mines of the England until management saw fit to promote him to the role of civil engineer. Growing increasingly tired of labor strikes, he boarded a ship to New York where he worked in an engine factory. While there, a shareholder in the Mecklenburg Mining Company offered him a position managing mines in North Carolina.[134]

Gluyas accepted the post, and travelled to the Piedmont after living only a year in New York. Once there, Gluyas typified the manager/supervisory post associated with middle class livelihood. Land owners held the man in high esteem, and he was regularly sought after to provide advice on machinery, land, and operations. Rather than the early mining dynamic of land owner/gold hunter, these industrial operations and skilled foreign labor contributed to an economic stratification of land owner, manager, and laborer. [135]

An 1857 issue of *Harper's Magazine* gives insight into the newly developed class dynamics of mining operations. The fourth installment of longer-running piece entitled, "North Carolina Illustrated" told a colorful, yet informative, tale of the journalist David Hunter Strother, writing under his pseudonym of Porte Crayon,

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[133] *Ibid,* 24.
[134] John Gluyas Papers, Southern Historical Collection, North Carolina at Chapel Hill.
[135] For examples, see letter August 20th, 1838 to Gluyas stating that "I am aware that you understand the nature of machinery very well, and also a good judge of ores," and a letter from 1847 imploring him to salvage a deteriorating mining operation.

visiting the operations of Gold Hill.[136] Matthew Moyle, "a manly specimen of a Briton," served as the supervisor and foreman of the mines. The "handsome Cornishman" offered to show the company around, and arranged for the crew to meet at a later time to go into the mines. Moyle and his assistant Bill Jenkins, another Cornish expert, took Crayon and company into a four-hundred foot shaft that evening, much to the delight of the gentlemanly tourists. [137]

Local North Carolinians found the Cornish miners generally agreeable. They were hard workers and skilled in their field. Described as "temperate and industrious," they lent a work ethic that contrasted sharply with the unskilled whites of placer mining.[138] Richard Knapp describes the group as being "superstitious, clannish, and Methodist." Cornish miners, accustomed to a wage labor economy, toiled hard and spent frugally. Carolinians noted that they rarely succumbed to the temptation of alcohol, and preferred to keep company with their families rather than Americans. An 1832 publication noted that, "Several of the miners imported from Cornwall are excellent men, and one or two of them preach."[139] Knapp quotes a telling verse found in the *Western Carolinian* in the first half of the nineteenth century that summarizes how North Carolinians viewed the Cornish immigrants:

> He never was given to swearing or drinking
> Yet got all his money by damming and sinking;
> He burred himself below all his life,

[136] Porte Crayon, "North Carolina Illustrated: Part IV, The Gold Region," *Harper's Magazine* (August, 1857), 290.
[137] Ibid., 291.
[138] Knapp and Glass, 24.
[139] *Niles Weekly Register,* May 21, 1831.

And when dead he was buried up here by his wife.[140]

Industrial Techniques and Machinery

When the Cornish miners arrived in the mines, they found the infrastructure of deep vein operations to be dangerous. Shafts were poorly shored, and a lack of control characterized the haphazard blasting operations. The Cornish were deep miners by trade; they worked underground and helped to shore up shafts and lend experience to blasting techniques and technologies. But perhaps most impressive was their ability to extend mines beneath the water table. Water had always been a difficult natural impediment for miners. Blasting could not continue underwater, and hauling buckets of liquid up to the surface was both time and labor intensive. The Cornish, however, had dealt with the same impediment in England created technologies in response to the problem.[141]

The Cornish pump allowed miners to lower the water table and pursue deeper mining. The pump was steam powered, and as such, created additional work for the topside laborers. But it afforded a plethora of new opportunities for deep vein mining and made the shafts substantially less disposable. In addition to allowing deeper extraction, the Cornish method of pumping fueled many of the water driven technologies of sorting. The pumped water, rather than being

[140] Knapp and Glass, 20.
[141] For more on Cornish machinery and influence on mining technologies, see Elizabeth Hines, ""McCullough's Rock Engine House: An Antebellum Cornish-style Gold Ore Mill near Jamestown, North Carolina," *Material Culture* 27(1995): 1-28, "Cousin Jacks and the Tarheel Gold Boom: Cornish Miners in North Carolina" *North Carolina Geographer 5* (winter, 1997): 1-10, and "Kernow Comes to Carolina: Cornish Miners in North Carolina's Gold Rush, 1830-1888," *Gold in History, Geology, and Culture: Collected Essays,* edited by Richard F. Knapp and Robert M. Tompkins (Raleigh: Division of Archives and History, Department of Cultural Resources, 1999): 131-147.

deposited to a nearby stream or river, was redirected to the heads of sluices and rockers. This enabled rockers and sluices to run constantly and become permanent fixtures of industrial sorting. Even as early at 1825, a mine in Montgomery County, North Carolina, used a "pump imported from England" to "power a rocker."[142]

In addition to steam-powered pumps, the Cornish also brought with them a host of milling technologies. In 1831, Cornish miner Elizier Kersey built a stone mill for a South Carolina miner. Elizabeth Hines noted the similarity of this documented to build to a vast number of other mills in the southeast, particularly in North Carolina. The "dry-stone mill" was an early drag mill, in which two round stones rotated around a circular basin, pulverizing the rock and ore into dust which was then amalgamated by mercury.[143] While Hines credits the Cornish with the invention of this particular technology, the mill closely resembles the arrastra and Chilean mill, believed to have been of South American and Mexican descent. The arrastra operated extremely similarly to the dry-stone, with the primary exception being that it was horse-powered rather than hand driven. The Chilean Mill, too, bore a close resemblance. These three strikingly similar pieces of technology probably have common ancestry, but the confusion of the advent of technologies was a product of the plethora of mining experts that descended on North Carolina during this period. Ravafinoli, Rothe, and Penman all had experienced in either England or

[142] *United States Geological Survey* (Washington, D.C.: 1895), 30.
[143] Hines, "Kernow comes to America," 138.

South America, and they, along with Cornish immigrants, brought the technologies employed with them to North Carolina.[144]

The stamp mill was also a feature of industrial extraction. Richard Knapp argues that the technology came from Germany, while late nineteenth-century geological and agricultural surveys report that the device was `a product of English ingenuity.[145] Because of its size, the stamp mill was generally housed in its own, separate building. Massive wooden dowels, capped with iron, pumped up and down, crushing the quartz. Not unlike an overlarge series of pistons, this technology required steam power to operate. Mill stations on the Catawba and Broad Rivers powered these large machines.[146]

Hydraulic Mining

Water represented a pivotal impediment to mining in the southern Piedmont until the advent of the steam pump. The process of moving water from the pits to the machines proved fruitful only because of the English invention. However, Appalachian foothill mining operations never lacked water, and more importantly, water pressure. The Catawba River provided the majority of the necessary water source, but the integral part of Burke County operations was the water pressure. The topography of parts of Burke and McDowell Counties in western North Carolina allowed sufficient water pressure to engage in a different method of industrial

[144] Knapp and Glass include discussion of these new technologies in their work, but further insight comes from a collection of North Carolina Geological Surveys. Separately, however, none of these sources fails to note the similarities between the arrastra, drag-stone, and Chilean mills. Rather than exist as pure, separate entities, it is likely these technologies borrowed from each other extensively. However, the most important aspect of these machines is their foreign heritage.
[145] Knapp and Glass, 24. *United States Geological Survey* (Washington D.C.:1894), 32.
[146] For more on stamp mills in North Carolina, see *United States Geological Survey* (Washington, D.C.: 1894) and Ebenezer Emmons, *Geological Report on the Midland Counties of North Carolina* (Washington, D.C.:1856).

mining, that of hydraulic mining. "Hyrdraulicking" as mining magazines called it, was an industrial operation in the sense that it was a more efficient process than previous placer mining and required the massive capital associated with industrial operations.[147]

Hydraulic mining is generally associated with the American West. Many studies of California and Colorado gold mining detail the devastating effects on the silt and water levels of creeks, streams, and rivers adjacent to mining operations. These operations occurred later than in western North Carolina and have better documentation. Additionally, instances of hydraulic mining in the state were significantly fewer and smaller than western operations. However, McDowell County miners employed hydraulic processes as early as 1858.[148] These hydraulic operations were generally either led or carried out by Dr. M. H. Van Dyke, a mining engineer.[149]

Van Dyke came to the state in the mid-1850s with the single-minded purpose of reinvigorating failing mines. Southern Piedmont operations were well-established deep vein mines, so Van Dyke concentrated his attention on the abandoned placer mines of the western portion of the state. Miners neglected these foothill mines in favor of western gold prospects in California or Colorado, and a population depression from outmigration retarded further progress. However, Van Dyke developed a system of mining that while capital heavy demanded little in the

[147] For more on Hydraulicking, see Eugene Benjamin Wilson, *Hydraulic and Placer Mining* (New York, NY: John Wiley and Sons, 1897).
[148] *United States Geological Survey* (Washington, D.C.:1895), 31.
[149] William P. Blake, "Mineral Resources of Northern Georgia and Western Carolina" *Transactions of the American Institute for Mining, Metallurgical, and Petroleum Engineers* (New York: 1896), 799.

way of labor. By diverting streams and using the natural topography of foothill areas, he generated enough water power to blast away the surface of hillsides.[150]

Hydraulic mining demanded certain features to prove effective. Topography and water flow constituted the two most important variables. Western North Carolina exhibited these favorable circumstances, with "water sources being abundant and perennial." The foothills, of course, supplied the physical relief necessary to create water pressure. On top of this, western North Carolina offered a third advantageous feature; the "extremely low price of labor" allowed for inexpensive construction and operation of hydraulic technologies. [151]

Van Dyke seized upon these opportunities immediately. One of his earliest stops was at the Jamestown Mine in McDowell County. At the peak of mining activity, some 3,000 hands had worked the mine, but upon the arrival of Dr. Van Dyke, the operation laid dormant for nearly thirty years. Van Dyke constructed a series of channels and hoses that carried water four miles from the original source at a descent of four inches per 100 feet. To do this, he constructed a dam on the Second Broad River. The water was carried through "artificial channels" to the mines; where the ducts crossed ravines, laborers constructed trestles. Many assumed that the mine had been exhausted, but citing the "ignorant and unsystemized" previous attempts Van Dyke theorized that much more gold remained in the soil. So much so, in fact, that he reasoned previous extractions did little more than create more favorable topography for the creation of water

[150] *Ibid.*
[151] "Gold Mining By The Hydraulic Process in North Carolina and Georgia," *Mining and Statistics Magazine*, Vol. X (January to June 1858), 28.

pressure. The operation employed four lines that tapered from the six inch hose to a nozzle only one and half inches in diameter. With this pressure, Van Dyke was able to blast away the surface of the earth, freeing loose gold deposits from the mountainside. Using the Burke rocking system of connected barrels, laborers washed the earth and amalgamated the resulting gold particulate.[152]

This new form of extraction allowed massive amounts of earth do be washed in a relatively short time. At the Jamestown mine, in nine days miners created a crater "20 feet in depth, 82 in length, and 28 in breadth." These four hoses also required the work of only "four men and two boys." Van Dykes new method of hydraulic mining proved effective and efficient by washing more earth with significantly less labor. Van Dyke's initial success prompted the formation of the Van Dyke Hose Mining Company and inspired increased financial investment. [153]

Jamestown was only Van Dyke's first success. Soon after, he moved to other recently abandoned projects in the western portion of the state. Van Dyke purchased the defunct Wilkinson Mine in Burke County which proved to be an even more ambitious effort. Here, miners rerouted the water a distance of no less than fifteen miles to supply the necessary pressure. Van Dyke also purchased the Collins mine of Rutherford County. Though the water was only diverted for four miles, the pressure allowed twenty hoses to be in simultaneous operation. After the hydraulic method was introduced, the mine exploded in size, and "commanded nearly 1000

[152] *Ibid.*
[153] *United States Geological Survey* (Washington, D.C.: 1895), 799.

acres of surface." By the time Van Dyke worked the Collins mine, the Jamestown mine had itself grown to nearly 400 acres of surface extraction. [154]

Van Dyke's business also consulted in the area; the Brindletown Mine, one of the original Burke boomtown mines, began hydraulic practices soon after Van Dyke's adjacent operation proved lucrative. Owned by a local investor, Dr. Benjamin Hamilton, Van Dyke provided an effective means to reinvigorate the area that locals took up themselves. The consulting business was going so well that even North Carolina Senator Thomas Clingman took notice; in 1859, he combined efforts with Van Dyke to exploit Georgia deposits under the heading of the Yahoola River and Cane Creek Hose Mining Company. This partnership evidences the intersection of Whig based economic reform, foreign investment, and industrial development. [155]

Conclusion

Industrial mining operations took the form of either deep, elaborate shaft construction or large-scale, hydraulic placer mining. Both of these invited new forms of labor, and as such, reorganized the social relations of labor. The southern Piedmont saw the advent of true economically-based classes as capitalists hired whites and rented slaves to work the land, furthering the transition to wage-labor that land rental placer operations began. Increased technology and capitalists also descended upon western counties like Burke and McDowell; though the operations required less labor, they still further entrenched a wage-labor market. The

[154] *United States Geological Survey* (Washington, D.C.: 1895), 800.
[155] Thomas E. Jeffrey, *Thomas Lanier Clingman: Fire Eater from the Carolina Mountains* (Athens, GA: University of Georgia Press, 1998), 139.

antebellum gold mining industry aided in creating these changes that had a profound effect on the economic ethos of the state.

CHAPTER THREE

ENVIRONMENTAL ALTERATIONS

Mining had a significant impact on the environment of North Carolina. From the first organized efforts in 1801 throughout the antebellum period, some 130 mines, most containing multiple veins, operated in the state. Deep mines regularly descended hundreds of feet into the earth, with some reaching depths of more than 450 feet. Powerful hydraulic operations blasted away portions of mountains and hillsides, upturning huge amounts of soil and hard rock in the process. The sheer physical scale of gold mining in North Carolina was impressive. But to fully understand the environmental effects of antebellum gold mining requires an examination of the intricate ecologies of the area. Miners affected more than the actual lands they mined. Waterways, flora, and fauna all felt the impact of mining operations. In cataloging the environmental consequences of mineral extraction, it becomes necessary to appreciate the dual role the human element played in the narrative. Mining both threatened human health and changed how humans viewed nature. Just as mining altered the environment of North Carolina, it too changed the human perspective of nature.

Riparian Alternations

Because of the mines' proximity to streams and rivers, the riparian environments of the local waterways suffered perhaps the greatest ill effects.

Pollution from tailings, damming rivers for water-powered mills and sorting equipment, and deforesting riversides to make room for machinery all affected the riparian ecosystems of North Carolina. One of the foremost threats to riparian ecosystems was the erosion and silt accumulation that resulted from mineral extraction. In placer operations, miners situated the sorting technologies that required water to operate directly adjacent to streams. Sluice boxes ranged in size from ten to 400 feet, and to accommodate these devices, farmers cleared the land around streams and rivers, creating a shoreline predisposed to erosion. Shore leach significantly raised the silt levels of adjacent waterways, creating muddy waters that affected aquatic life. [156]

The power required to operate sorting and milling technologies also affected riparian conditions. Sluice boxes, rockers, mill stations such as stamp houses, and hydraulic operations ran on power generated by water pressure. When able, miners dammed rivers and diverted streams to provide the necessary water power. Redirecting the natural flow of bodies made natural recovery impossible and silt continuously accumulated. Milling plants, also located on the moving water, similarly disrupted natural flows. Mills were essential to industrial sorting, and the Yadkin, Catawba, and French Broad Rivers all contained multiple milling stations.[157]

Later technologies, such as the industrial rockers and sluice boxes common in the Piedmont, ran on steam power that similarly disrupted riparian ecosystems. Steam power encouraged deforestation by requiring fuel. Timber was readily

[156] *Transactions of the American Institute of Engineers,* Volume 25, (New York : American Institute of Mining Engineers, 1896), 732.
[157] Mining and Smelting Company, "Report on the Gold Mines of Philadelphia and North Carolina" (Philadelphia, 1847), 10.

available in North Carolina, and miners relied on this vast resource for operation. A later mining enterprise in Stanly County used three cords of wood per day to power sorting technologies.[158] A Georgia mining operation ran through eight cords in a twenty-four hour period.[159] A sorting mill on the Yadkin River used seven cords per day to power two 100 horsepower pumps.[160] An 1897 geological survey noted that miners using wood for fuel depleted the once abundant timber reserves of the area.[161]

Unfortunately, evidence that describes the environmental cost of the silt accumulation is scarce, but California miners employed the same techniques, though admittedly on a larger scale. Thomas Russell, in his 1895 publication *Meteorology*, noted an important environmental effect of the practice: "Owing to the debris of gold mining, especially hydraulic mining," he argued, "the Sacramento River in Sacramento City is twenty feet higher than it was in 1849."[162] This led to widespread flooding of the area on a regular basis. In a more contemporary exploration of silt deposits, David Beesley commented on the negative effects in his environmental history of the Sierra Nevada Mountains. Riparian vegetation and aquatic life felt the most devastation of hydraulic mining practices, and he remarked that "Streams and adjacent areas were radically transformed…fish and aquatic life were affected by amounts of silt, mud, and mining debris that had no natural parallel," and that

[158] *Transactions of the American Institute of Engineers*, 732.
[159] *United States Geological Survey* (Washington, D.C.:1894), 125.
[160] *Ibid.,* 55.
[161] Francis Baker Laney, *The Gold Hill Mining District: Bulletin Number 21* (Raleigh: Edwards and Broughton, 1910), 14.
[162] Thomas Russell, *Meteorology: Weather, and Methods of Forecasting, Descriptions of Meteorological Instruments, and River Flood Predictions in the United State* (New York: McMillian and Company, 1895), 210.

natural recovery was made impossible because the "water sources were unable to clean themselves as greater and greater burdens were placed on them."[163]

Changes in fish populations illustrate the effect that mining operations had on aquatic life. Over silting, deforestation, and damming muddied the waters of rivers and streams in North Carolina. The Catawba River famously contained a number of game fish, specifically brown and rainbow trout. But an 1890 examination conducted by the Bureau of Fisheries concluded that the muddy waters of the Catawba and its tributaries contained fewer trout than catfish, though the river's temperature and local climate were ideal spawning grounds for game fish.[164]

Polution

Pollution had a significant impact on the ecosystems of nineteenth-century North Carolina. The 1860 Mortality Census of Rowan County noted that "The water at Gold Hill is thrown out of the mines at the rate of 200 gallons per minute, [a] compound of sulphur, copper, and copperas which is of a poisonous character, which has the effect of destroying vegetation, fish, frogs, snakes, and all water quadruples." More recent studies add mercury, a much more dangerous toxin, to the list of environmental pollutants associated with gold mining. Ample evidence exists indicating the widespread use of mercury in mining operations. Anne Newport Hall commented on the use of mercury when touring the Greensboro area in the early 1850s.[165] An advertisement for an ore-mill on the Second Broad River listed a full

[163] David Beesley, *An Environmental History of the Sierra Nevada* (University of Nevada, 2004), 52.
[164] United States Bureau of Fisheries, *Bulletin of the Bureau of Fisheries, Volume 8* (Washington, D.C.: 1890, 136.
[165] Anne Newport Royall, *Mrs. Royall's Southern Tour, Or, Second Series of the Black Book*, (Washington, D.C.: the author, 1830), 129.

mason jar of unused mercury in cataloguing the property's contents.[166] And in 1835, the government issued a patent to Green B. Palmer for a much-improved rocker design that included an internal slot for mercury.[167] In all, miners used roughly 12.5 million kilograms of mercury was used between 1801 and 1855.[168] This figure assumes that 1 kg of mercury was used for 1 gram of gold, a figure consistent with South American and African mining projects that share similar vein size and geology. Even this estimate is rather conservative, as some formulas estimate the use of two to four kilograms of mercury for each gram of gold.[169]

In 2007, a team of research biologists examined the floodplain sediments surrounding the Gold Hill mining area. They found mercury levels to be as high as thirty five times that of average background levels, ranging anywhere from 0.01 to 2.21 mg/kg.[170] Their findings supported the well-known fact that miners used mercury extensively in gold mining operations. But simply documenting mercury levels was not the scientists' goal. The study sought to address the process of biomagnification of mercury and the dissemination rate of anthropogenic sources. The authors noted that although mercury represented the leading aquatic pollutant worldwide, scientists still failed to fully understand its biological and ecological

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[166] Mining and Smelting, 5.
[167] Thomas P. Jones, ed., *Journal of the Franklin Institute, of the State of Pennsylvania, Vol. VIII* (Franklin Hall, 1831), 169.
[168] Richard Knapp and Brent Glass, *Gold Mining in North Carolina: A Bicentennial History* (Raleigh, North Carolina: Division of Archives and History, State Historical Association, 1999), 43-44. Using Richard Knapp and Brent Glass's conservative figures, roughly 399,766 troy ounces of gold was mined between 1801 and 1855. Using the accepted conversion of 31.1 grams in a troy ounce, this means 12,432,722.6 grams of gold was mined.
[169] Luiz Drude de Lacerda and William Salomons, *Mercury from Gold and Silver Mining: A Chemical Time Bomb?* (Berlin: Springer-Verlag Publishing, 1998) 15-17.
[170] Robert T. Pavlowsky, Scott A. Lecce, Gwenda Bassett, and Derek Martin, "Legacy of Hg-Cu Contamination of Active Stream Sediments in Gold Hill" *Southeastern Geographer* (Winter, 2010 Vol. 50), 1.

pathways. In quantifying the mercury content of floodplain sediment in the Gold Hill region, they hoped to better understand the how mercury transformed aquatic ecosystems.[171]

Mercury has a disastrous effect on riparian habitats. After tailings containing mercury are deposited back into aquatic ecosystems, the simultaneous processes of ethlyization and biomagnification occur. In the first, mercury, or Hg, becomes oxidized resulting in the more toxic Hg2 form. In the second, biomagnfication works in tandem with bioaccumulation. Bioaccumulation refers to the buildup of slow-poisoning mercury in aquatic plants and fish. Because of the relatively closed ecosystems of some freshwater fish, the mercury works its way through food webs, eventually returning back to humans via fish consumption. The process, then, negatively affects both humans and aquatic life. Both can experience a myriad of symptoms associated with ill-health, including stunted growth and shortened life expectancy. In humans, the ethylized and accumulated mercury results in increased rates of cancer, lung, and stomach disease, arrested physical development, and mental deterioration.[172]

Though this team of biologists studied industrial Piedmont operations, most modern environmental studies of mercury pollution in gold mining focus on small-scale, or artisanal, mines. Studies in Australia, Kenya, Ghana, and South Africa all agree that non-industrial, smaller mines pose much greater environmental threats because of their lack of regulation. Without government oversight or supervision,

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[171] *Ibid*, 1.
[172] Irene Kruk, *Environmental Toxicology and Chemistry of Oxygen Species, Volume 2, Part 1* (Berlin: Springer-Verlag, 1998), 221 and Jeffrey M. Neff, *Bioaccumulation in Marine Organisms: Effect of Contaminants from Oil Well Produced Water* (Oxford: Elsevier Ltd, 2002), 116-119.

these operations use superfluous amounts of mercury to maximize profit in impoverished areas.[173]A parallel exists between modern artisanal mining and placer operations in North Carolina. Though industrial output dwarfed small-scale yields, undisciplined, amateur miners used more mercury than necessary to extract the highest concentrations of gold.[174]

Once miners used mercury to create an amalgam, they burned off the chemical in open-air kilns. For the humans who inhaled it, mercury vapor caused toxic damage to the lungs, kidneys, and brain. Mad Hatter's disease, first diagnosed in 1860, resulted from toxic inhalation. The name of the condition derives from nineteenth-century hat makers who used water-soluble mercury to soften animal hides, such as beaver pelts. Over time, hatters began to notice the weakness, tremors, and changes in personality that resulted from mercury-induced degradation of brain and nervous system tissue. In North Carolina, symptoms of illness associate with mercury created a market for snake-oil medications. An 1847 edition of the *Carolina Watchman* included an advertisement for "Gold Mine Balsam," which supposedly countered the ill effects resulting from "the use of mercury." Specifically, the tonic addressed "Bilious and Nervous Afflections" associated with mercury poisoning.[175]

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[173] For examples, see Gary McMahon, et al., *Large Mines and the Community: Socioeconomic and Environmental Effects in Latin America, Canada, and Spain* (Washington, D.C.: International Development Research Centre, 2001) and Bernd Lottermoser *Mine Wastes: Characterization, Treatment, and Environmental Effects* (Queensland: James Cook University Press, 2010).
[174] For use of mercury in gold mining, see Knapp and Glass, and Andrew C. Isenberg, *Mining California: An Ecological History* (New York: Hill and Wang, 2005).
[175] *Carolina Watchman*, May 7, 1847.

Physical Alterations

In addition to pollutants, mining in North Carolina displaced a massive amount of earth. Ellen E. Wohl, in studying gold mining in Colorado, created a formula in an attempt to deduce the amount of land altered by gold mining operations. Colorado operations were similar to North Carolina operations in many ways. Their placer deposits gradually gave way to vein mining, and their gold was similarly fine. Wohl assumed that "anywhere from 1,200 to 2,400 pounds of rock were processed for each pound recovered" in vein-oriented mining. Her formula, she argued, erred on the side of caution. It accounted for richer ores (20% metal to rock ratio) than have been proven to exist in Colorado.[176] Using this information, one can estimate the sheer amount of earth extracted and processed. From 1804 to 1825 in North Carolina, miners panned for 228.62 pounds of gold, some of which was gold nugget and required no processing. According to Richard Knapp, between 1838 and 1860, miners extracted approximately 313,000 troy ounces, or 21,470 pounds of gold. Using Wohl's formula, more than 25 million pounds of earth was upset in the extraction of gold from North Carolina soil.[177]

The effect this upturned earth had on the fertility of the soil was obvious to miners of the time. Some noted the incompatibility of farming and mining the same land and took measures to prevent loss of improvable land. John Reed forbade mining on any land that had been or could potentially be planted.[178] Traveler John Featherstonhaugh, too, worried about the condition of the soil. His 1847 travel

[176] Ellen E. Wohl, *Virtual Rivers: Lessons from the Mountain Rivers of the Colorado Front Range* (Yale University Press, 2001), 61-2.
[177] Knapp and Glass, 44.
[178] Knapp and Glass, 97.

journal reveals that both he and local Burke County miners noticed the disappearance of cultivatable land. Visiting a surface mining enterprise in the area, he noted that the rich lands had "all turned topsy-turvy by the gold diggers, who had utterly ruined these beautiful valleys for agricultural purposes." He remarked that miners had "defaced [the land] in every direction with piles of washed earth and gravel eight feet high."[179]

However, he also noted the presence of "some attempt to restore fertility to the soil." He described the process of "paring the best part of the alluvial earth from the top, and throwing on one side to be afterwards replaced with the subsequent gravel one it had been washed." Though skeptical of its effects, Featherstonhaugh had the "satisfaction of seeing a crop of Indian corn that would average about fifty bushels per acre growing upon land that had been trenched the previous year."[180]

The relationship between mining and agriculture became increasingly antagonistic in later operations. By 1855, the Gold Hill group of mines led industrial production in the Piedmont, and some farmers found the operation impeded agriculture by monopolizing land use. On the other side of the continent California dealt with the same issue. The debate necessitated the reprinting of an article from *The New York Times* in the *Raleigh Register*, reasserting the superiority of agriculture to mining. [181]

The article, titled "Gold and Corn," contrasted the "dead, inorganic masses" of California gold with the "living…mystery" of Atlantic corn." "Drop a grain of

[179] George William Featherstonhaugh, "A Canoe Voyage Up The Minnay Sotor" (London: Richard Bently, 1847), 331.
[180] Ibid., 332.
[181] *Raleigh Register,* November 7, 1855.

California gold into the ground, and there it will lie unchanged until the end of time," the article offered. But plant "our gold," Atlantic corn, into the earth and it will "shoot upwards." The implication was obvious. Gold, which invites "Chaos…to break up the soil," was of no more use than "pig iron." The living corn, "Our blessed gold," however, was made to be consumed because of its "marvelous reproductive powers." The article continued the metaphorical comparison, echoing the sentiment of many farmers in the state.[182]

Human Ecology

Mines proved as hazardous to people as they were to natural environments. Obviously, mines and mining regions posed immediate physical dangers to those who worked in them, and even early placer mining created dangerous environments. Stephen P. Leeds noted that the unsystemized and exhaustion-style extraction created random pits, and travelers exercised "considerable caution to walk among them."[183] Additionally, a September 1831 edition of *The Miners' and Farmers' Journal* reported that a man had fallen into an open pit and received considerable injury.[184]

Shafts, too, proved hazardous. In 1832, the *Greensborough Patriot* ran a story about a man who was nearly crushed when an unstable outcropping of rock collapsed.[185] John Gluyas, the Welsh mining foreman, reported to his brother that he was in good health excepting "a small hurt which I received from a fall in one of the

[182] *Ibid.*
[183] Stephen P. Leeds, "Notes on the Gold Regions of North and South Carolina," *Mining Magazine, 2* (1854), 30.
[184] *Miners' and Farmers' Journal,* September 21, 1831.
[185] *Greensborough Patriot,* April 24, 1832.

shafts" when "a piece of timber broke under my foot in consequence of the dry rot in it." However, he conceded that his fall of "fifteen or twenty feet" could have been much worse, and it was pure luck that he was spared "from falling 160 feet." He considered the save a "narrow escape for my life."[186] In 1831 a man narrowly avoided a potentially fatal injury. A snake had fallen in the shaft the previous evening, and the first miner down in the morning was nearly bitten.[187] The flamboyant Porte Crayon, when touring the Gold Hill mines in 1857, expressed fear about being hoisted back to the surface of a shaft via the lode elevator, only to have foreman John Penman wryly inform him that they "have not lost many" this way.[188]

DISEASE

One of the greatest threats to human safety occurred on a biological level, and as a result, failed to be fully understood until well into the twentieth century. Disease ran rampant in the mining communities of North Carolina. The 1860 mortality schedule of Rowan County noted that "chronic diarrhea and Flux" were common in the "great mineral belt running from North to South." Disease constituted a constant problem for mining communities and served to interfere with operations, sometimes forcing the suspension of excavation. Issues of health were particularly acute in larger industrial operations.[189]

The Gold Hill mining region, encompassing portions of Rowan, Cabarrus, and Stanly counties, saw the most widespread health problems. The area became home

[186] John Gluyas To Thomas Gluyas John Gluyas Papers, Southern Historical Collection, University of North Carolina at Chapel Hill, December 9, 1837.
[187] *Miners' and Farmers' Journal,* October 11, 1830.
[188] Porte Crayon, "North Carolina Illustrated: Part IV, The Gold Region," *Harper's Magazine,* August, 1857, 291.
[189] Knapp and Glass, 81.

to large-scale operations later than other areas owing to a later settlement and an enduring agricultural heritage. Comprised of a sparse Germanic population that relocated to the area from Philadelphia after the Revolutionary War, soil exhaustion failed to dissuade planting until the late 1830s. As a result, the mines located in the Gold Hill area were simultaneously exposed to boomtown conditions and heavy industry. The mines at Gold Hill were home to some 800 workers at its height of operation in the mid-1850s, and the population included many foreign workers. These large cities created avenues for the transmission of disease by supplying a large population with little to no immunity.[190]

Because of the rapid increase in population, poor planning characterized many boomtowns. At Gold Hill, drainage proved a constant problem for new communities, and the climate of Piedmont North Carolina intensified these problems. The inhabitants of Gold Hill depended on the flow of the Yadkin River and its tributaries for water power and the smaller creeks and streams dried up in the summer months. This made waste disposal difficult, and several diseases were present that relied on fecal transmission. Chief among them was hookworm. [191]

In the last year of the nineteenth century, American zoologist Charles Waddle Stiles applied the work of Italian physicians to the Southeastern United States and created a breakthrough in nineteenth-century disease theory. As early as 1550, the condition known as "miners' anemia" had raised questions concerning health

[190] For more on immunity and disease, see Timothy Silver, *A New Face on the Countryside: Indians, Colonists, and Slaves in South Atlantic Forests, 1500-1800* (New York: Cambridge University Press, 1990) and Alfred W. Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900-1900* (New York: Cambridge University Press, 1986).

[191] For a general overview of the disease and a history of its attempted eradication in the United States and elsewhere, see John Farley, *To Cast Out Disease: A History of the International Health Division of the Rockefeller Foundation* (New York: Cambridge, 2004), 61-88.

hazards of mining. In the late eighteenth century, Italian doctors, examining the massive loss of energy, muscle, and even life, began investigating the epidemic that affected tunnel diggers. Dr. Dubini, of Milan, discovered intestinal worms in 1838 that he was able to link to the symptoms of diarrhea and fatigue. Once Stiles was able to find evidence of the same in the southeastern United States, the parasite known as hookworm incited a medical revolution.[192]

Hookworm thrives in moist, temperature conditions. American doctors, biologists, and zoologists immediately began citing the disease to explain the laziness of manual laborers, especially indentured African-Americans, in every portion of the southeast United States. They reasoned that it explained the lack of motivation and energy that characterized even the prosperous in the South. One report articulated this theory, saying "Largely due to it, a region that should be most fertile lies relatively uncultivated, a population derived from the best colonial blood ekes out a miserable existence, and is doomed to extinction unless it is soon relieved of the infection."[193]

Early reports found the disease "especially prevalent in North Carolina." A 1904 survey found that 37 percent of 140 Wake Forest students carried the parasite. The climate and industry of North Carolina provided favorable conditions for the spread of hookworm, and may help to explain the widespread illness mentioned in the 1860 mortality schedule of Rowan County.[194]

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[192] For more on early hookworm studies, see George Dock and Charles C. Bass, *Hookworm: Disease, Etiology, Pathology*, *Diagnoses, Prognosis, Prophylaxis, and Treatment* (St. Louis: C.V. Mosby Company, 1910).
[193] Ibid., 10.
[194] Ibid., 38.

The affliction was so prevalent in mining communities that miners began to regulate underground waste disposal. In 1903, the American Board of Health conducted a study of miners' parasites and waste disposal conditions in the South. The report found that one in four North Carolina miners on the Virginia border had some sort of intestinal parasite, despite a statute that forbade the disposal of fecal matter in shafts. However, at another, more hygienic site in Davidson County, the presence of a "privy box" impeded the transmission of parasites, and as such, contained only a 5% contamination rate.[195]

Mines also created landscapes favorable to the breeding of disease carrying insects, most notably mosquitos. Early placer mining created a landscape punctuated by small holes in the ground. The haphazard assortment of mines, each going no farther than ten feet into the earth, created pools of stagnant water that allowed insects to spawn and disease to spread. Mosquitoes, a particular nuisance in the Piedmont of North Carolina, provide an excellent avenue by which to spread disease.[196]

Most recent literature about the biological characteristics of mosquitoes concerns their amazing ability to adapt to local environments. The life cycle of the mosquito depends on their habitat, with temperature being the greatest variable. In low temperature environments, mosquitoes may survive for months. In warmer climates, they breed more readily and, as such, die much sooner. Mosquitoes require

[195] Charles Waddell Stiles, *The Prevalence and Geographic Distribution of Hookworm Disease in the United States: Hygienic Laboratory Report, Bulletin Number 10* (Washington, DC: Government Printing Office, 1903), 38. Five percent paraphrased as one in twenty two rate of infection.
[196] For more on the mosquitos and disease, see J.R. McNeil, *Mosquito Empires: Ecology and War in the Greater Caribbean, 1620-1914* (New York: Cambridge, 2010). For more on mosquitos in North Carolina, see Bell, *Mosquito Soldiers* (Baton Rouge: Louisiana State University Press, 2010).

an aquatic environment in which to lay their eggs, and their peculiar choices again speaks to their adaptability. Large or small bodies of water can both accommodate mosquito larvae. They can use everything from a lake to an upside-down bottle cap in which to deposit their eggs. However, they cannot safely lay eggs in moving water and require stagnant water to successfully spawn.[197]

As such, mosquitos had a huge presence during the summer months in the Piedmont of North Carolina. During the dryer seasons, small creeks and streams shrank, creating a number of small pools in which to lay eggs. Mining greatly improved their ability to procreate as it expanded the number of favorable breeding sites. Of particular consequence are the smaller, more contained sites. The *Anopheles* mosquito, known to be a particularly hazardous disease vector of malaria, thrived in artificial water containers.[198]

Mining towns also offered an increased span of time in which to spawn. The stagnant water that was collected with every rain allowed mosquitoes to thrive from the wet springs until late into the summer. This, in turn, increased the rate of disease transmission. Scant records from the period fail to note specific symptoms of malaria outside the characterization of southern laborers as lazy (indicating malaise), but mosquitos contributed to more broad characterizations of mining communities.[199]

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[197] For more on mosquito breeding and insect borne diseases in general, see Roger Webber, *Communicable Disease Epidemiology and Control: A Global Perspective* (Cambridge, MA: CABI Texts, 2009), 178-210.
[198] For a quick overview of malarial mosquitos, see Timothy Silver, *A New Face on the Countryside: Indians, Colonists, and Slaves in South Atlantic Forests, 1500-1800* (New York: Cambridge, 1990) and Bell, *Mosquito Soldiers: Malaria, Yellow Fever, and the Course of the American Civil War.*
[199] For notes on the laziness and lack of industry among southern slaves and laborers, see the aforementioned Denison Olmsted's and Charles Rothe's geological surveys, as well as Stephen P. Leeds examination of Piedmont mining operations.

Miners themselves were intensely aware of the hazardous health conditions of areas home to widespread mining. Letters from the period refer to landscapes as being either healthy or sickly, and a series of factors, such as the widespread presence of disease, presence of pests and insects, and climatic conditions contributed to these broad identifiers. As the letters of one miner show, disease played a large role in making economic decisions.

Welsh mining engineer John Gluyas was one of the few miners to keep detailed papers and correspondence. Being familiar with the diseases of mining operations in Cornwall, he understood the importance of inhabiting healthy locales. When approached about relocating from Cornwall to Cuba to aid in mining operations there, health represented a primary concern. In a letter to his brother, he stated that he knew the "Country is most sickly in July and August about the large towns and the low lands." Apparently, the owners of the mines had promised him that "w[h]ere (sic) the works is it is very healthy," but he remained skeptical.[200]

And he had good reason. Most personal correspondence from Cornwall offered grim reports of ill health in mining communities. One such letter read that "A great many have died here with the Cholera…there is about 8,000 inhabitants in Lelannelly out of which 40 have died in the last three weeks." [201] As such, Gluyas remained careful of disease after immigrating to America. In 1843, while living on a mining camp in Salisbury, North Carolina, Gluyas reported that he himself became

[200] John Gluyas Papers, Letter from Thomas Gluyas, 1831, Southern Historical Collection, University of North Carolina at Chapel Hill, Folder 2.
[201] John Gluyas Papers, Letter from Thomas Gluyas, August 27th, 1832.

"very ill with Bilious fever."[202] When asked to help manage a timber mill in a gold mining community in the previous summer, he responded that, "It would be too great a risk for my health" in "that season of the year."[203]

The widespread disease and sickly environs of the gold belt resulted from a combination of a climate favorable to disease and mining operations themselves. The presence of mosquitos, overly-humid climates, and poorly planned industrial boomtowns all contributed to create an unfavorable perception of the mining communities of the southern Piedmont.

The Nature of Change

Gold mining changed not only the physical environment but also how people viewed the state of North Carolina. The Philadelphia and North Carolina Mining Company, incorporated in 1847, published a short study to inspire mining in the area. Though gold existed in Pennsylvania, the interests of this Philadelphia-based company lay primarily in the gold fields of North Carolina. In stark contrast to earlier capitalists and geologists, this mid-century venture found nothing but admirable characteristics of the state. Where Denison Olmsted saw a population "mostly poor and ignorant," inhabiting a land described as being "a tiresome monotony of forests," they saw a "vast field for productive capital."[204]

The changes in perception that occurred between Denison Olmsted's 1824 tour and the company's 1847 analysis were significant. In two-decades, the burgeoning economic changes that Olmsted noticed had come to fruition.

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[202] John Gluyas Papers, Letter to Thomas Gluyas, 1843.
[203] John Gluyas Papers, Letter, June, 1843.
[204] Olmsted, 377 and Mining and Smelting Company, iv.

Additionally, over twenty years of profitable extraction on improved methods inspired confidence in the people and environment of the state. This profit, in turn, invited a more favorable outlook of the state's physical environment. Olmsted noticed that the endless timber gave the appearance of "great sterility," while the incorporators of this particular company saw the "thick forests…possessing all the materials and facilities for mining operations."[205] Additionally, the "navigable waterways" that reach into the Piedmont of the state provided the perfect internal transportation system. Finally, the region's "agricultural prosperity," once seen as the major impediment to industry, provided a stable food source for the area. Though as exploitative as earlier observations, this new, more favorable view of the North Carolina Piedmont was the direct result of increased technology. [206]

As investors came to look more favorably on the physical environment of North Carolina, they too began to have an increasingly favorable view of the people. Rather than ignorant agrarians, the Philadelphia Company saw a population that was "well organized and industrious;" one that possessed "industry, perseverance, and skill." Additionally, the company found the state's government as positive feature of the area. In contrast to the gold fields of South America, which were characterized by "unsettled governments and laws" and given to "intestine commotions and political revolutions," they saw North Carolina to have "a stable government and protective laws."[207]

[205] Olmsted, 376 and Mining and Smelting Company, iii.
[206] Mining and Smelting Company, iii.
[207] *Ibid.*

The bias of this company's document is obvious. It intended to inspire investors and benefactors, and as such, portrayed the area as friendly to mining as possible. However, their motivations were hardly different than Charles E. Rothe's twenty years previously. While Rothe portrayed the area as demanding capital to be profitable, two decades of increasingly profitable extraction and increases in mining technology created a more favorable view of the state.[208]

Though capitalists had long viewed nature as a commodity, the mineral industry of North Carolina altered their perception of North Carolina. Because of mining, local boosters were able to garner support for internal improvements in the mineral regions of the state. The most transformative of these changes, and one that would further affect the physical and mental landscape of the state, was the westward expansion of railroad lines.[209]

Some politicians noted that natural geography and natural resources of the area appeared to be in an antagonistic relationship. Mountainous western North Carolina possessed great mineral wealth, but according to economic and political boosters, the topography impeded economic and environmental exploitation. In an 1847 letter, Salisbury congressman Charles Fisher made a convincing argument to begin construction of a railroad line intended to connected lands west of Raleigh with eastern markets. In doing so, he cited the mineral and agricultural wealth of the area as a primary impetus. "Why," he wondered, was the western part of the state "situated just as our forefathers were, one hundred years ago?" Rhetorically, he

[208] *Ibid*.
[209] For a textbook overview of the Whig-based push for internal improvements in the western half of North Carolina, see Hugh Talmage Lefler and Albert Ray Newsome, *North Carolina: The History of a Southern State* (Chapel Hill, NC: University of North Carolina Press, 1954).

asked if, "is it because the western part of the state has no capabilities for internal improvement, or that our agricultural and mineral resources will not justify the labor and expense" of construction? No, he answered; if that were the case, it "would be folly to attempt what nature forbids," but because of the wealth afforded by the "geographical figure and geological formation" of the state, creating a railway would benefit the state as a whole. [210]

Fisher goes further in his explanation, juxtaposing the natural impediments and impetuses of the area. He writes that the mineral region "abounds with rocks of the hardest texture." He conceded that these "will be a senior objection to the formation of rail-roads through [the mountains]." But, he argued, these same rocks and mountains are home to the "great mineral region of the state," and must be connected to larger markets to continue exploitation. The mineral wealth of the west, primarily gold deposits, created an impetus to modernize and industrialize the state. However, the same natural formations that yielded this wealth inhibited exploitation. "Nature has locked us out from the marts of commerce," he declared, but the ethos of industry that settled on the landscape created a need to correct this error of nature. "The time has now arrived when [western Carolinians] will no longer rest satisfied in this seclusion" and "break the locks." Fisher demanded internal improvements to the state, despite the obvious and costly barriers, as a result of the area's gold. [211]

[210] Charles Fisher to H.W. Connor, November 21, 1847, Charles Fisher Papers, Southern Historical Collection, University of North Carolina at Chapel Hill.
[211] *Ibid.*

Gold mining and a more favorable economic view of the landscape also gave rise to scientific institutions in the state. The exploitation of mineral wealth encouraged scientists to descend upon the gold fields of North Carolina, and, in turn, to create a government body assigned to cataloguing the mineral resources. Effectively lobbying the state government to fund these projects, Denison Olmsted conducted the first North Carolina Geological Survey in 1823.[212]

Olmsted, a professor in the growing field of chemistry at Chapel Hill, realized the scientific and monetary potential of examining the gold fields more closely and systematically than previous studies. In the early 1820s, Olmsted suggested that the North Carolina Board of Agriculture create a department of geology. The board agreed and offered Olmsted $250 per annum over the course of four years to conduct extensive surveys in the area. Government officials, local investors, and geologists across the nation appreciated his contribution to the growing body of geological knowledge, and the Board of Agriculture continually funded these projects well into the twentieth century.[213]

These surveys deepened the knowledge of the geological environment of North Carolina. Over the course of the nineteenth century, geologists began to understand more fully the world beneath their feet. Each survey published began with an examination of previous studies and subtly corrected erroneous suppositions and conclusions as the body of geological knowledge grew. What they knew of bedrock changed significantly over the century. Olmsted's original survey

[212] "Olmsted, Denison," Appleton's Cyclopedia of American Biography, 1900.
[213] Subsequent surveys were conducted by Elisha Mitchell, Charles E. Rothe, Henry Nitze and George Hannah. These surveyors were generally either professors at Chapel Hill or geologists in the state department.

suggested that the gold fields encompassed some 1,000 square miles and existed solely in areas abounding with slate and gneiss. However, by the time Henry Nitze and Henry Wilkens conducted their work in 1897, the gold area had grown to include an area of some 4,000 square miles, and the bedrock formations had been extended to include all crystalline stone (including limestone and granite).[214] Additionally, a 1910 study of the Gold Hill region notes that Nitze and George B. Hannah's 1896 survey so deepened geological understanding that it constituted the discovery of a novel type of decomposed bedrock, dubbed "argillaceous."[215]

Conclusion

Antebellum gold extraction in North Carolina affected the land and the people of the state in important ways. Operations demonstrated the intricate relationship between humans and their environment as well as illustrated how conceptions of nature change. The rise of industrialism in the state hastened these alterations, and operations shed light on the relationship between economic orientations and the environment.

However, the story of gold mining in North Carolina is not one of environmental tragedy. The silt, mercury, and disease associated with initial technologies and non-industrial operations proved just as hazardous as later exploitation, though on a decidedly smaller scale. And if one extends the natural environment to include the human element, it becomes obvious that mining gave rise to government institutions and agencies that would further conservation

[214] Olmsted, 1 and Henry Nitze and Henry Wilkens *Gold Mining in North Carolina and Adjacent Appalachian Regions* (Raleigh: Guy V. Barnes, Public Printer, 1897), 12.
[215] Laney, 16.

through scientific study. Though gold mining had a profound, and often costly effect on the environment of North Carolina, to describe the growth of the mineral industry as a linear digression is inaccurate.

CONCLUSION

RETHINKING THE GOLD FIELDS

In 1860, nearly all gold mining in North Carolina ceased in response to wartime concerns. Though later efforts were made to revive the mineral extraction industry in the late-nineteenth and early-twentieth centuries, the industry never regained the size or scale it enjoyed during antebellum era. For nearly five decades gold was an important element of the state's economy.[216]

In *Gold Mining in North Carolina,* Richard Knapp and Brent Glass write that, "With notable exceptions, the history of gold mining in North Carolina does not reflect the grim portrait" of other studies of mineral extraction. They portray gold mining as being more benign and less exploitive than other extractive industries, and as such, slightly exceptional. For Knapp and Glass, gold mining in North Carolina was an atypical instance of both antebellum industry and mineral extraction. And in many ways, it was. The industry offers a unique opportunity to reexamine the history of the state, industry, and the environment. [217]

Gold mining offers an important instance of antebellum industrial achievement. Industrialists capitalized large mining outfits, equipped with cutting-edge industrial technologies, which were run by a class of engineers and experts. It

[216] For an overview of bellum and post-bellum mining, see Richard Knapp and Brent D. Glass, *Gold Mining in North Carolina: A Bicentennial History* (Raleigh, NC: Office of Archives and History, Department of Cultural Resources, 1999).
[217] Ibid., 1.

inspired local professionals and politicians to invest in the growing industry. And gold mining helped create a class of wage laborers. In doing all this, it contributed to changing the economic orientation of the state. Gold mining in North Carolina is evidence of the kind of antebellum capitalism that Bess Beatty described in her work concerning antebellum textile mills.[218]

Antebellum mineral extraction proved exceptional not just in the nature of the business, but in the location. Overwhelmingly, studies concerning the economic orientation of the South focus on the mono-crop plantations that typified southern agriculture. However, the subsistence-based agriculture of the southern Piedmont and western counties of North Carolina provides an alternative setting to those so closely scrutinized by previous scholars.[219]

As a result, eastern gold mining widens the scope of the debate. In North Carolina, a distinct industry arose from a special agrarian circumstance. In studying the economic orientation of the antebellum South, many scholars fail to note the internal divisions within the problematic and controversial boundaries of what is meant by the term South. Gold mining illustrates a different South, a South that exists outside the boundaries of plantation agriculture. Gold mining illustrates that there was no single, homogenized South, but rather a plethora of different Souths.[220]

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[218] Bess Beatty, *Alamance: The Holt Family and Industrialization in a North Carolina County, 1837-1900* (Baton Rouge, LA: Louisiana State University Press, 1999).

[219] This debate began with Eugene D. Genovese, *The Political Economy of Slavery: Studies in the Economy and Society of the Slave South* (Middleton: Wesleyan University Press, 1961). For a current historiographical overview, see the introduction to Tom Downey, *Planting a Capitalist South: Masters, Merchants, and Manufacturers in the Southern Interior, 1790-1860* (Baton Rouge, LA: Louisiana State University Press, 2006).

[220] For a discussion on the internal diversity and vacillating definition of the American South, see John Shelton Reed, "The South: What is it? Where is it? *My Tears Spoiled My Aim, and Other Reflections of Southern Culture* (University of Missouri Press, 1993).

In *Gold Mining in North Carolina,* Richard Knapp and Brent Glass also note that because industry never fully replaced farming, "The story of mining in North Carolina offers impressive evidence of industrialization that struck a balance between industry and agriculture." But the objections raised in response to industrial mining contradict this notion of balance. True, early placer mining adhered to agricultural rhythms and was conducted largely by farmers. But later, more intrusive efforts invited harsh criticism. By and large, industrial attempts existed well-outside the boundaries of what could be described as agricultural.[221]

The reaction of farmers to early mining illustrates the internal diversity of agrarians. Some were hesitant to integrate mining into their agricultural endeavors while others began digging immediately in hopes of quick and easy wealth. However, the vast majority of objections to both placer mining and heavy industry can and should be categorized as agrarian concerns. And these concerns contrasted sharply with the goals and priorities of capitalists, scientists, and mining experts. The vastly different views of humans involved in or objecting to extraction shed light on industrialists and agrarians viewed the landscape.

Though agrarians voiced moral concerns, economic boosters assured the people that science and system should assuage fears. When agrarians argued that agriculture was the most important pursuit for man, mining advocates argued that gold would lead to national aggrandizement and economic betterment for the state. When farmers worried that mineral extraction would impede planting, industrialists

[221] Knapp and Glass, 3-4.

argued that that mining would benefit agriculture by creating an increased market for crops.

These differing perspectives of the land had environmental implications. Some agrarians and industrialists had widely differing views of how to best put the land to use, and as such, had contrasting views of the land itself. The moral objections of some agrarians and the industrialists' calls for systemized extraction and order illustrate very different land ethics, and each was based on the productive capacity of the land. The way people interacted with the land determined their view of nature, and gold mining in North Carolina clearly illustrates the importance of this insight.

In many ways, the, gold mining in North Carolina was exceptional. However, gold can also be viewed as a typical aspect of antebellum North Carolina. Like in County Cornwall, mining was an important event woven into state's narrative. Alongside other industries, it helped to create modern North Carolina. When studying the history of Charlotte or the development of western railroad lines, it becomes quite typical to offer that the state's natural resources played a large role.

Indeed, gold may have played a more important role than historians of the state generally offer. Lefler and Newsome, and Link see gold mining as an industry worth merely paragraphs. In doing so, they fail to realize the scale, importance, and agency of gold in shaping the development of the state. Because gold mining occurred in boom and bust cycles for nearly five decades, many textbooks diminish its importance. However, it was arguably one of the most important non-agricultural

industries of the southern Piedmont and western portions of the state. As such, it had a transformative capacity. [222]

And to date, no historian has extended their study of the transformative capacity of gold to the environmental level. In this respect, gold mining again proves both exceptional and typical. It buoys the arguments of some and adds depth to the conclusions of others. A plethora of similarities exist between North Carolina and other instances of mining, particularly California. Similar themes, such as the rapid influx of people, including immigrants, into an area in a relatively short time, are present. The role of industrialization, modernization, and mechanization were incredibly important to understanding how humans affected their environment in each scenario. And the growth of urban commercial centers also had related environmental consequences in both instances.

These similarities invite comparable methodologies. As Dasmann and Isenberg offer in their works, one of the more fruitful ways to examine the environmental changes that occurred as a result of gold mining is through ecological webs. Using this scientific approach allows researchers to better understand the inherent connectivity of environmental agents. As this study has shown, the deforestation alongside waterways worked in tandem with tailings to affect the riparian habitats of fish. Similarly, tracing mercury through food webs provides a fuller understanding of the devastating affect this chemical had on human populations. Gold mining in North Carolina illustrates the effectiveness of ecological

[222] Hugh Talmage Lefler and Albert Ray Newsome, *North Carolina: The History of a Southern State* (Chapel Hill, NC: University of North Carolina Press, 1954), William A. Link, *North Carolina Through Four Centuries* (Wheeling, IL: Harlan Davidson, Inc., 2009).

models in understanding change and the relationship between humans and the environment.[223]

Additionally, gold mining provides an opportunity to extend the web into human ecology. Undermining the notion that a division exists between humans and nature allows the human element, both as a causal agent and effect-recipient, to be more fully understood. That humans feel the effects of both deliberate and unintentional environmental consequences is important in understanding the human role in nature. And Isenberg's insight that human beings, and not simply the machinery and technology they employ, affect the environment is illustrated by North Carolina mining.[224]

Though mining in North Carolina illustrates the effectiveness of employing ecological models, it also provides an ability to further extend the web into a more abstract, metaphorical tool. In North Carolina, economic progress came at an environmental cost. However, internal infrastructure improvements and a better understanding of the environment were also consequences of mineral extraction, and both facilitated the spread of ideas and information in the state. Both the North Carolina and United States geological surveys begat state conservation agencies, which eventually resulted in a deeper examination of the human role in nature. Additionally, conservation agencies themselves provided an impetus to better

[223] Andrew C. Isenberg, *Mining California: An Ecological History* (New York: Hill and Wang, 2005) and Richard F. Dasmann, "Environmental Changes Before and After the Gold Rush," *A Golden State: Mining and Economic Development in Gold Rush California,* edited by James J. Rawles and Richard J. Orsi (Berkley: University of California Press, 1999).
[224] Isenberg.

understand the relationship between humans, their environments, and resource management.

The call for systemized extraction and the associated agrarian portrayals also provide a similarity between eastern and western mining. Isenberg offers that gold mining in California juxtaposes a largely agrarian area with the mineral extraction industry. In short, he points to gold mining as an exception to normative and popular connotations of the region. Antebellum North Carolina mining, too, presents an odd picture of industry in a period and place not especially noted for such. The push for system, to make both landscapes ready for commercial extraction, is illustrated in both instances.[225]

But for all their similarities, there are also stark differences. Dasmann's essay highlighted environmental and ecological changes that occurred in California before the 1849 rush in an attempt to illustrate the consistency of environmental change in area. In effect, Dasmann argues that changes associated with mining, such as the draining of wetlands and growth of agriculture, would have happened with or without the gold mining industry, although economic growth considerably catalyzed the process. That environmental change had been occurring well before Argonauts in search of gold came to the state proved an enlightening insight.[226]

However, no such insight was needed in North Carolina. In the South, the relationship between humans and the land was predicated on a long-standing relationship of change. In an article comparing and contrasting the environmental histories of the American West and South, Mart Stewart offered that the

[225] Ibid.
[226] Dasmann.

human/land interaction in southern United States was historically "more informed by an agricultural experience than a wilderness one." As such, the human/nature dichotomy present in western studies means much less in the South.[227]

This geographical and cultural difference is clearly illustrated in southern mining. Unlike California, where wilderness advocates attempted to preserve natural areas, little environmental objection was present in North Carolina. Moral concerns dominated anti-mining rhetoric, and evidence of farmers openly condemning mineral extraction is scant at best. Instead, the North Carolina gold mining industry grew out of an agrarian society that had long since understood the productive capabilities of tended land and altered earth, and as such, raised few concerns about, and certainly did not see the need to document, negative environmental effects.

Gold mining contributes to the existing historiography of the state, mineral extraction, and environmental studies by being both typical and exceptional. It offers a standard narrative of early industry by illustrating the differing environmental perspectives that occurred in different economic orientations. However, it also showed a unique instance of subsistence agrarianism reacting to and interacting with early industry. Gold mining in North Carolina can borrow similar ecological methodologies from western studies of mining, but the human element played a different role in the Southeast by not overtly objecting to

[227] Mart Stewart, "What If John Muir Had Been an Agrarian," *Environmental History and the American South: A Reader*, Paul S. Sutter and Christopher J. Manganiello, eds. (Athens, GA: University of Georgia Press, 2009).

environmental destruction. It adheres to a typical narrative of resource extraction and economic progress, but offers an odd instance of antebellum industrial achievement. Gold mining in North Carolina, then, continues to be force of change on the existing historiography of the state, the environment, and mineral extraction.

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VITA

Jason Linwood Hauser was born in Dallas, Texas. Parents Lin and Kim Hauser soon moved to Birmingham, Alabama where Jason was raised. The first of two sons, Jason received his B.A. in History from Appalachian State University in 2009. In 2012, Jason received his M.A. in History, also from Appalachian State University. He plans to continue studying the relationship between agrarianism, agriculture, and the environment at Mississippi State University, where he is currently enrolled in a Ph.D. program.