

DUCKTOWN SMOKE: ENVIRONMENT, LAW, AND THE SUPREME COURT'S FIRST  
AIR POLLUTION CASE, 1832-1918

by

DUNCAN MAYSILLES

(Under the Direction of Peter C. Hoffer)

ABSTRACT

Copper smelting in the Ducktown Basin of southeastern Tennessee created one of the most dramatic environmental disasters in the South. At the same time, it gave rise to a quarter century of smoke litigation that ultimately led to the Supreme Court's first air pollution case. Local copper ore contained a high percentage of sulfur which miners removed by roasting the ore on open heaps. The method consumed huge amounts of timber as fuel, resulting in the logging of fifty square miles of forest. At the same time, it liberated vast quantities of sulfur dioxide into the atmosphere of the Basin, where it often remained trapped by weather conditions and the surrounding mountains. Sustained exposure to sulfur dioxide killed local crops and forests, and prevented reforestation of cutover areas. The combination of smelting and logging created a barren landscape exposed to the powerful erosive effects of the region's high annual rainfall. The result was an expanse of over thirty square miles of barren red badlands, an alien landscape set in the midst of the lush hardwood forests typical of the Southern Appalachians.

The same processes gave rise to a quarter century of litigation from the mid-1890s to the end of World War I. The claimants were mountaineer farmers, timber barons, and later, the state of Georgia. The venues ranged from local district and chancery courts to the United States

Supreme Court. The litigation occurred in a highly charged political context within which farmers, industrialists, loggers, the National Farmers' Union, and even the War Production Board battled to shape law and policy. In Tennessee, litigation and legislation changed Tennessee's law of nuisance to reflect the problems of scale presented by modern industrial enterprises. At the Supreme Court, Georgia's suit was transformed when Will Shippen, a local timber baron, encouraged collaboration between the state and the forest conservation movement. Government foresters, geologists, and chemists helped to transform a case sounding in traditional nuisance law into what became the Supreme Court's first recognition of a state's sovereign right to protect its natural resources from trans-border pollution.

INDEX WORDS: Conservation, Copper, Copper Basin, Ducktown, Ducktown Sulphur, Copper & Iron Co., Ltd., Environment, Forestry, National Farmers' Union, Nuisance, Smelter, Smoke, Sulfur Dioxide, Sulfuric Acid, Tennessee Copper Company

DUCKTOWN SMOKE: ENVIRONMENT, LAW, AND THE SUPREME COURT'S FIRST  
AIR POLLUTION CASE, 1832-1918

by

DUNCAN MAYSILLES

B.A., University of North Carolina at Chapel Hill, 1976

J.D., Duke University, 1979

A Dissertation Submitted to the Graduate Faculty of The University of Georgia in Partial  
Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2008

© 2008

Duncan Maysilles

All Rights Reserved

DUCKTOWN SMOKE: ENVIRONMENT, LAW, AND THE SUPREME COURT'S FIRST  
AIR POLLUTION CASE, 1832-1918

by

DUNCAN MAYSILLES

Major Professor: Peter C. Hoffer

Committee: James C. Cobb  
John C. Inscoe  
Edward J. Larson  
Paul S. Sutter

Electronic Version Approved:

Maureen Grasso  
Dean of the Graduate School  
The University of Georgia  
May 2008

## DEDICATION

To Teresa

## ACKNOWLEDGEMENTS

According to Greek mythology, Athena sprang fully formed from the head of Zeus. Graduate school quickly taught me that scholarly history is not written that way. Good scholarship is instead shaped by the valuable contributions of academic advisors, dissertation committee members, librarians, family, and supportive friends.

The present work delved deeply into four separate areas of history: legal, environmental, Southern, and Appalachian. The History Department at the University of Georgia proved to be a wonderful place to pursue such a project. The Department's strengths in each of these areas allowed me to form an unusually strong committee comprised of Peter Hoffer (chair), James Cobb, John Inscoe, Edward Larson, and Paul Sutter. The committee members gave unstintingly of their encouragement and insights, and of equal importance, provided me with their copious editorial comments. My experience with these scholars, individually and collectively, was personally and professionally rewarding.

The inspiration for this work occurred when I came across references to Ducktown while doing summer research on another project. Those initial references prompted me to spend the remainder of the summer doing archival reconnaissance in depth at the Georgia Department of Archives and History the Ducktown Basin Museum, and the National Archives. I learned, upon my return to the University in the fall, that both Dr. Hoffer and Dr. Cobb (the latter in conjunction with Dr. Thomas Dyer) had published on Ducktown. It was thus necessary to approach each professor for permission to pursue my project. They gave me their enthusiastic

authorization to proceed and shared their materials to further my own work. I am deeply grateful to each of them for their unselfish actions on my behalf.

Monograph history usually depends upon the active assistance of archivists, and this project was no exception. I enjoyed the kind assistance of archivists at the Georgia Department of Archives and History, the Tennessee State Library and Archives, the Historical Branch at the Cleveland (Tennessee) Public Library, and the National Records Administration in Washington. Special mention goes to Ken Rush, Richard Estes, and the staff of the Ducktown Basin Museum. I was the beneficiary of their successful efforts to rescue and preserve documents from the era of smoke litigation. Ken cheerfully set me up at a card table in one of the display rooms and began to bring out one box of documents after another from the Museum vault. Many of these had not been examined since their rescue. It is a heady experience for a historian to be the first to use an unexamined cache of important original correspondence. Ken and his staff did all they could to add to the pleasure of my visits by extending their hospitality and by sharing from their deep knowledge of Ducktown's mining heritage. I also enjoyed many stimulating conversations with Richard Estes, the Museum's historian.

I want to express my love and heartfelt thanks to my wife, Teresa, and to our children, Andrew, Bryce, Mary, Chara, and Emily for their encouragement. Teresa proofread the rough drafts and our friend, Beth Miller, edited the final draft. I thank both for their skill with the red pen. Thanks and appreciations also go to our friends Tony Warner, Jim and Emily Wert, Sharon Larson, Scot and Catherine Sherman, Clyde and Valerie Godwin, and John and Shari Thomas. You know what you have meant to us during these years. I also thank Dan Willoughby, John Tucker, Alex Panos, Jason Mattox, and other colleagues at the law firm of King & Spalding for the courtesies and flexibility they extended to facilitate the completion of this work.

*...a land in which you will eat bread without scarcity,  
in which you lack nothing,  
a land whose stones are iron,  
and out of whose hills you can dig copper.*

Deuteronomy

## TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS .....	v
LIST OF FIGURES .....	x
CHAPTER	
INTRODUCTION: THE VIEW FROM THE MOUNTAIN .....	1
1. “COVERING THE HEAVENS WITH A SMOKY PALL”: DUCKTOWN’S FIRST ERA OF MINING, 1843-1878 .....	26
2. “BUT NOW HE CAN SELL NOTHING”: THE REVIVAL OF DUCKTOWN MINING AND THE FIRST FARMER SMOKE SUITS .....	63
3. “THOUGH THE HEAVENS FALL”: FARMERS AND COPPER COMPANIES IN THE TENNESSEE COURTS AND LEGISLATURE .....	99
4. “SOME TERRIBLE LEPROSY OF VEGETATION”: GEORGIA’S ENTRY INTO THE DUCKTOWN FRAY.....	135
5. “THE ONLY TREE IN DUCKTOWN”: GEORGIA’S FIRST SMOKE SUIT AND THE DUCKTOWN DESERT .....	173
6. “A WIRY, UNTIRING, AND RESOURCEFUL CHAP”: WILL SHIPPEN, FORESTERS, AND GEORGIA’S SECOND SMOKE SUIT .....	219
7. THE SEARCH FOR REMEDY: ATTORNEY GENERAL HART, THE NATIONAL FARMERS UNION, AND SULFURIC ACID, 1907-1910 .....	279

8.	“LIKE THE POOR, THIS CASE WILL BE WITH US ALWAYS”: THE	
	DENOUEMENT OF DUCKTOWN SMOKE LITIGATION .....	325
	EPILOGUE: THE VIEW FROM THE MOUNTAIN.....	366
	BIBLIOGRAPHY .....	384

## LIST OF FIGURES

	Page
Figure 1. Map of the Ducktown Basin centered upon the Ducktown Sulphur, Copper & Iron Co., Ltd. at Isabella, Polk County, Tennessee.....	25
Figure 2. Sketch of a mining village in the Ducktown Basin .....	216
Figure 3. An aerial photograph of the Ducktown Desert.....	217
Figure 4. Another aerial photograph of the Ducktown Desert .....	218
Figure 5. Photograph showing housing for mining families in the Ducktown Basin .....	278
Figure 6. Photograph of the acid plant at Tennessee Copper Company at Copperhill, Polk County, Tennessee, circa the 1950s .....	323
Figure 7. Plan of the acid plant at Ducktown Sulphur, Copper & Iron Co., Ltd. ....	324

## INTRODUCTION

### THE VIEW FROM THE MOUNTAIN

He could see the smoke coming and he knew what it was. B. H. Seabolt, a septuagenarian farmer with a little spread in the Blue Ridge Mountains of Fannin County, Georgia, knew it well: it was a dark, bluish smoke with the rotten egg stench of sulfur. He also knew from whence it came. Looking north from Mr. Trammel's apple orchard on the top of the mountain, he could see the smoke gushing from the copper smelters ten miles away in Ducktown, just across the Tennessee border. As he later testified in 1914, "it come right through this county and scattered every way...When we have had a shower of rain and the smoke comes in, it will come in and settle down heavy and look like a fog, and when that dries off you can see the damage." The smoke ruined his garden of peas, beans, potatoes, cabbage, and corn by causing it to "parch it up like a frost." And then, mixing metaphors of ice and fire he added, "I will tell you how it does: you take fire and hold it close to it, and it would draw it up and turn a sorter brown color like fire would, if you hold it close to the stuff."<sup>1</sup>

The smoke damage to Seabolt's garden was but a hint of the far greater havoc wreaked in areas closer to the smelters of the Ducktown Sulphur, Copper & Iron Company (DSC&I) and the Tennessee Copper Company (TCC). Seen from Trammel's apple orchard or from any of the surrounding peaks, the heart of the Ducktown Basin was a fifty-five square mile expanse of

---

<sup>1</sup> Transcript, 265-72, Deposition of B. H. Seabolt, 1914, Georgia v. Tennessee Copper Co., United States Supreme Court, No. 1 Original, October Term, 1915. The docket numbers assigned to documents in this case are confusing because, as an original jurisdiction action, it received a new docket number for each term in which the case came before the Supreme Court. The initial designation of the case when filed in 1905 was No. 13 Original, October Term, 1905, and when finally dismissed in 1937, it received its final designation, No. 1 Original, Oct. 1937 Term. Documents filed in one term were frequently renumbered for use in subsequent terms. NARA archives the entire case file from 1905 to 1937 under its final 1937 designation. To avoid confusion, documents from the case will be identified by type and date rather than by docket number.

heavily eroded badlands. Seabolt could see miles of reddish-orange gullies, carved by water into dendritic patterns, where farms and forests stood not so long ago.<sup>2</sup>

It now offered a view that would not be out of place in the arid regions of the American West; but set amidst the lush hardwood forests of the Southern Appalachian Mountains, it was a bizarre and shocking vista that invariably excited the comments of visitors. A mining engineer described it in 1902 as a “desolate barren waste.” Stuart Chase, author of *Rich Land, Poor Land*, a 1936 manifesto for soil conservation during the Dust Bowl years of the Great Depression, called Ducktown “badlands without the balance and natural composure of a desert” and made it Exhibit A in his case against human abuse of the land. A scientist for the Tennessee Valley Authority wrote of it in 1938 as “the most severe denudation east of the Black Hills [of South Dakota].” In 1967, Grady Clay, a landscape architect, said it was “variously described as a hellhole, a blister, a desecration, something out of Dante’s *Inferno*, the Tennessee Badlands, the ugliest place in the South,” and, in less hostile terms, “a ravaged wonder” and “a strangely beautiful landscape of historic importance.”<sup>3</sup>

To many, it was simply a desert, known as the Ducktown Desert, or later as the Great Copper Basin Desert, even though the term was inaccurate from the perspective of the life sciences. Technically, a desert is an ecosystem defined in terms of aridity, a landscape that receives less than ten inches of rain annually. To the scientific mind, a desert is not an empty place devoid of life; it is instead a complex habitat populated by an array of flora and biota

---

<sup>2</sup> In most of the primary documents, writers used the old spelling “sulphur” instead of the modern, “sulfur.” I use the modern spelling except in reference to the company name, Ducktown Sulphur, Copper & Iron Company.

<sup>3</sup> S. W. McCallie, “The Ducktown Copper Mining District,” *The Engineering and Mining Journal* 74 (4 October 1902): 439-440; Stuart Chase, *Rich Land, Poor Land: A Study of Waste in the Natural Resources of America* (New York: Whittlesey House, McGraw-Hill, 1936), 49-53; James Smallshaw, “Denudation and Erosion in the Copper Basin,” (Knoxville, Tenn.: Tennessee Valley Authority, 1939), 1; Grady Clay, “Copper-Basin Cover Up,” *Landscape Architecture* 73, no. 4 (1983): 49-55, 94.

adapted to live in dry conditions. Ducktown was shaped by the superfluity of rain, not by its shortfall. Wherever human activity stripped the Basin surface of vegetation, naked landforms were rapidly sculpted into gullied badlands by the erosive power of sixty inches of annual precipitation. The most notable feature of its wildlife was the disappearance of species long adapted to moist southern highlands.

Yet, the idea of desert has a much broader meaning in the popular imagination, a meaning that turns more upon the sense of emptiness and desolation than upon diminished rainfall. The setting of Daniel Defoe's *Robinson Crusoe* (1719) was, for all of its well-watered greenery, a desert island because it was empty of people. The Ducktown Desert earned its name because it was largely empty of plant life.<sup>4</sup>

It was the popular notion of the term that captured the imagination of observers. In materials offered to the Federal Writers' Project of the Works Progress Administration in 1936, Robert Edward Barclay described it as a "strangely misplaced desert," which WPA writers modified to read, "barren as deserts." In the same year, Louise McKinney touted "our unique and attractive mountain desert" as a tourist attraction. She urged that cactus and "other desert plants should be secured and planted" to "make the barren country a real and more attractive desert" for "the thousands of people" who "would like to include the Beautiful Copper Basin Desert" in their travel plans. The idea of planting saguaro cactus in the Appalachian South was amusing as an ecological proposition; but it did speak to the pride that local people often take in points of locally distinctive landscape, whatever cause may lay behind the point of distinction. Another environmental disaster, Georgia's Providence Canyon, also known as Georgia's Little

---

<sup>4</sup> Daniel Defoe, *Robinson Crusoe: An Authoritative Text, Background and Sources, Criticism*, ed. Michael Shinagel, A Norton Critical Edition (New York: Norton, 1975). As Shinagel shows, Defoe's novel is widely believed to have been modeled on the adventures of Alexander Selkirk in the Juan Fernandez Islands of the coast of Chile. It was a place later celebrated by whalers as a source of greenery, fruits, and fresh water.

Grand Canyon, is a soil conservation nightmare from Georgia's cotton heyday and yet is a popular state park because the landscape is so weirdly compelling in its Deep South locale.<sup>5</sup>

Nature writers from outside the Basin tended to describe the Ducktown Desert in negative ways. Jesse C. Burt penned a 1956 article for *Nature Magazine* under the title, "Desert in the Appalachians," in which he blamed the formation of the Copper Basin Desert on activities in the previous century "when man's attitude towards the land was largely that of a predator." Guy Otwell disparaged both the landscape and its people in a 1975 edition of *Defenders of Nature* when he said Ducktown "was not an idyllic hick place. It is a nightmarish hick place. It is in the middle of a small but man-made desert." In a 1987 article in *Discover*, Wilton Barnhardt defied the ecologists: "the Copper Basin is the only bona fide desert east of the Mississippi," a "vast, raw plain, cooking in the sun," that served as "paradigm of environmental disaster."<sup>6</sup>

Long-time Basin residents tended to take a more benign view of the landscape. Yes, it was an utterly unique vista in the Southern Appalachians, but as M. L. Quinn noted, it gained the patina of familiarity to generations of miners and their families. The site of the great expanse of red gullies provided a distinctive sense of home and of place. The gullies were also a visible testament to the mighty industry that shaped the lives of all who lived and worked there. The

---

<sup>5</sup> Robert E. Barclay, "Information on Copperhill, Tennessee, for Inclusion in The American Guide Manual," (1936), Barclay Papers, TSLA; Workers of the Writers' Program of the Works Progress Administration in Georgia, *Georgia: The WPA Guide to Its Towns and Countryside*, with an introduction by Phinazy Spalding (University of South Carolina Press, 1940), 472; Louise McKinney, "Bad Lands of Copperhill," 19 March 1936, Hargrett Library, University of Georgia, clipping files, Fannin County folder. Fifty years later, when re-vegetation of the Ducktown Desert was well underway, local pride was one of the factors considered by M. L. Quinn in her plea to preserve at least a portion of the badlands; see M. L. Quinn, "Tennessee Copper Basin: A Case for Preserving an Abused Landscape," *Journal of Soil and Water Conservation* 43, no. 2 (March/April 1988): 140-144. For the Providence Canyon, see Paul S. Sutter, "Let Us Now Praise Famous Gullies: Georgia's Little Grand Canyon and Conservation in the South," in Charles Reagan Wilson, ed., *The Environment and Southern History* (Oxford, Miss.: University Press of Mississippi, forthcoming).

<sup>6</sup> Jesse C. Burt, "Desert in the Appalachians," *Nature Magazine*, 48 (November 1956): 486-488, 499; Guy Ottewell, "There Are No Ducks In Ducktown," *Defenders Magazine*, 50, no. 4. (August 1975): 338-339; Wilton Barnhardt, "The Death of Ducktown," *Discover* (October 1987), 35-43. Similarly, see Edwin Way Teale, "The Murder of a Landscape," *Natural History* 60, no. 8 (October 1951): 352-56.

treeless expanse was not without some benefits. Long-time residents still remember that that barren hills left residents the free of the mosquitoes, chiggers, and snakes so common in moist woodlands.<sup>7</sup>

\*\*\*

It is hard to make a desert (in the popular sense) in a region that receives almost sixty inches of rain each year, but that is what happened at Ducktown, Tennessee. The district is within a mountain-rimmed basin in the heart of the Southern Appalachian Mountains, where the extreme southeastern corner of Tennessee meets the northern border of Georgia and the western border of North Carolina. Copper mining began at Ducktown in 1850 and continued for a nearly a century-and-a-half until 1987. Clouds of sulfur dioxide smoke from the smelting of sulfur-rich copper ores created the desert; so did sustained cutting of the hardwood forests within the Basin. Loggers felled timber by the square mile for conversion into charcoal to fuel the roast heaps and smelting furnaces used for processing copper ore. Sulfur fumes released into the atmosphere by smelting precipitated back to earth where they killed much of the remaining vegetation and suppressed new growth. Drenching mountain rains washed the denuded soil and rock down Pumpkin Creek into the nearby Ocoee River, leaving behind a naked expanse of red gullies, void of soil, depleted of nutrients, and empty of all vegetation in its core except for scraggly patches of sedge grass and cat briar. Most native wildlife fled the barren land. Fish died in streams poisoned by mineral-laden runoff.

The areas of denudation caused by Ducktown's first era of mining, from 1850 to 1878, were relatively small. They rapidly grew larger during the industry's second era, beginning with

---

<sup>7</sup> M. L. Quinn, "Tennessee Copper Basin: A Case for Preserving an Abused Landscape," 41-42. Apart from local sensibilities, Quinn urged preservation of at least a portion of the badlands for their historical significance. The comments about mosquitoes, etc. are freely offered by the staff of the Ducktown Basin Museum, most of whom are lifelong residents.

the arrival of the railroad in 1890. Rail access allowed Ducktown Sulphur, Copper & Iron and its younger rival, Tennessee Copper, to increase ore production, ore smelting, and hence the volume of sulfur dioxide released into the Basin's atmosphere. The badlands soon began to expand into areas that had been largely spared during the first era. The growing peril gave rise to the first smoke litigation in 1896 and 1897. Each year thereafter, widening zones of devastation generated more lawsuits. Scores of claimants ranging from semi-subsistence hill farmers to wealthy lumber barons filed roughly two hundred lawsuits against the two great copper firms seeking damages for crop and timber losses and, of greater consequence to the companies, seeking court orders to abate the smoke by curtailing or even terminating smelting operations.<sup>8</sup>

Looming above all of the individual legal actions was a suit filed by the state of Georgia in the United States Supreme Court, *Georgia v. Tennessee Copper Co.*, that began in 1904 and lasted in its active phase until 1918 (it was finally dismissed in 1937). Georgia filed its case about seven years after the farmer suits began. The state sued for the limited purpose of forcing the copper companies to reduce smoke damage by ending the practice of open pit roasting of copper ores. It would not remain this simple. There were too many stakeholders to allow for simplicity. Arising as it did, out of the welter of private lawsuits, Georgia's Supreme Court case involved a wide array of interest groups: mountain farmers, the workers and merchants of the mining community, timber barons, forest scientists, New York and London investors, New South business promoters, politicians and lawyers from two great states, and the National Farmers Union. The case spilled out of the courtrooms and into the legislatures of Georgia and

---

<sup>8</sup> Most of the private cases were filed in either the District Court or Chancery Court of Polk County, Tennessee, though some of the larger cases were litigated in federal court in Chattanooga. The exact number of cases is difficult to determine because of a 1935 fire at the Polk County Courthouse that destroyed the district court records. I derived the estimate of 200 cases from appellate records at the Tennessee State Library, and from docket sheets and attorney correspondence archived at the Ducktown Basin Museum. As will be seen and explained in Chapter 3, a number of the claimants each filed multiple lawsuits during the course of the smoke wars.

Tennessee. It soon gained national attention from Gifford Pinchot's National Forest Service, Theodore Roosevelt, Bernard Baruch of the War Production Board, and even the Secretary of Navy, Josephus Daniels. All had a stake in the course and outcome of the case, and hence, over the control of sulfur dioxide emanating from the copper works.

Their many voices, whether expressed in measured tones in the Supreme Court, or in more strident registers at rallies of smoked-out farmers—and of worried mine workers—were heard against an even noisier background of converging forces. It was as if a strange mixture of elements was dumped by heavy machines into a roaring blast furnace at the copper works. The forces of agrarian populism, smokestack industry, industrial logging, the nascent forest conservation movement, and the mobilization for the Great War combined to form a strange and bewildering alloy. Political conflict between the copper interests, New South business advocates, agrarian groups, and the surprisingly powerful voice of mountain farmers served as the flux to meld the elements together. Litigation, the often-unwieldy hammer of the law, pounded the mass into a shape unanticipated by the initial parties.

When the smoke cases came to their effective conclusion at the end of World War I, the law of nuisance had been transformed. The Supreme Court established the constitutional basis for the federal common law of nuisance that would serve to advance state interests against trans-border pollution, until preempted by Congress's creation of the modern federal environmental legal system in the 1970s. Tennessee's state laws of nuisance were permanently altered in response to the growing scale of industry. Ducktown's copper industry was also transformed. New technology implemented under pressure of the lawsuits successfully extracted a significant portion of sulfur dioxide from smelter gases and converted it into sulfuric acid for use in the fertilizer industry to replenish the cotton fields of the South. The federal government created the

Cherokee National Forest on the western rim of the Ducktown Basin, within eyesight of the copper smelters. Only the Ducktown Desert remained unchanged. The changes to law and technology effected by the litigation could not reverse the damage wrought upon the Basin's Southern Appalachian landscape.

\*\*\*

The key ruling in *Georgia v. Tennessee Copper Co.* occurred in 1907 when the Court ruled that Georgia was entitled to an injunction against the copper companies to abate smelter smoke. In an opinion written by Oliver Wendell Holmes, the Court declared,

This is a suit by a State for an injury to it in its capacity as a quasi-sovereign. In that capacity the State has an interest independent of and behind the titles of its citizens, in all the earth and air within its domain. It has the last word as to whether its mountains shall be stripped of their forests and its inhabitants shall breathe pure air.<sup>9</sup>

It was the Supreme Court's first air pollution case. And it was the first time the Court had acknowledged a state's right to seek constitutional redress to preserve its air and natural resources from trans-border pollution.

The ringing words of by Justice Holmes opinion are still good law and were recently applied by the Supreme Court in a case about global warming. In an opinion issued exactly one hundred years after *Georgia v. Tennessee Copper*, the Supreme Court quoted and applied the same passage in *Massachusetts v. Environmental Protection Agency* (2007). In it, the Court declared for the first time that carbon dioxide and greenhouse gases were pollutants within the meaning of the Clean Air Act, and thus the EPA "has the statutory authority to regulate the

---

<sup>9</sup> *Georgia v. Tennessee Copper Co.*, 206 U. S. 230, 237 (1907).

emission of such gases from new motor vehicles.” The Court then ruled that the EPA’s “refusal to decide whether greenhouse gases cause or contribute to climate change” was arbitrary, capricious...or otherwise not in accordance with law.” The decision was an amazing consequence of smelter smoke litigation begun by a handful of mountaineer farmers on the eve of the Spanish-American War.<sup>10</sup>

\*\*\*

The lasting significance of the Ducktown story makes it much more than another dreary tale of environmental degradation. It is a complex history shaped by a web of natural and human forces that functioned at the local, regional, and ultimately, national levels.

Geography and Topography. Ducktown lies within a mountain bowl surrounded on all sides by the high peaks and ridges of the Unakas, the Blue Ridge, and other summits of the Southern Appalachian Mountains. Those peaks presented a formidable barrier to transportation and settlement that protected the Cherokee villages within by hindering white settlement from without—until the discovery of copper in 1843 provided a compelling reason for development. Afterwards, the mountains influenced the rise, death, and rebirth of the copper industry. They also captured the rains that created one of the nation’s greatest expanse of hardwood forest, a lure to the industrial logging industry that developed to harvest it. Those same heavy rains stripped fertile soil from the slopes wherever poor mining, logging, and farming practices removed the protective cover of vegetation. And most of all, the mountains trapped sulfur smoke within the Basin. As M. L. Quinn argued, the Ducktown Desert was the product of the region’s topography and other natural features as much as it was the result of human industry. The

---

<sup>10</sup> Massachusetts v. Environmental Protection Agency, 549 U. S. \_\_\_, No. 05-1120, slip op. at 15 (quoting Georgia v. Tennessee Co. ), 30 (greenhouse gases as pollutants), 32 (EPA arbitrary and capricious), (April 2, 2007). This was a 5-4 decision, with Justice Stevens writing for the majority, and with Chief Justice Roberts dissenting, joined by Justices Scalia, Thomas, and Alito. The dissenting justices also joined in a separate dissent by Justice Scalia.

mountains confined the smoke in toxic concentrations that might have otherwise dispersed over a broader region.<sup>11</sup>

Political geography also shaped the smoke litigation that resulted. The Georgia-Tennessee border ran east-west across the northern third of the Basin, leaving the greater portion of the bowl within Georgia. The blast furnaces of the Tennessee Copper Company sprawled atop a bluff besides the Ocoee River only a few hundred yards from the line. The works of the Ducktown Sulphur, Copper & Iron Co. were also close by, being just a few miles north. The thick clouds of smoke and sulfur dioxide from the roast yards and smelters inevitably drifted over the border into Georgia creating, in their wake, a crisis in pollution law that tested the U. S. Constitution's bedrock principles of dual federalism.<sup>12</sup>

Environment and the Law of Nuisance. The Ducktown story is a study in environmental history because it involves the interaction of human activity and nature. Yet the words "environmental" and "ecology" and their cognates must be used with caution to avoid anachronisms at the turn of the nineteenth and twentieth centuries. Even the use of "pollution" to describe dirty air was rare at the time. The litigants did not use the lexicon of environmentalism and ecology because the science and conceptual framework supporting those terms had yet to be

---

<sup>11</sup> M. L. Quinn, "The Appalachian Mountains' Copper Basin and the Concept of Environmental Susceptibility," *Environmental Management* 15, no. 2. (March/April 1991): 179-94.

<sup>12</sup> The Georgia-Tennessee became an issue again in 2008 when the Georgia Senate passed a resolution directing a new survey of the line on the grounds that an 1818 survey error placed the border south of the 36<sup>th</sup> parallel. At stake was Georgia's desire to move the border north to tap the waters of the Tennessee River at Nickajack Lake near Chattanooga as a remedy to the Peach State's historic drought conditions. At this writing, the outcome of the initiative is in doubt, but if succeeds, the former works of the Tennessee Copper Company would fall on the Georgia side of the line. If this had effort had succeeded a century ago, the entire course of Ducktown smoke litigation would have been completely different. See Jeffrey Scott, "Georgia Town at the Heart of Border Dispute," *Atlanta Journal-Constitution*, 8 February 2008 (regarding McCaysville, GA and Copperhill, TN); Greg Bluestein, "Georgia Lawmakers Push for Border Change," *Atlanta Journal-Constitution*, 21 February 2008; Eric Schelzig, "Lawmaker: Tenn. Will Stand Up to Ga. on Border Dispute," *Nashville Tennessean*, 22 February 2008; Schaila Dewan, "Georgia Claims a Sliver of the Tennessee River," *New York Times*, 22 February 2008.

developed. They spoke instead of poisonous vapors and fumes. The more sophisticated participants spoke of sulfur dioxide. For most, it was simply smoke.<sup>13</sup>

Environmental law, in the modern sense of a comprehensive statutory system to regulate air and water pollutants, did not exist either. No statute or regulation banned the emission of sulfur dioxide into the rural environs of the southern Appalachians in the early 1900s. Various governments enacted piecemeal, and largely ineffective, legislation in other parts of the country to address local problems of sewage, garbage, and urban smoke. Even so, the creation of a comprehensive system of environmental law to regulate air and water pollutants would await the slow growth of a new consciousness that eventually produced the Environmental Protection Agency, Clean Air Act, Clean Water Act, Endangered Species Act, and shelves of other federal and state laws in the early 1970s.

The lawyers and judges considered Ducktown smoke to be a case in the law of nuisance, the ancient body of common law dealing with offensive activity by one party that impaired another's use and enjoyment of property. Nuisance law addressed the rights and remedies concerning the drifting stench of a slaughterhouse, the diversion of storm drainage onto a neighbor's lot, the blocking of light by erecting a tall building, or, as in Ducktown, the emission of toxic smoke that blew onto the farms, orchards, and woodlots of others.

Nuisance law developed incrementally to resolve highly local disputes arising from small-scale activities. It was, as legal historian Christine Meisner Rosen and others argue, ill-suited to resolve regional impacts of pollution from modern industrial complexes such as in Ducktown. Smelter pollution from the Ducktown Sulphur, Copper & Iron Co. and the Tennessee Copper Company was on a scale that severely strained Tennessee's traditional doctrines of

---

<sup>13</sup> Adam W. Rome, "Coming to Terms with Pollution: The Language of Environmental Reform, 1865-1915," *Environmental History* 1, no. 3 (July 1986): 6-28.

nuisance. The tensions arising from the mismatch of ancient law and Industrial Age enterprise forced the battle of farmers and loggers against the copper industry and their wage-earning workers to spill out of the local courts into the Tennessee General Assembly. Claimants and industrialists thrust and parried in the lobbies of the Tennessee General Assembly in Nashville in a lengthy battle to enact or resist amendments to the substantive and procedural law of nuisance. Both sides experienced gains and losses, reflecting the surprisingly balanced forces of southern populism and industrial capitalism.<sup>14</sup>

Similar contests were beginning to occur in other smelting regions of America, notably in Butte, Montana, California's Shasta region, Northport in Washington State, and the Great Salt Lake Valley of Utah. The Ducktown battle preceded all but the contest in Butte, and was ultimately the most influential of the early smelter battles. Unlike the other cases, Ducktown's location on a state border created an interstate dispute that led the landmark constitutional battle in the United States Supreme Court. The legal and technological approaches in *Georgia v. Tennessee Copper Co.* shaped the international dispute between the United States and Canada regarding the Trail smelter in British Columbia several decades later. They also served as the

---

<sup>14</sup> For representative works on the development of nuisance law in response to industrial pollution see Robert G. Bone, "Normative Theory and Legal Doctrine in American Nuisance Law: 1850-1920," *Southern California Law Review* 59 (September 1986): 1101-1226; Joel Franklin Brenner, "Nuisance Law and the Industrial Revolution," *Journal of Legal Studies* 3 (1974): 403-33; Peter C. Hoffer, *The Law's Conscience: Equitable Constitutionalism in America* (Chapel Hill: University of North Carolina Press, 1990), 147-79; Paul M. Kurtz, "Nineteenth-Century Anti-Entrepreneurial Nuisance Injunctions—Avoiding the Chancellor," *William & Mary Law Review* 17 (Summer 1976): 621-70; John P. S. McLaren, "Nuisance Law and the Industrial Revolution – Some Lessons from Social History," *Oxford Journal of Legal Studies* 3, (1983): 155-221; D. M. Provine, "Balancing Pollution and Property Rights: A Comparison of the Development of English and American Nuisance Law," *Anglo-American Law Review* 7 (January-March 1978): 761-821; Christine Rosen, "Differing Perceptions of the Value of Pollution Abatement across Time and Place: Balancing Doctrine in Pollution Nuisance Law, 1840-1906," *Law and History Review* 11, no. 2 (Autumn 1993): 303-381; Christine Meisner Rosen, "Knowing Industrial Pollution: Nuisance Law and the Power of Tradition in a Time of Rapid Economic Change, 1840-1864," *Environmental History* 8, no. 4 (October 2003): 565-97.

template for federal actions against western smelters regarding damage to national forests during the Roosevelt and Taft administrations.<sup>15</sup>

Environment and Sovereignty. Richard N. L. Andrews, a scholar of environmental law, argued that environmental policy may be broadly defined to include “all the policies by which Americans have used the powers of government to exploit, transform, or control their natural surroundings.” Law shapes the use and occupation of the land, and thus impacts the natural-human environment, even when law is enacted without an explicitly environmental purpose. The laws of property, business, and taxation can all have this impact. And so, for example, the problem of Ducktown smoke was, in part, the result of action by the legislatures of Georgia, North Carolina, and Tennessee to promote construction of railroads that made the revival of the copper industry possible in 1890.<sup>16</sup>

---

<sup>15</sup> For representative historical studies of smelter pollution, see: Donald MacMillan, *Smoke Wars: Anaconda Copper, Montana Air Pollution, and the Courts, 1890-1924* (Helena: Montana Historical Society Press, 2000) (Butte, Montana); Stephen W. Charry, “Defending the Great Barbecue: W. Lon Johnson and the 1921 Northport Smelter Pollution Suits,” *Pacific Northwest Quarterly* 91, no. 2 (2000): 59-69 (lead smelting in northeast Washington State); Michael A. Church, “Smoke Farming: Smelting and Agricultural Reform in Utah, 1900-1945,” *Utah Historical Quarterly* 72, no. 3 (Summer 2004): 196-218 (Salt Lake area); John E. Lamborn and Charles S. Peterson, “The Substance of the Land: Agriculture v. Industry in the Smelter Cases of 1904 and 1906,” *Utah Historical Quarterly* 53, no. 4 (1985): 308-25 (also in the Salt Lake area). A New Deal era smelter suit between the United States and Canada is examined in. For studies of copper smelter pollution in Swansea, Wales, see Edmund Newell, “Atmospheric Pollution and the British Copper Industry, 1690-1920,” *Technology and Culture* 38, no. 3 (1997): 655-689; Ronald Rees, “The South Wales Copper-Smoke Dispute, 1833-95,” *Welsh History Review* 10, no. 4 (1981): 480-96. For the Trail smelter dispute, see John D. Wirth, *Smelter Smoke in North America: The Politics of Transborder Pollution* (Lawrence: University Press of Kansas, 2000), 43, 119, 203 (influence of Tennessee Copper case upon Trail Smelter dispute); D. H. Dinwoodie, “The Politics of International Pollution Control,” *International Journal* 27, no. 2 (1972): 219-35.

<sup>16</sup> Richard N. L. Andrews, *Managing the Environment, Managing Ourselves: A History of American Environmental Policy* (New Haven, Conn.: Yale University Press, 1999), ix. A number of other recent works emphasize law as a major factor of environmental history. Representative works include: J. Brooks Flippen, *Nixon and the Environment*, 1<sup>st</sup> ed. (Albuquerque: University of New Mexico Press, 2000); Samuel P. Hays and Barbara D. Hays, *Beauty, Health, and Permanence: Environmental Politics in the United States, 1955-1985*, Studies in Environment and History (Cambridge, Cambridgeshire; New York: Cambridge University Press, 1987); Robert B. Keiter, *Keeping Faith with Nature: Ecosystems, Democracy, & America's Public Lands* (New Haven, Conn.: Yale University Press, 2003); Arthur F. McEvoy, *The Fisherman's Dilemma: Ecology and Law in the California Fisheries* (Cambridge, Cambridgeshire; New York: Cambridge University Press, 1986); Karen R. Merrill, *Public Lands and Political Meaning: Ranchers, the Government, and the Property Between Them* (Berkeley: University of California Press, 2002). Theodore (Ted) Steinberg addresses the issue in *Nature Incorporated: Industrialization and the Waters of New England* (Cambridgeshire: Cambridge University Press, 1991 and in *Acts of God: The Unnatural History of*

It follows that the issue of sovereignty may have environmental implications. The creation and enforcement of policy, whether or not explicitly environmental, is an exercise of sovereignty, the supreme power over a body politic. Ducktown's natural environment and the course of its human occupation turned upon two great battles of political sovereignty, both of which came before the United States Supreme Court. For the Cherokees, it was a zero-sum game that pitted tribal sovereignty against Georgia's claim of state sovereignty. The tribe won the legal battle in *Worcester v. Georgia* (1832), but lost the political war when federal troops expelled the Cherokees from their ancestral home at bayonet point in 1838. With the transfer of sovereignty, Ducktown lost the gentle stewardship of the Cherokees. The heavily wooded landscape of Cherokee farmsteads was soon transformed, in less than a dozen years, into one of the nation's great mining districts for the benefit of distant investors in America's commercial cities and even further in London. (Whether the Cherokees would have eventually mined copper with the same vigor that modern-day tribes exploit their oil, gas, and coal reserves cannot be known.)

The other great battle over Ducktown sovereignty occurred sixty-seven years after the Cherokee Removal when the state of Georgia returned to the Supreme Court in 1904 in *Georgia v. Tennessee Copper Co.* This time, the state sought to assert its rights as a sovereign for an injunction to abate smoke pollution emitted by polluters acting beyond its jurisdiction. This forced a great constitutional battle over the scope of Article III original jurisdiction, and resulted in a landmark opinion by Oliver Wendell Holmes in 1907.

---

*Natural Disaster in America*, 2d ed. (New York: Oxford University Press, 2006). For overviews regarding the impact of politics and economics upon the development of American law, see Lawrence Meir Friedman, *A History of American Law*, 2d. ed. (New York: Simon & Schuster, 1985); Kermit Hall, *The Magic Mirror: Law in American History* (New York: Oxford University Press, 1989); Morton J. Horwitz, *The Transformation of American Law, 1780-1860*, Studies in Legal History (Cambridge, Mass.: Harvard University Press, 1977).

Farmers, Loggers, Miners, and Capitalists. As the state fought to assert its sovereign prerogatives, the farmers, miners, loggers, and capitalists of the area pursued their different livelihoods in a symbiotic relationship made contentious by the sulfur smoke. Mining created a cash economy of unusual strength and continuity for the southern mountains. Ducktown's copper industry lasted for almost a century-and-a-half, from the opening of the first mine in 1850 until 1987 when the mines finally closed. In turn, local farmers and loggers supplied its food and timber. Farmers found a ready market among the mining community. Without it, the district's isolation would have reduced most growers to a near subsistence level, which few of them wanted. Yet industry smoke rendered farming impossible for many. They had a market but could not grow the crops to supply it. That great irony gave rise to the individual smoke suits. The tension between farmers and the mining community was complicated by the permeable line between the two groups. Farmers often found wage labor at the mines or as suppliers of timber and quartz rock. Miners drifted back to farming as the seasons and personal inclinations dictated. Almost all of them came from the same Scots-Irish mountaineer stock.

When smoke damage strained the ties between local agriculture and industry, litigating farmers expressed their grievances with Jeffersonian yeoman rhetoric and drew upon the anti-corporate antipathies of southern agrarian populism. Yet they did so without tying their cause to the platform and organization of the Populist Party. The 1896 elections crushed the Populist Party (also known as the People's Party) before Ducktown smoke suits began in earnest. In the absence of a viable Populist Party, smoked-out Georgia farmers eventually embraced the agrarian movement in the form of the National Farmer's Union, but they did so more for its political and organizational support than for its agenda of cotton market reforms and cooperative farming. Almost none of the smoke suitors grew cotton because Ducktown's elevation and

shorter growing season prevented successful growth of the crop, with or without smoke. They had little personal concern for the issues that bound southern cotton growers to agrarian organizations.<sup>17</sup>

Instead, the link between the mountaineer farmers and the NFU may best be explained by Robert C. McMath's idea that formal agrarian groups were superimposed upon "existing interlocking rural social networks." This proved to be true in Ducktown. Farmers began the smoke wars before the rise of the NFU. They embraced the political strength of the organization when they found it useful for their own anti-copper purposes. And they continued to litigate under the NFU banner long after the organization suffered a precipitous decline among the South's cotton farmers.<sup>18</sup>

Industrial loggers, both local and non-resident, entered the Ducktown district in the 1890s. They pursued their own claims, seeking compensation for standing timber killed by sulfur dioxide. Some, notably Will Shippen, exercised the advantages of wealth and position to rally (defense attorneys would say manipulate) farmers against the copper companies and to flog state officials into doing the same. Both sides sought to capture the voice of Ducktown's populace with mixed, and often angry, results.

Technology. Joel Tarr, Martin Melosi, David Straddling and others have argued the importance of technology as a factor of environmental history. Technology was equally important to the law of nuisance that Ducktown litigants employed in the smoke wars. The law of nuisance allowed the copper companies to assert a defense that they were using the best

---

<sup>17</sup> Jeffersonian republican themes are explored on a national scale in Elizabeth Sanders, *Roots of Reform: Farmers, Workers, and the American State, 1877-1917* (Chicago: University of Chicago Press, 1999), and on a regional scale in Steven Hahn, *The Roots of Southern Populism: Yeoman Farmers and the Transformation of the Georgia Upcountry, 1850-1890* (New York: Oxford University Press, 1984).

<sup>18</sup> Robert C. McMath, *American Populism: A Social History, 1877-1898* (New York: Hill & Wang, Noonday Press, 1993), 9, 16-17, 40-42.

available technology. Similar notions also shaped the nature of legal remedies, since courts were reluctant to impose impossible goals upon the companies.<sup>19</sup>

Great advances in the state of mining technology occurred during the Ducktown story. The many stages of Georgia's Supreme Court case were marked by improvements in smelting processes, the use of high smokestacks for attempted dispersal of sulfur fumes, and the development of acid condensation plants to convert toxic fumes into marketable sulfuric acid. Some of the advances helped. Others failed miserably as pollution control measures, however well they improved production and profits. Georgia's Attorney General John C. Hart repeatedly delayed or suspended the state's case in the often vain hope that new technology would preclude the need for an injunction that might destroy the industry and the thousands of jobs it provided. He knew that wage earners and business people also exercised the vote, not just the farmers.

Conservation. Georgia's smoke suit began as a traditional nuisance case and was then transformed into a conservationist crusade under the aegis of Theodore Roosevelt, and with the direct support of Gifford Pinchot's Bureau of Forestry. The suit and the destructive processes that created the Ducktown Desert reached their climax at the same time that the federal government was conducting a massive survey of the Southern Appalachian forests for the purpose of promoting the creation of national forest reserves in the East. Georgia's lawyers eagerly utilized the reports and testimony of government experts in forestry, chemistry, entomology, and geology to shape its case before the Supreme Court. A number of foundational figures in American forestry, including B. E. Fernow, Carl Alwin Schenck, H. B. Ayres, and W. W. Ashe provided evidence in the case. Some testified for the state, others on behalf of the

---

<sup>19</sup> Joel A. Tarr, *The Search for the Ultimate Sink: Urban Pollution in Historical Perspective* (Akron, Ohio: University of Akron Press, 1996); David Stradling, *Smokestacks and Progressives: Environmentalists, Engineers, and Air Quality in America* (Baltimore: Johns Hopkins University Press, 1999); Martin V. Melosi, *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present* (Baltimore: Johns Hopkins University Press, 2000).

copper companies. The 1902 Wilson Report, issued by Secretary of Agriculture James Wilson under Roosevelt's endorsement, proved to be the linchpin of Georgia's case.

The watershed protection doctrines of George Perkins Marsh and the principles of renewable forestry were prominent in Georgia's suit. In *Man and Nature* (1864), he argued that deforestation, especially in mountain watersheds, led to the multiple evils of erosion, diminished stream flow, and even climate change. These themes were echoed repeatedly by government experts and Georgia's lawyers during the course of *Georgia v. Tennessee Copper Co.*<sup>20</sup>

The same was not true for wildlife. The very nature of nuisance law militated against such considerations. Nuisance law provided a means of awarding damages to property owners for damages to their crops and woodlots. Wildlife did not belong to anyone in particular and so was not a compensable element of loss. The notion of public stewardship of wildlife that underpinned the 1900 Lacey Act (banning transportation of certain threatened species across state lines), and which matured as a formal element of pollution policy with the 1973 Endangered Species Act, did not apply to Ducktown smoke litigation.

Nor did aesthetic concerns play a central role. Special Counsel Ligon Johnson argued for the recreational benefit of an Appalachian forest reserve in his role as an officer in several citizen forestry groups. Nonetheless, citizen impetus for the smoke suits came largely from farmers and loggers, not hikers, campers, and nature lovers.<sup>21</sup>

---

<sup>20</sup> George Perkins Marsh, *Man and Nature* (Cambridge, Mass.: Belknap Press of Harvard University Press, 1965). Marsh's stream-flow theories were later severely criticized by Lt. Col. Hiram Martin Chittenden of the Army Corps of Engineers. Chittenden published his attack in 1908, too late to influence either the Wilson Report or Holmes's 1907 Supreme Court opinion in *Georgia v. Tennessee Copper Co.* See Gordon B. Dodds, "The Stream-Flow Controversy: A Conservation Turning Point," *The Journal of American History* 56, no. 1. (June 1969): 59-69.

<sup>21</sup> Roderick Nash, *Wilderness and the American Mind*, 4<sup>th</sup> ed. (New Haven, Conn.: Yale University Press, 2001) (arguing the aesthetic motive for creating America's national parks to preserve spectacular landscape).

\*\*\*

I weave these themes together in the first book-length treatment of the Ducktown smoke litigation, and the first work of any length to make extensive use of the extraordinary cache of primary documents rescued by the staff and supporters of the Ducktown Basin Museum. Richard Estes and Guerdon Kopp learned of a large store of records from the Tennessee Copper Company and the Ducktown Sulphur, Copper & Iron Co. located in an abandoned store near the DSC&I works at Isabella. Long years of neglect under a leaking roof had reduced many of the documents to a sodden, moldy mess literally destined to be thrown as trash down an abandoned mine shaft. The two men obtained permission to rescue the documents and then moved them to the Ducktown Basin Museum at the former offices of TCC's Burra Burra Mine. Ken Rush led the conservation of the records when he began his tenure as Museum Director soon afterwards.

The Museum's displays present a wonderful overview of Ducktown mining and the community life of the miners and their families. For me, the Museum offered a treasure trove of unexamined documents from a quarter-century of smoke litigation. Much of this consisted of correspondence to and from trial counsel for the copper companies with opposing counsel, corporate management, and individual smoke suitors. These resources, supplemented by the abundant correspondence from Georgia's governors and attorney generals found at the Georgia Department of History and Archives, allowed for an unusually candid appreciation of the inner workings of Ducktown smoke litigation.

Legal historians lean heavily upon the extensive paper trail of opinions, orders, pleadings, motions, affidavits, and depositions left by litigation. The depth, quality, and accessibility of that paper trail increases with those cases that are appealed to higher courts, which is one of the many reasons that much of legal history is written from the top down. It is harder to write legal history

from the bottom up because that requires access to candid material that discretion and the conventions of legal drafting omit from formal documents filed with the courts. Death silences the voices of litigants from the past. Client confidentiality rules, and the often informal approach towards document retention practiced among smaller and older law firms, limit the availability of the correspondence and notes where the inner story of a case may be discerned.

I am an attorney and practiced law for several decades before entering the graduate history program at the University of Georgia. I know how lawyers think, and I know how they put their cases together. I wanted access to the kinds of documents that attorneys store in the gussets, the reddish expandable accordion folders stuffed into file cabinets and storage boxes in every busy law firm. Thanks to the timely rescue by the Museum, I had access to the inner aspects of the cases. The documents reveal the thoughts, often wry and caustic, of lawyers, company managers, and movers and shakers such as Will Shippen. There are also documents from hundreds of farmers and mine workers who wrote in the manner that they spoke, often in penciled letters written on lined foolscap paper. The voices of the participants are quoted liberally throughout this work.

\*\*\*

That said, all present historians of Ducktown owe debts to the area's earlier historians and chroniclers. Chief among these was Robert Edward Barclay, author of the trilogy, *Ducktown Back in Raht's Time* (1946), *The Railroad Comes to Ducktown* (1973), and *The Copper Basin* (1975). He spent almost his entire life in the Ducktown Basin and served for many years as

treasurer for the Tennessee Copper Company. His insider's knowledge and dry, insightful wit combined to make his writings essential works for all later historians of the region.<sup>22</sup>

Barclay devoted a chapter in *The Copper Basin* to the smoke litigation. He presented the smoke suits as the understandable response to an irrefutable harm, at least for those landowners nearest the smelters. He also admired the balance demonstrated by Georgia's Attorney General Hart. Nonetheless, Barclay presented the overall course of the cases, especially those from claimants living furthest from the copper works, as litigation run amuck, fueled by cross-border politics and the frenzied effort of claimant's lawyers to sign up cases by the score, both legitimate and otherwise.

Roy G. Lillard incorporated Barclay's work on Ducktown proper within a geographically broader work, *The History of Polk County, Tennessee* (1999). His work reflected the perspective of a direct descendant of local pioneers and life-long residence in the county. Another scion of Polk County, J. D. Clemmer, left a useful, though idiosyncratic, set of thirty-seven scrapbooks prepared in an unusual format. Each volume consisted a Department of Agricultural yearbook into which he pasted local news clippings, programs of community events, letters, and other items of interest, though often without including dates and sources. The oversight is forgivable because his clippings provide documents that are otherwise difficult or tedious to locate.<sup>23</sup>

Of writers from outside of the region, dozens of geologists and other scientists have studied mining, geology, and its ongoing reclamation, mostly presented in highly technical

---

<sup>22</sup> Robert Edward Barclay, *Ducktown Back in Raht's Time* (Chapel Hill: University of North Carolina Press, 1946); *The Railroad Comes to Ducktown* (Knoxville, Tenn.: Cole Printing and Thesis Service, 1973); *The Copper Basin, 1890-1963* (Knoxville, Tenn.: by the author, 1975).

<sup>23</sup> Roy G. Lillard, *The History of Polk County* (Benton, Tenn.: Polk County Historical and Genealogical Society, 1999); J. D. Clemmer Scrapbooks, Cleveland Public Library, Historical Branch, Cleveland, Tenn., available on microfilm as the James Donaldson Clemmer Scrapbooks on Polk County, 1884-1934, mf. 1525, Tennessee State Library and Archives, Nashville, Tenn. For a brief but useful survey of Ducktown mining history, see also Karen Daniels, *Tennessee's Historic Copper Basin Area: An Overview* (Benton, Tenn.: Polk County Publishing Co., 1985).

formats. Two graduate students, James W. Taylor and Nora Lynn Foehner, wrote useful historical geographies on Ducktown for their thesis projects. A number of writers described the Ducktown Desert in science and nature magazines for the general public.<sup>24</sup>

M. L. Quinn published three articles from the perspective of environmental history. The first situated the problem of smelter emissions, such as those of Ducktown, within the historiography of acid precipitation (acid rain). The second argued the local environmental factors that made Ducktown smelter emissions so devastating. The third addressed the course of local smelter technology. I expand upon each of these themes by setting them within their legal, environmental, and political context.<sup>25</sup>

James C. Cobb included a section on Ducktown in his *Industrialization and Southern Society*, and with Thomas C. Dyer, presented an environmental policy overview of Ducktown. In the scholarly legal literature, the Ducktown Supreme Court litigation gained mention in several brief student notes published in law journals in the early decades of the twentieth-century and scattered mention in later law journals. Robert V. Percival devoted a section to it in a recent article on early environmental cases.<sup>26</sup>

---

<sup>24</sup> James W. Taylor, "Ducktown Desert: A Study of the Impact of Industrial Culture Upon the Physical Development of a Secluded Area of the Southern Appalachians," (M.A. thesis, Syracuse University, 1947); Nora Lynn Foehner, "The Historical Geography of Environmental Change in the Copper Basin," (M. S. thesis, University of Tennessee, Knoxville, 1980). See fn 4 above for nature articles.

<sup>25</sup> In addition to M. L. Quinn's above cited article on environmental susceptibility, are her "Early Smelter Sites: A Neglected Chapter in the History and Geography of Acid Rain in the United States," *Atmospheric Environment* 23, no. 6 (1989): 1281-92; and "Industry and Environment in the Appalachian Copper Basin, 1890-1930," *Technology and Culture* 34, no. 3 (July 1993): 575-612.

<sup>26</sup> For Ducktown as an issue of constitutional environmental jurisprudence see, Robert V. Percival, "The Frictions of Federalism: The Rise and Fall of the Federal Common Law of Interstate Nuisance," University of Maryland, Pub-Law Research Paper No. 2003-02, available at <http://ssrn.com/abstract=452922> (accessed 21 June 2007). For an environmental policy overview, see James C. Cobb, *Industrialization and Southern Society, 1877-1984* (Lexington: University Press of Kentucky, 1984); James C. Cobb and Thomas G. Dyer, "Economic Prosperity or Environmental Protection: Georgia, Tennessee, and the Tennessee Copper Companies, 1903-1975," paper presented at Organization of American Historians, New Orleans, La. (April, 1979).

\*\*\*

I made use of these sources to give shape to the large body of correspondence, news coverage, and government documents that have heretofore remained unexplored. The present work is structured in a narrative framework that traces the course of Ducktown smoke chronologically from the days of the Cherokees through World War I. Two Supreme Court cases serve as the beginning and ending points of the narrative: *Worcester v. Georgia* (1832), and *Georgia v. Tennessee Copper Co.* (settled in 1918). The decrees issued in each case directly effected the use and occupancy of the Ducktown Basin. Law and environment are the twin trunks of the story from which branch explorations into Appalachian history, copper mining, southern and national politics, technology, agrarian populism, and other topics as they occur.

After a brief prologue, Chapter 1 begins the account by describing the Ducktown Basin at the time of the Cherokees and the legal and political struggles behind their forced removal in 1837. It continues with the first decade of sporadic white settlement in the 1840s, and the later explosive growth in the 1850s following the discovery of the South's greatest deposits of copper. After touching on the impact of the Civil War and the postwar return of copper mining, it closes with the reasons for its collapse in 1878.

Chapter 2 describes the twelve year hiatus from 1878, when the mines were closed, and the revival of the industry made possible by arrival of the railroad in Ducktown in 1890. The resumption of mining on a much greater scale gave rise to the first wave of smoke suits, filed by local farmers. Chapter 3 covers the farmer smoke suits in the Polk County, Tennessee courts, with attention to parallel legislative battles in Nashville.

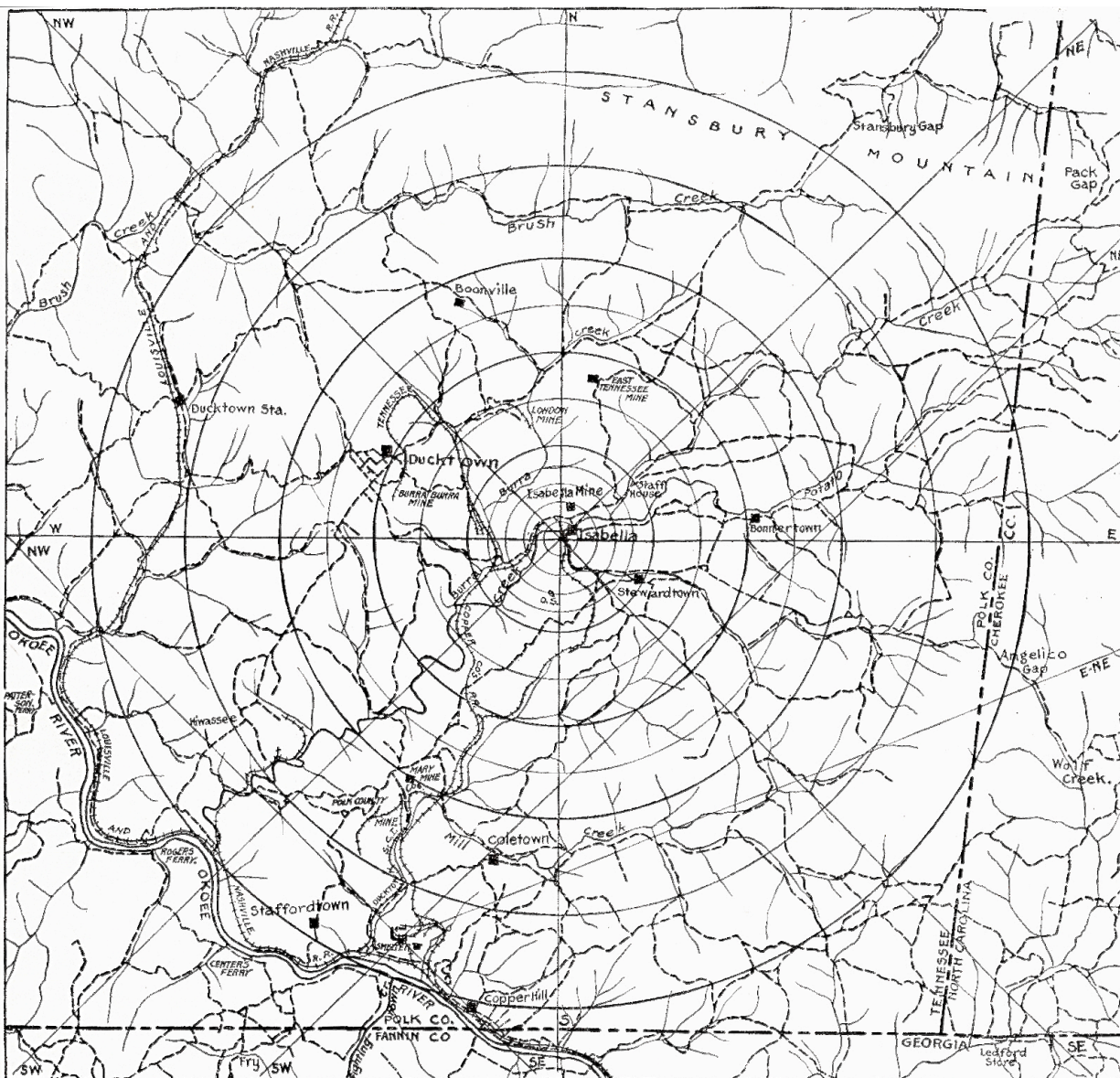
The focus then shifts from the individual farmer claims to Georgia's suit in the United States Supreme Court. Chapter 4 explores Georgia's political and social reasons for filing the

suit. I address the reasons why a state made famous by Henry Grady for its pro-industry New South ethos elected to challenge one of the greatest economic engines in the North Georgia mountains. Chapter 5 continues the story with Georgia's first round of Supreme Court litigation in 1904, the settlement of that case in the failed hope for a technological cure of the smoke problem, and the creation of the Ducktown Desert. The crucial link between Georgia's second Supreme Court case and the national forest conservation movement is the heart of Chapter 6, which addresses the resumption of the state's suit in 1905 and leads to the Supreme Court's 1907 decision. Chapters 7 and 8 cover the decade between 1907 and 1918 when the state's leaders coped with pressure from all sides over whether and how to implement their hard-won injunctive power. An epilogue sketches the aftermath with attention to the legal heritage of the case.

\*\*\*

When the litigation ended, the Ducktown Desert remained to dominate the view from every mountain top on the Basin's rim for the greater part of the twentieth century. The naked and gullied hills were, to outside observers such as Stuart Chase, a monumental display of human follies against nature. To others, the landscape was the tolerable price assessed by an industry that employed thousands of mountaineers for most of one-and-a-half centuries. For the many farmers who abandoned their livelihoods under the burden of smoke, it marked a lost way of life. To many of the remaining locals, it was a source of peculiar pride, an area of stark alien beauty amidst the lush hardwood forests of the Southern Appalachian Mountains.

And to three generations of foresters, biologists, geologists, Tennessee Valley Authority bureaucrats, and industry officials, the Ducktown Desert was America's most challenging reclamation project. But the story of that effort must remain for what I hope will be my second book on Ducktown.



PART OF THE DUCKTOWN BASIN WITHIN THE VICINITY OF ISABELLA.

Figure 1. Map of the Ducktown Basin centered upon the Ducktown Sulphur, Copper & Iron Co., Ltd. at Isabella, Polk County, Tennessee. The rival Tennessee Copper Company was located at Copperhill, Tennessee, which appears at bottom center, next to the outer circle. The common borders of Tennessee, Georgia, and North Carolina are noted. Polk County, Tennessee is west of Cherokee County, North Carolina, and both about Fannin County, Georgia on the south. The Toccoa-Ocoee River slices across the lower left corner, flowing to the northwest. The map was presented to the United States Supreme Court in the Report of John T. McGill, 1 January 1916, *Georgia v. Tennessee Copper Co.*, No. 1. Original, October Term 1914. Courtesy of the National Archives, Washington, D.C.

## CHAPTER 1

### “COVERING THE HEAVENS WITH A SMOKY PALL”:

#### DUCKTOWN’S FIRST ERA OF MINING, 1843-1878

Ducktown is a name older than the copper industry it later came to name. Some sources trace the name to Chief Duck and his village at the foot of Little Frog Mountain. Others point to Federal records that mentioned a village named Kawa’na (spellings vary), translated into English as duck, and hence Ducktown. Either way, a Cherokee village by that name was noted by white authorities as early as 1799 on a list of tribal settlements. By extension, the name came to be applied to the entire copper mining district located at the intersection of southeastern Tennessee, western North Carolina, and northern Georgia. The district lay inside a topographic basin, and so the name applied to the Ducktown Basin, or simply Ducktown. Later, it became the new name of the mining community once known as Hiwassee, which lay next to the Burra-Burra copper mine near the intersection of U.S. Highway 64 and Route 68. It was also the name of one of the two great copper companies in this account: the Ducktown Sulphur, Copper and Iron Company, Ltd.<sup>1</sup>

The area later came to be called the Copper Basin, a change that was in part an attempt to reduce confusing local nomenclature by using the new term as the general geographic term while preserving the older one as the name of the town at the Burra-Burra mine. The larger impetus behind the change was to mark the dominance of the modern copper industry in the twentieth century. Nonetheless, both names remain in common use. Copper Basin is the name applied by

---

<sup>1</sup> Robert Edward Barclay, *Ducktown Back in Raht’s Time* (Chapel Hill: University of North Carolina Press, 1946), 4-6; Betty J. Duggan, “Being Cherokee in a White World: The Ethnic Persistence of a Post-Removal Indian Enclave,” (Ph.D. diss., University of Tennessee, Knoxville, 1998), 90, 105-13.

the U.S. Geological Survey on its topographic maps. It also appears in the names of the local elementary and high schools, the Copper Basin Medical Center, and the Polk County/Copper Basin Chamber of Commerce. Ducktown appears in the name of many businesses. Its historical importance is captured in the name of the community museum, the Ducktown Basin Museum.

The transition between the two names began in the very last stage of the smoke litigation, around the time of World War I. Robert E. Barclay, the district's noted local historian, reflected the change in the titles of his three books. The first two, *Ducktown in Raht's Time* and *The Railroad Comes to Ducktown* covered the years from the Cherokee Removal in 1838 up to the turn of the century. His third book, *The Copper Basin*, describes events in the same area during the twentieth. Most of the participants in the smoke litigation, both inside and outside the Basin, used the older term and so it will be the name in greatest use here.<sup>2</sup>

The Basin's setting left it isolated until the 1840s when the lure of copper began its transformation from a scattering of farmsteads into a mining community of ten thousand people, and from a dense hardwood forest into what became a man-made wasteland. The area's geography and topography strongly shaped the course of its settlement and of the later smoke litigation, and continue to do so to the present day. Mountains surround it on all sides. On the west is the fifteen-mile width of the Unaka Range that separates Ducktown from the Tennessee River Valley. The Unaka Mountains (now more commonly called the Unicoi) are dominated by the peaks of Little Frog (3,322 feet) and Big Frog (4,224). Together, they and the outlying ranges

---

<sup>2</sup> Robert E. Barclay, *Ducktown Back in Raht's Time; The Railroad Comes to Ducktown* (Knoxville, TN: Cole Printing & Thesis Service, 1973; *The Copper Basin, 1890 to 1963* (Knoxville? Tenn.: by the author, 1975).

present a formidable barrier, pierced only by the gorges of the Ocoee and Hiwassee Rivers, to travel between the Ducktown Basin and the Tennessee River Valley.<sup>3</sup>

On the east, the Pack and Angelico peaks rise to 3,459 feet to separate the Basin from North Carolina. Beyond those peaks, the eastbound traveler must cross a hundred miles of mountains before descending to the lowlands of the eastern seaboard. On the north, Stansbury and Threewit reach to about 2,580 feet and run east-west, dividing the Ducktown Basin from the Hiwassee Plateau. Beyond the Hiwassee Plateau lie the Great Smoky Mountains and the great sweep of the Appalachian mountain system that stretches all the way to Maine.<sup>4</sup>

To the south, the slope rises gradually from the Basin floor until reaching the Blue Ridge, as it arcs through Fannin and Gilmer counties in Georgia. It is there that the Ellijay Valley provides the best access to the Basin. The long valley traces a fault line from Atlanta and Marietta by way of the former Cherokee town of Ellijay, and through the southern ramparts of the Blue Ridge to the town of Blue Ridge, before crossing the eastern continental divide for the

---

<sup>3</sup> The description is derived from Barclay, *Ducktown Back in Raht's Time*, 1-4; W. H. Emmons and F. B. Laney, *Geology and Ore Deposits of Ducktown Mining District, Tennessee*, U.S. Geological Survey Professional Paper 139 (Washington: Government Printing Office, 1926), 1, 13; James M. Safford and Tennessee Geological Survey, *Geology of Tennessee* (Nashville, Tenn.: S. C. Mercer, 1869), 469-71; Laurence La Forge, *Physical Geography of Georgia* (Atlanta: Stein Printing, 1925), 114-117.

<sup>4</sup> The heights of mountain peaks vary from source to source. The figures employed here are from topographical maps by the U.S. Geological Survey. Ducktown is at an awkward point in the USGS grid so several maps are required to encompass all of it. The following topographical maps were used: Defense Mapping Agency Topographical Center, "Eastern United States 1:250,000 Chattanooga, Tn, Series V501p, Ed. 4, Sheet Ni 16-3," (Washington D.C.: 1972), Defense Mapping Agency Topographical Center, "Eastern United States 1:250,000 Rome, Ga, Series V501p, Ed. 4, Sheet Ni 16-6," (1972), United States Department of the Interior Geological Survey, "Epworth Quadrangle, Georgia - Tennessee., 7.5 Minute Series (Topographic) No. 35084-H4-Tf-024," (1988), United States Department of the Interior Geological Survey, "Mineral Bluff Quadrangle, Georgia - North Carolina - Tennessee., 7.5 Minute Series (Topographic) No. 134 Ne," (1999), United States Department of the Interior Geological Survey and United States Department of Agriculture Forest Service, "Ducktown Quadrangle, Tennessee - Polk Co., 7.5 Minute Series (Topographic) No. 35084-A4-Tf-024," (2003), United States Department of the Interior Geological Survey and Tennessee Valley Authority Mapping Services Branch, "Isabella Quadrangle, Tennessee - North Carolina, 7.5 Minute Series (Topographic) 133-Se, No. 35084-A3-Tf-024," (1957, rev. 1978).

descent into the Basin. This was the route eventually followed by the railroad to reach the copper works in 1890.<sup>5</sup>

Behind the junction of the Unakas and the Blue Ridge stand the jumbled peaks of the Cohutta Mountains, capped by the 4,139 foot summit of Cowpen. The encircling peaks were never totally inaccessible and were heavily logged in the early decades of the twentieth century, but have always been considered a rugged, sparsely populated terrain. Congress took notice of this under the Wilderness Act of 1964 by designating the Cohutta Wilderness Area in 1975, Big Frog in 1984, and Little Frog in 1986.<sup>6</sup>

Viewed from within, Ducktown is a plateau rumpled by low ridges on the floor of a mountain-rimmed bowl. Its floor is about 1600 to 1800 feet above sea level, and as a whole lies about 1,000 feet above the Tennessee River Valley to the west. The Basin, as defined by the mountains, straddles the borders of three states. Some state boundary lines follow natural features. The Ohio River separates the states of Kentucky and Ohio. Some other borders follow a mountain range. The California-Nevada line runs along the Sierra Nevada range for much of its length. The common corner of Tennessee, Georgia, and North Carolina was established without heed to topography. A topographer might have preferred to run the lines between the three states so that Ducktown Basin fell completely within only one of those states. Had that been done, the problem of Ducktown smoke could have been resolved within a single state. Instead, the

---

<sup>5</sup> For the Ellijay Valley, see La Forge, *Physical Geography of Georgia*, 100-01.

<sup>6</sup> For the wilderness designations see, Wilderness Act, P.L. 88-577, 78 Stat. 890 (1964), codified as 16 U.S.C. §§1121, 1131-1136. For more on these wilderness areas see, Wilderness.net at <http://www.wilderness.net/index.cfm>, specifically the map is found a "National Wilderness Preservation System – Tennessee" at <http://www.wilderness.net/index.cfm?fuse=NWPS&sec=stateView&state=tn&map=tn> and the data at <http://www.wilderness.net/index.cfm?fuse=NWPS>, all sites accessed August 5, 2005. The foundational roles played by Aldo Leopold, Robert Sterling Yard, Benton MacKaye, and Bob Marshall in the wilderness movement and the passage of the Wilderness Act of 1964 are explored in Paul Sutter, *Driven Wild: How the Fight against Automobiles Launched the Modern Wilderness Movement* (Seattle: University of Washington Press, 2002).

common corner is in the northeastern quadrant of the Basin, so that roughly three-quarters of the Basin floor lies within Georgia, the northern quarter within Tennessee, and a small portion on the northeast quadrant lay within North Carolina. Smoke from the copper smelters of Ducktown usually respected the constraints of the surrounding mountains, but paid no heed to arbitrary political lines. Smoke generated in Tennessee flowed without physical impediment into Georgia, and to a lesser extent, into North Carolina. It was the failure of Ducktown smoke to obey the lines on a map that created an interstate crisis of constitutional law.<sup>7</sup>

The mismatch of political and topographical features also applies to the major river of the district. The Toccoa River flows from the Blue Ridge Mountains of Georgia, then into the Basin, where it changes names at the Tennessee line to become the Ocoee. The Toccoa/Ocoee River mocks the border between Georgia and Tennessee (which runs due east and west) by crossing it on the diagonal from southeast to southwest, with the result that a Georgian might own property north of the river but south of the border, and vice versa for a Tennessean.

The river flows gently across the Basin, receiving the waters of Pumpkin Creek, Fightingtown Creek, and other Basin streams. Between the Big Frog and Little Frog mountains, it careens down a twenty-five mile chasm before reaching the lowlands of the Tennessee Valley. The rapids of the Ocoee Gorge prevented its use for water-borne commerce, and even today are accessible only by rafts and kayaks. The river is one of the premier whitewater streams in the South; it served as the venue for white water sports in the 1996 Atlanta Summer Olympics.

The heights around Ducktown are modest compared to the great mountain ranges of the American West. Nonetheless, the stark relief of Ducktown's encircling mountains long presented

---

<sup>7</sup> The constitutional issues created by trans-border pollution at Ducktown foreshadowed the analogous problem of international law between the United States and Canada from 1927-1941 caused when smoke from the Trail smelter in British Columbia drifted over the border to cause harm in Washington State. See, John D. Wirth, *Smelter Smoke in North America: The Politics of Transborder Pollution* (Lawrence: University of Kansas, 2000).

a formidable barrier to the movement of people and goods. Though a network of Cherokee foot and horse trails wove through the mountains, wagoners, livestock drovers, and mail coaches avoided the highlands when traveling between the east coast and the interior. Roads between Tennessee and the Atlantic seaboard tended to skirt the mountains, and hence Ducktown, by crossing to the south over the easier, rolling terrain of the Tennessee Valley and the Georgia Piedmont. The Federal Road, built to connect Augusta, Georgia, with Nashville and Knoxville, Tennessee, followed this route, as did later highways and railroads. Atlanta owes its importance as a rail and interstate highway hub to the same tendency to circumvent the one hundred mile width of the southern Blue Ridge Belt.<sup>8</sup>

\*\*\*

The mountains that forced cross-country travel to the south also turned the path of white settlement away from the highlands into the Piedmont and the Great Appalachian Valley, at least through the early part of the nineteenth century. Inside the protective arms of the Unakas and the Blue Ridge, the lands of Ducktown were too high and too cold for the cotton plants so dear to southern growers, and too remote for significant white commerce. The copper that would make the Basin one of the richest districts in the South had yet to be discovered by whites. Geography and the protecting force of tribal sovereignty allowed the Cherokees of the Basin to maintain their lands and something of their cultural identity long after many of their tribal kindred had lost both in lower areas more accessible to white settlement.

---

<sup>8</sup> The Federal Road is described in Roy G. Lillard, *The History of Polk County, Tennessee* (Benton, Tenn.: Polk County Historical & Genealogical Society, 1999), 7-9; William Gerald McLoughlin, *Cherokee Renascence in the New Republic* (Princeton, N.J.: Princeton University Press, 1986), 77-91. McLoughlin describes the maneuvering by the federal government to secure the right of way for the road from the Cherokees. The impact of the mountains on transportation and settlement in the region is discussed in Laurence La Forge, "The Geographic Control of Human Affairs," in *Physical Geography of Georgia*, 157-165.

Ducktown was long a lightly populated backwater used by the tribe more for hunting than for long-term residence. A few villages could be found there, but not the great Cherokee towns observed by the Spanish conquistador, Hernando De Soto, in 1540, or by the American naturalist, William Bartram, during his 1775 journey through the mountains of Georgia and North Carolina. A view from the surrounding peaks of the Basin at the beginning of the nineteenth century would reveal a broad expanse of hardwood forest broken only by three small villages and some scattered dwellings, together with their surrounding fields and pastures. Ducktown lay on the Tennessee side of the Ocoee, and Fightingtown along a tributary on the opposite side. Turtletown was a few miles north of Ducktown on the other side of Threewit Mountain. Thin columns of smoke rose from the hearth fires in the wooden dwellings; corn, beans, and squashes grew in the adjacent gardens; horses and cattle grazed in the pastures; and hogs roamed the woods to feed on the mast from oaks and chestnuts. Cherokees left the slopes wooded because they preferred to live and farm in the valley bottoms where the land was rich, flat, and easily worked. Use of level land had the added benefit of limiting erosion that later white settlers would experience when farming slopes in such a rainy climate.<sup>9</sup>

Local population grew somewhat as land cessions to the whites led some Cherokees to relocate to the Basin, but even so, their numbers remained low. The 1835 census of the Cherokee Nation found within the Basin only 44 households with a total of 312 individuals scattered over an area twenty miles long and over ten miles broad. A typical family entry for Ducktown read, "Tan A De He: Twenty fullbloods. Five farmers. One mechanic. Two read Cherokee. Two

---

<sup>9</sup> Pre-Removal Cherokee presence in the Basin is discussed in Duggan, *Being Cherokee in a White World*, 90-128. For discussion of Cherokees in Polk County, Tennessee, see Roy G. Lillard, *The History of Polk County* (Polk County Historical and Genealogical Society, 1999), 1-38. Cherokee land use patterns are discussed in Douglas C. Wilms, "Cherokee Land Use in Georgia before Removal," in *Cherokee Removal Before and After*, ed. William L. Anderson (Athens: University of Georgia Press, 1991), 1-28.

weavers and three spinners.” Another for Turtletown mentioned “Ark A Lu Ka: Ten fullbloods. Three ferryboats. Three farmers. One reads English. Three spinners.” Most of the Basin area households were comprised of full-blooded Cherokees, though there were occasional references to “white intermarriage” and individuals “whose degree is not recorded.” Most households included least one farmer and a spinner or weaver, or both. Mechanics (probably blacksmiths and wagon wrights) and ferryboat operators appeared in many others. Many households had an occupant who could read the syllabic Cherokee text invented by Sequoyah in 1821, and who, presumably, had some exposure to the *Cherokee Phoenix* written in that text. Only a few mentions of English literacy appeared in the local listings.<sup>10</sup>

\*\*\*

The small population and low-intensity agriculture of the Cherokees had a gentle impact upon the landscape of Ducktown Basin. Twenty years later, the same view would reveal thousands of whites feverishly digging up the Basin floor to open copper mines, logging the forests for fuel and lumber, and raising the buildings to house and support them all. The Cherokees lost the Ducktown Basin, along with their remaining lands in the East, in a three-way battle for sovereignty over tribal lands fought between the Cherokee Nation, the federal government, and the state of Georgia.

Sovereignty is defined as the supreme power or authority over a given population and territory. With sovereignty comes the power to control the use (and abuse) of natural resources, whether that power is used wisely or poorly. The Ducktown Basin was the subject of two great battles over sovereignty, each of which had great bearing upon the use of its resources. Each

---

<sup>10</sup> James W. Tyner, *Those Who Cried : The 16,000 : A Record of the Individual Cherokees Listed in the United States Official Census of the Cherokee Nation Conducted in 1835* (n.p.: Chi-ga-u Inc., 1974), 193-94. Tyner warns that details of the census should be used with caution because the white census takers often lacked the familiarity with Cherokee language and social patterns; Duggan, 108-119.

battle included the state of Georgia as a primary combatant, and each ultimately came before the United States Supreme Court. The failure of the Cherokee to retain effective tribal sovereignty against the state of Georgia (and Tennessee) opened the Basin for white settlement and allowed for the eventual creation of the copper mining industry. Seventy years later, Georgia renewed the battle for sovereignty, this time against the state of Tennessee and its corporate citizens, in order to combat the damaging effects of smelter smoke from the copper works. Both contests presented a nexus of sovereignty, land use, natural resources, and the Supreme Court.

The Cherokee People asserted their sovereign claim to the land on the basis of their ancient occupation and on the terms of its many treaties with the United States. The United States claimed sovereignty over the same lands by virtue of its defeat of the British and the 1783 Treaty of Paris. Georgia's claim rested on its colonial charter from Britain and its status as a sovereign state within the United States. The competing legal claims and the swirling political and economic atmosphere in which they were pursued had lasting bearing upon the right of Cherokees to control the use and occupation of their homeland.<sup>11</sup>

The very act of making treaties strengthened the argument for tribal sovereignty because a treaty is, by definition, an agreement made between sovereign states or countries. Specific terms of the treaties extended the argument. In the 1785 Treaty of Hopewell, the Cherokees acknowledged themselves "to be under the protection of the United States of America, and of no other sovereign whatsoever." The document specified tribal boundaries and declared that if a

---

<sup>11</sup> Leading works on events leading to the Removal include William L. Anderson, *Cherokee Removal: Before and After* (Athens: University of Georgia Press, 1991), John Ehle, *Trail of Tears : The Rise and Fall of the Cherokee Nation*, (New York: Doubleday, 1988), John R. Finger, *The Eastern Band of the Cherokees, 1819-1900* (Knoxville: University of Tennessee Press, 1984), Stan Hoig, *The Cherokees and Their Chiefs: In the Wake of Empire* (Fayetteville, Ark.: University of Arkansas Press, 1998), Duane H. King, *The Cherokee Indian Nation: A Troubled History* (Knoxville: University of Tennessee Press, 1979), Theda Perdue and Michael D. Green, *The Columbia Guide to American Indians of the Southeast*, The Columbia Guides to American Indian History and Culture (New York: Columbia University Press, 2001).

non-Indian citizen of the United States attempted to settle on Cherokee lands, that person “shall forfeit the protection of the United States.” The 1791 Holston Treaty specifically identified the tribe as the Cherokee *Nation* and provided that “the United States solemnly guarantees to the Cherokee nation all their lands not hereby ceded.” The Treaty of 1819 acknowledged that while some Cherokees preferred to emigrate to the West, the majority chose to remain in the East and wished “to commence those measures which they deem necessary to the civilization and preservation of their nation.”<sup>12</sup>

Cherokees adopted features of white civilization according to a policy devised by George Washington and his secretary of war, Henry Knox. The first administration attempted to reconcile expansionist settlement policy with the Enlightenment attitudes of the Founders by helping the Cherokees, the Creeks, and the other Indian nations in the southeast to acquire livestock, tools, Anglo-American agricultural methods, skills in the manual arts, education, and Christianity. All of this occurred in the expectation that civilized Indians would relinquish unneeded tribal hunting grounds for transfer to white settlers. Congress aided that goal by passing the first of several Indian Trade and Intercourse Acts in 1790 to provide authorization and funding for the program, and the administration actively encouraged the participation of church mission societies to spread the creeds and culture of white society.<sup>13</sup>

The Cherokees readily accepted the material benefits of civilization, though more so in the Georgia Piedmont and in the Tennessee River Valley than in the highlands such as Ducktown, where tribal culture remained more conservative. In the lowlands, many departed

---

<sup>12</sup> The treaties in their ratified form are collected in United States and Charles Joseph Kappler, *Indian Affairs. Laws and Treaties*, vol. II (Washington: Government Printing Office, 1904), 8-11 (Treaty of 1785), 29-33 (Treaty of 1791), 140-144 (Treaty of 1817), and 177-181 (Treaty of 1819).

<sup>13</sup> For the motives and means of the civilization program see Finger, *The Eastern Band of the Cherokees*, 6-19, McLoughlin, 33-57, Perdue and Green, 75-79.

from traditional communal ways to farm on individually owned tracts where they raised cotton and livestock for market. An elite group of Cherokee families engaged in plantation agriculture with their own black slaves. Elias Boudinot, editor of the *Phoenix*, summarized tribal progress in 1826 in his often quoted, "An Address to the Whites," in which he proclaimed that the Cherokees as a whole had "22,000 cattle, 7,600 horses, 46,000 swine, 2,500 sheep, 762 looms, 2,488 spinning wheels, 172 wagons, 2,943 plows, 10 sawmills, 31 gristmills, 62 blacksmith shops, 8 cotton machines, 18 schools, 18 ferriors (sic), and a good number of public roads." To that list could be added 1,592 slaves.<sup>14</sup>

Even as the Cherokees embraced many aspects of civilization, they grew increasingly resistant to ceding more land, and instead, created a sophisticated new government to protect it. They formed a national council to unite the formerly autonomous town councils, and they began a transition from oral to written law. The tribe adopted 1817 Articles of Government and then recast the structure as a republican government in the 1827 Cherokee Constitution. The new government took care to enact a law that made further cessions to whites punishable by death.<sup>15</sup>

The assertion of Cherokee sovereignty met head-on with Georgia's claim of state sovereignty over the substantial area of tribal lands within the state's borders. The issue had been brewing for over thirty years, as white settlement in the state moved ever west and north towards the tribal lands defined by federal treaties and now administered by a centralized tribal government. Georgia's eagerness to remove the Cherokees arose from several factors, primarily gold, cotton, and racism. The 1828 discovery of gold on tribal lands in the North Georgia

---

<sup>14</sup> For the development of plantation slavery among the Cherokee and the Boudinot quotation, see Theda Perdue, *Slavery and the Evolution of Cherokee Society, 1540-1866* (Knoxville: University of Tennessee Press, 1979), 50-69, esp. 54-55.

<sup>15</sup> Perdue and Green, *The Columbia Guide to American Indians of the Southeast*, 82-86; V. Richard Persico, Jr., "Early Nineteenth-Century Cherokee Political Organization," in *The Cherokee Indian Nation: A Troubled History*, ed. Duane H. King (Knoxville: University of Tennessee Press, 1979), 99-108.

mountains at Dahlonega caused a gold rush in the South two decades before Sutter discovered gold in California. Eli Whitney's invention of the cotton gin made cotton agriculture profitable, sparking a great hunger for fresh cotton lands throughout the South. Some of the most desirable cotton lands in Georgia were those plantations already cleared and established by the Cherokees in the Piedmont and Ridge and Valley regions of northern Georgia.

Racism provided an additional motive for Indian removal. An earlier generation of Enlightenment thinkers admired the Cherokees. William Bartram, praised them in 1791 as "happy in their dispositions" living in "divine simplicity and truth, friendship without guile, hospitality disinterested, native, undefiled, unmodified by artificial refinements." Georgia's governor, George Gilmer, described them in 1855 as "the least worthy of remembrance of any human beings;" their men were slothful except in the hunt or when at war, and their women "were the least inviting of their sex." The state's long experience of Indian fighting, most recently in the Creek War of 1813-14, reinforced existing racial attitudes with an argument for frontier safety even though the defeat of the Creeks ended the threat of serious hostilities.<sup>16</sup>

State sovereignty became the issue by which Georgia advanced its material and racial concerns. The deep streak of state's right ideology that led to Georgia's secession from the Union in 1861 and which resurfaced in the *Tennessee Copper* case had roots in controversies over Indian lands. Much of the dispute centered upon an 1802 agreement in which Georgia ceded

---

<sup>16</sup> William Bartram, *Travels through North & South Carolina, Georgia, East & West Florida, the Cherokee Country, the Extensive Territories of the Muscogulges, or Creek Confederacy, and the Country of the Chactaws; Containing an Account of the Soil and Natural Productions of Those Regions, Together with Observations on the Manners of the Indians* (Philadelphia: Printed by James & Johnson, 1791), 350-51 [tribal spellings sic]; Gregory A. Waselkov and Kathryn E. Holland Braund, *William Bartram on the Southeastern Indians*, *Indians of the Southeast* (Lincoln: University of Nebraska Press, 1995), 77, 80-81. Waselkov and Braund collected the Indian excerpts in Bartram's *Travels* with page references to the 1791 edition, plus the entirety of Bartram's "Observations on the Creek and Cherokee Indians" (*n.p.*, 1789) and his "Some Hints & Observations Concerning the Civilization of the Indians or Aborigines of America" (*n.p.*, 1793?). Parallel citations will be provided to the 1791 edition of the *Travels* and to Waselkov and Braund. George Rockingham Gilmer, *Sketches of Some of the First Settlers of Upper Georgia, of the Cherokees, and the Author*, rev. and corr. by the author (Americus, Ga.: Americus Book Company, 1926), 247-250.

its claim to its western lands (the present states of Alabama and Mississippi) to the federal government in exchange for \$1,250,000 and the promise “that the United States, shall at their own expense extinguish for the use of Georgia, as early as the same can be peaceably obtained on reasonable terms the Indian titles to...lands within the state of Georgia.”<sup>17</sup>

Caught amidst the self-created complications of the civilization program, treaty recognition of tribal sovereignty, and the 1802 promise to Georgia, the federal government dithered over Cherokee policy for the next thirty years on the fading hope that more voluntary tribal cessions would resolve the matter. In the meantime, Georgia bristled over what it characterized as offenses to its honor as a sovereign state. The state complained that the civilization program of the federal government attached the Cherokees “to their country and to their homes as almost to destroy the last ray of hope that they would ever consent to part with the Georgia lands.” The federal claim of exclusive federal jurisdiction over Indian lands, the state argued, offended Georgia’s claim to “domain and empire” that descended to her from Britain and was in violation of the Reserved Powers clause to the U. S. Constitution.<sup>18</sup>

Georgia’s frustration escalated with the tribe’s adoption of the 1827 Cherokee Constitution and the discovery of gold on tribal lands in the Dahlonega area of North Georgia in 1828. White prospectors poked through every mountain valley in the tribal lands of Georgia and Tennessee in search of placer gold, causing sometime violent friction between whites and the

---

<sup>17</sup> The 1802 cession was recorded by the federal government in No. 68, Instructions to Land Officers, April 6, 1802, and No. 69, Georgia Cession, April 26, 1802, both in *American State Papers: Public Lands*, vol. I (Washington: Gales and Seaton, 1832), 113-114. It was published separately as *Articles and Agreement of Cession: Entered into on the 24<sup>th</sup> Day of April, 1802, between the Commissioners of the United States and those of Georgia* (Washington, D.C.: R. C. Weightman, 1807). Georgia ratified it in Georgia, *Laws*, 1802, 3-8, and is The agreement was in part an attempt to resolve the confusion arising from Georgia’s Yazoo Land Fraud. See Kenneth Coleman, ed., *A History of Georgia*, 2nd ed. (Athens: University of Georgia Press, 1991), 94-102. George R. Lamplugh, “Yazoo Land Fraud,” in *New Georgia Encyclopedia*, accessed Sept. 4, 2005: <http://www.georgiaencyclopedia.org>.

<sup>18</sup> Resolution, approved Dec. 22, 1826, Georgia *Laws*, 1826, 227-235; Resolution, approved Dec. 27, 1827, Georgia *Laws*, 1827, 236-250.

Cherokees. Choosing to wait no longer, the 1829 General Assembly declared, “all laws, ordinances, orders and regulations...passed or enacted by the Cherokee Indians... to be null and void.” It then responded to the tribe’s 1819 anti-cession law by declaring that any attempt to prevent Cherokee land transfers was a high misdemeanor punishable by four to six years of hard labor in the penitentiary. Three more acts in 1830 attempted to complete the elimination of Cherokee authority and ownership. The first authorized the governor to take possession of all gold mines, by force if necessary, that lay in “Cherokee country within the chartered limits of Georgia.” The second blatantly ignored Cherokee land titles by authorizing the survey of their territory within the state of Georgia into sections and parcels, and calling for a lottery to dispose fee simple grants in the parcels to the white citizens of the state. The third made it illegal for the Cherokees to assemble as a legislative or judicial body upon pain of four years at hard labor. In addition, the act barred whites from residing with the Cherokee Nation without having obtained a license from the state and swearing an oath promising to “support and defend the Constitution and the laws of the state of Georgia.”<sup>19</sup>

Samuel Worcester, a Congregational missionary to the Cherokees acting under the aegis of the federal civilization program, refused to obtain the license or to swear the oath and was then convicted for those offenses in the Superior Court of the newly formed Gwinnett County. His appeal to the United States Supreme Court became the vehicle that forced a resolution of the three-way argument about sovereignty over Cherokee lands. Worcester argued that the license law was void as an unconstitutional intrusion upon the exclusive control of Indian affairs granted

---

<sup>19</sup> Georgia, *Laws*, 1829, 98-101 (extending Georgia jurisdiction and nullifying Cherokee law); Georgia, *Laws*, 1830, 114-117 (Cherokee assemblies, license and oath), 127-143 (survey and lottery), and 154-156 (gold mines). For a useful work about the discovery of gold and its impact on Georgia relations with the Cherokees, see David Williams, *The Georgia Gold Rush: Twenty-Niners, Cherokees, and Gold Fever* (Columbia, S.C.: University of South Carolina Press, 1993), 7-46.

to Congress, and that Congress exercised that authority by entering into treaties that guaranteed Cherokee sovereignty and ownership over tribal lands. Therefore, Georgia's license law and, by extension, its entire package of anti-Cherokee laws were an unconstitutional intrusion upon federal authority. The state responded on two fronts. To the Supreme Court it reasserted its well-rehearsed arguments of state's rights, Georgia's claim to superior title through Britain, and the federal government's failure to honor the 1802 promise. To the public, it attempted to undo a public relations disaster of the first magnitude caused by jailing a minister of the gospel, who was a federally sponsored agent of the civilization program, a career missionary to the Cherokees, and a prolific translator of scripture and hymns into the Sequoyah alphabet. This antagonized those believers burning with the religious fervor of the Second Great Awakening and also the many liberal opponents of Jackson's Indian removal policy.<sup>20</sup>

Chief Justice John Marshall ruled in favor of Worcester and the tribe by declaring the Georgia law void. He recognized the competing claims of title but ruled that while the right of discovery, upon which the British and Georgian claims rested, gave them title vis-à-vis other European powers, it did not abrogate the Cherokee claim based on ancient possession. He then rehearsed the series of federal treaties to affirm the tribe's status as a sovereign nation subject only to the United States. Accordingly, he held "the Cherokee Nation, then, is a distinct community occupying its own territory, with boundaries accurately described, in which the laws of Georgia can have no force." In short, the Cherokees retained their right of self-rule and title to

---

<sup>20</sup> *Worcester v. Georgia*, 6 Peter (31 U.S.) 515 (1832). For a book length treatment of the case, see Jill Norgren, *The Cherokee Cases: Two Landmark Federal Decisions in the Fight for Sovereignty* (Norman: University of Oklahoma Press, 2004). For his translation work, see, S. A. Worcester and Elias Boudinot, *Cherokee Hymns*, 2d ed. (New Echota, Ga.: J. F. Wheeler printer, 1830); S. A. Worcester and Elias Boudinot, *The Acts of the Apostles* (New Echota, Ga.: John F. Wheeler and John Candy printers, 1833).

their lands; Georgia had no more sovereignty over them than it did over the laws and lands of a foreign country like Canada.<sup>21</sup>

This was a famous victory for the Cherokees, but they were soon to learn that the impact of a favorable appellate opinion is contingent upon the political will to enforce it—a lesson that would dramatically shape the course of the Ducktown smoke litigation eighty years later.

Georgia simply ignored the *Worcester* decision on the well-founded confidence that President Andrew Jackson would acquiesce. Jackson, a son of the Tennessee frontier and a famous Indian fighter, made the removal of Indians from east of the Mississippi a key initiative of his first administration. In his 1829 State of the Union address, he announced his sympathies with Georgia's arguments for sovereignty and reported his pronouncement to the Indians that "their attempt to establish an independent government would not be countenanced by the Executive of the United States." He advised the Indians to "emigrate beyond the Mississippi, or submit to the laws of those states." Then, in 1830, he succeeded in getting Congress to pass the 1830 Indian Removal Act to provide the authority and funds to implement a program to exchange Indian holdings in the East for new holdings across the Mississippi. Marshall's opinion and Jackson's removal act were not, on their face, in conflict because the act did not abrogate Indian title or sovereignty, and nothing in the opinion precluded the Cherokees from making the exchange for western lands if they chose to do so. Even so, the act made plain to tribal and state leaders that long-range federal policy was against continued Indian presence in the East.<sup>22</sup>

Despite the *Worcester* decision, intense federal and state pressure for emigration continued to increase, and the number of incidents between the Cherokee and whites miners and

---

<sup>21</sup> *Worcester*, 6 Peter (31 U.S.) at 560-562.

<sup>22</sup> Andrew Jackson, "State of the Union Address," U. S. Congress, House *Journal*, 1829-1830, 23-25.

the winners of Georgia's 1832 land lottery grew rapidly. A breakaway group of tribal leaders headed by Major Ridge concluded that emigration was inevitable; and therefore, it was best to negotiate a voluntary emigration while they still could, rather than to lose all by a forced ouster. To that end, Ridge and his party signed the 1835 Treaty of New Echota by which they relinquished all Cherokee land east of the Mississippi River and promised to emigrate to the West within two years. Signing the treaty was a desperate act done without tribal authority and in violation of the anti-cession law. They also knew that most of the Cherokee people, led by John Ross, were adamantly against the cession. Realizing that the Cherokees' hot anger over the loss of their mountain home would trump a cold exercise of what German theorists would later call "realpolitik," Major Ridge announced at the time of the treaty, "I have signed my death warrant". He spoke truly: vengeful opponents executed Major Ridge, his son, and other members of the Treaty Party.<sup>23</sup>

The Treaty of Echota brought Cherokee life in the Ducktown Basin to a drastic end. Soldiers of the United States Army under the command of General Winfield Scott forcibly rounded up almost the entire population of the Cherokee Nation for removal to newly designated Indian lands across the Mississippi, in what would become Oklahoma. During the 1838 Removal, members of the tribe were herded into encampments before being transported by steamboat, wagon, and on foot to the West. The blockhouse of one of those camps, Ft. Marr, still stands at the foot of Little Frog Mountain in Benton, Tennessee. Disease, exposure, and starvation haunted the some 17,000 Cherokees sent to the West in the Trail of Tears. An estimated 4,000 to 8,000 died during the journey. Some Cherokees managed to escape removal

---

<sup>23</sup> The Treaty of New Echota can be found at United States and Kappler, 439-449. The motives of the Treaty Party are assessed in McLoughlin, 448-451, Perdue and Green, *The Columbia Guide to American Indians of the Southeast*, 86-97. The story of Major Ridge's prediction and death appears in Thurman Wilkins, *Cherokee Tragedy; the Story of the Ridge Family and the Decimation of a People* (New York: Macmillan, 1970), 278.

when the government declined funding to keep the army in the field. About 1,100 people in and about the Great Smoky Mountains of North Carolina remained to form the nucleus of the Eastern Band of the Cherokees. Others hid in the mountains around Ducktown. John Caldwell hired some holdouts to help him build the Copper Road through the Ocoee Gorge in 1851. A few full-blood family groups remained in the Basin area, living in enclaves at Turtletown, on Little Frog Mountain, and elsewhere until the 1890s.<sup>24</sup>

\*\*\*

As the Army harried the Cherokees out of their Appalachian homes, whites poured into the region to take possession, often under the bitter gaze of the former occupants. Adventurers sought potential gold fields in the Blue Ridge near Dahlonega, and farmers coveted the cotton lands in the Ridge and Valley region of Georgia and Tennessee, especially the existing farms developed by the Cherokees under the civilization program. Ducktown, with its lack of discovered gold, its poor climate for cotton, and the formidable barrier to transportation presented by the surrounding mountains, remained a backwater for whites much as it had for the Cherokees. None of the early settlers expressed interest in the copper that, in little over a decade, would transform the Basin into one of the richest districts in the South.

Market prices for land determined in a system created by the Tennessee legislature reflected Ducktown's low value among settlers. The state surveyed its portion of the Cherokee lands, locally known as the Ocoee Tract, in 1836, and then passed an 1837 act to dispose of the tracts by sale at an initial price of \$7.50 an acre with stepped reductions in price for unsold land, beginning at \$5.00, then falling to \$2.00, \$1.00, and ending after four more stages at a penny per

---

<sup>24</sup> Concerning the blockhouse, see E. Raymond Evans, "Fort Marr Blockhouse: The Last Evidence of America's First Concentration Camps," *Journal of Cherokee Studies* 2, no. 2 (1977): 7-14. The Removal statistics are from Russell Thornton, "Demography of the Trail of Tears," in *Cherokee Removal: Before and After*, ed. William L. Anderson (Athens: University of Georgia Press, 1991), 75-95. For the late nineteenth-century presence of Cherokees in Ducktown see Duggan, 254-276, Lillard, 20-21.

acre. As in Georgia, cotton land moved quickly, but the highlands of Ducktown failed to draw buyers at the higher prices. Some bought in at \$1.00 per acre; most waited until the price fell to the penny. The few settlers who came engaged in small-scale grazing and farming, using the land as their Cherokee predecessors did, and leaving much the same limited impact on the landscape. During the first few years of white settlement, the Basin remained heavily wooded with game plentiful enough to stir the passions and appetites of hunters.<sup>25</sup>

Indians had long known of the copper deposits in Ducktown. The Cherokees and their ancestors used it to fashion decorated plates, beads, armbands, and axes. Spectrochemical tests in the 1970s established that the metal in artifacts found at the Etowah Mounds in Georgia and at other southeastern sites came from Ducktown. Copper from the Basin was part of a continent-wide trade in the metal among the tribes of North America, with the largest portion of the metal coming from the extraordinary deposits of readily accessible, native (naturally pure) copper along Lake Superior. For centuries, Indians whacked off chunks of metal from the Ontonagon Boulder, a huge mass of native copper in what is now the Upper Peninsula of Michigan. Stories of the boulder told by Indians and fur trappers drew white prospectors who found the legend to be true: even after all the Indian use, the boulder was still a four foot long, 3,700 pound copper nugget. Promoters sent the rock east where it enticed miners and capitalists to travel west to a land of long hard winters. There, beginning in 1843, they created the first major American copper rush of the century. Back in Tennessee, the deposits in Ducktown, though rich, lacked the boulders of native copper that excited attention in Michigan.<sup>26</sup>

---

<sup>25</sup> Barclay, *Ducktown Back in Raht's Time*, 12-13, 25, Nora Lynn Foehner, *The Historical Geography of Environmental Change in the Copper Basin*, 11.

<sup>26</sup> Sharon Iowa Goad, "Exchange Networks in the Prehistoric Southeastern United States" (M.A. thesis, University of Georgia, 1978), 51-53, 213; Claire Garber Goodman and Anne-Marie E. Cantwell, *Copper Artifacts in Late Eastern Woodlands Prehistory* (Evanston, Ill.: Center for American Archeology at Northwestern University, 1984),

Accident, not legend, led whites to the rediscovery of copper in Ducktown. The story, as recounted by R. O. Currey in his 1857 geological survey of Tennessee, began in 1843 when a Mr. Lemmons was panning for gold in Pumpkin Creek. Lemmons was one of large number of prospectors who wandered over the Southern Appalachians in hope of finding another gold strike like that in Dahlonega. He rejoiced to find “large crystals of a deep rich red color” that convinced him he had discovered the precious metal. Lacking a container, “he tied the cuffs of his coat with hickory withe and filled them” and then found friends and whiskey with which to celebrate all night long. He discovered next morning, when he woke from his alcoholic stupor, that the bright flecks had darkened to a rusty brown. They were iron pyrite, not gold. He was just one more prospector among the many who had been fooled by fool’s gold. Others discovered a black oxide of copper without appreciating its worth. Four years later, A. J. Weaver (some sources spell it Webber) showed greater appreciation for the oxide and shipped ninety casks of it to the Revere Smelting Works in Boston. Assayers at the firm, founded by the patriot and coppersmith of revolutionary fame, determined the ores to be of 14 to 22 percent copper. Though Weaver gained the satisfaction of a proven discovery, he chose to abandon Ducktown in pursuit of Mexican gold. He died en route across the Great Plains in a battle with Indians.<sup>27</sup>

Weaver evidently failed to appreciate the money to be made by supplying the large and rapidly growing national market for pure copper and its two major alloys: brass (a combination of copper and zinc) and bronze (copper and tin). During the colonial era, Americans used copper for coins, kettles, and pots. From brass came buckles, gun parts, sextants and other precision

---

7-9, 35-37, 70-74. For the discovery of the Ontonagon Boulder, see Larry D. Lankton, *Beyond the Boundaries: Life and Landscape at the Lake Superior Copper Mines, 1840-1875* (New York: Oxford University Press, 1997), 6-7.

<sup>27</sup> Richard O. Currey, *A Sketch of the Geology of Tennessee: Embracing a Description of Its Minerals and Ores, Their Variety and Quality, Modes of Assaying and Value; with a Description of Its Soils and Productiveness, and Palaeontology* (Knoxville, Tenn.: Kinsloe & Rice, 1857), 72-74., quoted in Barclay, *Ducktown Back in Raht's Time*, 44-45.

instruments, hardware, and wire for wool cards. Cannons, bells, and statues were made of bronze. Britain supplied colonial needs for these metals from long-established works centered on the copper mines of Cornwall, the smelters in Swansea, and the brass works in Bristol.

Americans supplemented the supply by recycling scrap metal and with the output from small copper mines in New England and the Mid-Atlantic colonies. Demand for copper in all forms outstripped supplies soon after the Revolutionary War. The ships of naval and merchant fleets gained copper bottoms after the discovery that copper sheathing gave protection from wood boring teredo worms and barnacles. A brass industry developed in Waterbury, Connecticut to make brass buttons for uniforms and metal clock works to replace traditional wooden gears. New technology created new product lines, such as parts for steam engines and copper plates for photographers. The few small copper mines in eastern America played out as demand grew. Investors were eager to develop new finds in Michigan and Tennessee.<sup>28</sup>

John Caldwell knew this and went to Ducktown in 1849 to make his fortune. As he recounted in an 1855 letter, he was “scouting for copper, and found some five or six tons in a cabin, ten feet square” on property reserved by the state for use as a school. He “found the country unexplored” and noticed that “the school section, a property now worth a million of dollars” was “attracting little or no attention.” Having only twenty dollars in his pocket, he “sat down in the woods for three hours, to mature a plan to control and open the section.” He then gathered the locals to tell them about the money to be made by leasing the tract for mining. He

---

<sup>28</sup> For the British copper and brass industry, see Joan Day, *Bristol Brass: a History of the Industry* (Newton Abbot, England: David & Charles, 1973), Henry Hamilton, *The English Brass and Copper Industries to 1800*, 2d ed. (New York: A. M. Kelley, 1967). For the American copper and brass industry, see Jeremy Brecher and others, *Brass Valley: The Story of Working People's Lives and Struggles in an American Industrial Region* (Philadelphia: Temple University Press, 1982), 1-6 (buttons, hardware, watches), Charles K. Hyde, *Copper for America : The United States Copper Industry from Colonial Times to the 1990s* (Tucson: University of Arizona Press, 1998), 1-14 (sheathing, steam engines, early US mines), William Gilbert Lathrop, *The Brass Industry in the United States; a Study of the Origin and the Development of the Brass Industry in the Naugatuck Valley and Its Subsequent Extension over the Nation*, Rev. ed. (Mount Carmel, Conn.: W.G. Lathrop, 1926), 21-67 (clocks, lamps, engine parts, photographic plates).

spoke in words calculated to appeal to the growing American spirit of economic boosterism, telling them “their condition would be improved and that civilization, intelligence, comfort, and wealth would be the inevitable result.” Boosterism was not a trait valued by the many who had settled on penny-per-acre land that nobody else had wanted. One man rose to say that “a large portion of the inhabitants had come here to get away from civilization, and if it followed them, they would run again.” Caldwell showed himself an able promoter by overcoming objections to convince a majority to embrace his call for progress and to endorse a bill for the mining lease.<sup>29</sup>

Approval was one major hurdle. Transportation was another. The ninety casks of ore sent by Weaver to Boston in 1847 went south seventy miles by wagon to Ellijay and then over the Cohutta Mountains to the nearest rail stop in Dalton, Georgia. The extension of the railroad from Dalton up the Tennessee Valley to Cleveland brought the tracks thirty miles closer to Ducktown—but on the wrong side of mountains. The only way between Ducktown and the Valley was by a Cherokee footpath up and over Little Frog Mountain. The Basin had the copper, Caldwell had the lease, investors had the money, and the railroad was tantalizingly near, yet without a viable wagon road, all was in a state of suspense.<sup>30</sup>

Caldwell solved the dilemma by blasting a road through the twenty-five-mile length of the Ocoee River Gorge. He made a wagon road where the Cherokees had never made a footpath. To that end, he again applied his persuasive talents to the local crowd, this time by speaking at a Methodist camp meeting in attempt to combine economic evangelism with a pitch for financing and labor. The local Methodists were more attuned to the sacred call of the Almighty than to the

---

<sup>29</sup> The account is from a letter from John Caldwell to Dr. R. O. Currey and C. A. Proctor, 1855, which appears verbatim in James M. Safford, *A Geological Reconnoissance [sic] of the State of Tennessee: Being the Author's First Biennial Report. Presented to the Thirty-First General Assembly of Tennessee, December, 1855* (Nashville: G. C. Torbett, 1856), 61-62.

<sup>30</sup> Barclay, *Ducktown Back in Raht's Time*, 56-57.

profane lure of the almighty dollar; they provided no funding and supplied only three laborers who all quit by the third day of work. He concluded that “public opinion [was] strong and powerful against the enterprise.” In lieu of local white labor and funding, Caldwell hired a dozen of the remaining Cherokees and scrounged for funding from outside investors. He finished the massive task in 1853 after two years of labor.<sup>31</sup>

The road wound through the gorge at a viable grade for wagon travel as it ascended one thousand feet to the summit. The path presented a visual spectacle that quickly gained the attention of observers. The geologist, Currey, commented that as the road and river pierced the cliffs “there is presented to the traveler at every turn in the stream, new scenery, and apparently on a grander scale.”<sup>32</sup> Another observer said the rocks of the gorge “reminded [him] of the mountains of Switzerland.”<sup>33</sup> What gladdened the hearts of investors was a different sight: an endless line of wagons making the four day round trip between Ducktown and Cleveland, carrying barrels of ore down to the railroad and hauling people, equipment and supplies back up the gorge to the mines.

\*\*\*

The boom could now begin. *Russell's Magazine* reported in 1858, “a species of contagious insanity broke out; the monomaniacal feature of which was now copper...Coat pockets protruded with the specimens they contained. Everybody talked copper.”<sup>34</sup> Speculators from New York, London, and from the rich cotton ports of Charleston, Savannah, and New

---

<sup>31</sup> Safford, 61-62.

<sup>32</sup> Currey, 76-77.

<sup>33</sup> Rosine M. Parmentier, “Journal of Rosine M. Parmentier, 1852,” (Cleveland Public Library, History Branch, Cleveland, TN). The comment was by a male friend traveling with Parmentier.

<sup>34</sup> “The Mining Interest at the South,” *Russell's Magazine* 3 (1858): 442-447.

Orleans formed corporations to jump into the scramble for the more promising mining sites. Skilled English copper miners came from Cornwall to provide the technical expertise. Local farmers rejoiced to find a market for their produce and livestock in the mining camps. Any man with a wagon and teams of oxen or mules could join the new workingman's aristocracy of the Copper Road freight haulers. Woodcutters and charcoal burners supplied the need for timber and fuel from the extensive hardwood forests. Certain local advantages aided the mining boom. At Lake Superior, northern ice and snow interrupted work and water-borne transportation for up to six months a year, and proved a misery to those whose experience of the lengthy winters was compounded by the great geographical isolation of the Upper Peninsula. In Tennessee, the milder climate allowed for work and travel throughout the year, and though the Basin was remote by eastern standards, there was no lack of supplies, news, mail, or fresh faces so long as the wagons kept rolling along the Copper Road.<sup>35</sup>

Ducktown mine operators also enjoyed the great advantage that the best copper ores lay at the surface where they could be easily worked. Copper readily bonded with sulfur, iron and other minerals in its natural state, forming different ores in different combinations. Additionally,

---

<sup>35</sup> For investment sources see contemporary corporate documents: Charter and By-Laws of the Burra-Burra Copper Company (1861) (headquarters in New Orleans), Charter and By-Laws of the Polk County Copper Company (1860) (New Orleans), and the report of the Union Consolidated Mining Company (1857) (New York, with directors in Charleston and Savannah), all from REB-TSLA, Reel 1, §8. Barclay asserts that the large majority of antebellum investors in Ducktown were American, not English. Barclay, *Ducktown Back in Raht's Time*, 47-49, 71. The extent of southern financing for Ducktown mining in the antebellum era serves as cautionary example to the usual New South themes of post-war northern capital for southern resource development; see Ronald L. Lewis, *Transforming the Appalachian Countryside: Railroads, Deforestation, and Social Change in West Virginia, 1880-1920* (Chapel Hill: University of North Carolina Press, 1998); Gavin Wright, *Old South, New South: Revolutions in the Southern Economy since the Civil War* (New York: Basic Books, 1986). Financing for Lake Superior mining came from Boston, New York, and Detroit; see William B. Gates, *Michigan Copper and Boston Dollars: an Economic History of the Michigan Copper Mining Industry*, Studies in Economic History (Cambridge: Harvard University Press, 1951), 31-38; Hyde, 32-43. The comparative advantages of the Lake Superior copper district and Ducktown are discussed in Gates, 3-5; Matthew Fontaine Maury and Richard Owen Currey, *The Polk County Copper Company of Tennessee: Its Mineral Resources and Mining Prospects* (New Orleans: Bulletin Book and Job Office, 1859), 7, 14. For the local impact of early Ducktown mining, see Barclay, *Ducktown Back in Raht's Time*, 40-41 (the mines as a local market), 263-265 (copper haulers as "aristocrats"), J. D. Clemmer, "John S. Hutchins Tells of His Copper Hauling Days," *Polk County News*, Feb 2, 1938.

atmosphere and water oxidized or decomposed ores lying close to the surface in a way that increased the percentage of copper. The action of both agents, especially with Ducktown's high annual rainfall (averaging over sixty inches), worked its chemical magic over millennia to create a layer cake of the different ores, each readily identifiable by its distinct color. At the surface, was the reddish-brown gossan comprised of iron pyrite, the stuff that fooled Lemmons, with some native copper. Below that was an extremely rich layer of decomposed ore known as black ore, though it appeared in different colors: red oxide (cuprite), black oxide, and green carbonate (malachite). The amount of copper in the black ores averaged 43 percent for red cuprite, 24 percent for the black oxide (the best samples contained 60 percent), and 21.5 percent for the green malachite. A layer of rock separated the rich copper oxides from the huge deposits of yellow copper pyrite below. The deep pyrite ores proved to be much leaner ore, containing only 1-5 percent copper, compared to the rich copper oxides near the surface.<sup>36</sup>

The percentages varied from sample to sample and from mine to mine, but all agreed that the red and black oxides were the best. They were cheap to mine because the shallow deposits did not require expensive underground shafts and because "the workman with his pick detach[ed] it with great ease." Miners stumbled upon an even easier source of copper once they learned how to precipitate it from the waters pumped out of the mines. They simply pooled the waters into reservoirs lined on the bottom with pieces of rust free scrap iron. The copper deposited onto the iron allowing workers to simply sweep it off with a broom. In 1859, three

---

<sup>36</sup> The ore description and percentages are from Currey, 81-84. There are many published analyses of the Ducktown ores, the most thorough of which is Emmons and Laney. The precipitation process is described in American Bureau of Mines and Union Consolidated Mining Company of Tennessee, *Report of the American Bureau of Mines* (New York: American Bureau of Mines, 1866), 7, Barclay, *Ducktown Back in Raht's Time*, 83, Charles Upham Shepard, *Report of Charles Upham Shepard, on the Ducktown Copper Region and the Mines of the Union Consolidated Mining Company, of Tennessee* (Charleston: Walker, Evans, 1859), 6.

mines, the Hiwassee, Eureka, and Isabella, obtained over 40,000 pounds per month in this manner.<sup>37</sup>

Fourteen mines opened between 1850 and 1854, yet for all of the activity, the mining boom did not immediately cause drastic wide-scale changes to the landscape. Frederick Law Olmsted, who would soon achieve fame for his design of New York's Central Park, traveled up the Copper Road to Ducktown during his 1853-1854 travels in the southern highlands. His only mention of the land was the comment that he "approached through the pretty valley of the [Ocoee], where...I met with hemlocks and laurels growing in great profusion." The social changes struck him more than the changes to the land. People at the mines constantly challenged him for being a speculator or a mineralogist. He dissuaded one curious person only after showing that his pouch contained "a pair of gloves, a knife, a corkscrew, a fleam, a tooth brush, a box of tapers, and a ball of twine" instead of ore samples and test implements. Informants told him of the recent population growth "of many thousand" in the Basin, and he noted the working population of "mostly white North Carolinians" and "several hundred Cornish men." The Cornish men enjoyed the high wages but longed for English wheat bread instead of corn bread, and for ale instead of corn whiskey. Yet he determined that the general population "must be remarkably scattered, for there is nothing like a village."<sup>38</sup>

J. D. Whitney, a federal geologist traveling through Ducktown at about the same time, noted that the area was heavily timbered with oak and other hardwood. It would not remain so

---

<sup>37</sup> The quotations are from Maury and Currey, 4-7. The precipitation process is described in American Bureau of Mines and Union Consolidated Mining Company of Tennessee, 7, Barclay, *Ducktown in Raht's Time*, 83, 256-257, Shepard, 6.

<sup>38</sup> The list of mines appears in American Bureau of Mines and Union Consolidated Mining Company of Tennessee, 7. Frederick Law Olmsted, *A Journey in the Back Country* (New York: Madison, 1860; reprint Williamstown, Mass.: Corner House, 1972), 242-246.

for long because the declining quality of the ore led the mines to begin smelting it on site in the mid-1850s. This in turn required the burning of entire forests to fuel the process. Initially, Ducktown mine operators shipped raw ore by wagon down the forty-mile length of the Copper Road and then by rail and ship to distant smelters in the northern states and even to Swansea, Wales. Freighters charged the same price for hauling high percentage ore as for low percentage material, thus mine profits declined as the best ore gave way to lower grades. Mine operators also realized that the greatest increase in the value of copper occurred at the smelting stage.<sup>39</sup>

The answer to both observations was to smelt the ore on site by roasting and smelting to increase the copper content. In his 1859 report, Professor Charles Upham Shepard described roasting as the use of fire to produce a form of black ore, “a microcosm of what for thousands of years had been going forward” through the effects of water and atmosphere. The process, developed in Swansea, began by piling eight feet of ore atop logs of wood. Workers ignited the wood to begin chemical combustion, so that “sulfur fumes pass off, and the whole mass begins to heat and ferment.”<sup>40</sup> The roasting phase lasted for months. Afterwards, the ores underwent smelting processing in two different kinds of furnaces interspersed with another round of open roasting. Reverberatory furnaces (essentially two-chamber ovens) calcinated or burned off additional sulfur, and blast furnaces melted and separated out iron and slag. The high quality ingot copper achieved after six stages of roasting and smelting was much cheaper to ship and a much more valuable product to sell. The amount and quality of Ducktown copper ingots encouraged others to establish a copper rolling mill and wire works in nearby Cleveland.<sup>41</sup>

---

<sup>39</sup> Ibid., 21, Barclay, *Ducktown Back in Raht's Time*, 53. Freight rates circa 1870 appear in Clemmer.

<sup>40</sup> Shepard, 4.

<sup>41</sup> Barclay, *Ducktown Back in Raht's Time*, 150-151, Emmons and Laney, 30-34.

What was good for copper companies was terrible for Ducktown forests. Without a railroad to import abundant southern coal into the Basin, wood was by necessity the only practical source of fuel. Cordwood fired the roast pits and the many furnaces consumed wood in the form of charcoal. Charcoal began as sawn timber. It was piled in a heap and then covered by clay or soil to slow burn with little oxygen in a manner that drove out water and volatile compounds without consuming the carbonized wood. The great hardwood forests of the Appalachian Mountains fell by the square mile to be reduced to charcoal for iron forges and copper smelting up and down the East Coast.<sup>42</sup>

An 1858 report to the shareholders of the Polk County Copper Company discussed wood requirements in Ducktown: an acre of forest yielded forty cords (a stack of wood 4 ft. high x 4 ft. wide x 8 ft long); each cord produced 33 bushels of charcoal; and a single blast furnace consumed 260 bushels of charcoal each day. Restated, each furnace burned approximately 75 acres of forest annually. The company assured its investors that it owned 750 acres of oak forest that would supply one blast furnace for ten years, enough to meet needs until the anticipated arrival of the railroad that would finally bring coal from the Cumberland Mountains.<sup>43</sup>

If it were only a matter of one smelter, the loss of 750 acres (approximately 1.2 square miles) of forest over ten years might have been acceptable given the huge expanses of Appalachian woodlands. And for herdsman, cutting down some of the woods had the incidental benefit of opening land for cattle grazing. The reality was much worse because of the cumulative fuel requirements for all of the smelters from all of the mines, plus the demand for lumber to

---

<sup>42</sup> Andrew J. Baker, "Charcoal," in Richard C. Davis, ed., *Encyclopedia of American Forest and Conservation History*, vol. 1 (New York: Macmillan, 1983), 73-77.

<sup>43</sup> Whitney's observation appears in Barclay, *Ducktown*, 53. The fuel statistics are from Maury and Currey, 11. Barclay argued a greater rate of forest loss using the figure of 20 cords to the acre rather than Currey's 40 cords, Barclay, *Ducktown Back in Raht's Time*, 262-63.

construct mines, offices, stores, and housing. In 1858, *Russell's Magazine* issued a prescient warning of the threat to southern mining from “the consumption of all available timber for fuel, greatly assisted...by the abominable practice of burning off the cattle ranges” (burning promoted pasturage by preventing the re-growth of trees). The magazine recommended adoption of European forestry practices to ensure sustainable resources of wood and charcoal, but this suggestion would remain unheeded in the southern Appalachians for a half century until the 1911 Weeks Act authorized the creation of national forest reserves in the East.<sup>44</sup>

\*\*\*

Forests could be expected to regenerate in Ducktown's moist, temperate climate but for the impact of sulfur smoke pollution, a problem noticed very early in the course of Ducktown mining history. Eugene Gaussoin, a Ducktown mining engineer, applied his professional eye to the phenomena in 1860, writing “Not a single tree worth sawing is left on the five hundred acres of the Hiwassee property, and on the one hundred and sixty acres of the Coheco, part of the timber is dead from the sulfurous vapors of the neighboring smelters.”<sup>45</sup>

Hardin Taliaferro, a Baptist preacher and nationally popular humorist, discussed the matter in his otherwise exuberant 1860 piece in the *Southern Literary Messenger*, “Ducktown, By ‘Skitt’ Who Has Been ‘Thar’.” Like Olmsted, the narrator, Skitt, ascended the Copper Road, describing it as “romantic in the extreme” though crowded with “Wagons! Wagons!! Wagons!!!” loaded with copper ore. At the top, Skitt left behind the stirring waterfalls and crags of the Ocoee gorge to gain a much different vista in Ducktown: “Look down about the centre of this Basin and behold those huge columns of smoke ascending towards heaven, spreading out at top like vast

---

<sup>44</sup> “The Mining Interest at the South,” 446.

<sup>45</sup> Eugene Gaussoin, *The Ducktown Copper Mines of Tennessee, Their Value, Present Management, and Future* (New York: by the author, 1860), 18.

sheaves.” Most of the mines had smelters, and from each came smoke “covering the heavens with a smoky pall.” Turning his gaze from the darkened skies to the valley floor, he cried out, “See! Their sulphurous smoke has killed most of the timber near them!”<sup>46</sup>

It would be unwarranted to read a tone of sylvan apocalypticism into Taliaferro’s Ducktown sketch. It was essentially humorous in tone, being one of six “Skitt” pieces he published in the *Literary Messenger* about people and places in the South. The Ducktown article was cast as a framed story involving a dialogue between the visiting sophisticate and several yokels about the boomtown conditions in the Basin, of which the smoke was only one aspect. More space was given to a rube’s tale of how, before the Copper Road and the start of mining, the greatest source of local income was the “witness ticket” or fee given to indolent Ducktown folks who hiked on footpaths over the mountains to attend court in the county seat of Benton down below in the Tennessee Valley. Gaussoin was even less of an antebellum environmentalist. His concern was the pragmatic determination of whether there was enough local wood on one company’s property to warrant the installation of a sawmill. As with most others, he saw wood merely as a logistical problem to be solved to keep the smelters burning.<sup>47</sup>

Mine operators solved the wood problem in the near term with resources on their own lands or by purchasing charcoal from local sources. The more serious problem was insufficient capitalization. Many of the several dozen mining companies chartered by the Tennessee legislature either failed to commence at all or spent too much money on acquiring land and not

---

<sup>46</sup> Hardin E. Taliaferro, "Ducktown, By "Skitt," Who Has Been "Thar"," *Southern Literary Messenger* 31 (November 1860). Note, many sources spell “Hardin” with an “e,” but the American National Biography says it is properly spelled with an “i.” For discussion of the southwestern frame story, see Ron Powers, *Mark Twain, A Life* (New York: Free Press, 2005) 19-21; Walter Blair, *Native American Humor* (San Francisco: Chandler, 1960), 90-101.

<sup>47</sup> Taliaferro’s sketches are collected in Hardin E. Taliaferro and Raymond C. Craig, *The Humor of H. E. Taliaferro* (Knoxville: University of Tennessee Press, 1987).

enough on operations. This, and the added costs of building and operating smelters, led to a wave of consolidation in the late 1850s that resulted in three main operations: Union Consolidated Mining Company of Tennessee (the largest), Polk County Copper Company, and Burra-Burra Copper Company of Tennessee. Each of the three managed to grow and prosper right up to the eve of the Civil War, producing together over three million pounds of copper annually. The mines directly employed about one thousand men and indirectly provided livelihoods to thousands more teamsters, woodcutters, merchants, farmers and their families.<sup>48</sup>

\*\*\*

A German immigrant, Julius Eckhardt Raht, was the guiding figure behind the formation of Union Consolidated Mining Company and became, by virtue of his many skills and indomitable spirit, the leading figure of the first era of the Ducktown copper industry. Raht was born in 1826 in the German Duchy of Nassau, where his father served as an appellate judge. The young man was educated in Bonn and Berlin in the fields of chemistry and mineralogy. The political and religious chaos of the failed German Revolution of 1848 prompted him, like thousands of other Germans, to emigrate to America. He explored mining operations in several parts of the United States before deciding that Tennessee's new copper industry provided the best opportunity to display his talents and to make his fortune. He was appointed captain of the mines soon after his arrival in 1854 and remained closely involved with the industry for the remainder of his life. During the next quarter century, he so dominated the first era of Ducktown's copper industry that the period became known as "back in Raht's time," a phrase that Ducktown historian, R. E. Barclay, captured as the title of his first book.<sup>49</sup>

---

<sup>48</sup> For the consolidations and population, see Barclay, *Ducktown Back in Raht's Time*, 40, 77-83. For antebellum production figures see Emmons and Laney, 30-31.

<sup>49</sup> The biographical sketch is from Barclay, *Ducktown Back in Raht's Time*, 186-205, 246-249.

\*\*\*

The outbreak of Civil War sorely tested Captain Raht's leadership skills. Ducktown copper was a critical military resource used to manufacture cannons, impact fuses for artillery shells, bullet casings for the newer breech-loading guns, percussion caps for the more common muzzle-loading weapons, and miles of telegraph wire. Ducktown lay in a politically unstable part of the Confederacy; many mountaineers in East Tennessee remained loyal to the Union while Polk County voted for secession and formed five companies of Confederate troops, including two from Ducktown.

On the eve of the war, northerners owned most of the mine shares and received most of the mine product. The Confederate government responded by sequestering Yankee shareholdings under a decree issued in January 1862, and selling them to southern sympathizers to ensure production and supply of copper for the war effort. Captain Raht remained in Ducktown, now supplying copper to the South. The mines remained active until November 1863 when federal troops destroyed the railroad and copper mills at Cleveland, effectively putting an end to operations at Ducktown for the duration of the war. (Raht left Ducktown and sat out the war in Cincinnati.) Union planners had no interest in operating the mines since they had adequate supplies of copper from the Lake Superior mines. With the mines closed, the workers scattered, the idle pumps allowed the mines to flood, and Ducktown fell to marauding bands of guerrillas.<sup>50</sup>

---

<sup>50</sup> For the importance of Ducktown to the confederate war effort and the course of events during the war, see Barclay, *Ducktown Back in Raht's Time*, 87-101, Ralph W. Donnelly, "Confederate Copper," *Civil War History* 1, no. 4 (1955). For the differing allegiances in the southern Appalachians see generally Kenneth W. Noe and Shannon H. Wilson, *The Civil War in Appalachia: Collected Essays*, 1st ed. (Knoxville: University of Tennessee Press, 1997). For a local pro-southern view see A. J. Williams, *Confederate History of Polk County, Tenn., 1860-1866* (Nashville, Tenn.: McQuiddy Print. Co., 1923; reprint, Signal Mountain, Tenn.: Mountain Press, 2002). The January 24, 1862 decree of sequestration was issued in the matter of Confederate States of America v. Union Consolidated Mining Co., and a copy of the decree may be found in REB-TSLA, Reel 1, §9.

Peace brought an end to the smoking guns and an immediate resumption of smoking copper furnaces. Captain Raht immediately returned to restore the industry pumping out the mines, restoring the works, and repairing the Copper Road. Returning mine workers were no doubt glad to have an income in the economically prostrate former confederacy. He gained the financial backing of reinstated northern owners by selling 200,000 pounds of ingots hidden in the mines from the Yankees and new copper precipitated from the flooded shafts as they were emptied. In the first year after war's end, Ducktown produced over one million pounds of copper. Those accomplishments were industrial miracles in the wreckage of the post-war South, but the spectacular revival could not hide four inter-related problems that threatened a peacetime closure of the mines: lack of direct railroad service to Ducktown, the increasing problem of wood supply, the exhaustion of the black ore, and the post-war decline of copper prices.<sup>51</sup>

The postwar annual reports of the Union Consolidated, Burra-Burra, and Polk County copper companies repeatedly addressed each of these problems. Exhaustion of the rich, easily reached black ores forced miners to incur the expense of digging tunnels to reach the lower quality yellow ore. Burra-Burra justified the cost of a 250-foot shaft by pointing to the "prospect of soon developing a large and inexhaustible supply of yellow ore."<sup>52</sup> Wood and charcoal presented problems of both cost and supply. Union Consolidated reported in 1866 that it bought a wood lot of 1,800 acres, a substantial tract of roughly three square miles, yet insignificant against its annual requirement of 1,200 -1,500 acres per year. Together, the copper companies logged out 30,000 acres or 47 square miles of timber in the Basin between 1865 and 1878. Plenty of wood remained miles away in the surrounding mountains, but the cost of cutting and

---

<sup>51</sup> American Bureau of Mines and Union Consolidated Mining Company of Tennessee, 8, Barclay, *Ducktown*, 130-133.

<sup>52</sup> Burra-Burra Copper Company of Tennessee, "Shareholder Report," 1871, REB-TSLA.

transporting it increased with distance and further strained the limited number of men, animals, and wagons in a region that still suffering the depopulation and destruction of war.<sup>53</sup>

Desperate operators pulled up and burned stumps from older woodlots and also turned to the forests at the headwaters of the Toccoa-Ocoee River where timber from still abundant forests could be logged and floated downstream to the smelters. The State of Georgia did its part to keep the fires burning. It passed a law in 1876 making it a crime “to obstruct, by the erection of fish traps, or otherwise... the main current of Toccoa River, in Fannin County, to the width of thirty feet, so as to interrupt or interfere with rafting or floating timber.” In 1878, it declared the Toccoa “a navigable stream so far as to authorize any person desiring so to do to float timber thereon.”<sup>54</sup> Both acts faced opposition from ordinary Georgians who had long asserted their common law riparian rights to fish in the river. For them, fishing was more than a pleasant pastime; it was also a way to supplement the limited corn and pork diets of the mountaineers. Recreational fishermen used rods and reels. White mountaineers and the Cherokees before them built fish traps across the river to catch large amounts of fish to feed many mouths. The new laws stirred resentment by subordinating the rights and needs of ordinary Georgians to the economic interests of the copper companies across the border.<sup>55</sup>

---

<sup>53</sup> Barclay, *Ducktown Back in Raht's Time*, 262-263 (statistics), Union Consolidated Mining Company of Tennessee, "Shareholder Report, 1866," REB-TSLA, Reel 1, Sec. 8, 5.

<sup>54</sup> The statutes appears in *Georgia Laws* (1876), vol. 1, 388, §1 and *Georgia Laws* (1878), vol. 1, 187 §1.

<sup>55</sup> There is a growing literature regarding the tensions of class and economics as they intruded upon common law rights or traditions of hunting, fishing, timber harvesting, and the use of waterpower for milling. See for example: Steven Hahn, *The Roots of Southern Populism: Yeoman Farmers and the Transformation of the Georgia Upcountry, 1850-1890* (New York: Oxford University Press, 1983) (stock laws as an element of Redeemer control over yeomen); Karl Jacoby, *Crimes against Nature: Squatters, Poachers, Thieves, and the Hidden History of American Conservation* (Berkeley: University of California Press, 2001) (a negative view on the social impact of game regulations); Richard William Judd, *Common Lands, Common People: The Origins of Conservation in Northern New England* (Cambridge, Mass.: Harvard University Press, 1997) (game laws as a local initiative); Theodore Steinberg, *Nature Incorporated: Industrialization and the Waters of New England*, Studies in Environment and History (Cambridge England: Cambridge University Press, 1991) (corporate control of New England rivers); Harry L. Watson, "The Common Rights of Mankind: Subsistence, Shad, and Commerce in the Early Republican South," *The Journal of American History* 83, no. 1 (1996): (subsistence fishing impaired by slave owners and commercial interests).

Deeper, leaner ore and ever more distant wood supplies ran up the costs of production at the same time that market prices for copper dropped precipitously. The expected post-war drop in price was compounded by additional factors. Imported South American copper and the rapid transition from copper-bottomed wooden ships to metal-hulled vessels acted to reduce demand for American metal. Copper prices fell from thirty cents per pound in 1865 to nineteen cents in 1870. Mine operators struggled to reduce costs by increasing production efficiency in every possible way, but it was not enough. Only the arrival of the railroad in Ducktown could save them by bringing cheap coal for the furnaces and more and larger equipment to boost economies of scale. In their 1869 annual report, managers of the Polk County Copper stated, “[W]hen this road is finished, the cost of producing refined copper...will be reduced forty percent by the substitution of mineral coal for wood and charcoal now used.” Coal not only cost less, but it burned so efficiently that “time now required to covert the raw ore to refined copper, four months, would be shortened two-thirds.” The Burra-Burra Copper Company informed its shareholders in 1871, “all that is now needed to place the mining and refining of copper, at Ducktown, on a level with the most certain and remunerative industries of the country, are railway facilities to the mines.” The Union Consolidated Mining Company told its investors in 1871 that, “compared with the saving in production of copper this railroad would effect for us, every other improvement sinks into insignificance.” The UCMC’s, Captain Raht stated the matter in more ominous terms, warning that without a railroad, “Nothing can be done at Ducktown until the Resurrection takes place.”<sup>56</sup>

\*\*\*

---

<sup>56</sup> Burra-Burra Copper Co., Report to Stockholders, 21 February 1871; Polk County Copper Company, "Report to the Board of Directors of the Polk County Copper Company at a Special Meeting Held October 20<sup>th</sup>, 1869", 4; Union Consolidated Mining Company of Tennessee, Report to the Stockholders, 21 June 1871, all REB-TSLA, Reel 1. The Raht quotation appears in Barclay, *Ducktown Back in Raht's Time*, 217.

The point was not lost on others. As Barclay related in his *The Railroad Comes to Ducktown* (1973), over a dozen competing, usually under-funded, rail ventures attempted to reach Ducktown from the east over the mountains from Asheville, North Carolina, from the south through the Blue Ridge from Marietta, Georgia, and from the west up the Ocoee Gorge from Cleveland, Tennessee. Each state saw Ducktown as the justification for railroad, and in turn, each saw the railroad as the means for boosting all forms of commerce in the southern Appalachians by creating a transmountain link to the national rail network. Year after post-war year, the mining companies repeatedly upheld the prospect of tracks running, through Ducktown from “the Atlantic seaboard on the one hand, to the Great West on the other” in their plea for financial support and patience from their shareholders.<sup>57</sup>

Hope died on both ends of the line. One railroad company after another collapsed under the financial and technical burdens of laying track in the mountains. As one company failed, another rose to continue the work. Yet overall, progress failed to occur at a pace that could justify continued operation of the mines under conditions of low copper prices, local wood shortages, exhaustion of the richer ores, and the high costs of wagon transportation on the forty-mile Copper Road to the nearest tracks in Cleveland, Tennessee.<sup>58</sup>

A quarter century of mining had transformed much of the Basin landscape from what existed at the time of the Cherokee Removal in 1838 and into the early 1840s. Most of the nearby forests were leveled. Mine buildings, stores, and dwelling now stood where only scattered farms could be found a quarter century earlier. Open pits and mine shafts marked the areas where

---

<sup>57</sup> Robert Edward Barclay, *The Railroad Comes to Ducktown* (Knoxville, Tenn.: Cole Printing and Thesis Service, 1973), 1-91. The quotation is from Polk County Copper Co., “Report to the Board of Directors, 20 October 1869, REB-TSLA, Reel 1.

<sup>58</sup> For the factors leading to the decline of the industry, see, Barclay, *Ducktown Back in Raht's Time*, 133-158.

miner dug to reach the rich oxide ores near the surface and the sulfurets deeper down. Areas of denuded ground surrounded the roasting yards and smelters. Yet the area's mountainous topography had so far frustrated every effort to bring the railroad to Ducktown.

The local mining industry was dying. Captain Raht, the hero of its post-war recovery, was now the target of shareholders in the United Consolidated Mining Company. They could not understand how he remained one of the richest men in Tennessee, while their dividends stopped and share prices declined. As the only person or entity with a deep pocket left in Ducktown, he inevitably came under fire in a shareholder lawsuit alleging various financial misdeeds during his stewardship of company operations. The truth was much simpler. He made his fortune legally by running a commissary business to supply food and sundries to the miners, and then by making shrewd investments of his profits throughout Ducktown and eastern Tennessee.<sup>59</sup>

He won his case, but nothing, short of rail access, could save the local copper industry. One by one, insolvent companies allowed the smelter fires to die, the last of them in 1878. Captain Raht then died in 1879. It was the end of an era. Workers dispersed, mines again flooded, and investors counted their losses. And, as anyone could have seen from the mountain peaks surrounding the Basin, "those huge columns of smoke" no longer covered "the heavens with a smoky pall."

---

<sup>59</sup> Barclay tells the story of the suit in chapters 14 and 15 of *Ducktown Back in Raht's Time*, 159-84. He also adds that Raht effectively forced miners to rely upon commissary credit by paying wages quarterly instead of monthly or weekly, 122-123.

## CHAPTER 2

### “BUT NOW HE CAN SELL NOTHING”: THE REVIVAL OF DUCKTOWN

#### MINING AND THE FIRST FARMER SMOKE SUITS

The railroad did eventually reach Ducktown. On a bright summer day in 1890, a train full of businessmen, politicians, and reporters left the terminal in Atlanta for the first rail trip to Knoxville by way of Ducktown. Proceeding over tracks laid by wage-earning white mountaineers and shackled, mostly black, convict laborers, it chugged northward ever higher through the foothills in Cherokee and Pickens counties to pierce the Blue Ridge Mountains in Gilmer County at the old Indian town of Ellijay. It continued up a narrow valley into Fannin County where it crested the mountains at the town of Blue Ridge. From there it followed the Toccoa River into the Ducktown mining district. Waiting at the McCays Depot (later renamed Copperhill), were several hundred people and a brass band to honor the momentous occasion. All eyes turned up river to see the first puffs of smoke from the train's smokestack; all ears strained to hear the locomotive's whistle and bell. When the train arrived, the brakes squealed, the band played, and then a hush came over the crowd as local dignitaries read and delivered a proclamation to the passengers. In the grandiloquent phrasings of the times, the proclamation stated, “We hail this event as the beginning of an era of matchless growth and prosperity to this, one of the richest sections of the South” made possible because “our inexhaustible supplies of copper...are now accessible to the outside world.”<sup>1</sup>

---

<sup>1</sup> B. F. Perry, “The First Trip by the Hiwassee—the New Line to Knoxville,” *Atlanta Constitution*, 23 August 1890, 3.

This was one of those rare moments when booster rhetoric rested firmly on present realities rather than airy hopes. Ducktown's copper resources were a proven fact, as was the demand for the metal to supply America's booming telephone, telegraph, and electrical industries. Completion of rail connections to Atlanta and Knoxville provided the remaining element necessary for the revival of mining in the district. The combination of abundant copper ore, an eager market, and rail access was irresistible to investors. London investors, operating as the Ducktown Sulphur, Copper & Iron Company, Ltd. (DSC&I), monitored the course of railroad construction, purchased the holdings of the old Union Consolidated Mining Company, and invested heavily to reopen the mines as the final lengths of track were laid. Another group of investors from Pittsburgh purchased the assets of the old Polk County Copper Company in 1891 and operated them as the Pittsburgh and Tennessee Copper Company. The third, and eventually, dominant entity in Ducktown's restored industry was the Tennessee Copper Company (TCC). Created by New York City capitalists, it acquired the struggling Polk County Copper Company and purchased dormant mining properties held by the heirs of Captain J. E. Raht in 1899. Each of the companies pumped out the water that had seeped from the rocks and flooded the long dormant mines. They brought in mining engineers and re-hired workers to rebuild, refurbish, and expand every aspect of the mine works. Now with a locomotive puffing away at the depot, the Basin's economic prospects were as solid as the rails that brought the train to them.<sup>2</sup>

\*\*\*

Rail access simultaneously secured Ducktown's future and ended twelve terrible years of local economic depression that followed the closing of the mines in 1878. The closing struck the district with terrible force because copper and the course of white settlement in the Basin were as

---

<sup>2</sup> The three companies are discussed in Robert Edward Barclay, *The Copper Basin, 1890 to 1963* (Knoxville ?, Tenn.: by the author, 1975), 1-48.

closely entwined as a muscadine vine on a tree. Prospectors and geologists discovered copper in Ducktown in the first decade following the Cherokee Removal. The industry grew in earnest in the 1850s and remained a nationally significant industry for the next quarter century, except for a brief hiatus during the latter years of the Civil War. In the years before the war, Ducktown achieved a level of sustained industrialization that most areas of the mountain South would not experience until the end of the nineteenth century when advancing railroads allowed large-scale coal mining to penetrate higher into the Appalachians. Ducktown's rich deposits of copper oxides, while they had lasted, allowed it to prosper during its first era even when the nearest railroad was a forty miles and a four day round trip by mule-drawn wagon to the tracks in Cleveland, Tennessee, on the other side of the Unaka Mountains. A generation of Ducktown residents had grown up with copper before the mines closed in 1878.<sup>3</sup>

When the clouds of smelter smoke drifted away from the dormant furnaces, the local economy drifted away with it. The population collapsed as jobless miners and their families left the Copper Basin to pursue gainful labor elsewhere. Most of the loggers and teamsters also lost their livelihoods. Many local farmers followed their former customers out of the Basin. Perhaps four or five thousand people lived in the Basin before the closure. Carl Heinrich, a mining engineer for the Pittsburgh and Tennessee Copper Company, said that by 1888, "less than five

---

<sup>3</sup> Robert Edward Barclay, *Ducktown Back in Raht's Time* (Chapel Hill: University of North Carolina Press, 1946), 126-28. For illustrative works on Appalachian industrialization see Ronald D. Eller, *Miners, Millhands, and Mountaineers: Industrialization of the Appalachian South, 1880-1930* (Knoxville: University of Tennessee Press, 1982); Ronald L. Lewis, *Transforming the Appalachian Countryside: Railroads, Deforestation, and Social Change in West Virginia, 1880-1920* (Chapel Hill: University of North Carolina Press, 1998); Paul Salstrom, *Appalachia's Path to Dependency: Rethinking a Region's Economic History, 1730-1940* (Lexington: University Press of Kentucky, 1944).

hundred tried very hard to eke out a scanty subsistence, hoping for better times from the revival of the once flourishing copper mines.”<sup>4</sup>

The farmers who remained lamented the loss of the market for the grain, vegetables, and fruit they formerly sold to the mining community. This was more than an inconvenience; little of what they grew could be profitably hauled over the mountains to distant markets. They could supply most of their food needs from the crops and hogs they raised, but they needed to purchase or barter for coffee, salt, powder, shot, and other items that could not be made or produced on the farm. They also needed cash for property taxes. Some farmers made a tedious journey of one or two weeks to lowland towns to sell white beans, sorghum molasses, and perhaps ginseng and other wild products. Others raised cattle on the cutover woodlands of the Basin. As had been true since colonial times, it was often easier and more profitable to drive livestock on the hoof out of the Appalachians to Atlanta, Dalton, and Cleveland than it was to carry produce by wagon over the miserable mountain roads.<sup>5</sup>

Though the mining-dependent populace suffered, the suspension of operations allowed the Ducktown landscape to begin a limited recovery. The scale of operations had been small enough during the first era of mining that most of the land retained sufficient fertility for some form of vegetation in the moist and now smoke-free climate. Some areas of barren ground remained in the vicinity of the roasting and smelting yards along Potato Creek where extensive exposure to toxic fumes denuded the soil and left it exposed to erosion under the heavy mountain

---

<sup>4</sup> Carl Heinrich, quoted in Brief and Argument of the Ducktown Sulphur, Copper and Iron Company, Ltd. on Final Hearing, 19-20, *Georgia v. Tennessee Copper*, United States Supreme Court, No. 5 Original, October Term, 1906.

<sup>5</sup> James W. Taylor, “Ducktown Desert: A Study of the Impact of Industrial Culture upon the Physical Development of a Secluded Area of the Southern Appalachians,” (M.A. thesis, Syracuse University, 1947), 45-46. For Appalachian droving practices see Wilma A. Dunaway, *The First American Frontier: Transition to Capitalism in Southern Appalachia, 1700-1860*, (Chapel Hill: University of North Carolina Press, 1996), 218-21; Salstrom, *Appalachia's Path to Dependency*, 8-9, 37, 123.

rains. In other, less damaged areas, second growth forest rose in many areas of the cutover land where the great hardwood stands once grew. Grasses and sedges exploited other areas of treeless space, creating a great expanse of pasture unusual in the heavily wooded Appalachians.<sup>6</sup>

Wide expanses of mountain grass and the range law attracted herds and herdsman to Ducktown from throughout the region. The law of open range prevailed at the time in the Basin; so the right to graze existed to all, without regard to property titles, except where title owners took the trouble to fence livestock out. Farmers had the burden of protecting their crops and orchards from free-ranging animals by raising fences around the cornfields, vegetable patches, and fruit trees. (The later fence laws reversed the burden by requiring livestock owners to fence in their animals.) The teeth and hooves of cattle and sheep kept trees from reclaiming the open ground. Herders enhanced the process by lighting fires every year to burn away young trees. Mining and logging altered Ducktown's former landscape of thick hardwood forests interspersed by small fields along the creek bottoms. Now, livestock grazing and the deliberate use of fire continued and extended those changes over much of the Basin.<sup>7</sup>

\*\*\*

Those few who stubbornly remained in the Basin during the hard times did so by clinging to the hope, and not without reason, that the railroad would eventually come to revive the copper industry and the fortunes of all who depended upon it. Even in the depths of the Basin's economic doldrums, the economic logic for a rail line to Ducktown remained strong enough to inspire continued investment and construction even after the mines had closed in 1878.

---

<sup>6</sup> Nora Lynn Foehner, "The Historical Geography of Environmental Change in the Copper Basin," (M.S. thesis, University of Tennessee, Knoxville, 1980), 11-24; Taylor, "Ducktown Desert," 45-46.

<sup>7</sup> Ducktown grazing and fire practices are discussed in Richard Wood, "Erosion Control and Reforestation of the Copper Basin," (Knoxville, Tenn.: Tennessee Valley Authority, Watershed Protection Division, Department of Forestry Relations, 1942), 7-8; R. E. Barclay, "Introduction to the Copper Basin," (pamphlet), TSLA, Barclay Papers, reel 8.

Ducktown's copper resources and rapid industrial growth in the American economy made it likely that mining companies would return to the Basin if the transportation problem was solved. The hopes of those who longed for the return of the industry gained strength with the advance of the Marietta & North Georgia Rail Road (M&NGRR) north from Atlanta and the Knoxville Southern Railway southwards from Knoxville.

The M&NGRR was the older of the two efforts, being chartered by the Georgia General Assembly in 1854. The burdens of the Civil War, the dearth of capital during Reconstruction, the distractions of business litigation, and the technical challenges of building railroads in the mountains caused it to flounder for decades. An infusion of northern capital in 1880 and the eager contributions from the mountain counties enabled it to extend northward, and convict labor extended the line to Jasper in 1883, Ellijay in 1884, and Blue Ridge soon thereafter.<sup>8</sup>

Notoriety surrounding the use of convict labor cast a shadow over the progress of construction. The state of Georgia leased black prisoners, often convicted on pretext charges, to private contractors at rates much lower than the going wages for labor. So many black men were reduced to this form of involuntary servitude that an 1876 *Atlanta Constitution* article under the headline "The Biped Zebra" considered its use on the M&NGRR and concluded that "at this rate it appears that the Negro is firmly and surely going back to a slavery that is worse than the one from which he was rescued, viz. a penal servitude."<sup>9</sup> From the perspective of the state, the practice accomplished several purposes: it relieved the cash-strapped post-war government of the expense for housing prisoners, while ostensibly providing revenue from the leasing; it provided a pool of labor for rebuilding the state's war-torn infrastructure, especially the railroads; and it

---

<sup>8</sup> Robert Edward Barclay, *The Railroad Comes to Ducktown* (Knoxville, TN: Cole Printing & Thesis Service, 1973), 61-90.

<sup>9</sup> "The Biped Zebra," *Atlanta Constitution*, 8 April 1877, 4.

provided a powerful means to reassert white control over blacks that had been lost with emancipation. The system was rife with racism and brutality. In the same article, it was noted that “there is not a court in Georgia in which the Negro is not given precisely the same justice that is meted to the white man, and yet nineteen of every twenty convicts are Negroes.” Contractors eagerly snapped up under-priced labor. The going rate for free black male labor was \$120 per annum, and yet the state leased each man to the railroad for \$11 per annum. News of abuses to black men could be suppressed; but when a young white man was whipped to death for escaping from an M&NGRR chain gang, the incident led to press coverage and an investigation.<sup>10</sup>

Construction on the Atlanta & Knoxville line gained notice on a more positive note: the great engineering challenge required to bring the railroad up from the Tennessee Valley through the gorge of the Hiwassee River to reach the heights of Ducktown. Railroad speculators long dreamed of reaching Ducktown from the Tennessee Valley by way of the Ocoee Gorge along the path of the Copper Road. That plan never gained any practical momentum and died along with the hopes of those investors who put their money into it. Now, a later set of visionaries with greater capital, including money from a bond issued by the city of Knoxville, sought to reach Ducktown by way of the even more tortuous Hiwassee Gorge, to the north of Ducktown. Track workers clawed their way up the Hiwassee to a point where they were confronted with a 425-foot escarpment between the riverbed and the Ducktown plateau above. They first created a series of switchbacks, carving the side of the mountain wall with a series of giant zigzags of track. This

---

<sup>10</sup> “A Convict’s Death,” *Atlanta Constitution*, 14 September 1881, 8. The use of convict labor in Georgia is discussed in A. Elizabeth Taylor, “The Origin and Development of the Convict Leasing System in Georgia,” *Georgia Historical Quarterly* 26, (1942): 113-28. For convict labor on southern railroads, see Scott Reynolds Nelson, *Iron Confederacies: Southern Railways, Klan Violence, and Reconstruction* (Chapel Hill: University of North Carolina Press, 1999); Alexander Lichtenstein, *Twice the Work of Free Labor: The Political Economy of Convict Labor in the New South* (New York: Verso, 1996).

required a train to proceed forward up one leg and then back up the next leg in successive fashion until gaining the top. Though it worked, it was slow and it necessarily reduced the length of a train to three or four cars to accommodate the shortest leg of the zigzags. Engineers soon devised a better approach by running a climbing spiral of track around Bald Mountain to its top where a trestle crossed over the chasm to the plateau. The resulting Hiwassee Loop circled the mountain one-and-half times so that the front end of a long train crossed over its tail as it climbed.<sup>11</sup>

The mighty feats of railroad engineering, the injection of foreign capital into the mines, and the realistic prospects of renewed prosperity gave the crowd at the McCays Depot plenty to cheer about as they met the train from Atlanta. Everyone on the station platform knew that the distinct puffs of locomotive smoke they saw gently wafting over the river would soon be followed by massive clouds of dense, odorous sulfur smoke from the reopened roast heaps and smelters—the sight and smell of money. Miners and farmers rejoiced together. Few if any of them anticipated that the returning smoke clouds would give rise to a quarter-century of smoke litigation.

\*\*\*

The railroad immediately produced economies of scale for Ducktown miners. One mining engineer commented that before rail access, the industry relied upon charcoal at the cost of ten cents a bushel (twenty pounds), and afterwards, trains brought coal by the carload from Kentucky at \$3.00 per ton. Other forms of technology improved production and lowered costs. Miners once used sledgehammers and hand drills to make holes for explosive charges to rip the ore from the earth; now they used diamond-tipped steam powered drills. Dynamite replaced

---

<sup>11</sup> Barclay, *Railroad*, 104-07.

black powder. A steam plant powered the mine hoists that lifted ore from the depths and the crushers and stamping mills that broke it into bits. Locomotives, instead of mules, hauled ore cars from the mines over a network of local rail lines to centralized roasting yards and smelting furnaces. Blast furnaces further refined roasted ores by forcing air through molten metal. Many of the advances were first employed by Capt. Raht's miners towards the end of Ducktown's first era of mining; now the combination of the railroad and abundant capital made their use widespread.<sup>12</sup>

New technology employed by Ducktown Sulphur, Copper & Iron Company and by the Tennessee Copper Company boosted production rates and reduced costs for almost every aspect of copper mining, except for the continued use of open heap roasting. This had been the state of the miner's art for initial smelting of pyritic (sulfurous) ores for centuries and remained in place despite the production inefficiencies it created. Roasting remained a slow process that could not keep up with the much faster secondary smelting performed in the furnaces. Roasting required one to three months for each mound of ore. Blast furnaces could do the secondary smelting of the same amount of ore in a few days. The difference created a production bottleneck that could be solved only by increasing the number of roasting heaps—or by finding a means to accomplish primary smelting without roasting. The copper companies chose to expand the number of roast heaps. DSC&I established two huge roast yards in the early 1890s, and then TCC built another when it began production in 1901. The three major roast yards, each up to half a mile long, consisted of hundreds of burning heaps. Each heap started with a layer of cordwood, then coke,

---

<sup>12</sup> Henrich, quoted in Brief and Final Argument of Ducktown Sulphur, Copper and Iron Co., 20; Barclay, *Ducktown*, 146-47.

then hundreds of tons of ore in a pile five feet wide, ten feet long, and five feet high. Open sheds covered the heaps to prevent rain from slowing combustion and from leaching out the copper.<sup>13</sup>

Though they continued roasting, it was not for lack of trying alternatives. Powerful economic incentives spurred efforts by Ducktown Sulphur, Copper & Iron Company to create a viable method for roasting sulfurous ores within a furnace (a process called pyritic smelting) instead of on open heaps. Pyritic smelting would reduce the production bottleneck because it was a faster process. The enclosed furnace retained heat to cook the sulfur out of the ore more efficiently than open heap roasting. Less coke and timber would be needed for fuel because the furnace could burn the combustible sulfur within the ore. Pyritic smelting would also be a major step towards the recovery of the sulfur because the sulfur-laden smoke could be then drawn from the furnace chimney for further processing. Sulfur was a valuable commodity and its use, especially in the form of sulfuric acid, was important to almost every aspect of industrial chemistry. It was also essential to convert phosphate rock into the superphosphate fertilizer so badly needed to replenish the worn out cotton fields of the South. London investors proclaimed the importance of sulfur by the priority they gave to it in the company's name: the Ducktown *Sulphur, Copper & Iron Company, Ltd.*<sup>14</sup>

---

<sup>13</sup> Sources generally agree on the scope and process of Ducktown heap roasting but differ on certain details. I present a composite drawn from: Barclay, *Copper Basin*, 4-5, 33-46; Barclay, *Railroad*, 179-80; M. L. Quinn, "The Appalachian Mountains Copper Basin and the Concept of Environmental Susceptibility," *Environmental Management* 15, no. 2 (1991): 580-83; James Smallshaw, "Denudation and Erosion in the Copper Basin," (Knoxville, Tenn.: Tennessee Valley Authority, 1939), 4. The startup activities of the Tennessee Copper Company are described in American Institute of Mining Engineers, "A Brief Description of the Operations of the Tennessee Copper Company Prepared for the Ducktown Excursion" (American Institute of Mining Engineers, Chattanooga, Tenn, 1908), 1-15; Barclay, *Copper Basin*, 23-48.

<sup>14</sup> For the advantages of pyritic smelting see M. L. Quinn, "Industry and Environment in the Appalachian Copper Basin, 1890-1930," *Technology and Culture* 34, no. 3 (1993): 589-91; "The Ducktown Basin, Its Ore Deposits and Their Development," *Chemical Industries*, May 1935, 81-83. For the use of sulfur in phosphate fertilizer see Lewis B. Nelson, *History of the U. S. Fertilizer Industry* (Muscle Shoals, AL, 1990), 85-93. For comment on the London company name, see W. H. Freeland and C. W. Renwick, "Smeltery Smoke as a Source of Sulphuric Acid," *The Engineering and Mining Journal* 89 (1910): 1116-121.

With these incentives, the race was on during the 1890s to develop pyritic smelting. The trick in smelting pyritic (also known as sulfide) ore involved the determination of the correct charge or mixture of ore, coke, and quartz for the furnace. Mining engineers achieved some success in experiments in Colorado, Montana, and Tasmania, but attempts to duplicate the results in Ducktown failed because of the different composition of the local ore. The pyritic ores mined during Ducktown's revival contained only 1-2 percent copper, about 25-30 percent sulfur, and up to 40 percent iron, a combination that frustrated repeated efforts by DSC&I to determine the correct charge. Each time, the furnace fire began properly and then died prematurely, leaving a partially processed slag that had to be dug out of the furnace. The company would eventually solve the problem, but in the meantime, both it and the later arriving Tennessee Copper Company were forced to continue open heap roasting into the first years of the new century if they were to remain in the copper business.<sup>15</sup>

The roast yards filled the mountain-rimmed Basin with astonishing amounts of smoke. The fires burned every hour of every day, rain or shine, creating a pall of smoke so thick that it hindered visibility even in the daytime. Windy days might disperse it, but on the frequent days of calm air and damp weather it settled close to the ground to create a sulfurous fog. James Smallshaw, a Tennessee Valley Authority scientist, interviewed long-time Ducktown residents in the late 1930s about the smoke experienced a generation earlier. E. R. Wallace said it was so thick that wagoners put bells on their teams so that the jingling sound would serve as a warning to oncoming travelers. Octavus Hankivell related that at night, the smoke made it impossible for

---

<sup>15</sup> The composition of Ducktown ores varied from mine to mine and year to year. The numbers provided are approximations drawn from a detailed metallurgical study in W. H. Emmons and F. B. Laney, *Geology and Ore Deposits of the Ducktown Mining District, Tennessee*, U. S. Geological Survey, Professional Paper 139 (Washington, Government Printing Office, 1926), 41-54. For other experiments in pyritic smelting, see Barclay, *Railroad*, 180-181.

him to follow wagon tracks on horseback. He had to dismount so he could walk the tracks with a lantern in one hand while leading the horse with the other. The horse was partly to blame: “after getting himself and the horse lost several times...he bought another horse with more sense and had no further trouble.”<sup>16</sup>

The greater volume of smoke soon became an intolerable burden to many local farmers. In testimony from *Ducktown Sulphur, Copper & Iron Co. v. Barnes* (1900), G. W. Prince said, “the smoke settles down on my place deeply unless the swift wind drives it away, and remains until nine and eleven o’clock AM so thick and dense as to deprive me and [my] family from the sunlight.” His fellow claimant, A. J. Bell, told how the smoke “settles on vegetation and when the sun strikes, it turns white and it dries it up. It also settles on iron tools and causes the rust to eat them up.”<sup>17</sup> Their testimony would be echoed by other witnesses over the next twenty years in hundreds of smoke cases. Local damage to vegetation and erosion of metals were telling clues that farmers suffered what later generations would call acid rain, or more properly, acid precipitation. Sulfur from the roast yards entered the air as sulfur dioxide (SO<sub>2</sub>) that precipitated either in dry form, or fell in wet form when it combined with water to form sulfuric acid (H<sub>2</sub>SO<sub>4</sub>). Both forms were troublesome because frequent temperature inversions trapped the gas within the Basin, and the prevailing humid, rainy weather encouraged acid formation. The consequences that the farmers understood experientially would eventually be considered at length from a scientific perspective in the smoke litigation to come.<sup>18</sup>

---

<sup>16</sup> Smallshaw, “Denudation,” 5.

<sup>17</sup> Transcript at 354 (Prince) and 387 (Bell), *Ducktown Sulphur, Copper & Iron Co. v. Barnes*, 60 S.W. 593 (Tenn. 1900). All of the transcripts to Tennessee appellate cases mentioned herein are held at the Tennessee State Library and Archives, Nashville (hereinafter TSLA) in R.G. 170. I edited the dialectical spelling that often appears in the transcripts, substituting, e.g., the pronoun “it” for “hit” and “family” for “famby.”

<sup>18</sup> M. L. Quinn, “Early Smelter Sites: A Neglected Chapter in the History and Geography of Acid Rain in the United States,” *Atmospheric Environment* 23, no. 6 (1989): 1281-92. Quinn argues for the importance of Ducktown and

\*\*\*

Smoked-out farmers had only three options: tolerate the smoke for as long as possible, abandon farming altogether, or file suit against the copper companies. If they litigated, their only recourse was under the law of nuisances, seeking either monetary damages or an injunction against the smoke. If any action was taken against the smoke, it would be on their initiative and at their time and expense. There were no regulatory agencies to act on their behalf because there were no federal or state regulations to control the smoke. None would be enacted until well into the twentieth century when California enacted the first state-wide air pollution law in 1947, followed by the federal Clean Air Act of 1963, and Air Quality Act of 1967.<sup>19</sup>

At the municipal level, anti-smoke initiatives arose in some major cities during the late nineteenth and early twentieth centuries to combat smoke from thousands of coal stoves, furnaces, and locomotives that coated every surface with layers of sooty filth. Progressive citizen groups, often acting at the instigation of middle and upper class women, urged passage of smoke ordinances to advance what David Stradling described as the “Victorian notions of cleanliness, health, and aesthetics” of the City Beautiful movement. The regulations were a start but failed to accomplish much. They often fell before jurisdictional challenges, especially when cities attempted to regulate interstate polluters such as railroads. Realistically, city action suffered the impracticability attendant to the local regulation of a regional problem. King Canute could not

---

other copper smelting operations within the historiography of acid precipitation. The scientific testimony is discussed in later chapters, but includes the following: Testimony and Exhibits of the Complainant, the State of Georgia, Upon Final Hearing, at 5 (first affidavit of J. K. Haywood), at 9 (second affidavit of J. K. Haywood), at 18 (affidavit of John M. McCandless, State Chemist of Georgia), *Georgia v. Tennessee Copper Co.*, No. 5 Original, October Term, 1906; Report of John T. McGill, *Georgia v. Tennessee Copper Co.*, No. 1 Original, October Term, 1914; J. K. Haywood, *Injury to Vegetation by Smelter Fumes*, U.S. Department of Agriculture, Bureau of Chemistry, Bulletin no. 89 (Washington, D.C., Government Printing Office, 1905).

<sup>19</sup> Richard N. L. Anderson, *Managing the Environment, Managing Ourselves: A History of American Environmental Policy* (New Haven, Conn.: Yale University Press, 1999), 207-210. Anderson’s work includes an extensive chronology of environmental law at pages 385-86.

stop the tide, and New York City could not stop the winds from carrying unregulated smoke from New Jersey onto the regulated area of Manhattan.<sup>20</sup>

Regulation was even rarer in the countryside, where one-industry towns like the Basin communities of Isabella, Copperhill, and Ducktown usually lacked the political will and resources to force regulations that might kill their golden geese. The citizens of Butte, Montana, proved to be the exception when they forced passage of a municipal smoke ordinance in 1890 that forced Anaconda Copper to move its smelting operations away from town. Issues of health, not cleanliness, prompted the initiative when a local physician noticed rising death rates during periods of intense smelter smoke. Local copper ores contained significant amounts of arsenic that smelting released into the atmosphere. The removal of the smelters improved the health of town folk but proved lethal to livestock downwind of relocated works because the arsenic then precipitated onto pastures causing hungry horses, cattle, and sheep to drop dead after eating the toxic grass. Unlike the assembled citizens of Butte, the farmers and ranchers of the Deer Lodge Valley lacked political clout to regulate away their problems and instead turned to the courts by filing for damages under the law of nuisance.<sup>21</sup>

---

<sup>20</sup> David Stradling, *Smokestacks and Progressives: Environmentalists, Engineers and Air Quality in America, 1881-1951* (Baltimore: Johns Hopkins University Press, 1999), 2, 61-84. For a contemporary federal report on urban smoke abatement, see Samuel Flagg, *City Smoke Ordinances and Smoke Abatement*, U. S. Bureau of Mines, Bulletin No. 49 (Washington: Government Printing Office, 1912). For representative works on progressive era urban smoke pollution in America see R. Dale Grinder, "The Battle for Clean Air: The Smoke Problem in Post-Civil War America," in *Pollution and Reform in American Cities, 1870-1930*, ed. Martin V. Melosi (Austin: Univ. of Texas Press, 1980), 83-103; Angela Gugliotta, "Class, Gender, and Coal Smoke: Gender Ideology and Environmental Injustice in Pittsburgh, 1868-1914," *Environmental History* 5, no. 2 (2000): 165-93; Stefano Luconi, "The Enforcement of the 1941 Smoke-Control Ordinance and Italian Americans in Pittsburgh," *Pennsylvania History* 66, no. 4 (1999): 580-94; Harold L. Platt, "Invisible Gases: Smoke, Gender, and the Redefinition of Environmental Policy in Chicago, 1900-1920," *Planning Perspectives* 10, no. 1 (1995): 67-97; Joel Tarr, *The Search for the Ultimate Sink: Urban Pollution in Historical Perspective* (Akron, Ohio: University of Akron Press, 1996); Joel A. Tarr and Carl Zimring, "The Struggle for Smoke Control in St. Louis: Achievement and Emulation," in Andrew Hurley, ed., *Common Fields: An Environmental History of St. Louis* (St. Louis: Missouri Historical Society Press, 1997), 199-220.

<sup>21</sup> For the Butte ordinance and Deer Lodge Valley problems, see Donald MacMillan, *Smoke Wars: Anaconda Copper, Montana Air Pollution, and the Courts, 1890-1924* (Helena: Montana Historical Society Press, 2000), 25-46, 83-99. Other works on rural smoke pollution include Stephen W. Charry, "Defending the Great Barbecue: W.

\*\*\*

Ducktown's ore, and hence its smoke, was blessedly free of arsenic, and its absence was a major reason why there was no public cry for health-oriented anti-smoke ordinances in Basin communities. Yet, the high sulfur content of Ducktown smelter smoke had a toxic impact upon crops, orchards, and woodlots that was plain enough to local farmers. The amount of smoke increased as the revived industry hit its stride, leading a group of ten farmers to file the first wave of suits in 1896 and 1897, later consolidated for appeal under the caption, *Ducktown Sulphur, Copper & Iron Co. v. Barnes*.

The *Barnes* lawsuits and several hundred others like them provide a description of the smoke suitors, their farms, their farms and their motives. They were men and women (Mrs. Margaret Madison filed many suits as a *femme sole*-a woman with the legal capacity to sue in her own right). And they came predominantly from the Scots-Irish and English stock that settled and farmed the southern mountains, with names such as Barnes, Bell, Carter, Fortner, Johnson, Madison, Runnion, Stuart, Thomas, and Willson. Copper drew some immigrants to the Basin from the British Isles and Germany in the first era. Italians, Poles, and Slavs, and other immigrants from dozens of other countries came in the early years of the revival, mostly to find work in mine construction. Few of them remained for long, and fewer became farmers with a

---

Lon Johnson and the 1921 Northport Smelter Pollution Suits," *Pacific Northwest Quarterly* 91, no. 2 (2000): 59-69 (lead smelting in northeast Washington State); Michael A. Church, "Smoke Farming: Smelting and Agricultural Reform in Utah, 1900-1945," *Utah Historical Quarterly* 72, no. 3 (Summer 2004): 196-218 (Salt Lake area); John E. Lamborn and Charles S. Peterson, "The Substance of the Land: Agriculture v. Industry in the Smelter Cases of 1904 and 1906," *Utah Historical Quarterly* 53, no. 4 (1985): 308-25 (also in the Salt Lake area). For studies of copper smelter pollution in Swansea, Wales, see Edmund Newell, "Atmospheric Pollution and the British Copper Industry, 1690-1920," *Technology and Culture* 38, no. 3 (1997): 655-689; Ronald Rees, "The South Wales Copper-Smoke Dispute, 1833-95," *Welsh History Review* 10, no. 4 (1981): 480-96. For the Trail smelter dispute, see John D. Wirth, *Smelter Smoke in North America: The Politics of Transborder Pollution* (Lawrence: University Press of Kansas, 2000), 43, 119, 203; D. H. Dinwoodie, "The Politics of International Pollution Control," *International Journal* 27, no. 2 (1972): 219-35.

claimant's interest in smoke litigation. R. E. Barclay, a life-long Ducktown resident and its leading historian, observed that "the foreign element disappeared after seven or eight years."<sup>22</sup>

All of the suitors were whites. Blacks lived in pockets throughout the Southern Appalachians, though their numbers as a percentage of the population were much lower than in the lowlands. Over four hundred black slaves once toiled in the Tennessee Valley portion of Polk County, west of the mountains that walled in Ducktown. Many of them remained in the county after emancipation; but they were not welcomed in the Ducktown Basin, where whites were determined to preserve steady jobs in the copper industry for themselves, by force if necessary. In 1894, a group of armed whites raided a camp of black laborers brought in to lay railroad track at the Mary Mine. The raiders came out of the night, fired an estimated fifty to a hundred shots, and tossed a few sticks of dynamite to roust the blacks out of their bunks and out of the Basin. Nobody was hurt but the point had been made. Barclay noted in 1934 that, "the Negro has always been banned from the Basin, except one employed privately," and added, "there has never been a Negro home here."<sup>23</sup>

---

<sup>22</sup> Ducktown Sulphur, Copper & Iron Co., Ltd. v. Barnes, 60 S.W. 593 (Tenn. 1900). Willson's name appears in records with both two "l's" and one. The determination of the number of the Ducktown smoke suits is a challenging problem. Most suits were filed in the Circuit Court of Polk County, Tennessee but records of them were lost when the court house burned in the mid-1930s. I was able to document almost two hundred claims from appellate records located at the Tennessee State Library and Archives in Nashville. Many more were identified from local docket sheets and attorney correspondence archived at the Ducktown Basin Museum, Ducktown, Tenn. The national backgrounds of Ducktown miners appears in Douglas Heffington, "Tennessee's Copper Basin: An Ethnic Overview," *The Tennessee Genealogical Magazine* 44, no. 2 (1997): 17-23; R. E. Barclay, "The Great Copper Basin of Tennessee," *The Louisville & Nashville Employee's Magazine* 10, no. 9 (November 1934): 4-7. The common Scots-Irish heritage shared by most of the smoke-suitors and by the white Polk County citizens from which local juries were then drawn precluded the copper companies from exploiting nativist and ethnic tensions as was done against ethnic immigrant smoke suitors in the 1921 Northport smelter litigation in Washington State; see Stephen W. Charry, "Defending the Great Barbecue: W. Lon Johnson and the 1921 Northport Smelter Pollution Suits," *Pacific Northwest Quarterly* 91, no. 2 (Spring 2000): 59-69.

<sup>23</sup> "Ordered to Leave at Once: Tennessee White Miners Threaten to Kill the Blacks if They Don't Leave," *Atlanta Constitution*, 30 April 1894, 1; Barclay, *Copper Basin*, 19-22. Barclay and the newspaper differ on the provocation for the raid. Barclay argues that Livingston deliberately replaced whites with blacks because the latter would be forced to spend their wages in the contractor's commissary. The paper reported Livingston's complaint that he only hired blacks when whites refused to work for him. For Polk County slavery see Historical Census Browser, "Tennessee: Total Slaves," Geospatial and Statistical Data Center, University of Virginia Library,

The suitors were all land owners for the reason that only those with vested property rights could maintain an action in nuisance. Most owned their farms in fee simple, partly because the rate of farm tenancy was much lower in the highlands than in the cotton regions of the South, and more because tenants lacked the incentive and time necessary to litigate cases that might last for years. The ownership requirement shut out the squatters in the mountains surrounding the Basin where they built little farmsteads on the lands of absentee timber owners. Those squatters nearest the roast pits and smelters must have suffered smoke damage, but without land titles, they did not have cognizable claims and were, in any event, loath to risk exposure to the authorities. George Peabody Wetmore, a New England aristocrat with extensive timber holdings in Polk County, spared no expense to prosecute squatters. He filed suit, through his local counsel, Charles Seymour, to eject them whenever found, lest they establish title by adverse possession. He and Seymour took one such case all the way to the United States Supreme Court in 1898.<sup>24</sup>

The smoke suitors came from all three counties of the Basin and thus involved the citizens of three different states. Of the ten *Barnes* claimants, six were residents of Polk County, Tennessee; three held lands in Fannin County, Georgia; and the farm of the tenth lay in Cherokee County, North Carolina. In later years, as the zone of smoke damage expanded, the greatest

---

<http://fisher.lib.virginia.edu/collections/stats/histcensus/php/newlong3.php>, accessed 4 November, 2006. For Appalachian slavery, see John C. Inscoe, *Mountain Masters, Slavery, and the Sectional Crisis in Western North Carolina* (Knoxville: University of Tennessee Press, 1989). Racial incidents occurred throughout the Southern Appalachians during the period, see W. Fitzhugh Brundage, "Racial Violence, Lynchings, and Modernization in the Mountain South," in *Appalachians and Race: The Mountain South from Slavery to Segregation*, John C. Inscoe, ed. (Lexington: University Press of Kentucky, 2001): 302-16. Barclay, "The Great Copper Basin," 6-7.

<sup>24</sup> For local squatters see Thurman Parish, "History of the Ocoee Ranger District. 1838-1988," U. S. Department of Agriculture Forest Service, Cherokee National Forest (1989?), reprinted as *The Old Home Place: Pioneer Mountain Life in Polk County, Tennessee* (Bentonville, TN: Polk County Publishing Company, 1994), 71-72 (page references are to the reprinted edition). *Wetmore v. Rymer*, 169 U.S. 115 (1898).

number of claimants would be Georgians, followed by the North Carolinians, but it bears noting that Polk County farmers were the first to litigate.<sup>25</sup>

They practiced a thoroughly mixed form of agriculture on farms from 40 to 250 acres. A few farms approached 1,000 acres along Hothouse Creek where some of the best tracts in the district were located. Good bottom land could also be found along other major streams, including the Toccoa/Ocoee River, Wolf Creek, and Fightingtown Creek. It is no accident that most of the early smoke suits arose from those areas. Sulfur dioxide smoke was heavier than air, especially when saturated with the pervasive moisture of the damp climate, so it tended to descend into stream valleys flow along their courses. Many observers commented how clouds of smelter smoke could be seen flowing along the Toccoa/Ocoee Valley before branching off into tributary valleys, passing over the prized bottom lands as it did so.<sup>26</sup>

The hilly topography of the Basin made the size of farms deceiving. This was not a land of broad level farms like those in the Midwest where row crops could be planted from border to border; instead, mountain farms consisted of fertile bottom lands, the less fertile but still workable gentler slopes; and the steepest sections that remained forested. The varied topography and highland climate encouraged a variety of crops. In the fields they raised grain crops of corn (maize), oats, rye, and wheat. Every farm had a garden patch for Irish and sweet potatoes, cabbages, peas, beans, squashes, and assorted greens. The orchards contained apple trees, peach trees, and hives of bees to pollinate them. Thousands of cattle, sheep, and swine provided meat, milk, leather, and wool. They grew some burley tobacco, but no cotton.<sup>27</sup>

---

<sup>25</sup> Residence data comes from the pleadings in *Ducktown v. Barnes*.

<sup>26</sup> Haywood, *Injury to Vegetation*, 19

<sup>27</sup> Data on crops and livestock, by county, is found in U. S. Bureau of the Census, *Report on the Statistics of Agriculture in the United States at the Eleventh Census: 1890* (Washington, D. C.: Government Printing Office, 1895), tables 5, 8, 10, 12, 14, 16, 20, 22, and 24.

Mixed agriculture led to the rational expectation that Basin farmers could provide most of their food needs from their own farms; yet they were not independent of the market economy, nor did they want to be. The farmer litigants of the 1890s lived adjacent to one of the great industrial complexes of the South in a district that now enjoyed daily rail service, daily newspapers from Atlanta, Nashville, and Knoxville, and telegraphic communication with New York and London. They were not the isolated subsistence farmers of Appalachian hillbilly legend.<sup>28</sup>

The area's earliest farmers did live in isolation behind the mountain barriers and practiced subsistence agriculture to a considerable degree. Those days soon ended with the arrival of the mining industry and the Copper Road. Afterwards, Ducktown farming and mining advanced side-by-side. As miners populated the Basin, each farmer expected to produce surplus meat and produce for sale in the mining communities in order to buy a wide variety of goods from merchants. A journalist observed in 1876 that, "nearly all the grain raised in Polk County finds a market at Ducktown," and it sold for a higher price at the mines than in the Tennessee Valley. The same was "equally true of meal, hay and all other supplies." Another captured the farmer-miner symbiosis by noting, "If it were not for the minerals, especially copper" at Ducktown, "it would be little else than a huge pile of mountains, or a pile of huge mountains, whichever you choose." With the copper industry, Ducktown "is about the best produce market in East Tennessee...I mean as to price, not quantity or quality."<sup>29</sup>

---

<sup>28</sup> For a thorough historiographical survey on the hillbilly construct and reaction thereto see John C. Inscoe, "The Discovery of Appalachia: Regional Revisionism as Scholarly Renaissance," in *A Companion to the American South*, John B. Boles, ed. (Malden, MA: Blackwell, 2002), 369-386.

<sup>29</sup> "Ducktown Copper," *Atlanta Constitution*, 29 March 1876, 1; "Our Ducktown Letter," *Knoxville Journal* 27 April 1874, 4.

Ducktown farmers agreed with the journalists, and for that reason, they entered suit against the copper companies with some reluctance. They valued the mining community as their best and nearest market and longed for a mutually beneficial economic relationship. Many were haunted by the economic suffering they had experienced when the mines were closed during the 1880s. They were not Luddite reactionaries against technology, nor were they environmental activists in the modern sense. Nuisance law in the industrial context inevitably touched on the greatest issues of environmental policy, but the Ducktown litigants did not see it that way. No environmental or conservationist organization stood behind them when they fired the first shots in the smoke wars.

Instead, the farmers sued the copper companies because smoke hindered their ability to participate in the thriving economy created by Ducktown's mining industry. The sulfur smoke killed their crops, and thus their stock in trade. Crop losses translated into lost income and lost purchasing power. Ultimately, smoke put their agricultural livelihoods at risk. A. J. Bell, one of the *Barnes* litigants, stated the problem succinctly when he complained that he was "amply able to support himself and family from his farm by raising good crops of grain...and all kinds of fruits and vegetables, and bee culture...and could carry to market some of the crops, etc. before the smoke, but now he can sell nothing."<sup>30</sup>

\*\*\*

Bell and his fellow *Barnes* litigants gave expression to their market frustrations by filing suits in the Circuit Court at Benton, the seat of Polk County, Tennessee, against Ducktown Sulphur, Copper & Iron Co. At the time of filing in 1897, the Ducktown Company was the only major copper firm in the Basin; the Pittsburgh & Tennessee Copper Company was in decline and

---

<sup>30</sup> Transcript at 153 (A. J. Bell deposition), *Ducktown v. Barnes*.

its successor, the Tennessee Copper Company did not begin smelting operations until 1901. The gravamen of their claims was that the company created a nuisance “by sending forth from its roast piles, smelters, and furnaces volumes of sulfur smoke, fumes, and poisonous gases, thereby poisoning the air,” killing their crops, orchards, and timber, and “shutting them off from the sunlight and rendering their homes unpleasant and unhealthy, ruining all their edged tools, killing their bees.” The litany of wrongs ended, in biblical turn of phrase, with the allegation that the smoke made “the whole country a barren plain.” For such wrongs, each claimant sought damages in the range of \$1,000 to \$2,000 dollars.<sup>31</sup>

The law of nuisances is an aspect of the great heritage of English Common Law that serves as the foundation for American law. Nuisance law involves offenses caused by one party that impairs another party’s use and enjoyment of property. The term derives from Middle English, through Old French, and ultimately from the Latin, *nocere*, to injure or harm. Typical actions giving rise to nuisance suits include the creation of offensive odors, as with animal rendering factories that waft onto the property of another, or the diversion of water onto another person’s land. For the *Barnes* claimants, the offensive agent was smelter smoke. Whatever the offense, the law of nuisances sought to enforce the maxim, *sic utere tuo ut alienum non laedas* (so use your property as not to injure your neighbor’s). It should be noted here that American lawyers also use the term “nuisance” in another sense, meaning a frivolous lawsuit, especially a claim for damages arising from a minor, or questionable injury. Participants in the Ducktown smoke wars used the term in its traditional sense, in reference to a type of lawsuit regarding the infringement of property rights.<sup>32</sup>

---

<sup>31</sup> Answers to Errors Assigned and Brief of Respondents, *Ducktown v. Barnes*.

<sup>32</sup> The rise of pollution cases from large-scale industries led gradually to the relaxation of the standard of strict liability expressed by the maxim, as will be seen in Chapter 3.

Mrs. Margaret Madison's complaint in nuisance was typical of the other *Barnes* suitors in the way that it set forth allegations of her ownership, her enjoyment of the property, and the offensive interruption to her enjoyment caused by the defendant's smelter fumes. In phrasings cast in an Arcadian or perhaps Old Testament air, she proclaimed ownership of valuable farm land that produced "wheat, corn, rye, oats, barley, Irish and sweet potatoes, and vegetables in goodly quantity," and on which "the apple and peach, the plum and quince, the cherry and the grape, and the berry family generally grew to perfection." Her land normally provided "a generous return for labors expended in their care and cultivation," and "that by that reason the small farmers around were contented and happy." Then came the allegation of harm, wherein smoke intruded into her contented rural life, in a manner akin to the storm in the third movement of Beethoven's pastoral symphony: the flowers and fruits of her gardens, the fruits in her orchards, and the native forests surrounding her home "have disappeared under the blighting poisons of the smoke, vapors, and gases emitted from the works" of the defendant copper company. Specifically, the nuisance was "smoke and noxious vapor charged with sulfuric acid, which is varied by air currents across the Tennessee line into Georgia, and which destroys" the vegetation on her farm. Claiming the mantle of the humble yeoman farmer, she disclaimed a desire for personal gain. Instead, she wanted "simply to make her bread on her farm, and eat it on it in peace and comfort."<sup>33</sup>

\*\*\*

Since Ducktown Sulphur, Copper & Iron Company was the sole defendant in the *Barnes* actions, it fell to the firm's counsel, Mayfield & Son, to frame the legal strategy later adopted by its soon-to-be rival, Tennessee Copper Company. The barren lands around the DSC&I works at

---

<sup>33</sup> Ducktown v. Barnes, 597-98.

Isabella made it pointless to deny the presence or toxicity of the smoke, though the degree of damage on a given farm was arguable. Rather than litigate damages, the Mayfields adopted a policy of doing everything possible to keep cases from going to jury trials. James G. Parks, who succeeded the Mayfields as DSC&I counsel, explained the policy in a letter to management about rising court costs. The costs for repeated continuances and appeals were “due to the long time the cases have been pending and the policy of delay that has been followed from the beginning.” He justified the expense saying, “It has undoubtedly given the smoke suitors a decided distaste for lawing, and has deterred many from suing who would have done so, if they could have railroaded their suits through the courts.”<sup>34</sup>

This was sound defense policy. As attorneys, they were advocates for their clients, not dispassionate framers of public policy about industrial smoke. As advocates, their job was to protect company coffers by defeating smoke claims. The safest way to do this was to use procedural maneuvers to keep cases away from juries. Underlying the strategy was the bedrock truth that Polk County juries would likely award damages to claimants if given the chance.

It would at first seem counterintuitive that Polk citizens would punish the only major employers and by far the greatest taxpayers in the county, but the very wealth and power of the companies made them targets in a context of strained local relations. Labor tensions placed the Ducktown company in a negative light, especially because many farm families had members who worked at least seasonally in the mines. The troubles began to brew in the spring and summer of 1899 with a series of incidents, some of them bloody. One worker, W. A. Curtis, was charged with carrying a concealed weapon and then firing it near a powder magazine on DSC&I

---

<sup>34</sup> James G. Parks to W. H. Freeland, 12 August 1905, DBM. Attorneys and clients of the period made frequent use of “law” as a verb meaning to litigate, an apt usage this author regrets is no longer prevalent in the courts. The litigation strategy of DSC&I and TCC may be compared to the extensive use of scientific evidence to dispute fault as was done in later smelter suits in the West. For a successful example of this approach see, Charry, “Defending the Great Barbecue: W. Lon Johnson and the 1921 Northport Smelter Pollution Suits.”

property. Another was charged with assault with intent to kill when he swung a shovel at a deputy sheriff who was moonlighting as a night watchman at the smelting furnaces. L. Y. Henson was charged in a third incident when he shot a man deep underground in the Mary Mine. W. H. Freeland, the General Manager of DSC&I wrote corporate counsel, P. B. Mayfield and insisted upon prosecuting all three men for what he considered a “prearranged conspiracy.” Matters worsened a few days later when a DSC&I superintendent, S. M. Reese was fatally ambushed and shot in early June. (Bloodhounds soon tracked the assailants into the mountains and treed them). Notwithstanding the recent events, Mayfield soon learned what Polk County jurors thought of Ducktown Sulphur, Copper & Iron Co. As he reported to Freeland, “the Grand Jury ignored the bill against Curtis and possibly no action was taken against Henson.”<sup>35</sup>

Labor tensions led to formal union activity later that year. In September, the American Federation of Labor established a local union among workers frustrated over the requirement that they consult a company doctor for work injuries instead of their personal doctor. DSC&I refused to recognize the union and discharged its members. Idle mines soon forced the company to relent on the physician issue. Success on that issue led to a demand a few weeks later for better wages and hours. The workers asked for a reduction of the daily shift from ten hours to eight, paid at a rate equivalent to nine-and-a-half hours at the old rate. A strike ensued when management refused, and tensions increased when the company attempted to replace striking union members with non-union “scab” labor. The union held the upper hand because AFL threatened that ALF engineers and firemen on the Atlanta & Knoxville Railroad would refuse to handle freight for the

---

<sup>35</sup> W. H. Freeland to P. B. Mayfield, 1 June 1899; P. B. Mayfield to W. H. Freeland, 10 July 1899, both DBM.

company. The threat that Ducktown's rail lifeline would become a noose moved DSC&I to agree to an eight hour shift and a ten percent raise.<sup>36</sup>

A much less violent matter, tax appraisals, also stirred local citizens against the copper companies. School and government leaders in the county seat of Benton periodically accused the copper firms of failing to pay their fair share of property taxes to support education and public improvements, notwithstanding the truth that the companies were by far the greatest source of tax revenue in Polk County. The argument was appealing to local farmers—and potential jurors—burdened with property taxes in years of good harvest and bad. Leaders in the Ducktown mining community saw things differently; the local quip was that “Polk County's got a big cow. We feed it up here, and they milk it in Benton.” In 1900, the Ducktown Company and the newly arrived Tennessee Copper Company fought and lost an appraisal suit. The valuation on DSC&I was quadrupled from \$55,000 to \$200,000, and that for TCC more than tripled from \$75,000 to \$250,000. (The higher assessment against newly arrived TCC's compared to its decade-old rival demonstrated the financial resources and commitment of its New York investors, a pattern that would shape the destiny of both companies and of Ducktown smoke litigation.)<sup>37</sup>

---

<sup>36</sup> The labor troubles of 1899 received extensive coverage in the *Atlanta Constitution*: “Reese Shot From Ambush,” 6 June 1899, 2; “Ducktown May Have Strike—Tennessee Companies Refuse to Employ Union Men,” 9 September 1899, 1 (doctor issue mentioned); “Ducktown Strike Settled,” 16 September 1899, 1 (doctor issue resolved); “Tennessee Miners on Strike—Asked an Eight Hour Shift with Nine and a Half Hours' Rate,” 29 October 1899, 5; “Serious Trouble is Brewing—Six Hundred Miners at Ducktown, Tenn. Are Armed,” 9 November 1899, 1; “Trouble Now at Ducktown—Non-Union Men Will Be Put in the Mines and Mills Today,” 13 November 1899, 2; “Deputies Going to Ducktown—Strikers Expected to Cause Trouble When Non-Union Men Work,” 2 December 1899, 7; “Increased Miners' Wages,” 21 December 1899, 8. The AFL threat is mentioned in G. G. Hyatt to Mayfield, Son & Aiken, 8 September 1899, DBM. The Tennessee Copper Company experienced another major strike in 1939; see, William Simson, “Parades Amid the Standoff in the Old Red Scar: Interpreting Film Images of Striking Industrial Operatives in the East Tennessee Copper Basin, 1939-1940,” *Journal of Appalachian Studies* 7, no. 3 (Fall 2000): 187-226.

<sup>37</sup> Grady Clay, “Copper-Basin Cover Up,” *Landscape Architecture* 73, no. 4 (1983): 49-55, 94 (cow quip); “Copper Companies Not at All Pleased with Their Tax Assessments,” *Chattanooga News*, 20 September 1900, also found in J. D. Clemmer Scrapbooks, vol. 2, 252 (TSLA).

Absentee ownership also worked against the companies. Most Polk County jurors struggled to make a living, whether on the farm or in the mines, and they readily identified with hard-scrabble smoked-out farmers against the interests of remote plutocrats. The Tennessee Copper Company headquarters were on Broadway in New York City, and its major owners were the Lewisohns, a German Jewish mercantile family. The patriarch, Samuel Lewisohn, sent his sons, Leonard and Adolph to America during the Civil War to import horsehair (used for stuffing mattress and upholstery) and ostrich feathers (for decorating hats). Upon arrival, the brothers began to export copper back to Germany and soon became major figures in American copper with mine holdings at Lake Superior and Butte, Montana, along with a large copper refinery in Raritan, New Jersey. Their financial peers were the Guggenheims, Bigelows, and other prominent mining families, not Scots-Irish southern mountaineers. The London owners of the Ducktown Sulphur, Copper & Iron Company, Ltd. were even more remote geographically, but present tensions with the English firm stirred old cultural memories of the American Revolution. Margaret Madison, owner of 160 acres in the Wolf Creek area of Georgia's Fannin County said, "small farmers in the rural district were contented and happy" until the recent smoke damage, and she was unwilling "to see her home wrecked, her patrimony destroyed, and she in her old age be driven out by her lordly neighbors from Great Britain."<sup>38</sup>

Margaret Madison's Jeffersonian yeoman rhetoric played well with Polk County jurors. Southern farmers struggled to maintain personal economic independence in a world increasingly shaped by national and international market forces. Hundreds of thousands of cotton farmers, including many in the Tennessee Valley lowlands of western Polk County, blamed their slide from ownership to tenancy on cotton brokers, industrialists, banks, and railroads that kept cotton

---

<sup>38</sup> Thomas R. Navin, *Copper Mining & Management* (Tucson: University of Arizona Press, 1978), 304-06; transcript at 52 (Margaret Madison demurrer), *Ducktown v. Barnes*.

prices low and growing costs high. The farmers in the Copper Basin struggled against visible smoke rather than against Adam Smith's "Invisible Hand," but shared in the problem of keeping their farms viable. Whether by reason of market economics or sulfurous smoke, agriculture was a losing proposition for most small southern growers, and for that reason the smoke litigants could count on a sympathetic hearing from jurors drawn from among their own kind in the Basin and from the cotton growers in the Valley.<sup>39</sup>

To prevent that from happening, company attorneys exploited every procedural ground for delay by means of motion, injunction, and appeal. Much of the strategy turned upon the sharp distinction that Tennessee jurisprudence made (and continues to make) between law and equity. The circuit courts exercised jurisdiction over law cases such as criminal matters, contract disputes, and personal injury claims, while the chancery courts exercised jurisdiction over equitable matters such as wills, estates, and land titles. The distinction was an accident of Anglo-American legal history but had great practical importance for Ducktown smoke litigation.

Nuisance allowed smoke suitors a choice of remedies: monetary damages to compensate for crop

---

<sup>39</sup> This is the argument of Hahn, *The Roots of Southern Populism*, 1-10. Hahn asserts that eighteenth-century "republicanism gave populism its ideological force and political vitality." Yeoman republican values certainly surfaced among the largely Scots-Irish farmers of Ducktown, but the degree to which this was a conscious embrace of Jeffersonian thought as opposed to the common human desire to protect home and livelihood is uncertain, especially because many farmers readily embraced seasonal employment at the mines. For leading overviews of populism see Lawrence Goodwyn, *Democratic Promise: The Populist Movement in America* (New York: Oxford University Press, 1976); John Donald Hicks, *The Populist Revolt: A History of the Farmers Alliance and the People's Party* (Minneapolis: University of Minnesota Press, 1931); Richard Hofstadter, *The Age of Reform: from Bryan to F.D.R.* (New York: Knopf, 1955); Robert C. McMath, *American Populism: A Social History, 1877-1898* (New York: Hill and Wang, 1993); M. Elizabeth Sanders, *Roots of Reform: Farmers, Workers, and the American State, 1877-1917* (Chicago: University of Chicago Press, 1999). For other major works with a focus on Georgia and the South, see Alex Mathews Arnett and Wayland Fuller Dunaway, *The Populist Movement in Georgia: A View of the Agrarian Crusade in the Light of Solid-South Politics* (New York: Columbia University, 1922); Edward L. Ayers, *The Promise of the New South: Life After Reconstruction* (New York: Oxford University Press, 1992); Numan v. Bartley, *The Creation of Modern Georgia* (Athens: University of Georgia Press, 1983, 2d. ed. 1990), 75-103; Barton C. Shaw, *The Wool-Hat Boys: Georgia's Populist Party* (Baton Rouge: Louisiana State University Press, 1984); C. Vann Woodward, *Tom Watson: Agrarian Rebel* (New York: MacMillan Company, 1938). Cotton was a significant crop in the Tennessee Valley lowlands of Polk County, Tennessee, with 1,045 bales produced in 1899, see United States Census Office, *Twelfth Census of the United States, Taken in the Year 1900*, vol. 5 *Agriculture*, part 1 *Farms, Livestock and Animal Products* (Washington, D.C: Government Printing Office, 1902, reprint, New York: Norman Ross Publishing, 1997), Table 10, "Acreage and Production of Cotton Fiber in 1899."

and timber losses, or an injunction requiring the copper companies to abate or eliminate the smoke. Choice of remedy dictated choice of court because a circuit court could not order injunctive relief, and a chancery court could not award unliquidated damages (a monetary award not readily fixed or calculable by contract) unless it first gained jurisdiction on an equitable issue. Only circuit courts allowed for trial by jury, and the chance to have the amount of damages set by sympathetic local citizens. Each type of court met infrequently in rural counties such as Polk, holding sessions only three or four times a year, each lasting just a week or two. Lengthy delays followed the transfer of a case between the two courts.<sup>40</sup>

The Mayfield firm first deployed its stalling tactics against the ten *Barnes* cases that the farmers filed in circuit court. The firm responded to the nuisance allegations with several arguments. It asserted that it should not be held liable in nuisance for conducting a lawful business when the use of open-pit roasting was the best and latest smelting technique. Next, the “incidental advantages” of mining operations to the local economy should be considered when awarding damages; and that the community acquiesced to the smoke by welcoming the return of mining. It then sought dismissal of several of the suits upon allegations that lawyers for the plaintiffs committed champerty. The charged referred to the then illegal arrangement whereby a lawyer agreed to take a percentage of the recovery as a fee instead of charging hourly or flat fees for time and services. The practice was prohibited in the belief that it encouraged excessive litigation, but was a boon to impecunious litigants who could not afford to pay lawyer fees up front. (Champerty laws were eventually abolished in most jurisdictions, making permissible the

---

<sup>40</sup> For equity jurisdiction, see Tennessee Acts, 1877, ch. 97, §§1-2, codified as Tenn. Code Ann. §16-11-102 (2005). Despite the modern trend towards the unification of law and equity, the distinction persists in Tennessee. Law courts and chancery courts remain separate institutions, and chancery is still generally barred from awarding unliquidated damages. *Ducktown Sulphur, Copper & Iron Co. v. Fain*, 109 Tenn. (1 Cates) 56, 64, 70 S.W. 813, 815 (1902). Unliquidated damages are defined in *Swift & Co. v. Memphis Cold Storage Whse. Co.*, 128 Tenn. 82, 158 S.W. 480 (1913).

contingent fee, “no fee unless you recover,” arrangements now commonly advertised by personal injury lawyers.)<sup>41</sup>

Jurisdiction was the last prong of the defense. DSC&I contended that citizens of Georgia and Tennessee had no right to sue in Tennessee courts for smoke damage occurring to lands situated outside that state. The argument was that the alleged offense was local in nature because it impacted real estate and thus had to be tried in courts having jurisdiction over the affected land. It followed that damage to Georgia land should be tried in Georgia courts.

The argument was coupled with a trick: Georgia courts had no jurisdiction over the Ducktown company under the narrow understanding of jurisdiction applicable at the time. Broadly speaking, a court’s jurisdiction over a defendant rested upon the presence of the defendant’s person (jurisdiction *in personam*) or property (jurisdiction *in rem*) within the geographic bounds of the court’s authority. The copper company, as a corporation, was deemed to be a legal person with a residence where it was chartered (London), where it conducted its operations (Polk County, Tennessee), or in such other states where it registered with a state to do business (which it had not done in Georgia). In the eyes of the law, the company had no legal presence in the state of Georgia, never mind how much smelter smoke it allowed to drift south over the state line to bedevil the farmers of the Peach State.<sup>42</sup>

The beauty of the argument for the DSC&I lawyers was that if it succeeded, Georgia smoke suitors would face the near impossibility of suing the company in either state. They would

---

<sup>41</sup> Transcript at 10-28 (DSC&I bill of injunction) and 127-28 (Fortner complaint), *Ducktown v. Barnes*; see also opinion, *Ducktown v. Barnes*, 60 S.W. at 594-96. The abolition of Tennessee’s champerty law became a factor in *Ducktown* smoke litigation. as will be discussed in Chapter 3.

<sup>42</sup> The distinction between jurisdiction *in personam* and jurisdiction *in rem* is drilled into law students during their discussion of *Pennoyer v. Neff*, 95 U. S. 714 (1877) in the opening sessions of the typical class on civil procedure. The case has been superseded by later expansion of the grounds for asserting jurisdiction but is still often assigned by professors because of its utility as a tool for Socratic hazing of new students. I still remember it almost thirty years after my law school days. The possible resort of Georgia suitors to the federal courts will be discussed in Chapter 3.

be barred from the Tennessee courts because an action for damage to real estate was local to Georgia. They would also be unable to litigate in their own state because Georgia courts had no jurisdiction over the company. It was the sort of legal logic that befuddled first year law students, and which became a fine-edged tool in the hands of a skillful attorney. It was also an argument that was more plausible in the 1890s than it would be true in later decades when notions of jurisdiction broadened. The “minimum contacts” test announced by the Supreme Court in *International Shoe Co. v. Washington* (1945), and the enactment of “long-arm” statutes, greatly expanded the ability of courts to assert jurisdiction over non-resident defendants in a wide variety of cases.<sup>43</sup>

\*\*\*

Underneath all of these defenses was the question of why the suits were filed at all, given the long and generally cooperative relationship between Ducktown farmers and Ducktown miners. The mines had been roasting raw or “green” copper ore in open heaps and then smelting the roasted ores in furnaces ever since the early 1850s. The only times the skies over the Copper Basin had been smoke-free since then were during the dreadful last years of the Civil War and the twelve year suspension of mining from 1878 to 1890—events that few cared to see repeated. So the question arose: why did smoke suddenly become an issue at the turn of the new century? Why then, in the late 1890s, and not fifty years earlier?

The Ducktown company raised the point in the *Barnes* litigation. The company complained that its methods were no different than those employed by Capt. Raht’s Union Consolidated Mining Company back in Ducktown’s first era. Operations after resumption of mining in 1890 “caused the smoke and the gasses to be emitted as in a manner had always been

---

<sup>43</sup> DSC&I Bill of Injunction, 595-96, *Ducktown v. Barnes*; *International Shoe Co. v. Washington*, 326 U.S. 310 (1945).

the case.” Those who complained now of smoke produced by the same methods used in the past were “malcontents fraudulently confederated and combined to vex, harass, and annoy” the company. This put the onus upon the farmers to differentiate post-1890 smoke from that of Captain Raht’s time.<sup>44</sup>

Their efforts to do so ranged from specious to credible. William Madison (Margaret’s son and fellow claimant) pointed to the recent use of coked coal in lieu of the former wood charcoal as the fuel for the roast heaps and furnaces. He was correct about the change of fuel but offered no support for the proposition that one fuel caused more smoke damage than the other. Charcoal and coke were analogous products, being carbon treated in airless fires. Coke began as coal dug from the nearby Cumberland and Alleghany mountains. It was then baked in airless ovens at high heat to drive out sulfur and other volatile components within it, creating an admirable high carbon smelter fuel that burned cleaner and hotter than ordinary coal. Madison nonetheless argued that use of wood charcoal “gave out no vapor or poisonous smoke of consequence.” Yet both fuels were used to the same end, to drive sulfur—the most obnoxious element of the smoke—out of the ore and into the atmosphere. If anything, the long-term reliance on wood had been even more destructive than the smoke from the fires it fueled. More than fifty square miles of forest fell to the axe and saw to feed the fires. The deforestation would prove to be a major element in the creation of the badlands of the man-made Ducktown Desert. Coke imported by rail from outside the Basin had the great benefit that it ended the total reliance upon local timber for smelting.<sup>45</sup>

---

<sup>44</sup> Record on Appeal, 16, *Ducktown v. Barnes*.

<sup>45</sup> *Ibid.*, 86.

William Madison then argued that he suffered no damage during the Raht years because the miners then “carried the ores through from five to six processes” of roasting and smelting “whereas the present company merely roasts the ores one time and smelts, thereby throwing a greater quantity of sulfur into the overhead air in a given time.” The assertion carried little explanatory force because again, whether done in two steps or six, the goal of smelting was to expel sulfur from the copper ore from whence it entered the atmosphere. His mother, Margaret Madison, came closer to the mark with her allegation that “current operations are worse than in the past because of use of high-sulfur ore.”<sup>46</sup>

It was true that the first era of mining employed the copper oxides found at and near the surface, ores that were rich in copper (often 25 percent or more) and low in sulfur. When mining resumed in the 1890s, the industry processed leaner sulfite ores containing only 2-5 percent copper and 25 percent or more sulfur. This meant that more ore had to be smelted to attain the same amount of copper, and that each ton of ore roasted and smelted released up to a quarter ton of sulfur into the atmosphere. John Quintell, a Ducktown miner for forty-five years, provided the most insightful response to the problem in his deposition. Yes, Capt. Raht used richer ore that contained less sulfur, but his daily production was also a fraction of that in the modern era. Raht mined 125 tons of ore per day. By 1898, the several mines of the district were producing 450 tons per day.”<sup>47</sup>

Quintell had it right. Though the type of ore had changed, the root of the problem was the rapid expansion of every phase of mining made possible by the railroad, electricity, dynamite, modern drills, and larger furnaces. Production figures told the tale. During the thirteen year period from 1866 to 1878, the combined production from of all the Copper Basin mines was

---

<sup>46</sup> Ibid., 54-55 (Margaret Madison), 85-86 (William Madison), *Ducktown v. Barnes*.

<sup>47</sup> Ibid., 555-63 (John Quintell), *Ducktown v. Barnes*.

24,000,000 pounds of copper. The Union Consolidated Mining Company, by far the biggest operator then, typically produced 1,300,000 pounds per year, using mostly the rich copper oxide ore. In the modern era, total copper production dwarfed earlier levels despite the use of lean sulfide ores. DSC&I produced 3,000,000 pounds per annum by 1901. TCC began operations that same year and soon dwarfed its neighbor. In 1903, it smelted 284,202 tons of ore to produce 10,690,389 pounds of copper, and every ton smelted released far more sulfur into the air than in the former days. By 1904, the district produced more copper every two years than it did during the entire fourteen years of post-war operation. It was not a matter of whether the roast heaps were fired with wood or coal. There simply was a great deal more ore smelted, and thus more sulfur released into the air than in the old days.<sup>48</sup>

\*\*\*

All of these defenses could have been addressed in circuit court and preserved for argument on appeal, but this would have exposed the company to the risk of jury trials where farmer jurors would listen sympathetically to the woes of farmer litigants. Instead, the Ducktown company filed a bill in the Polk County Chancery Court in 1897 to enjoin the circuit cases filed by the *Barnes* suitors on grounds that they constituted a “multiplicity of vexatious suits” and a “fraudulent confederation and conspiracy” against the company. Proceedings in chancery court avoided jury trials while still allowing the company to press all of the arguments on nuisance, jurisdiction, and champerty. The risk of unfavorable Supreme Court rulings remained the same whether the cases proceeded through the circuit court or through chancery. The worst that could

---

<sup>48</sup> Robert. A. Barclay, *Ducktown in Raht's Time*, (Chapel Hill: University of North Carolina Press, 1946), 155 (early production figures). For later production figures, see W. H. Emmons and F. B. Laney, *Geology and Ore Deposits of Ducktown Mining District, Tennessee, U. S. Geological Survey*, Professional Paper 139, (Washington, Government Printing Office, 1926), 32; American Institute of Mining Engineers, “A Brief Description of the Operations of the Tennessee Copper Company Prepared for the Ducktown Excursion,” American Institute of Mining Engineers, Chattanooga, Tenn., 1908.

happen was a remand of the cases back to circuit court, but if that occurred, a year or more of delay would have been achieved.<sup>49</sup>

Legal authority for the tactic was murky. The basic rule was that when a defendant was burdened with a multiplicity of suits arising from the same occurrence, it could file a bill in equity to be delivered from the “consequent harassment and vexation;” the chancellor could then enjoin the suits at law and combine them into one suit for disposition in chancery court. Some authorities questioned whether the rule allowed courts of equity to effectively usurp actions for damages from the circuit court. Smoke suitors failed to effectively argue the point; so Chancery granted the DSC&I bill, removed the cases from circuit court, and then to the surprise of the company, referred the cases to the Clerk and Master for determination of damages. Although a court of equity normally could not award unliquidated damages, an exception provided that when the chancery court properly gained jurisdiction on equitable grounds (here, multiplicity of actions), it also gained the power to resolve the case in toto, including damages.<sup>50</sup>

DSC&I invoked chancery jurisdiction by filing the bill for injunction, and then had the effrontery to appeal the awards to the Court of Chancery Appeals on the argument that chancery had no power to award unliquidated damages. The court rejected the point, saying “the complainant cannot be heard to seriously advance this contention.” Ducktown’s arguments on nuisance and jurisdiction also failed. First, the court stated the basic rule of nuisance, that when a business “is carried on in such a manner as to interfere with the reasonable and comfortable enjoyment by another of his property,” an action in nuisance for damages will lie. Liability for the nuisance was strict; therefore, “it is no defense” that the business is “a lawful activity”

---

<sup>49</sup> Record on Appeal, 10-28 (DSC&I bill of injunction), *Ducktown v. Barnes*, 60 S.W. 593.

<sup>50</sup> *Ibid.*, at 598, 606, 607. As will be seen, the court discussed the competing views on multiplicity of actions more thoroughly in another smoke case, *Ducktown v. Fain*, 109 Tenn. (1 Cates) 56, 70 S.W.813 (1902).

conducted “at a suitable location,” that it is “one useful to the public,” and that “the best and most approved appliances and methods are used.” Second, the damages could not be offset by whatever “incidental benefits” the copper works created by offering a local market for farm products. Third, past mining activities of Ducktown’s first era did not give the company “a prescriptive right to flood the adjacent lands with smoke and sulfur gases, destructive to timber and vegetables.” And finally, on the jurisdiction issue, the court ruled that damage from the smoke was personal and not local (a distinction relating to common law forms of actions), thus claimants from other states had jurisdiction in Tennessee courts for a nuisance originating in that state.<sup>51</sup>

Smoke suitors from Tennessee, Georgia, and North Carolina now had the court’s imprimatur to file smoke damage cases. DSC&I appealed once again to the Tennessee Supreme Court, but in *Ducktown Sulphur, Copper & Iron Co. v. Barnes* (1900), it adopted the opinion of the Court of Chancery Appeals with only minor modifications about the measure of damages to be applied for growing crops. The cases were remanded to the Polk County Chancery Court to re-determine the damages according to the proper formula. The farmers had won—or so it seemed.<sup>52</sup>

The company and its lawyers in the Mayfield firm suffered defeat on every substantive issue of nuisance law and jurisdiction, but nevertheless counted the case a success for purposes of delay. The *Barnes* cases never returned to circuit court, and in chancery, additional maneuvers delayed recovery of damages for almost six years. Of the ten claimants, six became worn out by the litigation and settled for token amounts. The seventh suffered dismissal for an illegal attorney

---

<sup>51</sup> Ibid., at 599-607.

<sup>52</sup> Ibid., at 607.

fee contract. Attorney P. B. Mayfield crowed to General Manager W. H. Freeland that his strategy “resulted in all the suits, but three, being dismissed, and doubtless other suits contemplated, were delayed and abandoned.” In 1901, the Polk County Chancery Court entered awards to the three remaining claimants. The amounts were disappointing and hardly worth the bother of five years of litigation in multiple courts. J. A. Fortner won \$66.66, Margaret Madison a like amount, and her son, William Madison, \$100.00. The company then appealed the modest awards to the Court of Chancery Appeals and the Supreme Court. Fortner’s award was increased to \$92.50; William Madison’s remained unchanged; and his mother’s fell to \$1.00. The three punch-drunk litigants did not receive payment until January, 1903. The legal frustrations of Ducktown farmers would become even worse as the litigation that started with the *Barnes* cases escalated into a full scale legal war over Ducktown smoke.<sup>53</sup>

---

<sup>53</sup> P. B. Mayfield to William H. Freeland, Aug. 12, 1901, Mayfield Papers; William H. Freeland to James G. Parks, Jan. 13, 1903, DBM.

## CHAPTER 3

### “THOUGH THE HEAVENS FALL”: FARMERS AND COPPER COMPANIES IN THE TENNESSEE COURTS AND LEGISLATURE

Attorney P. B. Mayfield bragged that his aggressive defense strategy in *Ducktown Sulphur, Copper & Iron Co. Ltd. v. Barnes* (1900) “resulted in all the suits, but three, being dismissed, and doubtless other suits contemplated, were delayed and abandoned.” It was not an empty boast. Margaret Madison, her son William, and J. A. Fortner were the only claimants of the ten to recover damages, and that the sums they received were so meager and so delayed as to make a mockery of six years of smoke litigation. They won every point of law, receiving judicial validation for the legitimacy of their claims under the law of nuisances. Yet, if success is measured by the amount of money recovered, the mountaineer farmers had to admit that David lost the first battle of the smoke wars to the corporate Goliath.<sup>1</sup>

Nonetheless, Mayfield was soon disabused of his hope that the results would forestall other farmer lawsuits. Four of the ten *Barnes* claimants, A. J. Bell, J. A. Fortner, and the two Madisons, returned for more combat by filing additional suits for smoke damage to their gardens, fields, orchards, and woodlots. And as the *Barnes* case ground through the Tennessee courts, 25 new suits were filed before the end of 1901. They would be followed by at least 175 other claims in the Tennessee courts against Ducktown Sulphur, Copper & Iron Co., the Tennessee Copper Co., or both. The actual number of the suits is difficult to determine because the Polk County Circuit Court suffered the loss of its records to fire in the 1930s. Even so, surviving case

---

<sup>1</sup> P. B. Mayfield to William H. Freeland, 12 August 1901, Mayfield Papers; *Ducktown, Sulphur, Copper & Iron Co. v. Barnes*, 60 S.W. 593 (Tenn. 1900).

records from the Tennessee appellate courts, together with local docket sheets and attorney correspondence archived at the Ducktown Basin Museum, allow for a well-documented estimate of the great extent of smoke litigation in the Tennessee courts for the twenty-five year period beginning in the mid-1890s.<sup>2</sup>

The mass of claims against the copper companies resulted in a legal war that clogged the courts of Polk County, Tennessee. Farmers saw the zone of smoke damage extend outward year by year from the TCC and DSC&I roast yards and blast furnaces. Most of the farms were modest properties, so few of the individual claims had potential for large monetary recoveries. Big awards went mainly to the great timber companies for smoke damage to their standing timber in the mountains rimming the Ducktown Basin and to the owners of the very best local farms, particularly those along Hothouse Creek. Nonetheless, the great number of smaller claims threatened the profitability of the copper companies. Worse, from the company viewpoint, actions filed by the farmers for anti-smoke injunctions could, if successful, force the companies to close altogether, with the consequent loss of livelihoods to the thousands who directly and indirectly depended upon them. For some farmers, the smoke problem was so bad, so injurious to their agriculture livelihood and way of life, that they were willing to pursue injunctive relief on the principle, *fiat justitia, ruat coelum* (let justice be done, though the heavens fall), even if that meant that the heavens fell over the Ducktown Basin. With the stakes this high, the battle spilled out of the courts and into the Tennessee General Assembly as farmers and industrialists thrust and parried over modifications to the substantive and procedural law of nuisances.

---

<sup>2</sup> Drawing from all of these sources, I collated the cases into a searchable chart by names, dates of filing, and docket numbers to arrive at the figures herein.

\*\*\*

As the *Barnes* case ground through the courts, lawyers for both companies joined efforts to gain passage of bills designed, as phrased by John Allen, DSC&I's London solicitor, "to render nugatory the smoke suits with which we have so long had to contend." Tully Cornick, counsel for Tennessee Copper, wrote his counterpart, P. B. Mayfield, "recurring to the conversations I have had with you formerly in respect to smoke suits, etc. and touching the legislation" to request Ducktown's assistance on three bills. Two bills proposed changes to the substantive law of nuisance to favor the companies. The third sought to limit the access of out-of-state claimants to the courts of Tennessee. Each of the bills was stridently anti-populist in intent, and in the manner that foreign corporations sought to manipulate the legislature from distant board rooms.<sup>3</sup>

The *Barnes* litigation convinced the companies of the need for statutory change to the common law of nuisance. Tennessee, like most jurisdictions, rooted nuisance law on the maxim, *sic utere tuo ut alienum non laedas* (so use your property as not to injure your neighbor's). This principle made a nuisance case a matter of strict liability that could be assessed in simple if/then terms. If the defendant's activity caused an objectionable consequence—whether smoke, stench, noise, or otherwise—that impaired a person's enjoyment of his land, then the "neighboring owner is entitled to recover all the damages he sustained."<sup>4</sup>

Courts in some states began to modify traditional nuisance law out of a growing concern that the principles of nuisance law framed in England centuries ago before the industrial revolution failed to respond to the realities of modern industrial civilization. Nuisance law

---

<sup>3</sup> John Allen to P. B. Mayfield, 25 January 1899; Tully Cornick to P. B. Mayfield, 24 January 1901, both from the Mayfield Papers.

<sup>4</sup> *Ducktown v. Barnes*, 60 S.W. at 603 (maxim), 606 (damages).

developed as means for resolving disputes between neighbors regarding offensive small-scale operations. If a soap maker offended his neighbor with the stench of boiling fats, matters could be readily adjusted by paying damages, or if need be, by issuing an injunction requiring the offender to take his smelly business elsewhere. Either way, the small scale of pre-industrial businesses allowed a court to order appropriate relief between the neighbors without causing wide-scale economic upheaval that might reshape the fortunes of thousands of other people.<sup>5</sup>

The huge scale of modern industry presented the biblical problem of pouring new wine into old wineskins; just as fermenting wine would cause inflexible skins to burst, the size and scope of expanding mining and manufacturing operations threatened to tear the rationale of nuisance law developed in simpler times. It was one thing to enjoin a local butcher shop when blood, guts, and flies frayed the sensibilities of others. It would be quite another to force relocation of a huge integrated enterprise like Chicago's Union Stockyards and its associated packing plants when that would impact the jobs and fortunes of an entire city or region.<sup>6</sup>

Smoke from modern mining, railroad, and manufacturing operations presented just such a problem. Some courts refused to consider industrial and railroad smoke to be a nuisance at all. Others abandoned strict liability and instead adopted a balancing test, especially when asked to

---

<sup>5</sup> For representative works on the development of nuisance law relating to industrial pollution see Robert G. Bone, "Normative Theory and Legal Doctrine in American Nuisance Law," *Southern California Law Review* (September 1986): 1104-1226; Joel Franklin Brenner, "Nuisance Law and the Industrial Revolution," *Journal of Legal Studies* 3 (1974): 403-33; Peter C. Hoffer, *The Law's Conscience: Equitable Constitutionalism in America* (Chapel Hill: University of North Carolina Press, 1990), 147-79; Paul M. Kurtz, "Nineteenth-Century Anti-Entrepreneurial Nuisance Injunctions—Avoiding the Chancellor," 17 *William & Mary Law Review* 17 (Summer, 1976): 6211-70; John P. S. McLaren, "Nuisance Law and the Industrial Revolution – Some Lessons from Social History," *Oxford Journal of Legal Studies* 3 (1983): 155-221; D. M. Provine, Balancing Pollution and Property Rights: A Comparison of the Development of English and American Nuisance Law," *Anglo-American Law Review* 7 (January/March 1978): 761-821; Christine Rosen, "Differing Perceptions of the value of Pollution Abatement across Time and Place: Balancing Doctrine in Pollution Nuisance Law, 1840-1906," *Law and History Review*, 11, no. 2 (Autumn, 1993): 303-381; Christine Meisner Rosen, "Knowing Industrial Pollution: Nuisance Law and the Power of Tradition in a Time of Rapid Economic Change, 1840-1864," *Environmental History* 8, no. 4 (Oct. 2003): 565-97.

<sup>6</sup> William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: Norton, 1991), 207-62.

impose injunctions to abate or terminate the nuisance. The test attempted to weigh the impact of the offense upon the neighbor against the economic and social consequences of an injunction. Elements of the test varied among jurisdictions though little attention was given to the ecological and aesthetic values that shape modern environmental law. In practice, the balance weighed the damage to the neighbors land against the utility of the industry for its products and the jobs it generated. It was a very hard test for individual farmers to win against large mining concerns with mighty payrolls.<sup>7</sup>

The national trend towards adoption of the balancing test reflected a shifting conception of what constituted the public good. Traditional nuisance law rested upon the belief the public good was best served by protecting the private enjoyment of property free of the intrusive activity of others. The standard of strict liability imposed by the maxim *sic utere tuo ut alienum non laedas* elevated private property rights above general economic considerations. The balancing test reversed the analysis by allowing local and regional economic concerns to rise above personal property rights.

A similar pattern could be found in Massachusetts when traditional rights to use and fish local streams were subordinated to the industrial use of the Merrimack River system. The state legislature and courts modified riparian law to allow the Boston Associates, a consortium of textile magnates, to erect a series of dams to provide water power to the textile mills in Lawrence, Lowell, and other cities. Private owners saw their property flooded, and fisherman lamented the decline of loss of salmon and shad now unable to ascend the river for spawning. As historian Ted Steinberg noted, “The notion of public good had been further refined to favor the industrial use of the river’s water.” The Ducktown Company urged adoption of the balancing test

---

<sup>7</sup> For example of judicial changes to nuisance law see Kurtz, “Nuisance Injunctions,” 642-649, 663-669; Rosen, “Knowing Industrial Pollution,” 573-586.

so it could industrialize the atmosphere for what it construed to be the greater good of the mining industry and all who depended upon its wages, expenditures, and products.<sup>8</sup>

In the *Barnes* decision of 1900, the Tennessee Supreme Court issued a conservative ruling that refused to embrace any of the modifications adopted by the courts of other states, and it reaffirmed its commitment to the strict liability and severe remedies of traditional nuisance law. It left traditional notions of the public good intact. Having failed in court, the Ducktown Sulphur, Copper & Iron Co. sought to change the situation by statute, and to that end, offered several bills in the Tennessee Legislature in 1899, and again in 1901. The first bill sought to redefine the meaning of nuisance per se to exclude smoke from industrial plants in rural districts (a circuitous way of describing copper smelter smoke from Polk County). If it passed, smoke suitors would have no remedy at all, whether for damages in circuit court or for an injunction in chancery. DSC&I counsel saw the measure as “manifestly just” and one that “eminently stands to the protection of all mining and manufacturing enterprises in the state.”<sup>9</sup>

Mayfield drafted the second measure, what he called the “incidental benefits” bill, to modify the strict liability standard of traditional nuisance law in two ways. First, it provided statutory direction to the chancery courts to exercise discretion when ruling upon requests for injunctions. Specifically, “the Court exercising sound discretion *may* immediately, upon petition of plaintiff, order *or* decline to order the nuisance to be abated.” In effect, the measure was intended to give statutory authority for chancery courts to apply the balancing of interests test that had been adopted judicially in other jurisdictions.<sup>10</sup>

---

<sup>8</sup> Ted Steinberg, *Nature Incorporated: Industrialization and the Waters of New England* (Cambridgeshire: Cambridge University Press, 1991), 166-186, quotation at 186.

<sup>9</sup> P. B. Mayfield to G. G. Hyatt, 4 February 1899, Mayfield Papers.

<sup>10</sup> The phrases are from the incidental benefits acts as adopted, Act of 17 April 1901, ch. 139 (emphasis added). 1901 Tenn. Pub. Acts 246.

The second aspect of the proposed “incidental benefits” bill was the effort to allow proof of economic benefits received by the plaintiff from the presence of the allegedly offensive industry. In the circuit court, the act would require two calculations when awarding damages: the first to determine the dollar amount of losses sustained to the complainant’s lands (usually expressed in terms of crop and timber losses), and the second, an offset based on increase in value to the land by reason of the copper industry. The idea was that the presence of the industry made crops and timber more valuable because of the local market it created, and that many tracts might also increase in worth, especially if they had value for mining or mine-related activities.

The third bill was a procedural measure that sought to limit out-of-state smoke suits by allowing only Tennessee citizens to file lawsuits *in forma pauperis* (literally in the form of a pauper) in the Tennessee courts. Normally, a claimant filing a lawsuit had to pay filing fees and post a bond guaranteeing payment of court costs if the suit failed. The requirements were burdensome to the poor, but could be avoided by filing *in forma pauperis* and swearing an oath of poverty. Though the procedure was a practical necessity for cash-poor litigants, the very idea of having to swear an oath of poverty rankled mountaineer pride. Margaret Madison said that, “she is an old woman without political or other influence and is classed with paupers by complainant [DSC&I]” and found it “passing strange that an English Corporation, backed by influence that money alone can command, should for a moment consult the wishes or interests of the poor who it derisively classes as paupers.”<sup>11</sup>

The copper companies privately resented the procedure but publicly tolerated it when exercised by Tennessee citizens, lest the firms be openly branded as anti-democratic devourers of the humble poor. Their reluctant tolerance ended when non-resident smoke suitors exercised the

---

<sup>11</sup> Transcript, 57 (demurrer and answer of Margaret Madison), *Ducktown v. Barnes*.

same privilege in Tennessee courts. P. B. Mayfield informed Tully Cornick “that the body of the suits pending, are brought by citizens of North Carolina and Georgia, and all are under the pauper’s oath” and suggested a bill restricting the privilege to Tennesseans.<sup>12</sup>

This was more than a matter of border pride because the risk of out-of state smoke suits was real and growing. Great clouds of smoke from the hundreds of roasting heaps descended onto farms across the Tennessee border. The DSC&I works at Isabella were only four miles from Georgia and even closer to North Carolina. The TCC works at Copperhill were less than a mile from the Georgia line. The companies carefully framed the issue in terms of comity: Georgia did not allow Tennessee citizens to file that way in Georgia courts, so simple fairness required a similar limitation upon Georgians using it to file in Tennessee. Mayfield argued “I do not think it probable that other states would be so lavish of interstate comity as to allow non-resident paupers to sue at will in their courts and to subject their citizens to costs and expenses.”<sup>13</sup>

The legislative package fared poorly in the 1899 session because of anti-corporate fervor in general and anti-copper hostility in particular. Tennessee had growing industrial centers in Knoxville, Chattanooga, Nashville, and Memphis, but populist themes (if not the Populist Party) remained potent within a state that was still predominantly rural and agricultural. Given that context, DSC&I made a strategic mistake by offering the measures through R. Meigs Copeland, a local attorney and legislator identified as an ally of the company. The DSC&I package failed that year despite the lobbying assistance of the Southern Railroad, which was beginning to face smoke suits of its own from the operation of locomotives and rail yards in cities. P. B. Mayfield grumbled that the measure would have passed “but for demagoguery in the House.” The 1899

---

<sup>12</sup> P. B. Mayfield to Tully R. Cornick, 5 Dec. 1900, Mayfield Papers.

<sup>13</sup> Ibid.

legislative session taught him that “open advocacy” by known DSC&I interests “before the last legislature served to abort rather than accomplish the end had in view.”<sup>14</sup>

The newly arrived Tennessee Copper Company joined the Ducktown Company in devising legislative strategy for the 1901 General Assembly. This time, they disguised copper company sponsorship because, as Mayfield put it, “I have slight confidence that open or known advocacy by any of us here would facilitate passage of any of the measures.” The two companies introduced the bills through a Memphis lawyer whose district was over three hundred miles west of the smelters. The trick worked. The anti-pauper bill passed as proposed. The incidental benefits measure also passed, though in modified form. The new law encouraged chancery courts to employ the balancing of interests test when deciding upon injunctions, but it excluded the use of the incidental benefits test in circuit court when assessing damages. Only the third measure, nuisance per se, failed to pass in any form.<sup>15</sup>

\*\*\*

A few months after the successful 1901 legislative campaign, the Ducktown company faced a new batch of twenty-one smoke suits, all of which were filed in circuit court under the pauper’s oath ahead of the new act. The corporate response to the twenty-one cases invoked a contest of dueling injunctions: some filed by the copper companies against the farmers, and some filed by the farmers against the copper companies. Before they were done, both sides managed to clog the Polk County Chancery Court, the Court of Chancery Appeals, and the Tennessee

---

<sup>14</sup> P. B. Mayfield to W. H. Freeland, 17 July 1899 (demagoguery); P. B. Mayfield to W. H. Freeland, 13 March 1901 (open advocacy), both from the Mayfield Papers.

<sup>15</sup> P. B. Mayfield to Howard Cornick, 26 January 1901 (Memphis strategy); P. B. Mayfield to Howard Cornick, 13 March 1901; P. B. Mayfield to W. H. Freeland, 20 April 1901, all from the Mayfield Papers. For the enacted legislation, see Act of 4 April 1901, ch. 126, 1901 Tennessee *Public Acts*, 197 (pauper’s oath); Act of 17 April 1901, ch. 139, 1901 Tenn. Pub. Acts 246 (incidental benefits). State Sen. C. D. M. Greer of Memphis introduced both bills as shown in the index of bills in 1901 Tennessee *Senate Journal*.

Supreme Court with a series of actions that went up and down the appellate ladder. And, matching case for case, each of the injunction actions in the Chancery Court were fought at much higher legal, social, and economic stakes than any one suit for damages in the District Court.

The Mayfields responded to the twenty-one cases with a repetition of the *Barnes* strategy, by filing another chancery bill, *Ducktown Sulphur, Copper & Iron Co. v. Fain*, for injunction on the grounds that the suitors acted unlawfully in combination to “vex, harass, and annoy complainant with a multiplicity of suits.”<sup>16</sup> There was more than a little irony to the argument, since the allegations of collusive suits paled in comparison to the reality of collusive legislative manipulation by the copper companies. Moreover, smoke suitors had no choice but to file separate claims for damages. Modern law, set forth in Rule 23 of the Federal Rules of Civil Procedure, allows for the combination of separate claims into a single class action “where there are questions of law or fact common to the class.” The procedure is frequently used in airline crashes, products liability cases, and other incidents generating multiple claims. In Tennessee, chancery courts had long employed an analogous procedure to combine separate equity bills with a common basis, but the concept of class actions did not extend to the circuit courts until the state adopted its version of the Federal Rules in 1971. Thus, smoke suitors could combine for injunctive relief in chancery, but they had to maintain separate actions for damages in circuit court.<sup>17</sup>

The point was not lost on the smoke suitors. One week after DSC&I filed to enjoin the *Fain* cases, a group of farmers led by William Madison responded with a chancery bill of their own, *Madison v. Ducktown, Sulphur, Copper & Iron Co.*, seeking both preliminary and

---

<sup>16</sup> *Ducktown Sulphur, Copper & Iron Co. v. Fain*, 109 Tenn (1 Cates) 56, 59, 70 S.W. 813, (1902).

<sup>17</sup> Tenn. R. Civ. Pro. 23 (1971), Advisory Commission Comments to §23.07.

permanent injunctions to “inhibit and restrain” DSC&I “from destroying any other timber, growing crops or other vegetation, or creating any other, or more noxious, foul, offensive and disagreeable odors and smells, poisoned by the sulfur fumes.” The farmers cast the issue as a fight to preserve hearth and home from the power of industry. They alleged that because of “immense volumes and quantities of smoke” from the roast heaps and furnaces, they “will be compelled to leave their homes and farms and sacrifice their lands which they had bought and paid for, upon which they were able to live in peace and plenty and enjoy the liberty of Americans, prior to the invasion of their rights by defendant.” Bitterness, rooted in the rising sense of being trapped and manipulated, seeped through the language of the chancery bill. The petitioners had offered to sell their lands to the company but were refused because the company “could not afford to buy all the lands within the territory covered by the smoke and fumes from its works.” Fourteen non-resident claimants who failed to file suit ahead of the new anti-pauper law, complained of a double injury: the smoke damage reduced them to poverty, yet they had no access to the courts “for the fraud of defendant in sending its attorneys to Nashville...and procuring the passage of Senate Bill number 307.”<sup>18</sup>

DSC&I felt the sting of the language and responded by reciting the “universal delight and encouragement” it received when mining resumed in 1890. Most people in the district understood that copper was the economic engine that provided income to miners, farmers, loggers, and draymen. When the industry collapsed, so did the economy and individual livelihoods. The converse happened when renewed investment in the Ducktown Mining District by northern and London shareholders encouraged other investors to finish the railroad. The

---

<sup>18</sup> Transcript at 6 (bill for injunction), 57-70 (affidavits of non-residents), *Madison v. Ducktown Sulphur, Copper & Iron Co*, 113 Tenn (5 Cates) 331, 83 S.W. 658 (1904).

railroad would not have entered the mountains but for the earnings to be made by serving the copper industry.<sup>19</sup>

Claimants attempted to argue that they had regional markets apart from the mining industry, but this was disingenuous. Ducktown was a notoriously isolated section of the Appalachians with poor road access to markets. No roads led west over the Unaka Mountains to the Tennessee River Valley except for the single lane Copper Road blasted through the Ocoee Gorge to serve the mines, and it began to fall to ruin after 1878. Squeezed as it was, through a chasm with cliffs on one shoulder and a torrent on the other, it required constant expensive upkeep to repair damage from falling rocks and washouts. The collapse of the copper industry removed the prime source of funding for road maintenance. Worse, the collapse removed the motive to repair it. And later, the arrival of rail access to Ducktown in 1890 removed the need for the road, at least until the coming automobile age required it. The new railroad did allow farmers easy access to other markets. By 1902 Brownlee Brothers store in Fannin County's Mineral Bluff assembled rail shipments of "large quantities of chickens, butter, and eggs to Atlanta every day" on behalf of local farmers. Still, the railroad owed its existence to the copper mines it was built to serve.<sup>20</sup>

After reaffirming the company's economic importance, the remainder of the company's demurrer adopted an impolitic, even vituperative tone. Most corporate lawyers prefer the velvet-covered fist to the poisoned pen out of justifiable fear that inflammatory prose only goads the opponent to further action. DSC&I attorneys threw that caution to the wind. They ignored composer Stephen Foster's popular sentiment, "Be it ever so humble, there is no place like

---

<sup>19</sup> Transcript at 117-128 (DSC&I demurrer), *Madison v. Ducktown*.

<sup>20</sup> "The Riches of North Georgia," *Atlanta Constitution*, 12 May 1902, 6.

home” and instead belittled yeoman lands as “poor barren mountain soil, almost wholly unfit for agricultural purposes and upon which only a scant existence can be eked out.” They then mocked the farmers’ cries of looming impoverishment from the smoke as “the staple demagogical cry that they were being put at the mercy of a rich and merciless private corporation.” Populist themes were not to be taken seriously for they merely afforded “so much pabulum to the average plebian of dwarfed mentality.”<sup>21</sup>

In August 1901, newspapers from cities at both ends of the Ducktown rail line considered the Madison injunction bill a threat to the industry that called for something more than sarcastic pleadings. The *Atlanta Constitution* noted “there are 10,000 people who are dependent for sustenance upon the works’ successful operations.” Knoxville’s *Journal and Tribune* wrote that “should the injunction have been sustained it would have confiscated or nullified three million dollars worth of property in Polk county and pauperized thousands of her men, women, and children.” Chancellor T. M. McConnell of the Polk County Chancery Court had these thoughts in mind when he refused to issue a preliminary injunction by fiat. The petitioners then exercised the well-worn tactic of forum shopping by traveling away from Polk County to present the case before a friendlier court in middle Tennessee. There, Chancellor J. S. Gribble issued the injunction that threw DSC&I, TCC, and the newspapers into a state of alarm. The companies brought the case back before Chancellor McConnell who then dissolved the injunction on August 20, 1901, pending a permanent ruling. The companies were safe for the moment but now realized that smoked-out farmers had learned to balance the scales of power with injunctions.<sup>22</sup>

---

<sup>21</sup> Transcript, 123, 127 (demurrer and answer of DSC&I), *Madison v. Ducktown*. “Pabulum” is the Latin spelling that in the shortened form “Pablum” became a trademarked name for infant cereal in the 1930s.

<sup>22</sup> “Smoke from Sulphur Works,” *Atlanta Constitution*, 15 August 1901, 3; “Injunctions are Dissolved,” *Knoxville Journal and Tribune*, 21 August 1901, 5.

\*\*\*

As the opponents swung away at each other with their mighty injunction cudgels, the number of smoke cases rapidly increased. DSC&I management grew so concerned that it hired James G. Parks away from the Polk County Circuit Court bench to serve as lead counsel over the Mayfield firm. General Manager W. H. Freeland gently explained to the Mayfields that “the growing magnitude and critical condition of our litigation calls for the almost exclusive attention of someone familiar, in detail, with our operations, the district and its people.” This was a circuitous way of saying that the company wanted someone it perceived to have greater legal clout. The Mayfields had designed and implemented the injunction strategy, but Parks was a master of circuit court procedure and wrote the leading Tennessee treatise on the subject. He literally wrote the book on strategies for legal delay. The Mayfields felt the change as an insult, refused to work under Parks, and instead switched sides; P. B. Mayfield’s son, J. E. Mayfield, became a prominent attorney for the smoke claimants.<sup>23</sup>

Parks would face the younger Mayfield over and over in smoke suits and would suffer many jury verdicts against the Ducktown company when the circuit court logjam finally broke in 1905. In the meantime, he worked his procedural magic toward the goal he described to his TCC counterpart, Howard Cornick, as “keeping a blocked docket.”<sup>24</sup> Defeat in the appellate courts only furthered the strategy of delay. The Court of Chancery Appeals dissolved the anti-claimant injunction in *Fain*, and in September, 1902, the Tennessee Supreme Court affirmed. In *Fain*, unlike *Barnes*, the court rejected the multiplicity of suits argument. It held that the concept

---

<sup>23</sup> W. H. Freeland to P. B. Mayfield, 13 November 1901; P. B. Mayfield to W. H. Freeland, 15 November 1901, both from the Mayfield Papers. Treatise authorship is mentioned in James G. Parks to W. H. Freeland, 18 February 1903, DBM.

<sup>24</sup> James G. Parks to Howard Cornick, 13 February 1903, DBM.

applied only to traditional areas of equity jurisdiction such as land titles and estates. Chancery could consolidate separate cases pertaining to a given tract of land or a certain decedent's property, but could not do the same with actions for unliquidated damages arising in nuisance or other torts.<sup>25</sup> Accordingly, the cases were returned to the circuit court for jury trials.

Once again, DSC&I lost on a substantive issue but accomplished the real goal of forcing more delay. Now that the twenty-one *Fain* cases were back on the docket, Parks informed DSC&I that "we shall interpose a motion to de-pauperize the plaintiffs, and thus get a continuance, unless they should be ready to make bond, which is improbable."<sup>26</sup> Judge Burke responded favorably to his predecessor by sustaining the motion and thereby delaying the cases until another term.

Notwithstanding the loss in *Fain*, Parks and Cornick recycled the well-worn and increasingly hollow arguments of multiplicity of suits, vexatious litigation, and champerty in two more injunction bills aimed at other smoke suits. Parks was confident that that one of the bills, *Tennessee Copper Co. v. Madison*, filed in November 1902 against twenty or so claims, would "meet conceived defects in the *Fain* bill."<sup>27</sup> Dozens of other claimants tried to circumvent the circuit court by filing suit before local justices of the peace. This required claimants to reduce their demands to \$500 in order to come within the lower jurisdictional limits of the local law courts, but they willingly did this in exchange for speedier resolution. Parks and Cornick responded with yet another injunction, *Ducktown Sulphur, Copper & Iron Co. Ltd v. Crofts*.<sup>28</sup>

---

<sup>25</sup> *Ducktown v. Fain* at 109 Tenn (1 Cates) at 64, 70 S.W. at 815.

<sup>26</sup> James G. Parks to W. H. Freeland, 17 February 1903, DBM.

<sup>27</sup> *Ibid*; *Tennessee Copper Co. v. Madison*, No. 287 (Chancery, Polk Co., Tenn, filed October 1902).

<sup>28</sup> *Ducktown Sulphur, Copper & Iron Co. v. Crofts*, No 292 (Chancery, Polk Co., Tenn, filed 21 December 1902).

All of the new suits were now stayed from further action. Parks reported in 1903 that, “we are now in good shape with all our litigation, so far as delay is concerned.”<sup>29</sup>

More opportunities for delay arose when claimants began to file damage suits naming the companies as co-defendants, on the theory that each was jointly and severally liable for the harmful smoke. This made sense from the claimant perspective because both companies now ran at full capacity using the same open-pit roasting process, and each contributed its respective portion of smoke to the massive cloud over the Copper Basin. It was usually impossible to determine which company’s smoke ruined that year’s apple crop. An action against both companies avoided the difficulty of allocating causation, and saved time and court costs.

Parks and Cornick realized this also and collaborated on a strategy to frustrate it. If TCC and DSC&I cared about saving legal fees and conserving judicial resources, they could have consented to appearing as co-defendants in the circuit court actions for damages, but this they would not tolerate. The refusal was in part based on the reluctance to submit themselves to proportional damages. By now, TCC was the larger company and most of the locals attributed two-thirds of the recent smoke damage to it and a third to its competitor. This formula was convenient and perhaps accomplished a rough sort of justice, but it also reinforced the idea of collective liability. The greater problem in the eyes of defense counsel was that litigation of suits with co-defendants was too expeditious for the plaintiffs. Delay was the goal, not judicial economy or justice.

After sharing legal research on the problem, the company lawyers each selected a co-defendant smoke suit to challenge with demurrers seeking dismissal on the grounds of improper joinder. Judge Parks’s circuit court successor, Judge George L. Burke, sustained both demurrers

---

<sup>29</sup> James G. Parks to W. H. Freeland, 17 February 1902.

and the Tennessee Supreme Court affirmed in *Swain v. Tennessee Copper Co.* (1903). It was a straightforward decision according to the weight of precedents holding that “if persons who maintain a nuisance act independently, and not in concert with others, each is liable for damages which result from his individual conduct only.” The rationale was that “if the law was otherwise, the one who did the least might be made liable for the damages of others far exceeding the amount for which he really was chargeable, without any means to enforce contribution or to adjust the amount among the different parties.”<sup>30</sup>

Nuisance law was (and is) an adversarial, locally focused system designed to address the impact of offense on the victim. By contrast, the modern American environmental legal system created in the 1970s is designed to make environmental policy, is national in scope, and seeks to regulate pollutants at the source.<sup>31</sup> Under traditional nuisance law, disputes were initiated by victims against wrongdoers, so the problem of allocating the liability and consequences became a matter in which the rights of the individual defendant were to be protected with the same vigor as the rights of the individual plaintiff. As with other aspects of nuisance law, this served in simpler times when the scale of offenses was small and the parties were likely to be in rough parity, as reflected in the precedents cited in *Swain*. Most of the cases of joint contribution reviewed in the opinion involved riparian disputes in which two or more parties acted separately to interfere with a stream in a manner that combined to flood the land of a neighbor. Other cases arose from quaint matters such as the combined stench from several urban pigpens and the loss of sheep from attack by the unrestrained dogs of several owners. Only two cited precedents arose from

---

<sup>30</sup> Howard Cornick to James G. Park, 8 September 1902 (exchange of authorities), DBM; *Swain v. Tennessee Copper Co.*, 111 Tenn. (3 Cates) 430, 444, 78 S.W. 93, 96 (1903). The *Swain* decision also resolved a companion claim, *Cole v. Ducktown Sulphur, Copper & Iron Co.*

<sup>31</sup> Recent historico-legal overviews of environmental law may be found in Richard N. L. Andrews, *Managing the Environment, Managing Ourselves: A History of American Environmental Policy* (New Haven: Yale University Press, 1999); Richard Lazarus, *The Making of Environmental Law* (Chicago: University of Chicago Press, 2004).

what would now be considered pollution issues: the discharge of sewage from separate lots into a common stream, and the court's own earlier smoke decision in *Barnes*.<sup>32</sup>

It happened that each of the smoke suits stayed by the *Tennessee Copper Co. v. Madison* and *Ducktown Sulphur, Copper & Iron Co. v. Crofts* injunction bills named both copper companies as co-defendants. The *Swain* opinion forced every claimant to dismiss his or her co-defendant action and then re-file as two separate actions, one against TCC and the other against DSC&I. The local justice actions were also dismissed and re-filed, this time in circuit court. The effective work of the corporate lawyers in *Swain* caused the already terrible circuit court backlog to instantly double. The result was so good that Parks and Cornick decided to voluntarily dismiss their two pending injunction bills. The copper companies had raised charges of multiplicity of actions and vexatious litigation in four injunction bills, *Barnes*, *Fain*, *Madison*, and *Crofts*; but after blocking the docket by doubling the number of suits against themselves, they no longer found it necessary to bandy those charges against the smoked-out farmers.<sup>33</sup>

\*\*\*

New cases continued to pile on top of all the long-delayed matters for several reasons. The passage of time and ever increasing rates of production expanded the zone of smoke destruction to encompass more farms and woodlots. On the older, already afflicted properties, the ongoing nature of the nuisance continued to generate new claims with every growing season, and each new claim had to be filed within the three year statute of limitation lest it be time barred.<sup>34</sup> Thanks to the *Swain* decision against joinder of the companies as defendants, every

---

<sup>32</sup> *Tennessee Copper Co. Swain*, 111 Tenn (3 Cates) at 436-53, 78 S.W. at 94-98.

<sup>33</sup> In October, 1903, dismissals were filed in both *Tennessee Copper v. Madison*, and in *Ducktown v. Crofts*; see Polk County Chancery Court Rule Docket, No. 2 for the entries.

<sup>34</sup> *Tennessee Code Annotated*, §28-3-105(1).

new claim had to be filed twice. The result was that many farmers filed three, four, and even more claims, in separate suits against the Ducktown company and then against Tennessee Copper.

Another impetus to litigation arose when the Tennessee General Assembly repealed the champerty law in 1899 thereby legalizing percentage and contingent attorney fee contracts.<sup>35</sup> The old law, Section 1781 of the Code of Tennessee (1858), forbade any party to “promise or agree to pay, or give any greater or less sum of money of any greater or less portion of the thing in litigation, upon any contingency, or upon the event of the suit.”<sup>36</sup> The related concept of maintenance, as defined by Lord Blackstone, barred a party from “officious intermeddling in a suit which no way belongs to one by maintaining or assisting either part, with money or otherwise, to prosecute or defeat it.”<sup>37</sup> The practical import of both concepts was that attorneys for smoke suitors could not openly enter into a contract for a fee contingent on the outcome or based on a percentage of the outcome (champerty), and could not agree to cover the costs of court during prosecution (maintenance). Whether they did so under the table was another matter.

The rationale for both principles was to prevent excessive litigation that might arise if clients were spared the burden of paying fees up front and if attorneys had a stake in the size and number of claims. Litigation could theoretically be reduced by forcing the client to pay attorney fees win or lose and by urging the attorney to charge only for time and services rendered. Throughout the nineteenth century, Tennessee courts occasionally dismissed suits for violation of the rules, as happened to one of the claims in the *Barnes* litigation.<sup>38</sup> Even so, judges were

---

<sup>35</sup> Act of 7 April 1899, ch. 178, 1899 Tenn. Pub. Acts 321.

<sup>36</sup> Code of Tenn. §1781 (1858).

<sup>37</sup> *Hayne v. Coyne*, 57 Tenn. (10 Heisk.) 339, 342 (1872).

<sup>38</sup> Transcript at 590, *Ducktown v. Barnes*.

hostile to the rules for being draconian in impact and for hindering the access of the poor to the courts, saying on one occasion, “it is not champerty by common law for a man to help his poor neighbor.”<sup>39</sup> A cynic might have added that it was not champerty for an attorney to receive a larger fee; and thus in a legislature full of lawyers, it was no surprise that champerty and maintenance laws were eventually abolished by statute.<sup>40</sup>

Company lawyers considered the end of champerty and maintenance as the modern victory of venality over the wisdom of the ages. A cluster of country lawyers in the Polk County seat of Benton, followed by others in Georgia and North Carolina, realized that there was legal gold to be mined in the mountains above the town, and then set about building portfolios of contingent fee cases by hustling for smoke suits. Lawyers found smoke suits appealing because they met the three criteria of a good contingent fee case: clear liability, provable damages, and a defendant with deep pockets. The *Barnes* decision resolved the liability issue by declaring copper smoke to be an actionable nuisance. Damages were relatively easy to prove as farmers took turns testifying for each other about crop losses. And best of all, DSC&I and TCC had the deepest pockets in East Tennessee, something claimants’ lawyers already knew from their lucrative tort actions for worker deaths and injuries. It certainly beat trying to make a living by doing legal piece-work, such as wills, deeds, and divorces for cash poor farmers.<sup>41</sup>

Defense attorneys who might have welcomed the increased caseload as grist for their legal mills, more often expressed irritation over the phenomena. Before they switched sides, the Mayfields offered deposition testimony from N. B. Graham, a newspaper publisher and the local

---

<sup>39</sup> Weedon v. Wallace, 19 Tenn (1 Meigs) 286.

<sup>40</sup> Sanders v. Riddick, 127 Tenn (19 Cates) 701, 156 S.W. 464 (1913). Contingent fees are now expressly authorized. Tenn. Sup. Ct. Rule 8, Canon 1.5 (c) (2005).

<sup>41</sup> Work injuries remained tort actions in Tennessee until it adopted workers’ compensation in 1919.

Clerk of Court, that “when these parties began to import lawyers into the country from Marietta and Morganton, Georgia, Cleveland [Tennessee], and other points for the purpose of bringing suits for smoke damages it looked like the industry in Ducktown had been and would be menaced.”<sup>42</sup> Parks opposed a bill for additional special terms of court to reduce the judicial backlog by arguing that it would only work to accommodate “a lot of conscienceless scoundrels [who] have been riding the Georgia and North Carolina territory working up smoke claims.” He added that the lawyers lured clients “into their hands with the understanding that they will try to get something for them, and if not, they will lose nothing.”<sup>43</sup> By his estimation, such lawyers were “shysters,” and “a lot of blackmailers...who are trying to hold us up for blood-money.”<sup>44</sup>

The cynicism was not total; corporate counsel often acknowledged the reality of smoke damage if not the dollar values claimants placed upon it. Parks recommended settlement with Billy Humphrey, a farmer and preacher “who was forced to leave his little farm with his old wife and no property” after living “across the Ocoee [River] opposite the mines as long as he could stand it.”<sup>45</sup> Owners in the Hot House Creek district had some of the best farmland in the Basin. Parks acknowledged, “They were men of good standing,” and that “there can be no doubt that these farmers have been pretty badly injured.”<sup>46</sup>

Parks and his allies were more skeptical of other claims. Their attitude towards individual cases bore some relation to the distance of claimants’ farms to the roast heaps and smelters.

---

<sup>42</sup> Transcript at 308 (deposition of N. B. Graham), *Ducktown v. Barnes*. Graham’s willingness as Clerk of Court to testify for a party in a pending case was at the least a dubious ethical choice.

<sup>43</sup> James G. Parks to J. K. P. Marshall, 27 January 1909, DBM.

<sup>44</sup> James G. Parks to W. H. Freeland, 8 January 1906 (shysters); James G. Parks to F. L. Mansfield, 6 February 1909 (blackmailers), both DBM.

<sup>45</sup> James G. Parks to W. H. Freeland, 6 November 1903, DBM.

<sup>46</sup> James G. Parks to W. H. Freeland, 24 January 1908, DBM.

Parks mentioned “the law of the diffusion of gases” in a letter to co-counsel, W. B. Miller, adding whenever a claimant’s property lay closer to the TCC works than to the DSC&I smelters in Isabella, “that fact ought to weigh greatly in our favor.” Actually, patterns of smoke damage failed to correspond solely to distance. Sulfur dioxide smoke was heavier than air, so on still days, it tended to collect and flow in the lowest portions of the Basin, along the Toccoa/Ocoee River and its tributaries. That is why the early *Barnes* suitors clustered along Wolf Creek, and also why Parks worried about cases filed by the farmers of Hot House Creek.<sup>47</sup>

On windy days, clouds of smoke blew over higher ground and often reached into the mountains that walled the Ducktown Basin.” J. K. Haywood, a chemist with the United States Department of Agriculture, noticed similar patterns in his 1905 study of smelter smoke at the Mountain Copper works in the Mount Shasta region of California. He observed that northerly and westerly winds drove smoke up the gulches because “the fumes have a tendency to keep together and drift for long distances up these natural chimneys.” Southerly winds sent smoke “drifting over one high hill” and then “down the valley of the Sacramento.”<sup>48</sup>

Nonetheless, the law of diffusion of gases provided grounds to question claims arising from the more remote property owners. With distance, the suspicion grew that litigating was more lucrative than mountain farming. J. V. Kisselburg, a farmer near Mineral Bluff in Fannin County asserted, “Some of my neighbors kicks sometimes, but they say they are going to get damage, as they claim that it is easier to get money out of the copper co. by lawing them than it is to work for it.”<sup>49</sup>

---

<sup>47</sup> James G. Parks to W. B. Miller, ? February 1908, DBM.

<sup>48</sup> J. K. Haywood, *Injury to Vegetation from Smelter Fumes*, U.S. Department of Agriculture, Bureau of Chemistry, Bulletin no. 89 (Washington: Government Printing Office, 1905), 7-8.

<sup>49</sup> J. V. Kisselburg to Thomas S. Felder, 5 July 1912, GDAH, RGS 9-1-1, box 4, folder 4.

\*\*\*

Company attorneys also made a link between mining employment and the filing of claims. Many farmers worked for the mines, as wage laborers, as suppliers of wood and quartz rock (a flux for smelting), or as teamsters. The argument arose that some claimants filed only in retaliation for the loss of employment. The Ducktown Company alleged that it “found inexpedient and impracticable to give to all who so desired official position...and out of this as a consequence, dissatisfaction and disaffection arose.” J. H. Barnes, whose farm was only two miles from the DSC&I roast heaps, admitted, “I had a contract of furnishing wood and it stopped me. If I had worked on for the company, perhaps I would not have sued.”<sup>50</sup> The reverse was also true, when legitimate smoke claims were settled in exchange for renewal of wage labor or contract work. J. E. Mayfield, now representing claimants, wrote Parks to suggest that Avery McGhee’s case could be settled if the company would receive and pay for rock he delivered. DSC&I agreed to allow smoke suitors in the Wolf Creek area to resume hauling rock for the company if they would settle for only payment of the court costs.<sup>51</sup>

The link between employment and smoke suits requires cautious appraisal. Conduct that was assessed by the companies as the abusive tit-for-tat filing of smoke suits by would-be employees and contractors, may warrant a different reading. Mixed employment was a common practice among mountaineer farmers living near mining and logging operations. Highland farming was never easy and was rarely a totally self-sufficient livelihood, so opportunities for supplementary income were welcome, especially if work off the farm coincided with slack times

---

<sup>50</sup> Transcript at 16 (dissatisfaction), 524 (Barnes employment), *Ducktown v. Barnes*.

<sup>51</sup> J. E. Mayfield to James G. Parks, 9 October 1903, Mayfield Papers; James G. Parks to W. H. Freeland, 8 January 1906; W. H. Freeland to James G. Parks, 11 January 1906, both DBM.

in the growing season. Farmers preferred both sources of support, but if smoke rendered farming unprofitable or impossible, the importance of non-farm work became all the greater. It was only right that suits should be filed if the copper companies simultaneously ruined farms and denied employment. Conversely, cases could be settled cheaply if the opportunity to resume mine employment made it possible to hold onto farms a little longer. Southern agrarian populism had its counterpart among industrial workers. In Ducktown, the fight to preserve home and livelihood through agricultural, public work, or both remained an expression of the populist spirit pitting individuals and families against the great economic forces of market and industry.<sup>52</sup>

\*\*\*

Claimants were caught in a three-way problem: their ability to make a living at farming was impaired or ruined by smoke, their opportunities for wage and contract work were often barred at the mines, and the successful strategy of “keeping a blocked docket” prevented relief in the courts. Avery McGhee bitterly complained that “all of the efforts of complainants to obtain some compensation for the loss of their homes, crops, and timber have so far been in vain...on account of the delays defendants have been able to obtain.” Each time they filed in circuit court, the companies “waited until a few days before the term convened at which the suit stood for trial and have then obtained an injunction from the chancellor.”<sup>53</sup>

---

<sup>52</sup> For the link between southern agrarian populism and labor see McMath, *American Populism*, 108-42; C. Vann Woodward, *Origins of the New South* (Baton Rouge: Louisiana State University Press, 1971), 253-54. The debate over extent of subsistence agriculture and the degree to which individuals engaged in public work has generated a substantial literature. Compare Ronald D. Eller, *Miners, Millhands, and Mountaineers: Industrialization of the Appalachian South, 1880-1930* (Knoxville: University of Tennessee Press, 1982), xv-xxvi, 86-137 to Wilma Dunaway, *The First American Frontier: Transition to Capitalism in Southern Appalachia, 1700-1860* (Chapel Hill: University of North Carolina Press, 1996), 2-21, 123-28; see also Paul Salstrom, *Appalachia's Path to Dependency: Rethinking a Region's Economic History, 1730-1940* (Lexington: University Press of Kentucky, 1994), 41-59 (part-time mountain farmers).

<sup>53</sup> Bill of injunction, Avery McGhee v. Tennessee Copper Co., No. 314 (Chancery, Polk Co., TN, filed July 13, 1903).

Despite their frustration over delay tactics, most claimants continued to file their cases in the Tennessee state courts for lack of practical alternatives. Georgians and North Carolinians could not litigate in their own state courts because of the inability to establish jurisdiction over the copper companies under the narrow jurisdiction standards of the day. Article III of the Constitution and a series of federal judiciary acts allowed for diversity jurisdiction, meaning that federal courts could assert jurisdiction in suits between citizens of different or diverse states, but only a few claimants did so. Many claimants were barred from federal court by the “amount in controversy” requirement established by Congress in diversity jurisdiction cases. The idea was to prevent the federal courts from being burdened with financially small matters.

The amount in controversy requirement in force at the outset of the Ducktown cases was \$2,000, as set by Congress in 1877. It was raised to \$3,000 in 1911, midway through the sweep of private smoke suits. The requirement posed no difficulty to the several timber barons who filed large claims in federal court. It was an effective barrier to most of the smaller farmers. Experience in the Polk County District Court showed that most verdicts involving small mountain farms were considerably under \$500. That is why so the *Crofts* claimants were willing to set their claims at only \$500 dollars in order to have them expedited for trial before a justice of the peace. It was hard for all but the most prosperous farmers to make a plausible claim for damages in excess of \$2,000.<sup>54</sup>

Distance was another barrier to federal court. The federal courts in Chattanooga and Knoxville were considerably further than the Polk County courts in Benton. Train travel was the

---

<sup>54</sup> U. S. Constitution, Article III; Act of March 3, 1887, 24 Stat. 552 (\$2,000); Act of March 2, 1911, 36 Stat. 1091 (\$3,000); see generally 15 Moore’s Federal Practice 3d §§102App.04 [3-7] (2007). The amount in controversy requirement rose to \$75,000 in 1996. Diversity jurisdiction cases were handled in the federal circuit courts, which functioned as one of the two main trial courts in the federal system until they were merged with the federal district courts in 1911. The pre-1911 federal circuit courts are not to be confused with the later federal circuit courts of appeal created in 1911. See, Erwin C. Surrency, *History of the Federal Courts* (Dobbs Ferry, NY: Oceana Publications, 2002), 35-64, 83-92, 103-112.

only practical way out of the Ducktown Basin to Benton and points beyond. A rail trip to Benton was a good deal shorter and less expensive than travel to Chattanooga or Knoxville. Ducktown smoke litigation occurred at a time when automobiles were a novelty (the first automobile appeared in the Basin in 1906), and good roads were almost non-existent in the Southern Appalachians. The roads were so bad that when L. H. Abernathy bought a car in Atlanta in 1907, it took him fifteen days to find a viable route over unpaved roads to his home in Copperhill. The old Copper Road down the Ocoee Gorge had fallen into disrepair after the arrival of the railroad. Ducktown would not have a direct automobile highway over the Unakas to Benton until construction of the Kimsey Highway in 1920.<sup>55</sup>

Benton remained the best of courthouse destinations for all but the wealthiest smoke suitors. Even then, some suitors were so poor that they could not afford a local train ticket and were compelled to travel the Copper Road on foot or by horse. E. M. Harbison reported to the *Knoxville Journal & Tribune* about a November 1905 session of court in Benton where he observed “women and children in attendance” who had “been forced to travel thirty-five miles through the rain and over one of the roughest roads that mortals ever had to travel.” He also noted men who had suffered so badly from exposure from rain and cold on their way through the Gorge that “they never attended another earthly court.”<sup>56</sup>

Resort to federal court had another negative consequence. Plaintiffs were far more likely to find friends, or least sympathetic locals, on a Polk County jury. Federal courts drew their jury pools from a much greater geographical area and thus from people who were considerably more detached from the problems of smoked-out farmers. Jury considerations, jurisdictional issues,

---

<sup>55</sup> Robert Edward Barclay, *The Copper Basin, 1890 to 1963* (Knoxville? Tenn.: by the author, 1975), 106, 148 (first car and Abernathy); Roy G. Lillard, *The History of Polk County, Tennessee* (Benton, Tenn.: Polk County Historical & Genealogical Society, 1999), 177 (Kimsey Highway).

<sup>56</sup> E. M. Harbison, *Knoxville Journal & Tribune* (24 July 1911), quoted in Barclay, *Copper Basin*, 107-08.

and the costs and burden of travel eliminated federal court as an option for most of the smoke litigants. Moreover, establishment of a law court within the Basin at Ducktown in 1911 removed what little incentive there was for filing in distant courts.

\*\*\*

For all of these reasons, claimants continued to pursue their claims locally, even though their choice subjected them to the array of delay tactics in the state courts. In 1902, the farmers fought back with three more anti-company injunction bills in addition to the pending Madison bill. This time the companies aggressively countered the populist threat of injunction by loudly proclaiming the workingman's disaster that would ensue. When P. J. Farner filed an injunction bill in January, 1902, local papers, and even the distant *Washington Post* quoted the response of Tennessee Copper's president: "when the injunction is served upon him he will shut and close down the entire works and mines and pay off and discharge every man."<sup>57</sup> In a front page article captioned "Disaster Threatens Ducktown," the *Knoxville Journal and Tribune* feared a repetition of events occurring when the mines closed in 1878, when men too poor to pay for transportation "were then forced to put their wives and little ones in the public road and walk away, carrying as much of their personal effects as possible upon their persons."

TCC counsel, Tully Cornick, worked to shift the blame for the present crisis. He admitted to the papers "that there is no doubt but that the abutting land owners suffer some injury by reasons of the smoke" but avowed that the company was willing to settle on reasonable terms by paying damages or by purchasing "the right or easement to flood the land in question with the smoke generated on their roasting yards." Settlements failed to occur because "lands assessed at taxation for sixty cents per acre are claimed to have been damaged not less than \$10 per acre."

---

<sup>57</sup> "How Injunction Would Work," *Washington Post*, 20 January 1902, 8.

Cornick did not mention the docket strategy used to effectively deny farmers recourse in the circuit court.<sup>58</sup>

Two more bills followed, one by Farner's kinsman, Isaac Farner, in the following November, and the other by Avery McGhee in September, 1903, making a total of four pending anti-company injunction bills. It was here that the tactical wisdom of the 1901 legislative campaign came into play. The incidental benefits act imposed the duty of "exercising sound discretion" when deciding upon injunctive relief.<sup>59</sup> With power came responsibility; the genius of the act was that elected chancellors (the title of judges in chancery courts) answered to local voters for their decisions about whether to close the mines. They legitimately framed their rulings in terms of balancing costs and benefits but would be less than human if they failed to consider the number of voters impacted by smoke compared to the number that would suffer from unemployment or conditions of general economic decline. Chancellor N. Q. Allen granted an injunction by fiat to P. J. Farner and then took only seven days to reverse it, saying "I decline to be the instrument either lawful or otherwise of stopping an industry for even a short time in mid-winter which furnishes food and fires to a laboring population of over 5000 people."<sup>60</sup> The claimants, he ruled, had adequate remedy at law by pursuing claims for monetary damages, notwithstanding the role that the chancery played in creating the appalling backlog in circuit court.

Chancery issued similar rulings in the other three injunction bills, thus putting the burden of appeal on the smoke suitors. P. J. Farner abandoned his injunction bill, but the others took

---

<sup>58</sup> "Disaster Threatens Ducktown," *Knoxville Journal and Tribune*, 20 January 1902, 1.

<sup>59</sup> Act of 17 April 1901, ch. 139, 1901 Tenn. Pub. Acts. 246.

<sup>60</sup> Decree, 17 January 1902, *P. J. Farner v. Ducktown Sulphur, Copper & Iron Co. and Tennessee Copper Co.*, No. 261 (Chancery, Polk. Co., TN, filed 10 January 1902).

their cases to the Court of Chancery Appeals. There, in a series of two-to-one rulings, the court ruled in their favor by reversing denial of injunctive relief. The split decisions recast at a higher level the same populist ideas expressed several years earlier by the elderly Margaret Madison in the Barnes case. Writing for the majority in the *McGhee* case, Judge S. F. Wilson framed the issue as “whether these complainants shall be permitted to live in the homes that they have occupied and on which they have supported their families, or shall they be compelled to leave their homes and seek residences elsewhere?” He then asked “What right has any enterprise, however beneficial in its results to the public generally, to say that he must vacate his home?” He concluded that he knew of “no principle of law and of no decision that authorizes works, manufacturing establishments or other enterprises, however extensive their operations, or however beneficial to the public in general, by the methods of their business, however necessary, to drive a citizen from his home.”<sup>61</sup>

The majority opinions in *McGhee*, *Madison*, and *Farner* were not well reasoned. The sweeping terms of the rulings elevated the status of private dwellings to a degree of absolute right and ownership never contemplated in Anglo-American law, and without apparent regard for the consequences the rulings caused to others. In his dissent, R. M. Barton, Jr. argued that a person’s right to life and property had never been absolute but was subject to limitations such as eminent domain. He opined that the majority, in its pursuit of absolute right, had abandoned the exercise of discretion that lay at the heart of equity jurisprudence. Specifically, the grant of extraordinary relief by injunction “was always a matter of grace or discretion and not of fixed right.” In its willingness to destroy a mighty industry with a payroll of thousands “without regard

---

<sup>61</sup> Transcript (Court of Chancery Appeals majority opinion), *McGhee v. Tennessee Copper Co.*, TSLA R.G. 170, Tennessee Supreme Court East, Box 1431 (1904). *McGhee* is one of the three component cases resolved in *Madison v. Ducktown Sulphur, Copper & Iron, Co.*, 113 Tenn. (5 Cates) 331, 83 S.W. 658 (1904), but its transcript is separately archived as noted.

to consequences” for the sake of modest farms appraised for taxes at \$100 (Madison) and \$83.00 (F. M. Carter), the majority acted according to the maxim, *fiat justitia, ruat coelum* (let justice be done, though the heavens fall) instead of the equitable principle *salus populi est suprema lex* (let the welfare of the people be the supreme law). Barton then recited national precedents where courts of equity exercised discretion through use of the balancing test to deny injunctive relief for the public good. Oddly, he failed to cite the 1901 Tennessee incidental benefits act to the same end. He concluded with a warning that the rulings in the Ducktown injunction cases would put “the entire business interest of the state...at the mercy of those who are willing to set in motion such destructive agencies.”<sup>62</sup>

Copper officials and railroad executives agreed and worked together on the legal and political fronts to reverse the rulings. The legal staff of the Louisville & Nashville Railroad offered assistance counsel because of the railroad’s growing exposure to nuisance claims and its direct financial stake as owner of the AK&N railroad that served the mines. TCC counsel, Howard Cornick, advised DSC&I’s James G. Parks that, “we have the Governor interested in the matter and think he will exert such influence in our behalf as he may be able to exert within the strict bounds of propriety.”<sup>63</sup> Parks, a Republican, ran for office as state representative “to be there to try to get needed legislation in case the injunctions were granted.” To that end, he asked and received the tacit backing of Cornick’s Democratic law firm. Parks also insisted on the support of DSC&I wage employees. He complained to management when one DSC&I

---

<sup>62</sup> Transcript (Court of Chancery Appeals dissenting opinion), *McGhee v. Tennessee Copper Co.*, TSLA.; Act of 17 April 1901, ch. 139, 1901 Tenn. Pub. Acts 246 (incidental benefits).

<sup>63</sup> Milton H. Smith to J. Park Channing, 14 October 1903; Howard Cornick to James G. Parks, 16 October 1903, both DBM.

mineworker said “he would not vote for me because of...my stand for the company in the smoke suits while I was Judge.”<sup>64</sup>

Abundant legal precedent more than political pressure led the Tennessee Supreme Court to reverse the Court of Chancery Appeals in each of the three injunction cases. In its opinion, issued on November 26, 1904, the court agreed with Judge Barton’s argument that the enjoyment of one’s home was not an absolute right, and then employed the 1901 incidental benefits act to balance the interests of the parties. The court determined that it could do justice without letting the heavens fall upon “two great mining and manufacturing enterprises that are engaged in work of very great importance, not only to their owners, but to the State, and to the whole country as well,” in order to protect “several small tracts of land, aggregating in value less than \$1,000.” Claimants had a remedy at law for damages, and therefore, should not be allowed to cause economic havoc to protect “thin mountain lands of little agricultural value” and an aggregate tax value of less than \$1,000.<sup>65</sup>

The Tennessee Supreme Court thus applied the balancing test to weigh the equities between mountain farmers and the copper companies, and ruled that the scale tipped decidedly in favor of industry. Corporate relief was immediate. Ducktown’s general manager, W. H. Freeland fired off a coded cablegram to the company’s managing directors in London advising that “the injunction has been refused in every case by supreme court.” The directors responded with another coded cablegram declaring that the ruling “has given us the greatest satisfaction.” Freeland then proclaimed the ruling “will practically mean that so far as our own state courts are

---

<sup>64</sup> James G. Parks to W. H. Freeland, 6 September 1904; James G. Parks to Howard Cornick, 6 September 1904; Howard Cornick to James G. Parks, 28 October 1904; James G. Parks to W. H. Freeland, 3 December 1904, all DBM.

<sup>65</sup> *Madison v. Ducktown Sulphur, Copper & Iron Co.*, 113 Tenn. (5 Cates) at 339, 363-366, 83 S.W. at 659, 666-667.

concerned, no future action for injunction on the grounds of nuisance will stand.” This proved to be true.<sup>66</sup>

\*\*\*

The 1904 *Madison v. Ducktown* decision ended the popular debate over injunctive relief by taking the weapon away from farmers. At the same time, the companies were losing their own injunction club as they ran out of procedural grounds to enjoin circuit court cases: claimants’ attorneys had learned their hard lessons in how to properly file actions for damages. By 1903, Parks lamented that “the delays hitherto have not been the result of continuances from term to term, but by injunction. It is plain that we have about exhausted this means.”<sup>67</sup> Soon, local juries could begin to dip into the coffers of the copper companies with awards to their fellow citizens.

Trials of the *Fain* cases, all of which were against the Ducktown Company only, began in late in 1903 and continued for several more years. Most cases resulted in verdicts for the plaintiffs with awards ranging from \$46 to above \$500, and most falling in the \$100–\$200 range. The amounts were not huge, but were not insignificant either, given that the daily wage for miners was around a dollar per day. By 1907, the newer claims, filed separately against each company began to move through the circuit courts. Awards for these cases tended to be higher with claimants recovering totals of \$300–\$500 for each pair of cases. Some of the prominent farmers of the Hothouse Creek community recovered combined amounts exceeding \$1,000.

The copper companies could no longer enjoin the circuit court trials but continued other maneuvers to stem the increasing flow of verdicts and to delay payments. They routinely

---

<sup>66</sup> W. H. Freeland to DSC&I directors, 28 November 1904; DSC&I directors to W. H. Freeland, 29 November 1904; W. H. Freeland to James G. Parks, 1 December 1904, all DBM. The application of the balancing test in *Madison* and its rejection in *Georgia v. Tennessee Copper Co.* (1907) is considered in Peter C. Hoffer, *The Law’s Conscience*, 155–67.

<sup>67</sup> James G. Parks to Howard Cornick, 13 February 1903, DBM.

appealed awards of damages to the Tennessee Supreme Court even though the grounds for doing so were slim, often amounting only to blanket assertion that the awards were excessive or not supported by the evidence. The Supreme Court just as routinely affirmed the verdicts, though the exercise did accomplish the goal of delaying payment by another year or so. No sanctions were imposed for what would now be considered frivolous appeals filed only for purposes of delay.

The parties also continued their legislative wrangling. Smoke suitors tried and failed to win repeal of the 1901 anti-pauper and incidental benefits acts. In 1903, claimant lawyer, B. B. C. Witt complained to his colleague J. E. Mayfield, “We are not going to get anything from the legislature...it seems that the mining co[mpanie]s & their attorneys have the thing down.”<sup>68</sup> The companies tried and failed that same year to block addition of another week of circuit court intended to expedite the backlog. Parks complained that his judicial successor, Judge Burke, declined to oppose the bill.<sup>69</sup> In 1909, the companies did manage to block an act authorizing special terms of courts with imported judges, after a letter writing campaign in which Parks solemnly assured legislators that “we have not been trying to delay the trial of these cases.”<sup>70</sup>

More and more cases passed through circuit court, creating a new problem for the copper companies: witnesses. Corporate counsel always feared local bias against the copper companies, and this proved true when trials began. Farmers easily obtained testimony from fellow farmers about crop losses. The companies had a much harder time trying to find effective rebuttal witnesses. Parks complained to Cornick “it is out of the question to depend upon local witnesses”

---

<sup>68</sup> B. B. C. Witt to J. E. Mayfield, 13 February 1903, DBM.

<sup>69</sup> James G. Parks to Howard Cornick, 3 April 1903, DBM. For the added week, see Act of April 15, 1903, c. 355, Tenn. Pub. Acts 1079.

<sup>70</sup> James G. Parks to F. L. Mansfield, 6 February 1909, DBM. Both the Senate and House versions of the special terms bill died in committee. H.B. 112, 56<sup>th</sup> General Assembly (Tenn., 1909); S.B. 148 56<sup>th</sup> General Assembly (Tenn, 1909).

because “neighbors having no suits expect to have at some time; besides they all sympathize with each other.” Credible, local pro-company witnesses were hard to obtain because communities were tight and grudges long lasting; “you can hardly prevail upon our best citizens to...make voluntary witnesses.” As for bringing in outside witnesses, “to send a lot of scalawags would be worse than sending nobody.”<sup>71</sup>

Parks proposed legislation in 1903 to provide another civil procedure fix. Instead of relying upon local witnesses and, for that matter, local juries, he proposed revising the hallowed right to trial by jury with a new system called jury of view. Under the new system, the court would pick a panel of five witnesses from a wide area, perhaps even outside of Polk County, and charge them with the power to personally view the allegedly damaged farms and then set the amount of compensation. This would bypass a regular jury and the need for rebuttal witnesses. Parks listed other advantages. First, experience with a similar system in eminent domain condemnation cases, showed him that “a jury of view rarely gives one-fifth what an ordinary jury in the court will allow.”<sup>72</sup> This was because his “good men” would be more willing to evaluate damage if summoned by the court instead of a company attorney. Second, he advised Cornick that the jury of view process “would give us more delay than is possible under present laws” and backed his contention with an eight page letter describing all the ways this could be done.<sup>73</sup>

This time, the Tennessee Copper Company broke ranks with Ducktown Sulphur, Copper & Iron. Despite repeated letters and meetings, TCC refused to back the bill, largely for fear that it would backfire on the company as “an evident admission of liability for damages.”<sup>74</sup> Parks

---

<sup>71</sup> James G. Parks to Howard Cornick, 13 February 1903, DBM.

<sup>72</sup> James G. Parks to W. H. Freeland, 14 February 1903, DBM.

<sup>73</sup> James G. Parks to Howard Cornick, 13 February 1903, DBM.

<sup>74</sup> Howard Cornick to James G. Parks, 9 February 1903, DBM.

privately railed about his greater procedural knowledge compared to the young attorneys in Cornick's firm who, though "above average for their years," have yet "to acquire that calm judicial poise and level-headedness that constitutes the chief element of value of a lawyer to his client." Still, he admitted it was pointless to introduce the measure because "it would necessarily become known to the members...as a bill for the benefit of the copper companies" and could not overcome the strong anti-corporate populist mentality if only one of the companies backed it.<sup>75</sup> The jury of view idea never again resurfaced. The circuit court, now working apace with added weeks, would continue to handle cases with local witnesses and traditional juries for the many remaining years of Ducktown smoke litigation.

\*\*\*

The copper companies survived the farmer smoke suits. So did the livelihoods of the thousands of workers and their dependents. Tennessee's conservative common law approach to the law of nuisance, as articulated in *Barnes*, had posed a serious threat to the industry. The companies met the threat by obtaining a statutory modification that encouraged chancery courts to apply the balancing of interests tests when ruling on injunctive relief. Their victory was pyrrhic. The frustration and anger generated by the strategy of "keeping a blocked docket" led the State of Georgia to file suit on its own behalf in the United States Supreme Court, transforming a fight between farmers and industrialists in the legislature and courts of Tennessee into a battle with a much more powerful plaintiff, in a court far removed from local political pressure.

What of farms, farmers, and rural populism? The results were mixed. Many farmers suffered lasting damage to their lands and livelihood that money could not replace. They lost

---

<sup>75</sup> James G. Parks to W. H. Freeland, 18 February 1903, DBM.

their power of injunctive relief in the Tennessee courts. Even so, rural populists and their supporters in the Tennessee legislature achieved major accomplishments. They added more weeks of court to restore viability to a circuit court system that almost collapsed under corporate delay tactics. They defeated the attempt to redefine nuisance per se in a way that would have barred nuisance actions against rural smokestack industries. They prevented the imposition of the incidental benefits offset in the calculation of smoke damages. The right to jury trial in nuisance actions and the right to call one's own valuation witnesses remained intact. Local farmers continued to set the verdicts.

Ducktown smoke was a problem too big to be addressed with the principles and methods of traditional nuisance law. The parties fought in the legal trenches and legislative committee rooms to shape it in ways that advanced their respective interests. Neither side achieved a complete victory. Yet by the vigor and persistence of their combat they transformed the Tennessee law of nuisance in a way that achieved a rough accommodation between the populist concerns of the farmers and the economic realities of the industrial age. Georgia's Supreme Court case would extend the transformation by converting nuisance law from a private remedy into a state tool for responding to interstate smoke pollution—an outcome that more accurately reflected the scale of industrial nuisance, if not the personal harm suffered by property owners, at the turn of the century.<sup>76</sup>

---

<sup>76</sup> *Georgia v. Tennessee Copper Co.*, 206 U.S. 230 (1907); *Georgia v. Tennessee Copper Co.*, 240 U.S. 650 (1916).

## CHAPTER 4

### “SOME TERRIBLE LEPROSY OF VEGETATION”:

#### GEORGIA’S ENTRY INTO THE DUCKTOWN FRAY

By 1903, farmers in the Ducktown Basin were beside themselves with frustration. Each growing season brought another round of dismay as acid from the smoky clouds killed the fruits of their labors on the stalk, the vine, and the branch. It was bad enough to suffer the damage. It was worse to know that they could have profitably sold all of their produce to the miners—if only they could grow it. Added to this was the realization that their efforts to fight the smoke problem in the Tennessee courts were going nowhere.

Ambrose Bierce, a contemporary journalist, self-described cynic, and author of *The Devil’s Dictionary* (1911), defined litigation as “a machine which you go into as a pig and come out of as a sausage.”<sup>1</sup> After five or six years of litigation in Tennessee, it was obvious to the smoke suitors that they were being ground into sausage and that the company lawyers were turning the crank. James G. Parks for DSC&I and Howard Cornick for TCC had out-maneuvered them at almost every turn by applying their considerable legal skills, bolstered by the resources and power available to them as corporate attorneys. Their strategy of “keeping a blocked docket” kept cases for monetary compensation from reaching juries in the Polk County Circuit Court. In the Polk County Chancery Court, they blocked the farmers’ repeated attempts to abate the smelter smoke. Each of the petitions for injunction against the copper companies languished in seemingly endless rounds of appeal. A torrent of cases entered the judicial system;

---

<sup>1</sup> Ambrose Bierce, *The Unabridged Devil’s Dictionary*, edited by David E. Schultz and S. T. Jones (Athens: University of Georgia Press, 2002), s.v. “litigation.”

but after more than six years of litigation, only a thin trickle dribbled out of the judicial tap. Only a few had managed to bring their suits through trial, verdict, judgment, and appeal to final payment of their claims, and of those, poor Mrs. Madison won only a dollar.<sup>2</sup>

Also, the copper companies also won most of the legislative battles in Nashville. With the active support of corporate counsel and lobbyists from the railroads, they changed the common law of nuisance in favor of industry. The new law required chancery courts to employ the balancing of interests test when ruling upon petitions to enjoin smokestack industries. Now, the economic consequences of an injunction—the millions of dollars invested in plant and equipment, the number of employees and households dependent upon industry wages, and the general economic impact of a closure—had to be weighed in the balance against the dollar impact of industrial smoke upon the operations of typically modest mountain farms. Another statute hindered cash-poor Georgians and North Carolinians from initiating suits in the Tennessee courts by prohibiting out-of-state litigants from filing *in forma pauperis*. They now had to spend scarce dollars to post a bond for costs at the commencement of suit.

Parks and Cornick defended their clients almost too well. Georgia litigants concluded that they had little or no effective recourse in the Tennessee judicial system and instead voiced their complaints to more sympathetic ears in their home state. Lawyers had a useful term, “home cooking,” to describe the suspected tendency of courts and juries (and legislatures) to favor local interests. The Georgia smoke suitors had been forced to eat Tennessee home cooking for more than six years. Now they intended to respond in kind with legal remedies served up from Georgia kitchens by cooks who were beyond the control of the two big copper companies. If individual Georgia mountaineers were outmaneuvered by corporate powers in Tennessee, the obvious

---

<sup>2</sup> James G. Parks, “Status of Smoke Litigation of the D. S. C. & I. Co. February 24<sup>th</sup>, 1903,” DBM.

solution was to cajole the powers in Atlanta to continue the fight in a more favorable venue with legal resources that only the state could wield. Or, to return to Bierce's definition, Georgians wanted a different sausage grinder, one that was capable of grinding up corporations, with the strong right arm of the state of Georgia at the crank.<sup>3</sup>

\*\*\*

It was not clear, as a matter of law, what Georgia could do about cross-border smoke pollution. Given the lack of federal and state anti-pollution legislation, the issue appeared to be governed by the common law of nuisances, yet it remained an open question whether the ancient principles encompassed an action by one state to enjoin pollution generated by individual or corporate citizens in another state. It was a problem of historical scope. English law lords developed the principles of nuisance law in a nation where sovereign power rested ultimately in the Crown, as tempered by the powers of Parliament. Unified sovereignty over England and Wales (Scotland had its own courts) favored the consistent formulation and administration of nuisance law throughout the realm from Kent to Cumberland.

Ducktown smoke blew over a different legal landscape, encompassing three sovereign states that jealously maintained their prerogatives against each other, with separate judicial systems and legislatures in each. A state's judicial and legislative power was nominally commensurate with its geographic borders. Yet the cross-border realities of commerce, crime, and now corporate smoke pollution, confused the clarity promised by lines on a map. Smoke clouds, and the winds that moved them, did not respect state lines. And, if that were not enough, each state shared sovereign authority with a federal government that operated its own courts and legislature in a complicated constitutional arrangement that had been marked by endless

---

<sup>3</sup> When litigating away from their home cities, corporate law firms routinely engage local counsel to ameliorate the impact of home cooking, even when it is not otherwise required by applicable licensure rules.

litigation, even a civil war, in an ongoing struggle to determine the respective powers of the states versus Washington, and the states vis-à-vis each other.

Divided sovereignty gave rise to a welter of questions: did Georgia have the power to compel corporate citizens in Tennessee to abate the production of poisonous fumes that drifted over the common border? Could the matter be litigated in Georgia courts? If not, did the federal courts have the power to provide an effective remedy? What role could or would the United States Supreme Court play in the matter? The answers to these question involved arcane issues of civil procedure—the law of how and where cases are to be tried—such as jurisdiction, venue, justiciability, standing, and substantive questions. They were the sort of issues that a law professor might pose to befuddled law students. There were also serious questions about the central claim—what the lawyers called substantive law, as in the substance of the case—that needed to be answered. Chief among these was this: did the state of Georgia have a legally recognizable interest in the fight over Ducktown smoke? Nuisance law turned upon the violation of property rights, but the state of Georgia long ago disposed of its northern holdings to private citizens in the 1832 lottery of Cherokee lands. Did it retain sufficient property interests to give it a legally recognized stake in a nuisance case? If not, could Georgia obtain relief under some other theory? This was a good examination question for a class in tort law. All of these questions, both procedural and substantive, would eventually be addressed at length by lawyers and judges during the course of Ducktown smoke litigation.<sup>4</sup>

---

<sup>4</sup> These issues will be addressed in Chapter 6 regarding the decision rendered in *Georgia v. Tennessee Copper Co.*, 206 U.S. 230 (1907). For the land lottery see *New Georgia Encyclopedia*, s.v. “Land Lottery System,” (by Jim Gigantino) <http://www.georgiaencyclopedia.org/> (accessed 26 February 2007).

\*\*\*

In the meantime, the suffering farmers and timber owners in Georgia were neither lawyers nor law students, and their patience with abstruse legal principles had long since been exhausted in their as yet futile private cases in Tennessee. They demanded a political solution. To that end, citizens from the mountain counties circulated petitions to Governor Joseph M. Terrell and goaded their delegation in the General Assembly to action. Mercer Ledford, a state senator from Union County, located just east of the heavily damaged Fannin County, heeded the call. Lacking a solution to all of the bedeviling legal issues, he employed a time-honored maneuver that gave a positive response to his constituents without encumbering the legislature with any real responsibility to solve the problem: he proposed a resolution for a study commission. Fellow legislators quickly grasped the wisdom of this approach. The measure easily passed in both the House and Senate and was enacted on August 17, 1903 as Resolution No. 47.<sup>5</sup>

The measure began with two recitals (the “whereas” clauses), the first noting that “it has been represented that great and irreparable damage has been, and is being done to the timber, fruits, and agricultural interests in the counties of Murray, Gilmer, Fannin, Union, and Towns” by the “smoke and fumes produced by the smelting of copper ores” in Ducktown. The second recital declared that “some steps should be taken looking toward the suppression of this evil.” It continued with two resolutions. One called for the creation of a five-member commission consisting of the commissioner of agriculture, the state chemist, state geologist, and two citizens to be named by the governor. They were to investigate “the damage already done and the damage likely to be done” and then to report their findings to the governor—as opposed to the General Assembly. The other resolution charged the governor, upon receipt of the report, “to

---

<sup>5</sup> Senate Resolution 47, 1903 Ga. *Senate Journal*, 436; 1903 Ga. *House Journal*, 752.

take such steps as shall be deemed proper and necessary to correct this evil and to prevent future damage.”<sup>6</sup>

Another governor might have objected at the receipt of such a vague charge, especially when the General Assembly failed to pass any specific laws to empower state action against smoke pollution. Governor Terrell did not object and instead took prompt action to comply with the resolution. He was young for a governor, entering office at age forty-one, full of the vigor and zeal that enabled him to earlier serve ten successful years as attorney general. In that office, he proved his skills as a litigator on criminal and civil matters. He won all twelve of the cases he argued before the United States Supreme Court in a series of death penalty appeals, business tax disputes, and railroad regulatory matters. As governor, he demonstrated a progressive bent with enactment of a pure food and drug law, the creation of the state Court of Appeals, and laws to limit child labor and to curb agricultural speculation. The Ducktown resolution provided him with an opportunity to lead the state in another legal battle—this time on a progressive crusade against smoke damage.<sup>7</sup>

Governor Terrell did not dally and named the commission members only two days after enactment of the resolution. It was a well-balanced team designed to be responsive to investigative and political needs. Commissioner of Agriculture O. B. Stevens held his post by popular election in a state where the farm population still outnumbered the urban citizenry. His presence on the commission gave it political heft. The other designated members, State Chemist John M. McCandless and State Geologist W. S. Yeats, were trained specialists who gave the

---

<sup>6</sup> Resolution of 17 August 1903, no. 47, 1903 Ga. *Laws* 691.

<sup>7</sup> The biographical sketch is drawn from Alton DuMar Jones, “The Administration of Governor Joseph M. Terrell in Light of the Progressive Movement,” *Georgia Historical Quarterly*, 48, no. 3 (September 1964): 271-290, and from Kenneth Coleman and Stephen Gurr, eds. *Dictionary of Georgia Biography* (Athens: University of Georgia Press, 1983), s.v. “Terrell, Joseph Meriwether” by James F. Cook.

group scientific credibility. For the at-large members, Governor Terrell named two North Georgians, J. H. Witzel, the ordinary (probate judge) of Fannin County and W. E. “Buck” Candler, a prominent citizen of Union County, to represent local interests.<sup>8</sup>

Altogether, the terms of the resolution and the composition of the commission demonstrated the understanding that Ducktown smoke posed its greatest threat to vitality of the agricultural and timber economy in the mountains. The political machinery of the state moved to protect livelihoods and the economically valuable natural resources of wood, water, and soil rather than natural beauty, wildlife populations, or what later generations would describe with terms such as the environment, ecology, and ecosystems. In 1903, Georgia’s mountain farmers and loggers were the endangered species deserving the aid of the state, not the wild creatures of the woods and waters.

Despite its weighty and urgent charge, the commission moved with less dispatch than the governor, allowing two months to pass before making its investigative tour of the mountain counties. The growing season was over and the leaves had fallen by the time they arrived in late October. If they failed to observe growing crops and leafy trees, they saw enough to conclude that the copper works “are hourly, daily damaging and destroying vegetable life...for miles within the boundaries of this state.” They built a lengthy record based on personal inspection of smoke-damaged farms, a view of the mine works, and meetings with afflicted farmers. On that basis, they warned that unless stopped, “a large area of farming and timber country within the limits of the State will certainly be destroyed and lost to the present owners.” Those observations, though dramatic, were to be expected given the well-publicized scale of the smoke problem. The more surprising language came in the conclusion, where the commissioners opined that “it is better that this industry should be entirely annihilated than that the present intolerable

---

<sup>8</sup> “The Ducktown Copper Mine,” *Atlanta Constitution*, 20 August 1903, 6.

conditions should continue.” This was the first official declaration that Georgia’s entry into the Ducktown smoke wars threatened the continuity of Ducktown’s copper industry.<sup>9</sup>

Wilmon Newell, the state entomologist, was not a member of the commission but toured the region that same month to provide a scientific perspective upon instructions from Governor Terrell. Upon arrival, Newell traveled the Basin in the company of Judge Witzel, and three local farmers, A. B. Dickey, J. W. Anderson, and J. Wilson. The farmers, all from the Hot House Creek area that extended from Fannin County, Georgia into North Carolina’s Cherokee County, were locally prominent men who each had private smoke cases languishing in the Tennessee courts. Dickey had become spokesman for the Hot House community through his frequent demands and explanatory letters to Judge Parks, the DSC&I lawyer. Together, Wetzels and the farmers made sure Newell saw their own damaged lands and guided him to the blighted farmsteads of their neighbors.<sup>10</sup>

The tour allowed the entomologist to note the concentric zones of destruction extending from the DSC&I works in Isabella and the TCC works at Copperhill. In the first zone, with a radius of two miles, sulfurous acid “has removed from the country all traces of vegetation, save an occasional patch of Bermuda grass.” Within four miles of the works “all forest trees...are destroyed and the earth devoid of practically all vegetation except broom-sedge.” In the next

---

<sup>9</sup> Report of the 1903 Ducktown Commission to Governor J. M. Terrell, 20 November 1903, attached as Ex. A to Motion for Leave to File Bill of Complaint, 13-14, *Georgia v. Ducktown Sulphur, Copper & Iron Co., United States Supreme Court*, No. 14 Original, October Term 1903. Note: Georgia’s first Supreme Court Case was initially filed against “The State of Tennessee; the Ducktown Sulphur, Copper & Iron Company (Ltd.); and the Pittsburg and Tennessee Copper Co.” Georgia soon dismissed its claim against the state of Tennessee and also realized that the Pittsburg and Tennessee Copper Co. had been acquired by the New York backed Tennessee Copper Co. prior to the institution of the suit. The state filed a Motion to Amend Original Bill to reflect these changes, revising the caption to read, *Georgia v. Ducktown Sulphur, Copper & Iron Co. (Ltd.), Pittsburg and Tennessee Copper Co., and Tennessee Copper Co.* To avoid confusion, I will refer to Georgia’s first Supreme Court case as *Georgia v. Ducktown Sulphur, Copper & Iron Co.* The state’s second Supreme Court case was filed in 1905 under the more familiar caption, *Georgia v. Tennessee Copper Co.*

<sup>10</sup> Newell’s party is described in “Copper Fumes Killing Trees,” *Atlanta Constitution*, 29 October 1903, A1.

zone, extending to five or six miles, “50 to 75 per cent of all timber is dead,” and beyond that, areas of smoke damage could be detected ten to twelve miles from the refinery. Worse, “the area of devastation is steadily increasing.” The zones of destruction correlated to the presence or absence of agriculture: “in the area already denuded of forest growth no attempt is made to grow crops” and “is totally abandoned except by the employees of the copper-mining companies.”<sup>11</sup>

Newell then applied his entomological training to the question of whether the trees died from insect infestation or diseases as opposed to sulfurous acid damage. He cut down and examined trees both dying and dead to examine the insect populations within them. There was little evidence of insect infestation. Instead, the insects he observed “are of species which feed upon *dead* vegetable matter and are therefore not responsible for the death of the trees.” Newell determined that “possibly the death of one tree out of every five hundred dead is chargeable directly or indirectly to insect work,” a rate well within normal occurrence in healthy smoke-free forests. If insects did not kill the trees, neither did fungal diseases. No signs of fungal growth appeared upon examination of the roots. Observations pointed instead to death from sulfur fumes. Healthy trees could withstand insect infestation for extended periods, and often put out suckers from the trunk and roots. The smoke-damaged trees in Ducktown did not put out suckers, and instead the “root, trunk, and branches are killed at almost the same time. The cambium layer (the cell forming tissue) of smoke-damaged trees “becomes blackened before the tree has succumbed to the poison.”<sup>12</sup>

---

<sup>11</sup> Report of Wilmon Newell to Governor J. M. Terrell, 28 October 1903, attached as Ex. B to Motion for Leave to File Bill of Complaint, 15-18, *Georgia v. Ducktown Sulphur, Copper & Iron Co.* United States Supreme Court, No. 14 Original, October Term 1903 (herein Newell Report). The opening lines of the report reference the Governor’s role in his investigation: “In accordance with your instructions, I visited...”

<sup>12</sup> *Ibid.*, 15-16.

His findings represented the first scientific examination of Ducktown smoke damage. Prior to his study, litigants on both sides of the smoke suits accepted the damaging effect of smoke upon crops and timber as a given. It was a fact that could be readily seen and appreciated by all within the Basin. Like the weather, people could experience and react to smoke without understanding the related science. Everyone could see and smell the smoke. They saw it blot out the sun on frequent occasions. All could observe the expanding zones of denudation. The Tennessee Supreme Court had already declared smoke to be actionable nuisance in *Ducktown Sulphur, Copper & Iron Co., Ltd. v. Barnes* (1900), a decision reached with a notable lack of scientific testimony from either side. Claimants and copper lawyers therefore gave little attention issues of causation in the course of the private smoke suits and instead debated the extent of damage upon individual properties.<sup>13</sup>

Attorney General Hart and Dr. Newell appreciated that Georgia's impending lawsuit against the copper companies would recast smoke litigation upon a much greater scale, one that required a solid scientific appreciation. The higher stakes of a state-initiated law suit required a factual basis that rested upon more than anecdotal descriptions of smoke damage. Newell began that effort by applying methods of biological field study and then construing his findings against known scientific data in the fields of entomology and plant science. And the first fruit of his research was to rule out insect infestation as the primary cause of local tree death. He concluded that "many square miles are being denuded of all forest growth and the devastation can be traced to no other agency than the sulfur fumes from the copper refineries at Ducktown and Isabella."<sup>14</sup>

The entomologist then broadened his attention from a close study of bark and roots to survey the larger landscape. He added that, "within a radius of ten miles...all merchantable

---

<sup>13</sup> *Ducktown Sulphur, Copper & Iron Co. v. Barnes*, 60 S. W. 593 (Tenn. 1900).

<sup>14</sup> Newell Report, 17.

timber, i.e. timber suitable for lumber, has already been destroyed” and warned that, “a continuance of present conditions will convert this territory into a barren desert.” His comments provided an accurate description of present conditions and showed prescience about the future. This was one of the first recorded instances in which the term “desert” was applied to Ducktown.<sup>15</sup>

He did not use the term carelessly. He was a professionally trained life scientist and presumably knew something of the technical factors that define a desert in geographical and biological terms. His use of the term stemmed from an experiential, perhaps even atavistic, appreciation of the shocking expanse of empty, barren terrain in the midst of what used to be lush Appalachian forest and farmland. In this way, he anticipated later observers who would describe the area with phrases such as “a small but extreme man-made desert” and as “the only bona-fide desert east of the Mississippi, the handiwork not of nature but of man.”<sup>16</sup>

Newell was correct about the impact of smelter fumes. A parade of scientific foresters would later testify to the toxic effect of sulfur smoke, but forest loss in the Ducktown Basin could not be attributed to the fumes alone. He identified smelter smoke as the cause of mortality among standing timber, but that alone did not explain the extent of denudation in the area. He failed to address the impact of more than a half-century of intense logging in the Basin. The axe, not sulfur smoke, caused most of Ducktown’s first great wave of deforestation. During the three decades of the industry’s pre-railroad years, fifty square miles of standing timber were converted to charcoal for consumption in the roast heaps and furnaces or were sawn into lumber for mine

---

<sup>15</sup> Ibid., 17.

<sup>16</sup> Guy Ottewell, “There Are No Ducks in Ducktown,” *Defenders Magazine* 50, no. 4, (August 1975): 338-339 (“man-made desert”); Wilton Barnhardt, “The Death of Ducktown,” *Discover* (October 1997): 35-43 (bona-fide desert); James W. Taylor, “Ducktown Desert: A Study of the Impact of Industrial Culture Upon the Physical Environment of a Secluded Area of the Southern Appalachians,” (M. A. thesis, Syracuse University, 1947).

and building construction. Logging created an area of deforestation much greater than the zones of smoke damage around the small-scale roast heaps and furnaces of the first era. Circumstances changed by 1903 when the revived industry hit its full stride. Modern mining ran on coal and coke imported by rail rather than on locally produced wood charcoal. That alone might have encouraged areas of forest regeneration except for the vastly greater amounts of sulfur smoke caused by the use of high sulfide copper ores and the much larger scale of operations. The area of denudation was expanding, but the question of how much of that was caused in the first era versus the second would remain for more careful investigators to determine.<sup>17</sup>

Newell returned to firmer analytical ground when he considered the consequences of Ducktown deforestation. Forest preservation was a “matter of moment” to local inhabitants and to the state at large. Stable forests “supplied the people with wood, one of the prime necessities.” Healthy forests prevented erosion and floods by absorbing runoff. Shady forests and their leaf litter preserved watersheds by keeping ground water from drying out. The converse was also true. Newell warned that “removal of forests means rapid soil erosion” making “the land utterly useless for agriculture.” Tree loss “conduces to extremes of flood and drought.”<sup>18</sup>

Each of his predictions marked him as a student well-schooled in the principles of watershed conservation articulated forty years earlier by George Perkins Marsh in his landmark work, *Man and Nature* (1862). Marsh, a Dartmouth educated Vermonter, was a man of remarkably wide-ranging talents and interests. Trained as a lawyer, he became a noted philologist fluent in twenty languages with a specialty in Icelandic. He was also an experienced diplomat, serving as ambassador to Turkey and Italy. Observations made during his extensive

---

<sup>17</sup> For a comparison of smoke damage caused during the first and second eras of Ducktown mining, see Nora Lynn Foehner, “The Historical Geography of Environmental Change in the Copper Basin,” (M.S. thesis, University of Tennessee, Knoxville, 1980), 9-49. Taylor, “Ducktown Desert,” 28-60.

<sup>18</sup> Newell Report, 17.

travels in the Mediterranean basin led to his insight that human conduct, specifically deforestation, could lead to disastrous consequences such as erosion, flood, drought, loss of arable land, even permanent climate change. The roots and humus of forests, he concluded, regulated stream-flow by retaining water from heavy rains. The shady forest canopy slowed evaporation of water within the watershed, thereby releasing it more gradually to keep streams flowing during drier periods. Marsh was a man ahead of his times; but his book became one of the foundational texts for the nascent conservation movement, and soon inspired the state of New York to create the Adirondack State Park to protect the Hudson River watershed.<sup>19</sup>

His stream-flow theories would eventually be vigorously challenged in 1908 by an officer in the Army Corps of Engineers, H. M. Chittenden, but that was in the future, and for now, Newell applied them with the devotion of a disciple. The entomologist was determined to implement Marsh's principles to reverse the damage to the Ducktown Mining District. Reclamation of the devastated areas was urgently needed but advised this "is possible only by reforestation, which under present conditions is impossible." The clouds of sulfur smoke had to be stopped, and if that required the closing of the mines, then so be it; for "the forest interests of Fannin County, Georgia are of far more value and importance to the commonwealth than any revenue to be derived directly or indirectly, from copper mining and refining." These were bold words for a man whose primary duties involved the detection and eradication of insect pests to cotton, corn, vegetables, and fruit. The once relatively anonymous civil servant, a person

---

<sup>19</sup> George Perkins Marsh, *Man and Nature* (New York: Scribner, 1884; reprint, Cambridge: Belknap Press of Harvard University Press, 1965). For Marsh's place in the nineteenth-century foundations of the conservation movement, see Donald J. Pisani, "Forests and Conservation, 1865-1890," *Journal of American History* 72, no. 2. (September 1985): 340-359. A major appraisal on the sources, novelty, and significance Marsh's conservation doctrines appears a series of essays by Graeme Wynn, Ian Terrell, Richard W. Judd, Marcus Hall, and David Lowenthal published in a special edition of *Environment and History* 10, no. 2 (May 2004). For Marsh's life and work, see David Lowenthal, *George Perkins Marsh, Prophet of Conservation* (Seattle: University of Washington Press, 2000). A shorter biographical sketch appears in American National Biography, s. v. "Marsh, George Perkins" (by Sylvia B. Larson), <http://www.anb.org/> (accessed 25 February 2007).

inevitably called “the Bug Man,” now rose to the status of a prophet for natural resource conservation whose pronouncements were quoted verbatim in the *Atlanta Constitution* and even the *New York Times*.<sup>20</sup>

\*\*\*

The 1903 reports by Newell and by the legislative commission received generous press coverage in Georgia under headlines such as “Sulfur Fumes Destroy Vegetation in Fannin,” “Copper Fumes Killing Trees,” and a seven column illustrated article captioned “Georgia Forests Withered By Sulfur Fumes.” In another article, published a month before the Wright Brothers’ historic first powered airplane flight, an un-named reporter imagined a flight over the blighted Ducktown Basin: “If a man were up in a balloon, hovering over the boundary line between Georgia and Tennessee, and were to take a look far down in the direction of this Ducktown, he would see a cloud of smoke that obscured the landscape, as though...a giant had laid down an enormous cigar, still burning.” Underneath that cloud “the smoke settled on trees, leaving an acid deposit, like a blight and the trees shriveled and died.” It was as if the countryside “had contracted some terrible leprosy of vegetation that ate its sad way farther and farther from the point of first infection.”<sup>21</sup>

Coverage like this could have only occurred with the cooperation and encouragement of the Governor’s office. The *Atlanta Constitution* returned the favor showing Governor Terrell and Attorney General John C. Hart at their best and busiest on the Ducktown matter. The paper gave daily mention in captioned articles, and in its political column, “Gossip at the Capitol,” of the

---

<sup>20</sup> Gordon B. Dodds, “The Stream-Flow Controversy: A Conservation Turning Point,” *The Journal of American History* 56, no. 1 (June 1969): 59-69; Newell Report, 17; “Georgia May Sue A Sister State,” *Atlanta Constitution*, 1 November 1903, 9; Furnaces Denude Georgia,” *New York Times*, 2 November 1903, 9.

<sup>21</sup> “Report Ready for Governor: Sulfur Fumes Destroy Vegetation in Fannin,” *Atlanta Constitution*, 14 October 1903, 7; “Copper Fumes Killing Trees,” *Atlanta Constitution*, 29 October 1903, A1; “Georgia Forests Withered by Sulfur Fumes,” *Atlanta Constitution*, 22 November 1903, A5.

many meetings held by the two men as they weighed the state's legal options in response to the two investigative reports. The possibilities included the state's participation in the farmers' suits for damages and injunction, or perhaps a direct action by the state against the copper companies. The third and most dramatic alternative was a suit in the United States Supreme Court "against the state of Tennessee for a mandamus to compel the latter to stop the destruction of property in Georgia." The paper noted that if the latter course was adopted, it would present "an entirely new question...arising out of one of the most important provisions of the federal constitution—that dealing with the relations of one state to another." Such a course "will be unique, and will be fraught with interest to the legal profession all over the country; indeed, it will be of such peculiar nature as to interest lawyers in all parts of the world, for there is no other nation on the globe in which a similar action at law could be heard." Together, the published contents of the reports, and news of the evident determination of Terrell and Hart to act upon them in a constitutionally novel way, combined to stir excited expectations of an interstate conflict of historical proportions.<sup>22</sup>

\*\*\*

James B. Parks and Howard Cornick, lawyers for the two copper companies, kept abreast of the Georgia newspapers brought to them on the daily trains, and as reprinted in Tennessee journals. Parks sent a copy of the commission report to W. H. Freeland, the DSC&I general manager, along with a clipping from the *Ducktown Gazette*. He noted that the newspaper "has gotten the bug man's report mixed up with that of the other members of the Commission." In the same letter, he mentioned that verdicts were rendered in two of the local smoke suits, one for

---

<sup>22</sup> "Georgia May Sue A Sister State," *Atlanta Constitution*, 1 November 1903, 9; "State Gossip Caught in Capitol Corridors," *Atlanta Constitution*, 2 November 1903, 5; "Gossip at the Capitol," *Atlanta Constitution*, 5 November 1903, 6, and 6 November 1903, 6.

\$170 and the other for \$100, but dismissed them as “little suits.” Parks showed greater concern about the progress of the three injunction suits filed by William Madison, Isaac Farner, and Avery McGhee that were now in the Tennessee appellate courts. In October, 1903, the Court of Chancery Appeals ruled against the copper companies in the same month that Newell and the Commission were tramping the Basin landscape in the company of smoked-out farmers. For the moment it appeared that Madison, Avery, and Farner might succeed in their quest to shut down the mines by injunction. They were enemies at the gate and posed a threat far more pressing than the maneuverings of a potentially dangerous but still distant foe on the other side of the mountains in Atlanta. Parks faced the nearer threat by collaborating with Cornick and corporate lawyers volunteered by the Louisville & Nashville Railroad to prepare what would be a successful appeal of the three injunction cases to the Tennessee Supreme Court.<sup>23</sup>

The threat from Atlanta appeared even more remote at the Broadway offices of the Tennessee Copper Company in New York City. At the same time anti-copper press coverage rose to a high pitch in Atlanta, TCC officers informed the *Wall Street Journal* of the company’s profitable year and its intention to double production. The company paid a dividend of \$1.25 per share in July, 1903, and anticipated a like amount after the close of the year. Present earnings and future prospects were so good, that it planned more and larger smelting furnaces to increase production from the present rate of one million pounds of refined copper per month (twelve million per annum) to twenty-five million pounds per annum. The company coffers were flush with cash, allowing it to finance the expansion from earnings without the need to borrow funds or to float a stock offering. Sulfur smoke from the company’s smelters exposed it to lawsuits by

---

<sup>23</sup> James G. Parks to W. H. Freeland, 20 October 1903 (hopes for successful appeal to the Tennessee Supreme Court). For correspondence regarding collaboration between the copper companies and the L & N Railroad, see Howard Cornick to James G. Parks, 12 October 1903; J. Parke Channing to Milton H. Smith, 14 October 1903; Milton H. Smith to J. Parke Channing, 14 October 1903, all DBM.

the dozen, constant bad press, and now the risk of state action, yet the firm's response was to increase operations. Expansion would inevitably increase the amount of acidic fumes belched into the air and thus provoke more smoke litigation. So be it: Tennessee Copper officials were content to let farmers, journalists, and politicians yammer at will about smelter smoke so long as there was money to be made in the southern mountains.<sup>24</sup>

Governor Terrell and Attorney General Hart could follow the New York financial press just as easily as the copper companies monitored the Georgia papers. The published reports of expansion plans added yet another element of urgency to the demand for state action on the problem of Ducktown smoke. Inaction is a frequently used and occasionally wise tool of public policy, but it was not a viable option for the smoke problem. The cry for relief shouted out by North Georgia mountaineers, matured to a matter of state policy when adopted as a joint resolution of the General Assembly. Newell and the commissioners provided empirical support with evidence of the widening zones of crop and timber damage extending from the mine works across the border into Georgia. The press repeated the findings in a series of articles that elevated a once local nuisance (in both the legal and popular senses of the term) into a popular cause. With those factors in mind, Terrell and Hart took the next step by drafting and sending a formal demand letter to Governor James B. Frazier of Tennessee.<sup>25</sup>

Some might have considered the mere sending of a letter to be a weak, tentative opening to a legal war. It could be done more dramatically by filing suit at the courthouse without warning and then having a uniformed sheriff or marshal appear at the doorstep of the unsuspecting defendant to serve the summons and process. Despite the perhaps malicious

---

<sup>24</sup> "Tennessee Copper," *Wall Street Journal*, 29 October 1903, 5.

<sup>25</sup> Governor J. M. Terrell to Governor J. B. Frazier, 25 November 1903, Governor James B. Frazier Papers, 1903-1905, TSLA, G.P. 33-2, Cont. 8, File 8.

pleasure of litigation by ambush, demand letters served several important functions that led to their use in most civil cases. They provided an opportunity to resolve disputes without the costs, delays, and risks of a lawsuit. Even if the demand was refused or ignored, the effort of making it tended to put the plaintiff in a better light during the ensuing trial by allowing him or her to argue that “we tried to resolve this without wasting the court’s time but the defendant would not listen to reason.” This was even more important in the present case because Georgia intended to invoke a court’s equitable power to grant an injunction to abate the smoke. Every court of equity in America sought to apply the ancient maxim, “he who seeks equity must do equity.” This was a fundamental rule of fairness that meant, at the very least, that the use of a demand letter in pursuit of a peaceful resolution was encouraged and might even be rewarded by the court.<sup>26</sup>

Demand letters, whether by a creditor seeking payment from a debtor on a delinquent account, by an accident victim seeking compensation from the negligent party, or here, by the governor of a sovereign state seeking an end to cross-border smoke pollution, all have the same three basic elements: the statement of grievance, a request that the recipient resolve the grievance in a specified manner, and the threat, whether express or implied, that litigation will ensue if the recipient fails to act as requested. Governor Terrell’s one-page letter of November 25, 1903, contained all three elements. He first briefly recited background events, beginning with mention of the joint resolution and the formation of the commission in response to complaints from mountain counties “that the timber, fruit and agricultural interests...had suffered great and irreparable damage on account of the fumes produced by the smelting of copper ores.” This much was not news. Farmers and timber owners in the tri-state area had been litigating smoke damage claims against the copper companies for the better part of a decade. That made it

---

<sup>26</sup> Georgia codified the maxim in Ga. Code 1863, §3017; it is now codified as Ga. Code Ann. §23-1-10.

necessary for Governor Terrell to explain how a long-running private dispute had now become a controversy between two sovereign states. For Georgia's part, the state became "interested in the question because of the great damage done to a large area of the public domain and the threatened total destruction of all vegetation within thirty or forty miles" of the copper works.<sup>27</sup>

Turning to the second element of a demand letter, Terrell asserted that Tennessee had a duty to intervene to abate the smoke damage because it was caused by corporations "which I understand are created by the laws of Tennessee." Specifically, he requested that his counterpart in Tennessee "take steps to prevent a continuation of the methods now used for smelting ores by these corporations." The third aspect of a demand letter, the threat of lawsuit, remained implicit owing to the dignified tone required in a letter between the leaders of two sovereign states. The bullying tone, often used in a demand by a landlord against a delinquent tenant, had no place in a communication between parties of this stature.<sup>28</sup>

Governor Terrell's letter, though admirably brief, clearly written, and dignified in approach, was nonetheless flawed. He asserted a claim of damage to Georgia's public domain that begged the question of whether the state actually suffered harm to its property interests independent of the property rights of its citizens. The state had little if any remaining public domain in the affected part of the state. Except state-owned buildings and highways, all of the land in North Georgia was in private hands. There were no state parks or wildlife refuges at the time. The letter also revealed the state's hope for a technological cure to the smoke problem that was more a matter of wish than reality. The demand for an end to "methods now used for smelting ores" was, more specifically, a demand to end the roasting of ores on open heaps, in the expectation that the long-sought pyritic method of performing primary smelting in enclosed

---

<sup>27</sup> Ibid.

<sup>28</sup> Ibid.

furnaces would somehow produce less sulfur smoke. Why that would be so was a mystery because whether green ore was roasted on heaps or burned in a furnace, the end remained the same: the expulsion of sulfur from copper ore and its ejection into the atmosphere.

Tennessee's Governor Frazier jumped on the third major problem of the demand letter in his response of December 14, 1903. After first expressing regret over any possible injury to citizens of another state, he wrote, "I know of no power vested in me as Governor of Tennessee to interfere and prevent such injury." That statement, to Georgia ears, was on a par with the classic response of a defendant in a dog bite case: "I am sorry, but that's not my dog." It was nevertheless correct. The Georgia demand letter implied that Tennessee was vicariously liable for the acts of corporations which it had created by grant of a charter, or in the case of foreign corporations, had authorized to do business by act of the secretary of state. The argument carried little weight because the very heart of corporate law was the creation of a new, artificial entity that shared some of the attributes of a natural flesh-and-blood person, including the capacity to sue and be sued in court. A corporation enjoyed the great benefit of limited shareholder liability upon condition that it could be sued and held liable for its conduct. That is why Governor Frazier insisted that "if the citizens of Georgia are injured by the operation of these works *by their owners*...the courts of Tennessee and possibly of the United States are the only tribunals I know of in which redress can be sought."<sup>29</sup>

Governor Frazier would have done well to end his response on that point. Instead he added another page of text that drew heavily upon the arguments and attitudes of the copper companies, leading to the reasonable inference that copper lawyers helped to draft the response.

---

<sup>29</sup> Governor J. B. Frazier to Governor J. M. Terrell, 14 December 1903, TSLA, Frazier Papers, Container 2, Folder 11, (emphasis added). The dog bite defense is nicely demonstrated by a hotel clerk to Inspector Clouseau in Peter Sellers's comedic film, *The Pink Panther Strikes Again* (1976).

He observed that, “from information obtained from Ducktown, the extent of the injury done by these industries has been very greatly exaggerated” and then slightly distanced himself from the remark by adding, “but as to this I have no opinion.” He repeated the contentions made by DSC&I and TCC in the pending Madison, Farner, and McGee injunction cases. Yes, the smoke was an inconvenience and possibly caused injury, but the mines gave employment to many. And the benefits of the industry outweighed the damage to the surrounding lands: “I am informed that the lands both in Tennessee and in Georgia, lying near to these works, would, in the absence of the copper mines, not be of very great value.”<sup>30</sup>

As a matter of law, these arguments were essential to application of the newly-enacted balancing of interests test then under consideration in the Tennessee’s appellate courts regarding the three injunction cases. It would have been better for Tennessee and the copper companies if the arguments had been confined to court and kept out of the reply to the demand letter. Hearth and home should not be lightly insulted. Georgia mountaineers and their political leaders inevitably heard Governor Frazier’s denigration of their lands, and the suggestion of exaggerated damages, as a form of mockery that became fighting words when quoted in Georgia newspapers. The *Atlanta Constitution* repeated the comments under the headline “Frazier Says He Cannot Act” and ended the article with the observation that Governor Terrell “at once turned the letter over to Attorney General Hart” for further action. “It is confidently expected that a suit at law will be the outcome.” Popular expectations were one spur to action. A greater spur was the knowledge that that state of Georgia would appear a toothless opponent unless it filed suit soon after receiving Governor Frazier’s response. Acting on Governor Terrell’s instructions, Attorney

---

<sup>30</sup> Frazier letter, 2.

General Hart simultaneously met public expectations and gave effect to the implied threat of the demand letter by filing suit in the United States Supreme Court on January 20, 1904.”<sup>31</sup>

\*\*\*

The owners and officers of Ducktown Sulphur, Copper, and Iron and of the Tennessee Copper Company recognized the suit as a dramatic and threatening change in Georgia’s policy towards the Ducktown mining district. It ended a half-century of close cooperation in which the state reached across its northern border to embrace the copper industry. Though the mines, and hence their taxable property, lay in Tennessee, Georgia had long valued the industry as a powerful economic magnet that could attract a railroad from Atlanta up and over the Blue Ridge Mountains to unite the North Georgia to the rest of the state. The northern counties could not develop economically without a railroad to transport their resources to distant markets, and nothing was more likely to spur railroad investors to build it than the prospects of handling freight for a well-established copper industry.

Georgia legislators understood this from the earliest days of Ducktown mining. The 1853 Georgia General Assembly authorized construction of a line upon the finding that “there are large bodies of copper ore now raised and raising...on both sides of the state line between Georgia and Tennessee which cannot be shipped to places of manufacture without the aid of a railroad.” More than a dozen other acts and resolutions followed in succeeding decades to promote the Ducktown line. Georgia provided convict labor to build it, lent state funds to finance it, and even forgave those loans when construction faltered. The General Assembly also encouraged extensive logging in the Toccoa River watershed for the benefit of the copper industry. It passed laws declaring the Toccoa to be a navigable stream and forbade dams, fish

---

<sup>31</sup> “Frazier Says He Cannot Act,” *Atlanta Constitution*, 16 December 1903, 3; Motion for Leave to File Bill of Complaint, Georgia v. Ducktown Sulphur, Copper & Iron Co., United States Supreme Court, No. 14 Original, October Term 1903.

traps, and other impediments that interfered with the rafting of logs from Georgia forests down the river to Ducktown to fuel the roast heaps and smelters.<sup>32</sup>

The *Atlanta Constitution* joined in the embrace with headlines that celebrated the progress of the railroad through the mountain counties. It reported in 1870 that the people of North Georgia “are all alive for the project” and declared that “the railroad is the great instrumentality of progress and development” that would allow the section to “blossom like the rose.”<sup>33</sup> When Governor James M. Smith traveled the route of the line to Ducktown in 1874, the paper said “the people of these sequestered counties are enthusiastic over the prospect of a connection with the rest of mankind.” It noted the Governor’s “deep interest in the early development of the great mineral resources of the State” and his concern that he “did not see how this could be done with the aid of railroads.”<sup>34</sup>

The *Constitution* lamented the closing of the mines in 1878. It asserted that “the suspension of work there at any time, and especially at the present, would be a great drawback upon all this section of country.”<sup>35</sup> It worried when North Carolina’s Governor Thomas Jarvis boasted that that a competing rail link from North Carolina would reach Ducktown first and that

---

<sup>32</sup> Act of 9 February 1854, no. 363, 1853-1854 Ga. *Laws*, vol. 1, 425. Other Ducktown railroad enactments include Act of 24 October 1870, no. 223, 1870 Ga. *Laws*, vol. 1, 340 (creating the Marietta and North Georgia Railroad and lending state funds to it); Act of 27 August 1872, no. 124, 1872 Ga. *Laws*, vol. 1, 179, 181 (authorizing line from Cartersville to Ducktown); Act of 17 August 1872, no. 212, 1872 Ga. *Laws*, vol. 1, 324 (authorizing railroad from Atlanta to the Tennessee border “at or near the Ducktown copper mines”); Act of 17 August 1872, no. 238, 1872 Ga. *Laws*, vol. 1, 360 (creating the North Georgia and Ducktown Railroad Co.); Act of 25 February 1876, no. 53, 1876 Ga. *Laws*, vol. 1, 40 (leasing convict labor to the M & N. G. R. R.); Act of 28 February 1876, no. 271, 1876 Ga. *Laws*, vol. 1, 254 (M. & N. G. R. R. branch line to Ducktown); Act of 7 October 1885, no. 27, 1884-1885 Ga. *Laws*, vol. 1, 671 (loan forgiveness). For pro-Ducktown river legislation, see Act of 26 February 1876, no. D, 1876 Ga. *Laws*, vol. 1, 388; Act of 13 October 1879, no. 246, 1878-1879 Ga. *Laws*, vol. 1, 187.

<sup>33</sup> “The Marietta and Ducktown Railroad,” *Atlanta Constitution*, 6 November 1870, 3.

<sup>34</sup> “The North Georgia Railroad,” *Atlanta Constitution*, 11 July 1874, 2; “The Governor’s Trip,” *Atlanta Constitution*, 17 July 1874, 2.

<sup>35</sup> “The Ducktown Failure,” *Atlanta Constitution*, 21 July 1878, 1.

“Chattanooga and Atlanta will be completely flanked and their importance as strategic railroad points will disappear.”<sup>36</sup> When the Georgia line won the race allowing the mines to reopen in 1890, the paper proclaimed that “The completion of this road opens up a limitless territory rich in agricultural resources, minerals, timber, and water powers...and well may Tennessee and Georgia rejoice over its completion.”<sup>37</sup>

Editorial policy and legislative action towards Ducktown were an expression of the New South ideology that prevailed in Georgia during the last quarter of the nineteenth century. The term “New South” is historically elastic and has been applied to every era of southern history from the end of the Civil War up to and beyond the modern civil rights era of the 1950s and 1960s. In its narrowest sense, as articulated by the *Constitution*’s nationally famous editor, Henry Grady, it was a campaign to revive the war-torn region with a combination of agricultural diversification (to reduce the near total reliance upon cotton as a money crop), promotion of industry (with northern capital and expertise), and white supremacy (to reverse civil rights advances for African-Americans imposed by the North during Reconstruction). Diversification largely failed; southern agriculture remained fixed upon cotton until the boll weevil and other factors forced reconsideration of the issue after the turn of the century. White supremacy prevailed through the institution of Jim Crow segregation and the elimination of black voting strength through intimidation and eventual disfranchisement.<sup>38</sup>

---

<sup>36</sup> *Atlanta Constitution*, 25 February 1880, 2; see also “The Marietta and North Georgia,” *Atlanta Constitution*, 12 August 1882.

<sup>37</sup> “The First Trip by the Hiwassee,” *Atlanta Constitution*, 23 August 1890, 3.

<sup>38</sup> The literature on various aspects of the New South is immense. For regional overviews, see C. Vann Woodward, *The Origins of the New South, 1877-1913* (Baton Rouge, Louisiana State University Press, 1951, 1971) and Edward L. Ayers, *The Promise of the New South: Life After Reconstruction* (New York: Oxford University Press, 1992). For an intellectual and cultural approaches, see Paul M. Gaston, *The New South Creed: A Study in Southern Mythmaking* (New York: Knopf, 1970); Nancy Silber, *The Romance of Reunion: Northerners and the South, 1865-1900* (Chapel Hill: University of North Carolina Press, 1998). For an economic approach, see Gavin Wright, *Old South, New*

Results on industrialization were mixed. Drawn by the attractions of the South's large pool of unskilled labor, low wages, and low taxes, investment money poured into the South to build railroads and factories, and to exploit the region's mineral and timber resources. Southern transportation, utilities, and industries increased markedly, but at the price of perpetuating a colonial economy that exported raw materials and partially finished goods to the North and then purchased higher value finished goods made by better paid workers in northern factories. Over time, the South became "a low wage region in a high wage nation." Even so, throngs of sharecroppers were eager to leave cotton farming, with its uncertainties of weather and crops prices, in the hope of a somewhat steadier life of wage labor in the mills. Many mountaineers from areas where they had never grown cotton were just as eager to leave their hilly farms for work in the mines.<sup>39</sup>

The revival of copper mining at Ducktown fit well within the pattern of New South industrialization. The Basin provided an array of attractive incentives for investors from New York and London. The *Wall Street Journal* reported that "with low wages, cheap fuel, a mountain of low grade copper ore, and a modern smelter, the Tennessee Copper Company has attracted considerable attention in the copper world." The same prospects enticed DSC&I investors in London to enter the district a decade earlier in 1889. The copper interests delivered on their end of the New South bargain. Their faith in the viability of the Ducktown mines spurred

---

*South: Revolutions in the Southern Economy Since the Civil War* (Baton Rouge, Louisiana State University Press, 1986), 156-197; James C. Cobb, *Industrialization and Southern Society, 1877-1984* (Lexington: University Press of Kentucky, 1984), 1-26. For the New South in Georgia, see Kenneth Coleman, ed., *A History of Georgia*, 2d. ed. (Athens, University of Georgia Press, 1991), 207-237, 252-254; Numan V. Bartley, *The Creation of Modern Georgia*, 2d. ed. (Athens: University of Georgia Press, 1990), 45-102. For the boll weevil and other factors shaping cotton monoculture, see Pete Daniels, *Breaking the Land: The Transformation of Cotton, Tobacco, and Rice Cultures Since 1980* (Urbana: University of Illinois Press, 1985), 3-22, 91-133, 155-183; James Conrad Geisen, "The South's Greatest Enemy? The Cotton Boll Weevil and its Lost Revolution, 1892-1930," Ph.D. diss., University of Georgia, 2004.

<sup>39</sup> Wright, *Old South, New South*, 7 ("low wage region...").

railroad investors to finish the line through North Georgia, to the great economic advantage of every mountain county along the way. The county seats of Canton, Jasper, Ellijay, and Blue Ridge were all now securely tied to the regional and national rail network. Timber from Gilmer County, marble from Pickens County, minerals and farm products from Fannin County all found ready markets in Atlanta and beyond. In the Copper Basin, hundreds, maybe thousands, of Georgian earned their living in whole or in part from mining. Having done their part to fulfill the New South agenda, the two great firms, Ducktown Sulphur, Copper & Iron, Co. Ltd., and the Tennessee Copper Company, might have expected the long embrace with the Georgia to continue with even greater fervor.<sup>40</sup>

\*\*\*

Smoke had always been a part of the relationship between the state and the industry. Ducktown smelter smoke had drifted across the border for over a half a century before it became a matter of official state concern in Atlanta. Georgia had long accepted smelter smoke as the expected price of industrial and economic progress. It was not a problem worthy of state attention until the volume of smoke—and consequent damage to local crops and vegetation—reached an unprecedented scale with the rapid expansion of the industry and the switch from oxide to sulfide ores. Sulfide ores contained roughly 2 percent copper and 25 percent or more sulfur. With those factors in mind, the fourteen million pounds of copper produced in 1903 revealed the scope of the problem: the copper came from 350,000 tons of ore that also yielded almost 90,000 tons (or 180,000,000 pounds) of sulfur. Some of the sulfur was consumed during

---

<sup>40</sup> “Tennessee Copper,” *Wall Street Journal*, 29 October 1903, 5.

smelting. The rest rose from the roast heaps and furnaces to enter the air over the Basin where it remained trapped by the mountains on all but the more windy days.<sup>41</sup>

The growing volume of sulfur smoke inevitably left its mark on the landscape with the expanding zones of smoke seen and documented by the legislative commission and Wilmon Newell. It also ended the rhetoric of shared prosperity and replaced it with the rhetoric of war. Mountaineers first raised the cry. The General Assembly authorized combat by its legal champions. Attorney General Hart, in his formal challenge before the Supreme Court, alleged that sulfur smoke from the mines was “a hostile invasion on the part of Tennessee and its citizens” upon the state of Georgia. The *Atlanta Constitution* echoed the phrase with the headline, “Georgia Seeks to Repel Invasion by Tennessee.”

Invasion was a strong word with important legal and historical connotations. The legal significance would surface later in the Supreme Court litigation; in the meantime, the term struck a powerful chord in the hearts and souls of Georgians who shared a visceral hatred for an earlier invader, William Tecumseh Sherman. Thousands of living Georgians retained vivid personal memories of the sufferings they endured when Sherman’s Army of the Tennessee marched, fought, and burned its way through the entire length of the state. After burning Atlanta, his army left a three-hundred mile trail of deliberate destruction to cities, towns, factories, mills, gins, farms, and homes. Attorney General Hart was ten years old when Union troops plundered his

---

<sup>41</sup> For production figures, see W. H. Emmons and F. B. Laney, *Geology and Ore Deposits of Ducktown Mining District, Tennessee*, U. S. Geological Survey, Professional Paper 139, (Washington, Government Printing Office, 1926), 32; American Institute of Mining Engineers, “A Brief Description of the Operations of the Tennessee Copper Company Prepared for the Ducktown Excursion,” Paper presented at the American Institute of Mining Engineers, Chattanooga, Tenn., 1908. For Ducktown ore composition, see Walter Harvey Weed, *The Copper Mines of the World* (New York: Hill Publishing, 1908), 350.

native Greene County on the way to the sea. Those Georgians born after the event were raised on a diet of biscuits, gravy, and tales (both real and apocryphal) of Sherman's depredations.<sup>42</sup>

The state's political and cultural leaders carefully nurtured memories of the event as part of a larger campaign to enhance white identity and supremacy with stories of the glories and sufferings of the Lost Cause of the Confederacy. In 1874, the General Assembly set aside April 26, the day of Gen. Joseph E. Johnston's surrender to Sherman, as Confederate Memorial Day. Atlanta's official seal depicted a phoenix rising from the ashes in defiance of Sherman's burning of the city.<sup>43</sup>

Characterization of Ducktown smelter fumes as an invasion was more than a figure of speech. The smoke confronted the senses in a way that gave weight to the rhetoric of invasion. It was not a hidden industrial menace like lead in house paint. It had the sensed immediacy of Sherman's army. His troops could be seen as they marched out of Chattanooga for Georgia. The endless trains of wagons could be heard at a distance, and the sounds of its guns yet further. And, if one came too close, the odor of thousands of unwashed men, their cooking fires, and their poorly sanitized camps could be smelled. Ducktown smoke shared some of those attributes. It carried the acrid stench of rotten eggs. It was a visible mass that blocked the sun, and if viewed from the surrounding heights, it appeared to flow over the landscape. Like an advancing army, it left a trail of destruction after it moved on.

---

<sup>42</sup> Sherman's march unquestionably involved deliberate, extensive destruction, but the extent and nature of the destruction is a matter of debate. Compare Mark Grimsley, *The Hard Hand of War: Union Military Policy Toward Southern Civilians, 1861-1865* (Cambridgeshire: Cambridge University Press, 1995), 171-204 and John F. Marszalek, *Sherman's March to the Sea* (Abilene, Tex.: McWhiney Foundation Press, McMurray University, 2005). For an environmental perspective on the march see Harry G. Summers, "Desolation and War: Necessity and Choice," paper presented at the First International Conference Addressing Environmental Consequences of War: Legal, Economic, and Scientific Perspectives, Washington, D.C. (June 1998); C. Royster, *The Destructive War: William Tecumseh Sherman, Stonewall Jackson, and the Americans* (New York: Knopf, 1991).

<sup>43</sup> "Confederate Memorial Day in Georgia," University of Georgia, Carl Vinson Institute of Government, <http://www.cviog.uga.edu/Projects/gainfo/confmem.htm>, accessed 20 May 2007. For a recent work on southern historical memory, see James C. Cobb, *Away Down South: A History of Southern Identity* (New York: Oxford University Press, 2005).

Invading smoke made a refugee of J. H. Verner and his family. He testified in 1905 that the smelter smoke “killed all my fruit trees, timber and crops, and I had to leave and follow something else for a living.” He abandoned the farm in 1899 and moved to the town of Ducktown, where he supported his family as a teamster “hauling wood for citizens, goods for merchants, and any one I could get.” He tried but failed to get work at the mines. Scores of Georgia mountaineers made similar complaints to their political leaders. The problem was getting worse and would not resolve without action. The invasion needed to be repelled.<sup>44</sup>

\*\*\*

Georgia’s fight against Ducktown smelter smoke was a specific response to a geographically isolated threat. It was not part of a general state campaign against air pollution. The smoke suit was a high profile exception to a long-standing policy of legislative and judicial tolerance of industrial smoke. The greatest human source of sulfur dioxide in Georgia and the rest of the nation was the burning of coal to heat homes and to fire up steam boilers to power locomotives and factory equipment. Coal generated about 100,000 tons of sulfur dioxide pollution in Georgia in 1900, and that amount rose to 200,000 tons by 1920. The amount of pollutants, though great, did not lead to a general outcry for relief. Georgia’s cities and industries were growing, but did not approach the smoke producing magnitude of New York’s population or Pittsburgh’s industrial steel industry. And unlike Pittsburgh or Ducktown, the state’s open topography south of the mountains allowed coal pollutants to disperse through the atmosphere before causing the visible damage so evident in the Basin. That being so, the General Assembly

---

<sup>44</sup> Transcript, 43 (deposition of J. H. Verner), *Madison v. Ducktown Sulphur, Copper & Iron Co., Ltd.*, Chancery Court, Polk Co., TN, No. 247.

did not feel compelled to act against coal pollution until 1967 when it joined the modern campaign against air pollution by enacting its first comprehensive air quality act.<sup>45</sup>

Georgia courts also tolerated smoke as an acceptable consequence of progressive civilization. This posture first surfaced in opinions involving nuisance claims against railroads, especially the operation of trains in urban settings. In a set of cases from Augusta, neighboring property owners, long accustomed to the urine, manure, and noises of horse-drawn wagons, complained that steam locomotives were “shaking the houses, thereby breaking the plastering and filling the houses with dust and smoke.”<sup>46</sup> The engines spooked horses, causing them run away pell-mell to the risk of others, and exposed homes to the risk of fire from flying cinders. Trains and their tracks impeded traffic. The Georgia Supreme Court affirmed the lower court’s refusal of an injunction, saying, “in these days of modern improvements, we admit the legality” of permitting trains on city streets, but it did allow individual actions for damages to proceed.<sup>47</sup> The right to damages was restricted in a later case involving a railroad built through the village of Stone Mountain to haul granite quarried from the mountain of the same name. As in Augusta, the villagers sued for damages, but this time, the court applied the incidental benefits rule to affirm a zero verdict for claimants. It held that the complaining neighbors were not entitled to damages if the presence and improvements brought about by the railroad increased the value of their properties in an amount greater than the amount of the damages caused by the trains.<sup>48</sup> On

---

<sup>45</sup> For the EPA figures and discussion of sulfur dioxide in Georgia, see R. Harold Brown, *The Greening of Georgia: The Environmental Improvement in the Twentieth Century*, (Mercer University Press, 2002), 209-223; Act of 14 April 1967, no. 433, 1967 Ga. Laws, vol. 1, 581-590.

<sup>46</sup> *Vason v. South Carolina R.R. Co.*, 42 Ga. 631 (1871) (affirming denial of injunction).

<sup>47</sup> *South Carolina R.R. Co. v. Steiner*, 42 Ga. 631 (1871) (affirming denial of injunction, remanding for determination of damages).

<sup>48</sup> *Guess v. Stone Mountain Granite and Ry. Co.*, 72 Ga. 320 (1884). For other cases denying injunctions against railroads see *Guess v. Stone Mountain Granite and Ry Co.*, 67 Ga. 215 (1881); *Powell v. Macon & Indian Springs*

this point, the Georgia Supreme Court was even more favorable to industry than its Tennessee counterpart, because the latter court refused to apply the incidental benefits rule on behalf of the copper industry in *Ducktown Sulphur, Copper & Iron Co. Ltd. v. Barnes* (1900).<sup>49</sup>

Georgia's Supreme Court showed the same favorable disposition toward steam-powered factories. In 1856, it affirmed judgment against homeowners when they attempted to enjoin a steam-powered carpentry shop in Columbus because of noise. Chief Justice Joseph H. Lumpkin first dismissed the noise issue by observing that "we know of no sound, however discordant, that may not, by habit, be converted into a lullaby, except the braying of an ass or the tongue of a scold." He then declared that one may "as well attempt to stop up the mouth of Vesuvius as to arrest the application of steam to machinery at this day."<sup>50</sup> Judicial tolerance had its limits as demonstrated in a case by the owners of an office building against a coal-fired steam laundry in downtown Athens, a few blocks from the University of Georgia School Of Law. The landlord contended that the laundry's use of soft coal created a dense cloud of dark smoke that forced its professional and business tenants to keep their windows closed on hot days to their great discomfort (this occurred long before the advent of air conditioning). The court recognized that the use of coal was necessary in homes, businesses, and factories, and that "as population thickens, the impurities thrown into the air are increased." It added that "pollution of the air" is "actually necessary to the reasonable enjoyment of life and indispensable to the progress of society." As an inescapable component of modern life, smoke pollution did not give rise to an

---

R.R. Co., 92 Ga. 209, 17 S.E. 1027 (1893); Ga. R.R. and Banking Co. v. Maddox, 116 Ga. 64, 42 S.E. 315 (1902) (grant of injunction reversed except regarding operations on Sundays); but see *Kavanaugh v. Mobile and Girard R.R. Co.*, 78 Ga. 271, 2 S.E. 636 (1886) (reversing refusal of injunction where city authorization was invalid); *Coker v. Atlanta, Knoxville, and Northern Ry. Co.*, 123 Ga. 483, 51 S.E. 481 (1905) (invalid ordinance).

<sup>49</sup> *Ducktown Sulphur, Copper & Iron Co., Ltd. v. Barnes*, 60 S. W. 593 (Tenn. 1900).

<sup>50</sup> *Mygatt v. Goetchins*, 20 Ga. 350, 358-359 (1856). For other anti-injunction rulings in favor of steam-powered factories see *Cunningham v. Rice*, 28 Ga. 30 (1856) (flour mill); *Powell v. Foster*, 59 Ga. 790 (1877) (grist mill); *Knox v. Reese*, 149 Ga. 379, 100 S.E. 371 (1919) (cotton gin)

actionable case for nuisance unless it was generated “in an unreasonable manner so as to inflict injury.” Whether the laundry’s use of soft coal in lieu of cleaner burning hard coal was unreasonable under the circumstances was a question for the jury.<sup>51</sup>

Neither the courts nor the legislature had occasion to consider smelter smoke generated by operations within the state. The major Georgia mining operations—marble, stone, kaolin clay, gold, coal, and crushed stone—did not involve the smelting of sulfurous ores. The government was largely tolerant of mining’s other impacts. Gold mining drew white settlers into Georgia’s Blue Ridge Mountains in the 1830s and remained a favored endeavor of the state for the remainder of the century. The General Assembly did all it could to promote gold mining with little regard to the consequences to the surrounding lands and waters. It authorized hydraulic mining, the technique of blasting high pressure water shot from hoses to wash gold-bearing deposits out of the hillsides. The water jetted from the nozzles with such force that “accidentally striking a man or animal, they would be killed in an instant.” The muddy runoff passed through sluice flumes that isolated the gold while allowing enormous loads of dirt and gravel to wash into the streams. The method eroded slopes, ruined watercourses with loads of silt, and flooded downstream lands wherever it was employed.<sup>52</sup>

Nevertheless, the General Assembly granted hydraulic miners a general right of way to impound and divert streams for their operations on the argument “that by this process alone can the mineral wealth of large portions of our mining districts be ever fully developed.” It also issued corporate charters to numerous companies with unambiguous names describing the streams they intended to despoil, such as the Yahoola River and Cane Creek Hydraulic Hose

---

<sup>51</sup> *Holman v. Athens Empire Laundry Co.*, 149 Ga. 345, 100 S.E. 207 (1919).

<sup>52</sup> For a description of hydraulic mining in Georgia, see M. F. Stephenson, *Geology and Mineralogy of Georgia* (Atlanta: Globe Publishing, 1871), 102-04.

Mining Company. Farmers in California succeeded with a nuisance action against hydraulic mining in 1884, but no similar reported case occurred in Georgia. Georgia's Supreme Court did enjoin two small mining operations near the piedmont town of Cartersville when neighbors complained that operations diverted and polluted local streams, but neither case involved hydraulic mining. Nor did the cases do anything to quell state-wide excitement over the revival of gold mining when the Dahlonega Consolidated Gold Mining Company began operations at about the same time that copper revived in Ducktown.<sup>53</sup>

Georgians were also excited about the possibility of copper mining of their own. A report by Walter Harvey Weed, published by the United States Geological Survey in 1904, renewed hope of creating a viable copper industry in several parts of Georgia, especially where the Ducktown ores extended over the border from Tennessee into Fannin County. There was no reason to expect that Georgia ore was any less sulfurous than ore from Tennessee. Nonetheless, the *Constitution's* editors cited the report and insisted "the time has come when the new battleship *Georgia* will be sheathed with Georgia copper." Sporadic copper mining in Fannin County proved disappointing with the brief exception of the No. 20 Mining Company that

---

<sup>53</sup> For Georgia gold mining, see David Williams, *The Georgia Gold Rush: Twenty-Niners, Cherokees, and Gold Fever* (Columbia: University of South Carolina Press, 1993), and Digital Library of Georgia, "There's Gold in Them Thar Hills, Gold and Gold Mining in Georgia, 1830s and 1940s," [www.http://dig.galileo.usg.edu/dahlonga](http://dig.galileo.usg.edu/dahlonga), accessed 16 March 2007 (an extensive collection of digitized original documents and images, including some on hydraulic mining). Act of 13 December 1858, no. 163, 1858 Ga. *Laws*, vol. 1, 157 (right of way); Act of 11 December 1858, no. 60, 1858 Ga. *Laws*, vol. 1, 72 (Yahoola). The Cartersville cases are *Satterfield v. Rowan*, 83 Ga. 187, 9 S.E. 677 (1889); *Woodall v. Cartersville Mining and Manganese Co.*, 104 Ga. 156, 30 S.E. 665 (1898). The California case is *Woodruff v. North Bloomfield Gravel Mining Co.*, 18 F. 129 (Cir. Ct., N.D. Cal, 184). For a scientific overview of California hydraulic mining, see Grover Carl Gilbert, *Hydraulic-Mining Debris in the Sierra Nevada*, U. S. Geological Survey, Professional Paper 105 (Washington: Government Printing Office, 1917). Gilbert estimated that hydraulic mining sent over billion cubic yards of sediment into the Sacramento and San Joaquin river basins and ultimately into San Francisco Bay where deposits threatened navigation.

produced 86,000 tons of ore over a three-year run from 1916 to 1918. All of it was carried by rail across the border for smelting at the works of the Tennessee Copper Company.<sup>54</sup>

\*\*\*

Aldous Huxley wrote “Consistency is contrary to nature, contrary to life. The only completely consistent people are the dead.”<sup>55</sup> Even so, the *Constitution’s* booster rhetoric for copper on the Georgia side of the border was jarring when read alongside the war rhetoric of its ongoing articles against the operations of Tennessee Copper and Ducktown Sulphur, Copper & Iron located less than five miles away on the other side of the border. The difference turned upon the geographic consequences of the state line and the local topographical features that made that line problematic. Topography concentrated the smoke problem, allowing it to flow over the border into the Georgia portion of the Basin. The same mountains contained the problem in ways that minimized the political and economic consequences of Georgia’s response to it.

The Ducktown Basin may be imagined in the triangular shape of a canned ham, oriented lengthwise north and south, narrow in the north and widening to the south, with the mountains serving as the rim of the container. The Georgia-Tennessee line runs due east and west for about ten miles across the floor of the pan from one mountain rim to the other without relation to the dominant topographic features. The northern fourth of the pan lies on the Tennessee side and the

---

<sup>54</sup> Walter Harvey Weed, “Copper Deposits in Georgia,” in *Contributions to Economic Geology*, United States Geological Survey, Bulletin no. 225, ed. S. F. Emmons and C. W. Hayes (Washington: Government Printing Office, 1904), 180-81; “Copper Mining in Georgia,” *Atlanta Constitution*, 9 November 1904, 7; Robert Edward Barclay, *The Copper Basin, 1890 to 1963* (Knoxville? Tenn.: n.p., 1975), 49-50.

<sup>55</sup> Aldous Huxley, “Wordsworth in the Tropics,” cited as quotation no. 30,000, *The Columbia World of Quotations*. New York: Columbia University Press, 1996. [www.bartleby.com/66/](http://www.bartleby.com/66/) (accessed 19 April 2007).

southern three-fourths are in Georgia. Only a tiny portion of the Basin extends into North Carolina, a major reason why that state declined to join suit against the copper companies.<sup>56</sup>

The surrounding mountains trapped sulfur smoke within the Basin except when the wind was high. The smoke, being heavier than air, usually failed to rise up and over the mountains and instead often lingered close to the ground, especially in the humid air of the southern Appalachians. Instead of rising, it flowed over the bottom lands where farmers planted their crops and climbed the rumpled slopes of the Basin's floor. Instead of dispersing into the atmosphere, it remained in a highly concentrated state, causing damage too severe and too pervasive for Georgia authorities to ignore. A different result might have occurred if smelting occurred in a flat, windy landscape that allowed smoke to disperse over a wider region.

The same mountains also made the damage a geographically isolated problem. Dora Galloway, daughter of a TCC copper miner, noticed this effect when she traveled out of the Basin to visit her grandparents in Farner, a village a few miles up the track beyond where Stansbury Mountain guarded the Basin's northern rim. In a trip of only a dozen miles, she traveled from a man-made desert back into the Appalachian hardwood forest: "We had barely settled in our red plush seats when the train slowly moved away from the station; and hardly no time until we left the barren hills...with trees looking as though they were flying by the windows." The Basin's drainage patterns also worked in Georgia's favor: all the local streams flowed into the Toccoa/Ocoee River which then drained into Tennessee. Silt from denuded slopes and water-borne mineral toxins from the mines flowed away from Georgia's portion of the Basin without troubling the rest of the state.<sup>57</sup>

---

<sup>56</sup> For a detailed description of Ducktown topography and drainage, see Laurence LaForge, *Physical Geography of Georgia* (Atlanta: Stein Printing Co., 1925): 114-116.

<sup>57</sup> Dora T. Galloway, *Little Girl in Appalachia* (Newport, KY: by the author, 1964), 15-16.

Favorable drainage patterns and protective mountain walls made it possible for Georgia to fight smelter smoke with a targeted lawsuit. Litigation could accomplish the state's ends without altering its pro-industry policies. The problem was specific to the Ducktown Basin. TCC and DSC&I were the only offenders of note—and they were on the other side of the border. The fight against their smoke did not require enactment of a general pollution law at the risk of irritating thousands of voting polluters, as would be the situation in the event of a state-wide effort to control sulfur dioxide from coal and other sources.

The geography of the state line also shaped Georgia's response in other ways. The border controlled tax benefits, but it did not control the smoke. Georgia industry generated Georgia taxes, and so the state might have tolerated the smoke if the smelters were on its own side of the border; but they were not. Tennessee enjoyed almost all of the direct tax benefit of the copper industry in the Ducktown Basin. Property taxes assessed against the two great companies made Polk County one of the wealthiest counties per capita in Tennessee. Georgia could not tax property across the state line. Nor did it have an income tax or sales tax at the time that would generate a relatively direct link to the industry by taxing earnings paid to Georgia mine workers and sales to the mining community from Georgia merchants. Smelter emissions troubled both states, but Tennessee had all the taxable benefit. Georgia just got the smoke. Those simple facts made DSC&I and TCC vulnerable to the demands of Georgia smoke-suitors for action by their government in Atlanta.<sup>58</sup>

Georgia's lack of direct tax benefit in the Ducktown mining industry served the political cause of the smoke victims. The citizenry of the North Georgia mountains did not, as a rule, carry much weight in the legislature because the region was geographically smaller and far less

---

<sup>58</sup> Georgia enacted the sales tax in 1929 and the modern income tax in 1931, Act of 29 August 1929, no. 427, 1929 *Ga. Laws*, vol. 1, 103-117; Act of 31 March 1931, no. 5, 1931 *Ga. Laws*, vol. 2, 24.

populated than the broad piedmont and coastal plains. The mountains added relatively little to an economy based on cotton and urban industrialization. Cotton grew poorly north of the Blue Ridge, and the industrial centers were concentrated in Atlanta and the fall line cities of Augusta, Macon, and Columbus. Even so, the smoke resolution passed in both houses with near unanimous votes for the simple reason that the copper companies were on the other side of the border. Action against the Tennessee Copper and Ducktown Sulphur, Copper & Iron would not pit Georgia farmers against Georgia industry. Nor would it cost the state anything in lost tax revenue. No state is eager to kill a taxable golden goose, but the copper industry was Tennessee's golden goose, not Georgia's. Tennessee's government acted to protect its economic interests by amending the law of nuisance in favor of the copper industry. Georgia could afford to heed the political demands of smoked-out farmers and loggers by authorizing an investigation and a lawsuit.

\*\*\*

In January, 1904, Attorney General Hart headed to the Supreme Court in Washington, D.C. for the opening round of Georgia's legal war against Ducktown, Sulphur, Copper & Iron Co. and the Tennessee Copper Company. With him was Congressman Farish Carter Tate, whose district embraced the Georgia portion of the Basin. Tate might have had mixed sympathies as he weighed the factors for and against his visible support of the smoke suit. The fortunes of his extended family owed more than a little to the copper industry, yet his district embraced the areas most badly damaged by the smoke.

His political stature rested in part upon his family's New South industrial success. That success began with the good luck of his grandfather, Sam Tate, when he acquired land lot no. 147 (in what is now Pickens County) in one of the lotteries of Cherokee land. The parcel lay in

the heart of huge and valuable marble deposits that became even more valuable with the arrival of the Marietta & North Georgia Railroad in the 1880s. The line built in the obsessive drive to reach Ducktown, ran right past the marble quarries. The product of the family's quarries could now be shipped all over the country. Rail access allowed Stephen Tate, Farish's father, and Col. Sam Tate, Farish's brother, to build local operations into a nationally prominent concern. The statue in the Lincoln Memorial at the nation's capitol was carved from Tate marble. Only Vermont produced more marble in America. Col. Sam celebrated the family's fortunes by building an Italianate mansion out of pink marble quarried from the Tate mines.<sup>59</sup>

Yet, the immediate concerns of Farish Tate's mountain constituents outweighed the fact that the Tate family owed its fortune to the railroad built to serve the copper industry. Ducktown smoke was a political matter, not just a legal one. North Georgia voters had pressured their representatives in the General Assembly into action against smelter smoke. Congressman Farish C. Tate was a professional politician and knew the prevailing mood in his district toward the copper companies on the other side of the border. It was that sense that led him to join Attorney General Hart's group as Georgia's battle against invasive smoke moved to the Supreme Court.<sup>60</sup>

---

<sup>59</sup> For Tate family history, see Lucius Eugene Tate, *History of Pickens County* (Atlanta: W. W. Brown, 1935; reprint, Spartanburg, SC: Reprint Co., 1978); William Tate, *Documents and Memoirs, Genealogical Tables, the Tates of Pickens County* (Marietta, GA: Continental Book Co., 1953); Robert E. Barclay, *The Railroad Comes to Ducktown* (Knoxville, TNP Cole Printing and Thesis Service, 1973), 173-178.

<sup>60</sup> "Supreme Court Hears Motion," *Atlanta Constitution*, 26 January 1904, 8.

## CHAPTER 5

### THE ONLY TREE IN DUCKTOWN: GEORGIA'S FIRST SMOKE SUIT, PYRITIC SMELTING AND THE DUCKTOWN DESERT

On January 24, 1904, Attorney General John C. Hart boarded a train for the six hundred mile trip from Atlanta to the United States Supreme Court in Washington, D. C. The occasion was the first hearing in Georgia's fight for an injunction against the copper companies. He was joined by Ligon Johnson, a young Atlanta lawyer hired to serve on the case as special counsel, and by F. C. Tate, a Georgia congressman whose district embraced the smoke damaged counties. The journey across four southern states gave Hart many hours to consider his two-phase strategy, a plan that combined legal and technological approaches to reduce, or better, to eliminate sulfur pollution from the burning roast heaps of Ducktown.<sup>1</sup>

The first phase was the Supreme Court lawsuit, filed under the caption, *State of Georgia v. State of Tennessee; the Ducktown Sulphur, Copper & Iron Company (Ltd); and the Pittsburgh and Tennessee Copper Co.* (Hart's caption contained a factual bobble that he soon amended: the Tennessee Copper Company purchased the holdings of the Pittsburgh firm before the suit was filed.) Georgia's case rose from a welter of smoke suits filed by scores of Georgia mountaineers in the Tennessee courts. Those suits were, at the moment, bogged down in a morass of procedural and substantive motions and appeals due to the skillful and determined defense by James B. Parks for the Ducktown company and Howard Cornick for Tennessee Copper. The attorney general sought to circumvent the Tennessee courts by filing Georgia's lawsuit directly

---

<sup>1</sup> "Supreme Court Hears Motion; Judge Hart and Ligon Johnson Present Their Case in Washington," *Atlanta Constitution*, 26 January 1904, 8.

in the United States Supreme Court as an original jurisdiction action. He needed the Court's permission to do so, and it was to that end that he and his companions traveled to Washington for a hearing on his Motion for Leave to File Bill of Complaint.<sup>2</sup>

Success on the motion would enable Hart to pursue the second phase of his strategy. The Supreme Court's grant of jurisdiction carried the threat that it would issue an injunction limiting smelter smoke in terms that might force the end of the copper industry in Ducktown. Hart intended to use that threat to compel the copper companies into adopting a new means of smelting raw ore. He blamed the practice of open heap roasting as the cause of Ducktown's smoke problem, and declared that he filed suit "to suppress this method of roasting the ore." Yet he intended to fight a limited war, declaring that, "it was not the purpose of the State of Georgia to suppress and drive out of business this enterprise, representing an investment of over a million dollars." A new method of furnace smelting, known as pyritic smelting would, he believed, make it possible for the companies to continue operations while reducing the volume of sulfurous smoke that roiled the atmosphere of the Ducktown Basin. If it worked, far less acid would precipitate from the black clouds onto the crops, orchards, and wood lots of Georgia mountaineers. Farmers could resume growing crops for the local market, and loggers could put the woods to productive use. The lawsuits and the political pressures they generated might

---

<sup>2</sup> Motion for Leave to File Bill of Complaint, *Georgia v. Ducktown Sulphur, Copper & Iron Co.*, U. S. Supreme Ct., No. 14 Original, October Term, 1903. Georgia's first Supreme Court Case was initially filed against "The State of Tennessee; the Ducktown Sulphur, Copper & Iron Company (Ltd.); and the Pittsburg and Tennessee Copper Co." Georgia soon dismissed its claim against the state of Tennessee and also realized that the Pittsburg and Tennessee Copper Co. had been acquired by the New York backed Tennessee Copper Co. prior to the institution of the suit. The state then filed a Motion to Amend Original Bill to reflect the changes; the revised caption became *Georgia v. Ducktown Sulphur, Copper & Iron Co. (Ltd.)*, *Pittsburgh and Tennessee Copper Co.*, and *Tennessee Copper Co.* To avoid confusion, I will refer to Georgia's first Supreme Court case as *Georgia v. Ducktown Sulphur, Copper & Iron Co.* The state's second Supreme Court case was filed in 1905 under the more familiar caption, *Georgia v. Tennessee Copper Co.*

subside. And maybe the relentless transformation of southern Appalachian greenery into western badlands would come to an end.<sup>3</sup>

\*\*\*

As the train rolled over the miles of tracks, Attorney General John C. Hart and his young colleague, Ligon Johnson were keenly aware of the legal challenge before them. They were able lawyers, but each was making his debut appearance in the United States Supreme Court, an experience that only fools could take lightly. Judge Hart, age 50, grew up on a piedmont cotton farm in Greene County, Georgia during the years of the Civil War. As a young man, Hart commenced the well-worn path of Georgia politicians that took him from the farm to studies at the state university in Athens, followed by the private practice of law in his home county, service in the legislature, elevation to the bench as a superior court judge, and now election to state office as attorney general. His position made him the chief legal advisor to Governor Joseph M. Terrell. This placed him in an awkward position on the Ducktown case because Terrell was a veteran attorney general with a brilliant record of wins before the Supreme Court, where Hart had yet to earn his spurs. It nonetheless fell to the new attorney general to devise a legal strategy to transform the pleas of smoked-out Georgia mountaineers and the mandate of the General Assembly into a winning case of constitutional law.<sup>4</sup>

His thirty-one-year-old assistant in the cause, Ligon Johnson, was part of the post-war generation. Johnson was born into a prominent white Alabama family in Tuskegee. The attractions of a larger city led him to begin private practice in Atlanta after college at Emory and law school at the University of Virginia. He was young, single, and had only a decade of legal

---

<sup>3</sup> John C. Hart, *Second Annual Report of John C. Hart, Attorney-General of Georgia* (Atlanta: Geo. W. Harrison, 1904), 5-8.

<sup>4</sup> For Hart's life see, "Attorney General Hart and His Important Work," *Atlanta Constitution*, 20 November 1904, A-5.

experience, but his intelligence led Hart to associate him in a pending corporate tax case against the Louisville and Nashville Railroad. Johnson's work in that matter persuaded the United States Supreme Court to review it on a grant of certiorari. A Supreme Court victory on either that case or the Ducktown litigation would secure his reputation as a rising legal star that might propel him out of Atlanta to an even larger professional arena.<sup>5</sup>

The two men represented different models of legal education. Hart entered the profession in the traditional manner of reading for the law, which amounted to an apprenticeship under a practicing lawyer. The young man performed legal chores around the office and shadowed his mentor in conferences and court appearances. He devoted quieter moments to self study over law books, with an emphasis upon practice-oriented treatises and the *Georgia Code*. Johnson followed the newer path of formal education in a law school. He spent his days at a considerable remove from the workaday legal world by attending law classes on the University of Virginia campus. Some of his professors probably lectured. Others may have adopted the case study method, devised by Christopher Columbus Langdell at Harvard in the 1870s and gradually adopted by other law schools. The case method combined the detailed study of case opinions issued by appellate judges with a vigorous Socratic dialogue between professor and student on the facts, holding, and rationale of each decision.<sup>6</sup>

Both models had their merits if done well. Reading for the law gave the prospective attorney valuable exposure to the participants in the legal system—clients, opposing attorneys, cops and criminals, judges and juries—and how they acted within it. It was an education in

---

<sup>5</sup> For Johnson, see *The National Cyclopedia of American Biography*, vol. F (Clifton, NJ: J. T. White, 1934-1942), q.v. Johnson, [Robert] Ligon. The railroad case is *Wright v. Louisville & Nashville R.R.*, 189 U.S. 512 (1903) (grant of certiorari), 195 U.S. 219 (1904) (reversed in favor of Georgia). His work on the railroad case is mentioned in "Georgia Seeks to Repel Invasion by Tennessee," *Atlanta Constitution*, 21 January 1904, 7.

<sup>6</sup> For a comparison of the two methods see, Lawrence M. Friedman, *A History of American Law*, 2d. ed. (New York: Simon & Schuster, 1985); Robert B. Stevens, *Law School: Legal Education in America from the 1850s to the 1980s* (Chapel Hill: University of North Carolina Press, 1983).

applied law where an attentive student with a good mentor could learn which trial tactics succeeded, and just as important, which ones failed. It also served as a superior training ground for future politicians like Hart because the student gained a working familiarity with local and state office holders. At the University of Virginia, Johnson's law school professors sought to instill a conceptual framework of the law and the advocacy skills useful to practice in appellate courts. His training left him short of exposure to the rough and tumble of daily law practice, but he acquired an analytical approach to the law both broader and deeper than might ordinarily be acquired by trailing behind a country lawyer in the routine matters of a county seat law practice.

It was good that the two men combined their respective strengths on the copper case because it was a high-stakes, politicized venture into a poorly charted area of constitutional law. Judge Hart served at the pleasure of Georgia voters and necessarily remained alert to the political implications of the case. Many cases handled by the attorney general's office had a relatively small audience and low voter impact. The appeal of an ordinary murder conviction concerned the friends and relatives of the accused and the victim within a given community, but only those killings made notorious by excessive violence or by racial and ethnic factors, gained public attention statewide. Business tax and regulation disputes, another group of cases commonly handled by the attorney general, were important to government and business interests, but usually stirred little interest outside those circles. The Ducktown copper case was different. It was a political venture from the outset. Georgia entered the fight only when voters from the mountain counties goaded the General Assembly into passing its 1903 resolution mandating investigation and legal response to the smoke damage. Governor Terrell made it something of a personal crusade and took pains to encourage extensive press coverage about every aspect of the

case. The presence of state senator Tate on the train to Washington served as a constant reminder of the political implications of the case.<sup>7</sup>

It was easy to stir public interest against smelter smoke. The reports and photographs from the North Georgia high country of dead forests and barren landscape, blighted by fumes from across the border, made for dramatic copy. And win or lose, the case would change the lives of many. The *Atlanta Constitution* observed that a Georgia victory could force the closing of the copper mines unless “some method different from the present one of abstracting the copper from the crude ore is discovered.” If not, it “will mean that two of the largest corporations in Tennessee and Great Britain will lose an investment of something like \$2,000,000.” If Georgia should lose, “it will mean the devastation of twenty to thirty square miles of Georgia territory by the killing of all vegetation upon it.”<sup>8</sup> The *Chattanooga News* responded with Tennessee fears that a Georgia victory and the closing of the mines would lead to economic calamity. “This would be a deplorable event...nearly every family at Ducktown, among the working classes, draws sustenance from this enterprise, and to destroy it would prove to be a great disaster and would mean untold suffering.”<sup>9</sup> The *Knoxville Tribune* asked, “What is Georgia wanting to clean up Ducktown for? Let Georgia wash her own children and keep her hands off Tennessee’s.” And thus, reporters in 1904 anticipated the jobs-versus-environmental dichotomy typical of environmental news coverage at the end of the twenty-first century.<sup>10</sup>

---

<sup>7</sup> The range of cases handled by Hart during his eight years as attorney general appears in his annual reports, e.g. John C. Hart, *The Second Annual Report of John C. Hart, Attorney-General of Georgia* (Atlanta: George W. Harrison, State Printer, 1904).

<sup>8</sup> “Georgia Wins First Point,” *Atlanta Constitution*, 2 February 1904, A5; “Georgia Seeks to Repel Invasion by Tennessee,” *Atlanta Constitution*, January 24, 1904, 7.

<sup>9</sup> “Georgia-Tennessee State Line Dispute,” *Chattanooga News*, 25 January 1904.

<sup>10</sup> *Knoxville Tribune* quoted in “Talks About Atlanta,” *Atlanta Constitution*, 23 February 1904, 6. The dichotomy is expressed in an aptly titled essay, Richard White, “Are You an Environmentalist or Do You Work for a Living?” in

\*\*\*

The legal novelty of the case presented another set of pressures on Hart and Johnson. Their immediate task was gain the Supreme Court's permission to file Georgia's smoke suit as an original jurisdiction action. The Court normally functioned as an appellate body, reviewing cases that originated in lower trial courts. Article III of the U. S. Constitution authorized it to depart from its appellate role to act to act as a trial court in special circumstances, notably those cases "in which a state shall be a party," as in cases between two states or a dispute between a state and citizens of another state. This was called original jurisdiction because such cases began and ended in the Supreme Court. Most original jurisdiction cases were between states, and most of those concerned boundaries. The boundaries of the former British colonies were often poorly defined, and in states where a river defined the boundary, a shift in its course could upset a border by carving land from one state and adding it to another. Mark Twain devoted a chapter of *Life on the Mississippi* to the boundary havoc created by the writhing river.<sup>11</sup>

If Hart and Johnson were handling a boundary case, they could have relaxed and played cards on the train trip to Washington in the confidence that original jurisdiction would be allowed as in earlier cases. Instead, they had the challenge of persuading the Supreme Court to expand the scope of original jurisdiction to embrace, for the first time, an interstate smoke pollution case. No state had done that, so there was no precedent and no assurance that the Court would permit it. If the Court refused, the case would end before it began; Georgia would have no remedy against Tennessee or its copper companies, and smoked-out Georgia farmers and timber

---

*Uncommon Ground: Rethinking the Human Place in Nature*, ed. William Cronon (New York: Norton, 1996), 171-185.

<sup>11</sup> U. S. Const. Art. III, §2. The cases are collected in James William Moore, *Moore's Federal Practice* 3d, vol. 22 §402.02[1][e]. For the problem of river boundaries see Mark Twain, *Life on the Mississippi* (Boston: J. R. Osgood, 1883), ch. 1; Theodore Steinberg, *Slide Mountain, or The Folly of Owning Nature* (Berkeley: University of California Press, 1995), 21-51 (Missouri River).

owners would be left to their own devices in the Tennessee courts. The zone of smoke damaged farms and forests would continue to expand deeper into Georgia.<sup>12</sup>

Georgia had two reasons for seeking original jurisdiction for its smoke pollution case. First, the state refused to file suit in the courts of Tennessee alongside the cases of individual smoke suitors, because that would require Georgia to subjugate its sovereign authority to the courts of another state. This was something that no state would willingly permit. Second, Georgia could not press the matter in its own courts because the defendants were, as Hart and Johnson alleged, “beyond its power and control.” Tennessee was no more likely to submit to a Georgia court than Georgia would submit to one in Tennessee. The companies were also out of reach. They were chartered in London and New York, and they conducted their operations in Tennessee. Georgia thus had no basis for asserting jurisdiction over them under the more restrictive jurisdiction doctrines of that time.<sup>13</sup>

The framers of the Constitution devised original jurisdiction to address quandaries of that sort, recognizing that only the United States Supreme Court had the independence and institutional dignity to serve as an appropriate forum when a state or foreign ambassador was a party. Even so, the Court accepted original jurisdiction reluctantly and required litigants to first seek its permission before filing. The Supreme Court’s *modus operandi* and institutional apparatus were heavily oriented towards appellate review of decisions rendered by inferior courts. It considered original jurisdiction an awkward deviation from its usual function. Trial courts were better equipped to serve as finders of fact thanks to the architecture and procedures that allowed judges and juries to observe and evaluate the direct and cross examination of

---

<sup>12</sup> The cases are collected in Moore, *Moore's Federal Practice*, 3d ed., vol. 22 , §402.02[1][e].

<sup>13</sup> Petitioner’s Brief for Leave to File Bill of Complaint at par. nineteenth, *Georgia v. Ducktown Sulphur, Copper & Iron Co.*, U. S. Supreme Court, No. 14 Original, October Term, 1903.

witnesses. The Supreme Court operated without juries and found it necessary, when adjudicating original jurisdiction actions, to take testimony in the written form of depositions and affidavits, or to defer fact finding to special masters.<sup>14</sup>

Another cause for its reluctance, and for its insistence upon a request for permission, was the potential of abuse presented by original jurisdiction actions. The problem had its roots in Georgia history that led to one of the first great Supreme Court cases, *Chisholm v. Georgia* (1792). The legacy of that case directly impacted the present mission of Hart and Johnson. Article III of the Constitution made federal jurisdiction available in actions “*between* a state and a citizen of another state,” which was at first taken to mean that it applied in both directions: when a state, acting as plaintiff, sued a citizen of another state, and in reverse, when a citizen of one state initiated a lawsuit against another state. In 1792, Alexander Chisholm, a South Carolinian, filed suit in federal court against Georgia to collect a debt for supplies sold to the state during the American Revolution. Georgia objected that as a sovereign state it was immune from suits to which it did not consent, and thus refused to submit to jurisdiction in the matter. The Supreme Court ruled for Chisholm on the rationale that Article III jurisdiction trumped Georgia’s claim of state sovereignty.<sup>15</sup>

The decision caused a constitutional uproar. Other states quickly realized that the decision also robbed them of their sovereign immunity against out-of-state suitors. In response, Congress and the states immediately passed the Eleventh Amendment to prevent more claims like Chisholm’s. The amendment narrowed Article III by providing that “the judicial powers of the United States shall *not* be construed to extend to any suit in law or equity commenced or

---

<sup>14</sup> For the Supreme Court’s view of original jurisdiction purpose and history see the majority opinion by Justice George Shiras in *Missouri v. Illinois*, 180 U.S. 208 (1901).

<sup>15</sup> *Chisholm v. Georgia*, 2 U.S. (2 Dall) 419 (1793); U.S. Constitution, art III, §2, cl. 2 (emphasis added).

prosecuted against one of the United States by citizens of another state...” Georgia lost the battle and won the war. Its actions in forcing adoption of the amendment was a matter of pride to its citizens and received detailed consideration a century later in the *Atlanta Constitution’s* coverage of the smoke suit.<sup>16</sup>

The new amendment restored sovereign immunity to the states but frustrated individuals with otherwise plausible claims against another state. Clever lawyers sought to circumvent it by recasting prohibited claims of citizens against another state into a new form, as permitted claims between states. New Hampshire sought the Court’s original jurisdiction in 1882 when it tried to collect on past-due bonds sold to its citizens by Louisiana. In an 1899 case, New Orleans shippers prompted Louisiana to sue Texas to bar enforcement of its quarantine laws. The Supreme Court rejected original jurisdiction in both cases on the ground that the putative actions between states were in reality state-level efforts to pursue the private claims of individual citizens. In the latter case, *Louisiana v. Texas*, the Court ruled that in order to maintain original jurisdiction between the two states “it must appear that the controversy to be determined is a controversy arising directly between the State of Louisiana and the State of Texas, and not a controversy in the vindication of grievances of particular persons.”<sup>17</sup>

The language in *Louisiana v. Texas* created a significant hurdle for Georgia’s smoke suit. It was all too easy for the copper companies to argue that Georgia’s proposed Supreme Court action was actually an attempt to bolster the claims of individual Georgia citizens in the

---

<sup>16</sup> U.S. Constitution, amend. XI (emphasis added); Moore, *Moore’s Federal Practice*, 3d ed., vol. 22 §402.02[2][a]. See 28 U.S.C. §1251 (1948, amended 1978) which further narrows article III by making a distinction between the Supreme Court’s original and *exclusive* jurisdiction (cases between states, as in boundary disputes) and its original but *non-exclusive* jurisdiction (cases by a state against citizens of another state). “Georgia Seeks to Repel Invasion by Tennessee,” *Atlanta Constitution*, January 24, 1904, 7.

<sup>17</sup> *New Hampshire v. Louisiana*, 108 U.S. 76 (1882) (action on bonds); *Louisiana v. Texas*, 176 U.S. 1 (1899) (quarantine); Note, *Virginia Law Review* 10, no. 2 (December 1923): 147-150.

Tennessee courts. North Georgians had scores of pending individual cases for smoke damages and many were also co-plaintiffs in the three injunction cases filed by William Madison, Avery McGee, and Isaac Farner. The chronology of events established that the state of Georgia was a latecomer to the smoke litigation. North Georgia citizens began filing individual smoke suits in the Tennessee courts against the copper companies around 1897. By 1902, the scores of individual suits were hopelessly bogged down thanks to the stratagems of corporate lawyers for the copper companies. Voters from the mountain counties of North Georgia then pressured the 1903 General Assembly into passing a resolution that mandated action by the governor and attorney general. In January, 1904, the state filed its motion in the Supreme Court for leave to file its bill of complaint. In short, the state case could be fairly construed as an abusive attempt to circumvent the Tennessee courts by starting a parallel original jurisdiction action in the United States Supreme Court. Both companies argued that point throughout the proceedings. The Tennessee Copper Company alleged that Georgia was acting on behalf of private smoke claimants from its mountain counties, and “is in fact lending its name to said individuals.”<sup>18</sup>

\*\*\*

It was a strong argument, and if Hart and Johnson were to overcome it, they needed to show that the state of Georgia had a legally recognized grievance distinct from those suffered by its citizens in the mountain counties. To that end, they based their motion on the idea of invasion, the same word used in the press to stir popular support for their cause. Their motion began with a description of the invasive force and the damage it caused. “Vast quantities of smoke, sulfur fumes, and noxious and poisonous fumes and vapors” rose from the open roast heaps operated by the mining companies. The sulfur smoke was “discharged” (a verb carefully chosen to indicate a

---

<sup>18</sup> See for example the Demurrer of Tennessee Copper Company, par. second, *Georgia v. Tennessee Copper Co.*, U. S. Supreme Court, No. 13 Original, October Term 1905.

deliberate act of industry as opposed to non-culpable act of nature) “for a radius of thirty miles or more from...Ducktown” onto five North Georgia counties. Sulfur fumes ruined crops, pastures, orchards, and trees, creating a “zone of destruction growing each month.” The loss of plant cover destroyed the watershed by creating a “barren waste subject to sudden, severe, and dangerous floods” that carried top soil from previously fertile bottom lands and washed away roads and highways. Smoke-damaged lands lost value, which in turn caused a reduction of property taxes that had already reduced the state’s revenue in the district “more than one-half.” Then, after nine paragraphs about property damage, they added half a paragraph about health, alleging that the health of Georgia citizens “has been seriously injured and impaired, their vitality lessened, their susceptibility to all diseases...greatly increased.” They followed the description of the invasion with a recitation of the frustrated efforts to resolve it peaceably, citing and attaching the General Assembly’s resolution, the investigative report, and the exchange of letters between Georgia’s Governor Terrell and Tennessee’s Governor Frazier.<sup>19</sup>

The Attorney General and his young assistant then transformed the facts of invasion into a constitutional mandate that required the Supreme Court’s grant of jurisdiction under the oldest and most fundamental principles of American federalism. First, they alleged that the actions of the respondents “constitute and are a hostile invasion on the part of Tennessee and its citizens upon Georgia.” Next, they meekly asserted Georgia could do nothing about it on its own. “All diplomatic and amicable negotiations have failed,” and it had no jurisdiction over the defendants. War against Tennessee and the copper companies was not an option because the Constitution forbade Georgia “from any invasion, aggressive operation or other direct action.” Last, the lawyers cited Article IV, Section 4 to invoke the constitutional guarantee from the United States

---

<sup>19</sup> Petitioner’s Brief for Leave to File Bill of Complaint at pars fourth through seventeenth, nineteenth, Georgia v. Ducktown Sulphur, Copper & Iron Co., U. S. Supreme Court, No. 14 Original, October Term, 1903.

to the individual states that it “shall protect each of them against invasion.” It followed that the federal government should honor that guarantee with the grant of the Supreme Court’s original jurisdiction to resolve the dispute without the force of arms or the loss of blood.<sup>20</sup>

The rhetoric of invasion and war provided a necessary constitutional footing to their arguments, but not without a whiff of marshal bombast and historical irony. The image suggested by the pleadings was of two rows of cannons facing off across the Georgia-Tennessee border, ready to add gun smoke to the clouds of sulfur smoke swirling above. Georgia now beseeched the Court to assert federal power against invasive pollution. The justices well remembered when Georgia engaged in an armed rejection of federalism during the Civil War. Justices Oliver Wendell Holmes and John Marshall Harlan both fought in the Union Army. By 1904, the South had long since returned to the federal fold, and Edward Douglass White, a Confederate veteran, sat on the bench alongside Holmes and Harlan.<sup>21</sup>

The two Georgia lawyers chose their words carefully with eyes cast to the past and the future. An invasion is the hostile entry upon the lands or person of another. It is the ultimate violation of sovereignty. The state’s sense of offended sovereignty was as real as the smoke damage to its northern counties. Ducktown smoke litigation was but the latest in a long line of confrontations by Georgia to assert or defend its sovereign rights for causes both good and bad. It fought against the British to secure its independence during the Revolution. Its position in

---

<sup>20</sup> Ibid, at pars. eighteenth and nineteenth. See U. S. Constitution, Art. I, §10, cl. 3 (power to wage war exclusively reserved to Congress); Art. IV, §4 (guarantee to states).

<sup>21</sup> For their role in the Civil War, see Mark DeWolfe Howe, *Oliver Wendell Holmes: The Shaping Years: 1841-1870* (Cambridge, Mass.: Harvard University Press, 1957), 80-175; Loren P. Beth, *John Marshall Harlan: The Last Whig Justice* (Lexington, Ky: University Press of Kentucky, 1992), 53-67; Robert B. Highsaw, *Edward Douglass White: Defender of the Conservative Faith* (Baton Rouge, LA: Louisiana State University Press, 1981), 18-20.

*Chisholm v. Georgia* (1793) forced the adoption of the Eleventh Amendment to the Constitution in 1795 to preserve state sovereign immunity.<sup>22</sup>

Georgia then pressed to extinguish Indian tribal sovereignty with its borders. In the 1802 Articles of Agreement and Cession, it insisted upon the federal government's promise "to extinguish the Indian title to all the other lands within the state of Georgia" in exchange for release of the state's claim to western lands in what are now the states of Alabama and Mississippi. When the federal government failed to eliminate Cherokee tribal sovereignty by treaty, Georgia then tried to accomplish the same end by legislative fiat, an action that forced a confrontation in the Supreme Court in *Cherokee Nation v Georgia* (1831) and again in *Worcester v. Georgia* (1832).<sup>23</sup>

Georgia's insistence upon state sovereignty, renamed as states' rights, led to secession and the Civil War. Afterwards during Reconstruction, white Georgians overthrew the Republican administration imposed by the victorious North. They restored their version of state sovereignty by reasserting home rule and white supremacy under the Democratic Party banner. For Attorney General Hart, the present Supreme Court fight against Tennessee and the copper companies was another phase of a very long battle.<sup>24</sup>

---

<sup>22</sup> *Chisholm v. Georgia*, 2 Dall. (2 U.S.) 419 (1793). The amendment was ratified in 1795 and formally added by presidential message in 1798; see John V. Orth, *The Judicial Power of the United States: The Eleventh Amendment in American History* (New York: Oxford University Press, 1987).

<sup>23</sup> United States, *Articles and Agreement of Cession: Entered into on the 24<sup>th</sup> Day of April, 1802, between the Commissioners of the United States and those of Georgia* (Washington, D.C.: R. C. Weightman, 1807); *Cherokee Nation v. Georgia*, 5 Pet. (30 U.S.) 1 (1831); *Worcester v. Georgia* 6 Pet. (31 U.S.) 515 (1832).

<sup>24</sup> These incidents, except Reconstruction, are surveyed in Ulrich Bonnell Phillips, *Georgia and State Rights: A Study of the Political History of Georgia from the Revolution to the Civil War, with Particular Regard to Federal Relations* (Washington: Government Printing Office, 1902).

The rhetoric of invasion also served as a prescient insight that interstate pollution was a physically intrusive threat to state sovereignty that required federal intervention. The novelty was in the federal aspect of their argument; government action against pollution was not new. Smoke from high-sulfur sea coal mined at Newcastle and burned in London bedeviled the English capital long before the Industrial Revolution. Edward I, Richard III, and Henry V each enacted laws to limit its use. Raw sewage fouled rivers running through every major city. The stench occasionally reached a level of foulness that stunned the usually tolerant nostrils of people trained by exposure to odors before the days of flush toilets. London's Great Stink of 1858 caused an outcry that forced legislation to create the authority and funding for construction of a municipal sewer system. Government had the power to act against pollution if the people causing the pollution and those suffering from it were within the same jurisdiction.<sup>25</sup>

Congress made its first enactment on water pollution with the passage of the 1899 Refuse Act. It was a tentative first step. The act barred disposal of solid trash and debris into navigable streams and harbors without a federal permit, but it expressly excluded the flow from "streets and sewers and passing there from in a liquid state." The distinction turned upon the limited construction Congress placed upon its constitutional power to regulate commerce. Congress clearly had power to regulate navigable waters because they were a major avenue of commerce. Solid trash posed hazards to navigation, by damaging hulls and clogging ship channels, that liquid waste did not. Within its modest scope, dumping solid trash and debris into navigable waters became a crime that could be prosecuted in federal trial courts.<sup>26</sup>

---

<sup>25</sup> David Urbinato, "London's Historic Pea Soupers," *EPA Journal*, 20, no. 1/2 (Summer, 1994): 44; Stephen Halliday, *The Great Stink of London: Sir Joseph Bazalgette and the Cleansing of the Victorian Metropolis* (London: Alan Sutton, 1998).

<sup>26</sup> U.S. Const. Art. I, §7, cl. 3 (Commerce Clause); Refuse Act of 1899, 33 U.S.C. §§407, 408, 411, 413 (2004); Timothy R. Young, "Criminal Liability under the Refuse Act of 1899 and the Refuse Act Permit Program," *The Journal of Criminal Law, Criminology, and Police Science* 63, no. 3 (September 1972): 366-376. The problems of

At the turn of the nineteenth century, Congress had yet to seriously address other aspects of pollution at the national level. It was not until 1948, with passage of the Federal Water Pollution Control Act, that Congress embraced the Commerce Clause as authority for regulation of the quality and health of water as opposed to its importance to navigation. In the meantime, the States were on their own regarding other forms of interstate pollution, and their efforts to combat it inevitably provoked constitutional battles over state and federal sovereignty.<sup>27</sup>

\*\*\*

Hart and Johnson knew that the Supreme Court had addressed interstate pollution on only one earlier occasion, in *Missouri v. Illinois and the Sanitary District of Chicago* (1901). The case arose when Chicago had a great stink of its own. Sewage generated by its booming population, the wastes from the hundreds of thousands of cattle and hogs in its stockyards, and the slaughter room filth from its meat packing houses all flowed down the lazy Chicago River directly into Lake Michigan, which was the city's source of drinking water. City engineers built a system of fresh water intakes far out into the lake beyond the polluted waters near the shore, but could not outreach the ever-expanding area of contaminated water.<sup>28</sup>

The Chicago Sanitary District then devised a new solution on a scale that would have impressed Egypt's pharaohs: they reversed the flow of the Chicago River. Between 1887 and 1900 they dug a channel through a low ridge that separated the Chicago watershed from the Mississippi River system. Water that once flowed east into Lake Michigan now flowed west all the way across Illinois via the Des Plaines River, thence into the Illinois River, and finally into the

---

jurisdiction as a factor of environmental law are considered in Richard J. Lazarus, *The Making of Environmental Law* (Chicago: University of Chicago Press, 2004), 29-42.

<sup>27</sup> Robin K. Craig, *The Clean Water Act and the Commerce Clause* (Washington, D.C.: Environmental Law Institute, 2004), 10-35, 110-118.

<sup>28</sup> *Missouri v. Illinois*, 180 U.S. 208 (1901).

Mississippi River at a point forty-three miles above St. Louis. The Mississippi served as the common border between Illinois and Missouri, with the line running down the center of the main channel. Chicago pollution that entered the Illinois side of the river fouled Missouri's portion. Missouri officials complained that "fifteen hundred tons of poisonous undefecated [i.e. unpurified or untreated] filth of said Sanitary District of Chicago will be daily carried...into the Mississippi" where it will "pollute and poison said water with the germs of diseases of various and many kinds."<sup>29</sup>

Missouri filed a Supreme Court original jurisdiction action seeking an injunction to stop the flow of sewage from Chicago. The defendants responded with a vigorous demurrer alleging that the Supreme Court lacked jurisdiction to hear the matter. The Court ruled for Missouri in a six-to-three decision authored by Justice George Shiras. The majority conceded that the Court's previous original jurisdiction cases concerned state borders, state property rights, and issues of interstate commerce. It then extended the scope of original jurisdiction by declaring, "it must surely be conceded that, if the health and comfort of the inhabitants of a State are threatened, the State is the proper party to represent and defend them."<sup>30</sup>

The opinion in *Missouri v. Illinois* provided partial support for Georgia's Ducktown smoke case while leaving other issues unresolved. Both cases concerned pollution, but the differences outweighed the similarities. Missouri presented a public health issue, and argued its strong sovereign interest in the health of its citizens. The Court readily grasped the state's

---

<sup>29</sup> Ibid.

<sup>30</sup> Ibid., 241. Missouri lost on the merits five years later when the Court denied its request for injunction, *Missouri v. Illinois*, 200 U.S. 496 (1906). The dispute continued under different captions until resolved when the Court ordered Illinois to build sewage treatment facilities. *Wisconsin v. Illinois*, 289 U.S. 385 (1933). See Robert V. Percival, "The Frictions of Federalism: The Rise and Fall of the Federal Common Law of Interstate Nuisance," University of Maryland, Pub-Law Research Paper No. 2003-02, 4-14; available at SSRN: <http://ssrn.com/abstract=452922> or DOI: 10.2139/ssrn.452922.

concern that “contagious and typhoidal diseases introduced in the river communities” by the reversed Chicago River “may spread themselves throughout the territory of the state.” The language of the opinion reflected the scientific advances that girded Missouri’s argument. John Snow established the empirical link between cholera and contaminated water in his famous 1855 study, *On the Mode of Communication of Cholera*, which linked deaths in a London epidemic to specific contaminated wells. He ended the epidemic with a dramatic gesture by removing the handle from the worst of the wells. Louis Pasteur’s work in microbiology, Karl Eberth’s identification of the typhoid bacillus, and Robert Koch’s 1883 discovery of the *vibrio cholerae* germ were all widely known at the turn of the century. The parties could and did argue whether the volume of diverted sewage posed a health threat hundreds of miles away in St. Louis, but at least the paradigm of sewage, water pollution, and disease was well established.<sup>31</sup>

Georgia’s lawyers also gave a nod to public health with a line or two about smoke and respiratory problems. They could not press the point because the scientific link between sulfur dioxide and public health had yet to be established to the same degree as for sewage-contaminated water. All they had to offer was anecdotal evidence from Ducktown smoke suitors and the contradictory evidence of local doctors. J. H. Verner testified that smelter smoke “caused me and my family to cough, sneeze, vomit, and was very disagreeable...I was advised by the doctor to take one boy that had had the measles out of the smoke.” He did as advised but the boy died. When pressed by company lawyer, he admitted that he could not swear that the smoke caused the death. Dr. H. A. Rogers testified for DSC&I that “it is true that at times the smoke

---

<sup>31</sup> Ibid., 241; John Snow, *On the Mode of Communication of Cholera* (London: J. Churchill, 1855). For recent works on Snow, medical mapping, and cholera, see Peter Vinten-Johansen, et al., *Cholera, Chloroform, and the Science of Medicine: A Life of John Snow* (New York: Oxford University Press, 2003); Tom Koch, *Cartographies of Disease: Maps, Mapping, and Medicine* (Redlands, Calif.: ESRI Press, 2005); Sandra Hempel, *The Strange Case of the Broad Street Pump: John Snow and the Mystery of Cholera* (Berkeley: University of California Press, 2007). For a more skeptical view of Snow and the pump handle, see Kari S. McLeod, “Our Sense of Snow: The Myth of John Snow in Medical Geography,” *Social Science & Medicine* 50, no. 7-8 (2000): 923-35.

settles down strong enough to cause considerable coughing” but “without any detrimental effects.” Noting that sulfur is a germicide, he vaunted the benefits of exposure to smelter smoke: “I have frequently recommended patients who were suffering from hay fever and asthmas to make daily visits...and place themselves where the smoke was thick, and remain there for some time.” Dr. L. E. Kimsey responded that it was “extremely irritating to the organs of respiration” and increased the impact of lung diseases. His brother and fellow physician, Dr. Fred M. Kimsey, advised his consumptive patients to leave Ducktown, but he did not go so far as to blame tuberculosis on the smoke.<sup>32</sup>

Advancement of the argument about the health effect of sulfur dioxide would have to await developments in the new discipline of industrial hygiene. Alice Hamilton and other hygienists began the systematic empirical and experimental studies to establish the health hazards of industrial toxins, and to define safe levels of exposure. Their work is now carried on by a host of federal agencies collected under the umbrellas of the Department of Health and Human Services and the Department of Labor. The Agency for Toxic Substances and Disease Registry, a unit of the Centers for Disease Control in Atlanta, released its *Toxicological Profile for Sulfur Dioxide* in 1998. The authors of the 233 page report evaluated hundreds of scientific studies to establish that sulfur dioxide is hazardous to health. Short term exposure to high levels “can be life-threatening,” and cause “burning of the nose and throat, breathing difficulties, and severe airway obstruction.” Long-term exposure to sulfur dioxide led to significant loss of pulmonary function among workers at copper smelters and pulp mills. Though they came ninety

---

<sup>32</sup> Transcript, 42-43 (Deposition of J. H. Verner), *Madison v. Ducktown Sulphur, Copper & Iron Co.*, Chancery Court, Polk Co., TN, no. 247; TSLA Supreme Court East Box 1412, 1905; Deposition of H. A. Rogers, and Affidavits of Fred M. Kimsey, and H. A. Rogers, all at *Madison v. Ducktown Sulphur, Copper & Iron, Co.*, 113 Tenn. 331 (Transcript pgs. 111-113, 333), TSLA Supreme Court East Box 1443, 190. For a history of industrial hygiene, see Christopher C. Sellers, *Hazards of the Job: From Industrial Disease to Environmental Health Science* (Chapel Hill: University of North Carolina Press, 1997).

years too late to impact the Ducktown litigation, the findings proved the Kimsey brothers right, and Dr. Rogers wrong.<sup>33</sup>

Lacking as it did a scientifically established public health rationale, the Georgia case turned instead upon property damage. The problem was that almost all of the damage occurred to privately owned property, notwithstanding Georgia's allegations of flooded out highways and the reduction of state tax receipts paid on smoked-out farms. Two big questions remained: Did the state have a sufficient property to sustain Supreme Court original jurisdiction when private owners held almost all of the smoke-damaged lands? Was the case in reality an improper state-level attempt to advance the individual smoke damage claims of its citizens? Hart and Johnson hoped that their characterization of pollution as an invasive threat to state sovereignty would carry them to victory. They made their arguments, and the Court took the matter under advisement. There being nothing more they could do at the moment, they boarded the train for the long and perhaps more relaxing trip back to Atlanta.

\*\*\*

One week later, on February 1, 1904, the Supreme Court granted Georgia's request for permission to file the state's smoke suit as an original jurisdiction action. The ruling was not the Court's final word on the issue. It was merely a preliminary approval that could be modified or revoked in later stages of the case. The copper companies would certainly resume their attack against original jurisdiction when they later filed their demurrers to have the case dismissed. Even so, Georgia's Attorney General and his young colleague had reason for confidence that the initial ruling would be upheld because the Court was more inclined to affirm an earlier ruling than to reverse it at a later hearing.

---

<sup>33</sup> Agency for Toxic Substances and Disease Registry, "Toxicological Profile for Sulfur Dioxide" (Atlanta, GA: Department of Health and Human Services, Public Health Service), <http://www.atsdr.cdc.gov/toxprofiles/tp116.pdf> (accessed 30 June 2007), 1-4, 13-42 (as paginated in the report).

Johnson and Hart also had personal reasons to be pleased. They won a major point in their first appearance in the Supreme Court on a difficult issue of first impression. This placed Hart in good stead with the governor and the voting public. Johnson added to his profile as a rising young attorney. Strategically, the victory secured the legal phase of the two-part plan. The grant of jurisdiction meant that Georgia could now request an injunction against the copper companies in terms that might force the end of mining operations. That threat gave the state the leverage to pursue the second, technological, stage of its strategy.<sup>34</sup>

Hart wanted an engineering fix for Ducktown smoke. There were only three ways to abate a nuisance: move it, end it, or control it with some form of technology. Mine operators had removed the problems in the earliest days of Ducktown, by shipping some raw ore for processing at the Revere Smelting Works. (Paul Revere was a coppersmith before he achieved fame for his Midnight Ride to warn of the British Army during the American Revolution.) Other ore was shipped to Swansea, Wales, the largest copper smelting complex in the British Isles. Processing ore at distant smelters was rarely an economical solution because the cost of shipping a ton of raw ore was always greater than the cost of shipping the small amount of metal extracted from it. Ducktown miners understood the problem and abandoned the practice in the late 1850s as soon as they gained the ability to smelt ore on site. If local smelting was cost beneficial during Ducktown's first era, when using rich 25 percent ore, it made even more sense in the industry's second era with the use of low grade ore containing only 2-3 percent copper.<sup>35</sup>

---

<sup>34</sup> "Georgia Wins the First Point," *The Atlanta Constitution*, 2 February 1904, A5.

<sup>35</sup> Robert E. Barclay, *Ducktown in Raht's Time* (Chapel Hill, University of North Carolina Press, 1946), 45, 61, 66-68, 84-86. Efforts to find technological solutions to smelter are discussed in Timothy J. LeCain, "When Everybody Wins Does the Environment Lose? The Environmental Techno-Fix in Twentieth-Century American Mining," in Lisa Rosner, ed., *The Technological Fix: How People Use Technology to Create and Solve Problems* (New York: Routledge, 2004), 137-154; Frank Uekoetter, "Solving Air Pollution Problems Once and for All: The Potential and Limits of Technological Fixes," in Lisa Rosner, ed., *The Technological Fix: How People Use Technology to Create and Solve Problems* (New York: Routledge, 2004), 155-174.; Michael A. Church, "Smoke Farming: Smelting and

Apart from the costs, shipping ore for processing to distant smelters would have simply transferred the smoke problem from one locale to another. Swansea had enough smoke problems of its own. British authorities were pressuring Swansea companies to abate or end smelter smoke at the same time Hart was litigating against the Ducktown Company and Tennessee Copper. Georgia could end the smoke by killing the local industry at the cost of eliminating a mainstay of the mountain economy. Or, the state could force adoption of new control measures. On behalf of the state, Hart chose the third course out of concern for the thousands of citizens in three states who depended upon the two great copper companies for their livelihoods. He and his young colleague did their part in court. Now it was the turn of the engineers.<sup>36</sup>

There was no shortage of suggestions. One idea was dispersal. The members of the 1903 legislative commission proposed the use a tall chimney of two-hundred-fifty feet “so that the poisonous smoke would be carried far into the heavens and dissipated by the winds.” Dispersion had a powerful logic to it. Many substances become less potent and obnoxious when mixed into a large volume of air or water. Cigar smoke and heavy perfume are easier to tolerate out-of-doors than in a small, stuffy parlor. The first urban sanitation systems worked on the same principle by collecting filth in sewer mains and directing it untreated into large bodies of moving water for

---

Agricultural Reform in Utah, 1900-1945,” *Utah Historical Quarterly* 72, no. 3 (Summer 2004): 196-218). LeCain phrased the alternatives as “the transformational techno-fix, the relocational techno-fix, and the delaying techno-fix.” Uekoetter discussed the often tense interaction between civic reformers, professional engineers, industry, and often dubious inventors in the search for effective abatement of smoke from coal-fired furnaces. Church described bag-house technology used to remove arsenic, lead, and other metals from smelter smoke in Utah.

<sup>36</sup> For studies of copper smelter pollution in Swansea, Wales, see Edmund Newell, “Atmospheric Pollution and the British Copper Industry, 1690-1920,” *Technology and Culture* 38, no. 3 (1997): 655-689; Ronald Rees, “The South Wales Copper-Smoke Dispute, 1833-95,” *Welsh History Review* 10, no. 4 (1981): 480-96. “Georgia Veteran Tells Why He is for Simmons,” *Atlanta Constitution*, 17 April 1904, 3.

dilution. Tall smoke stacks accomplished the same effect by sending smoke up away from ground level into the winds high above the city.<sup>37</sup>

Dispersion worked to a degree, but often failed when the volume of sewage and smoke exceeded the capacity of wind and water to disperse it. The slow moving currents at the foot of Lake Michigan frustrated Chicago's effort to dilute sewage into that huge body of water. Whenever winds died in periods of calm, killing smog occurred in cities with heavy concentrations of industry as happened in the steel town of Donora, Pennsylvania in 1948 and in London in 1952. Advocates of dispersion also failed to account for the way that dispersion regimes led to the gradual accumulation of toxins in air and water. At best, dispersion simply removed pollutants from one locale to another, less favored, locale downstream or downwind. Historian Joel Tarr summarized dispersion efforts as the "search for the ultimate sink."<sup>38</sup>

Another approach was the removal of sulfur from the smoke. An armchair scientist from Nashville wrote the editor of the *Ducktown Gazette* with his plan smelting ores within one hundred six-by-ten foot ovens, each connected by a common flue to collect the smoke. The smoke would then be sprayed by steam and then forced through a vat of cold water to convert sulfur dioxide gas into useable sulfuric acid. He was right about the goal but woefully short on the complex techniques of chemical engineering needed to bring it about. Mining experts in Ducktown, and in the industry as a whole, could only wish that the solution was that easy. They longed for a technique of sulfur extraction that was both technically and commercially viable. They knew that open heap roasting hurt industry profits two ways: by allowing a valuable

---

<sup>37</sup> The commission suggestions appear in "Georgia Forests Withered by Sulphur Fumes," *Atlanta Constitution*, 22 November 1903, A5.

<sup>38</sup> Joel A. Tarr, *The Search for the Ultimate Sink: Urban Pollution in Historical Perspective* (Akron, Ohio: University of Akron Press, 1996), 7-35.

commodity to literally go up in smoke and by exposing mining companies to lawsuits for all of the damage it caused.<sup>39</sup>

Ducktown's copper companies knew they could sell all of the sulfur they expelled from their ores, if only there was a way to capture it during smelting. The chemical had thousands of industrial uses in everything from fertilizer, petroleum refining, steel processing, cloth dyes, and dynamite. When August Raht contemplated Ducktown's pre-railroad decline in the 1870's, he saw harvesting of sulfur as one of the keys to the industry's salvation. "Unless a plant could be built at Ducktown for the production of sulfuric acid," then "Ducktown is gone without redemption." Unfortunately, an economic process for extracting sulfur from smelter smoke did not exist then, nor did it exist two decades later when Carl Henrich, a noted mining engineer, considered the waste and damage from open roasting. "If the sulfur were only present in more concentrated form and capable of economical utilization" then "its value would greatly exceed that of the copper in the ore." The trouble was that "no practical method of saving it is now available." For lack of technology to remove the sulfur, he suggested dispersion by the use of tall smokestacks to at least mitigate the damage.<sup>40</sup>

Miners could not send smoke up a chimney until they first discovered a successful method for pyritic smelting, the primary smelting of sulfide copper ore within a furnace. They knew how to connect a blast furnace to a chimney. The trick was to successfully smelt the sulfur-rich ore in a blast furnace. It was a long-cherished goal. W. H. Freeland, the general manager, said, "Pyritic smelting has been the dream of the metallurgists for the past thirty years." They

---

<sup>39</sup> "Abate the Smoke Nuisance: A Scientific Plan for Controlling the Noxious Gases that are Destroying Vegetation," *Ducktown Gazette*, ca. June, 1902, collected in the J. D. Clemmer Scrapbooks, vol. 2, pgs. 120-121, TSLA.

<sup>40</sup> Barclay, *Ducktown in Raht's Times*, 163 (August Raht quotation); Carl Henrich, "The Ducktown Ore Deposits and the Treatment of the Ducktown Copper-Ores," *Transactions of the American Institute of Mining Engineers* 25 (1896): 173-245, especially at 228-29.

had a well-designed furnace and knew the correct ingredients—ore, coke, and quartz—to feed into it, yet each time they fired up the furnace, the mixture caused the fire to die and the contents to congeal into a cold unprocessed mass. They were like a chef whose every soufflé collapsed despite the use of a good oven and the right ingredients.

Serendipity, the trump card in the inventor's hand, provided the answer when careful engineering experiments failed. As Ducktown historian, Robert Barclay, told it, a blue-collar workman stumbled upon the solution when he decided to toss more quartz onto a waning fire and then went home to bed. He learned next morning that the furnace continued burning throughout the night. The workman repeated the step on the next two days, and the furnace continued to run smoothly until the ore was thoroughly processed.<sup>41</sup>

Whether discovered by deliberate experiment or by luck, pyritic smelting was a major achievement. Its advantages led D.S.C.&I managers to immediately implement the new process at their Isabella complex. Pyritic smelting ended the production bottleneck caused by roasting. The old method was the slowest stage in the mining process. It took three or four months to roast the amount of ore that secondary smelters processed in a few days. Pyritic smelting combined primary roasting and secondary smelting into one process, and accomplished both stages in a matter of days. Production costs for labor and fuel declined as the pace of smelting increased. With those benefits in mind, DSC&I abandoned roasting on August 16, 1902, and completed the transition to pyritic smelting a year later on October 5, 1903.<sup>42</sup>

---

<sup>41</sup> The story of the discovery is told in Robert Edward Barclay, *The Copper Basin, 1890 to 1963* (Knoxville? Tenn.: s.p., 1975), 4-7.

<sup>42</sup> W. H. Freeland testified that roasting ended there on August 16, 1902; see Transcript, 58 (Deposition of W. H. Freeland, 25 March 1905), *Madison v. Ducktown*. Barclay says the transition was completed on October 25, 1903, Barclay, *Copper Basin*, 7.

The Tennessee Copper Company adopted the process at its Copperhill works for the same reasons. It announced to the *Wall Street Journal* on October 29, 1903, that in light of DSC&I's success, it too would make the switch to pyritic smelting. The younger company explained that the new method would lower costs of production to eight cents per pound of copper. It would also save four pounds of copper per ton of ore lost during roasting. This was a significant boost in the yield when processing ore that, at best, contained thirty-two pounds of copper to the ton.<sup>43</sup>

Hope stirred that use of pyritic smelting in lieu of open heap roasting would end Ducktown's smoke problem. A Knoxville newspaper reported that the new process, if successful, "will free the community of the deadly sulfur smoke" that had killed "all vegetation for miles around Ducktown." A. B. Dickey, a prominent farmer from the Hot House Creek community wrote DSC&I counsel, James B. Parks, to say "I am now satisfied that the company is going to abandon the roasting of ore" and suggested that the time was now right to settle the smoke damage suits awaiting trial in the Polk County District Court. "Now if the smoke is taken off, and a reasonable damage [is paid] to people who are really damaged, it looks to me that this would be much the best way to settle it." The Tennessee firm told the financial community that "the new system will save...heavy damages by reason of the smoke nuisance causing damage to farming lands."<sup>44</sup>

Technological progress, economic motivation, and the grant of original jurisdiction led to a rapid settlement of the Supreme Court case. On February 10, 1904, Attorney General Hart, Ligon Johnson, and Governor Terrell met in Atlanta with W. H. Freeland, general manager of

---

<sup>43</sup> "Tennessee Copper: New System of Smelting to Be Inaugurated," *Wall Street Journal*, 29 October 1903, 5; "Tennessee Copper: Surplus After Dividend Payments," *Wall Street Journal*, 7 January 1904, 5.

<sup>44</sup> "To Eliminate Sulphur Fumes," *Atlanta Constitution*, 13 January 1903, 4; A. B. Dickey to James B. Parks, 10 March 1904, DBM; "Tennessee Copper: New System to be Inaugurated," *Wall Street Journal*, 29 October 1903, 5.

DSC&I, J. Parke Channing, president of TCC, and their respective counsel. Freeland stipulated for DSC&I that, “the discovery of a new process has enabled this company to abolish the former practice of roasting ore, that the new process is in actual and successful operation, and that the roasting of ore will not again be resumed.” Channing acknowledged that TCC was still roasting ore on open heaps, but would not light any new fires in the roast yards after completion of the new furnaces in April. He cautioned that, “It takes from three to four months to roast ore after it has once been lighted and therefore it is a physical impossibility to stop roasting when it is once under way.” When the present fires burned out as summer’s end, the era of open heap roasting in the Ducktown Basin would be over. For Georgia’s part, Hart, Johnson, and Terrell agreed that the state would not ask for a temporary restraining order. They also dismissed the state of Tennessee, realizing that it was not a necessary party to the action. Representatives for Georgia and the two copper companies signed a settlement agreement and filed it with the Supreme Court. The Court approved and then dismissed the case without prejudice in April.<sup>45</sup>

The little two-word phrase, “without prejudice,” gave the state great power by leaving open the threat of future proceedings for an injunction. A dismissal *with* prejudice would permanently end the case. A dismissal *without* prejudice allowed the state to renew its lawsuit if the present arrangements failed to solve the smoke problem. Before settlement, the lawsuit was like a bomb with a burning fuse that threatened to blow up the local copper industry. Settlement without prejudice snuffed out the burning sparks while leaving the fuse in place. The state could re-light the fuse when it chose. The bomb would not be defused until 1937, long after many of the present actors had died.

---

<sup>45</sup> Georgia v. Ducktown Sulphur, Copper & Iron Co., 194 U.S. 629 (1904) (granting motions for leave to file amended bill, to dismiss state of Tennessee, and for leave to file stipulation of settlement); “Will Not Press Suit of State,” *Atlanta Constitution*, 10 February 1904, A3; “Ducktown Case Out of Court,” *Atlanta Constitution*, 19 April 1904, 5.

\*\*\*

This was a bizarre settlement in one respect. It appeared on its face to be a typical agreement by one party to suspend litigation in exchange for the other party's promise to stop an objectionable practice. The surrounding facts showed it to be otherwise. Hart filed Georgia's lawsuit on January 24, 1904, after the Ducktown Company had already closed its roast yards, and after TCC announced its intention to do the same. Political pressures in Georgia compelled his action. The case began as a citizen protest amplified by the General Assembly resolution. Terrell and Hart were on the spot and had to respond with demonstrable action in the courts. Invasion had to be answered with victory. A course of patience and passivity towards the copper companies was hazardous to their political careers. James Parks, attorney for the Isabella company, later commented on Hart's political motivations for suit and settlement: "he was anxious to get rid of his suit...so as to get as much political capital out of it as possible for himself and Governor Terrell, both of who were at that time candidates for re-election."<sup>46</sup>

Georgia's Ducktown case occurred in a regulatory vacuum that increased the political pressure upon the two state leaders. It was a much different political environment than what Congress established in 1970 when it created Environmental Protection Agency (EPA). The EPA and its state level counterparts function as bureaucracies that provide a significant layer of political insulation to elected officials on environmental matters. They make their own regulations in a rule-making process that is conducted at a remove from normal legislative politics. Disputes arising from their regulatory activities are channeled through several rounds of administrative hearings before they ever reach a court of general jurisdiction. There were no environmental agencies in 1903. The political and legal vectors at that time went in a straight

---

<sup>46</sup> James G. Parks to W. H. Freeland, 3 December 1904, DBM.

line directly from angry voters, through a sympathetic General Assembly, and then to Terrell and Hart without a lengthy bureaucratic detour.<sup>47</sup>

Intransigence by the copper companies also provoked the suit. The Ducktown firm squandered credit earned by its discovery as its lawyer worked to suppress news of the switch to pyritic smelting. W. H. Freeland, the general manager, considered publicizing the company's commitment to pyritic smelting by submitting an article to a professional journal. James B. Parks, responded with an April 21, 1903 letter expressing his concern that news of the change would undercut the defense argument made in scores of pending smoke cases that roasting was the best available technology. He wrote, "Our position heretofore has been that we have been using the only known method of successful treatment; and we have put it to the courts to say whether we should be permitted to follow accepted standards, or whether we should be driven out." An article about pyritic smelting could be used by the plaintiffs to argue that DSC&I and the other copper companies in the Basin willfully continued open roasting despite knowledge of a new and presumably less destructive process. He suggested that "it would be good policy to let the impression remain for a while that pyritic work in Ducktown is still in the experimental stage." Freeland followed the advice by delaying the article. It appeared a year later, after settlement of Georgia case, in the May 26, 1904 issue of *Engineering and Mining Journal*.<sup>48</sup>

Parks also warned his counterpart at Tennessee Copper about the need to sound a consistent note about the new method. In a letter to Howard Cornick in May, 1903, he advised that, "There is a wide-spread impression among people that the companies could use other

---

<sup>47</sup> See Richard Oliver Brooks, Ross Jones, and Ross A. Virginia, *Law and Ecology: The Rise of the Ecosystem Regime* (Burlington, VT: Ashgate, 2002), for a study of how ecological science, public environmentalism, politics, and environmental law combined to create the modern environmental regulatory system.

<sup>48</sup> James G. Parks to W. H. Freeland, 21 April 1903, DBM; W. H. Freeland, "Smelting of Raw Sulphide Ores at Ducktown," *Engineering and Mining Journal* 77 (26 May 1904): 837.

methods, if they would, but that they use this [roasting] because it is the most profitable.”

Cornick responded the following day with similar concerns and speculated that “Mr. Freeland might be able to testify that the new process is really an experiment...with no absolutely fixed understanding...as to its ultimate success.” The efforts of both attorneys to control the state-of-the-art defense provided little reason for Hart to forego his planned Supreme Court case.<sup>49</sup>

The Tennessee Copper Company gave an even worse signal to Hart by adding one hundred fifty more roast heaps to its Burra Burra yard in 1903, the year after the DSC&I success with pyritic smelting. TCC knew about the discovery. Its works at Copperhill were only three miles from the DSC&I works at Isabella, and its Burra Burra facilities were even closer, making it easy for each firm to monitor the other. Nonetheless, TCC did not announce its intentions to stop roasting until the fall of 1903 when the last roast fires at Isabella were dead or dying. Ducktown historian Robert Barclay considered the delay from his perspective as TCC’s long-time treasurer, and wrote that, “apparently the growing agitation over the smoke nuisance was not being taken seriously by Randolph Adams,” the TCC general manager at the time. Adams’s stance only confirmed the suspicions of smoke-suitors that TCC found roasting profitable and would continue it until forced to stop. The economic advantages of pyritic smelting suggested otherwise, that TCC would eventually be forced to match its competitor, as discussed in its news releases later that fall. Political pressures did not allow Hart to delay suit to see those plans become a reality.<sup>50</sup>

In the end, Hart’s 1904 Supreme Court actions made little difference to either company.

The case settled quickly on terms that required them to do nothing that they were not already

---

<sup>49</sup> James G. Parks to Howard Cornick, 21 May 1903, and Howard Cornick to James B. Parks, 22 May 1903, both DBM.

<sup>50</sup> Barclay, *Copper Basin*, 36-37; compare M. L. Quinn, “Industry and Environment in the Appalachian Copper Basin,” *Technology and Culture* 34, no. 3 (July 1993): 575-612, fn 46.

committed to doing for solid business reasons. Hart may have advanced the Tennessee firm's timetable for the conversion, but otherwise left it unscathed. The Supreme Court case was, in its current posture, a sideshow to the much more threatening legal battles in the Tennessee appellate courts. Parks and Cornick anxiously monitored the progress of the three private injunction cases filed by a trio of farmers: William Madison, Avery McGhee, and Isaac Farner. The plaintiffs had a far greater commitment to winning a final decree of injunction than Hart and Johnson had yet demonstrated. Each plaintiff was a smoked-out farmer with long-standing grievances against the copper companies. They were veteran fighters in the smoke wars with multiple pending actions filed under their names. The battle had long since turned personal.<sup>51</sup>

The copper companies defeated each of the injunction cases in the Polk County Chancery Court. The smoke suitors then met success before the Court of Chancery Appeals in October 1903, when it reversed the lower decrees in each case by votes of two-to-one. The decisions stunned management and counsel at the two firms and sent them scrambling to marshal support in Nashville, and among corporate friends, for the next and final appeal to the Tennessee Supreme Court. Georgia's case had been settled for ten months when the Tennessee's highest court ruled for the copper companies on November 26, 1904, in terms that effectively ended anti-copper injunction actions in that state. Writing in the afterglow of victory, James B. Parks said to W. H. Freeland, "I believe this decision will have a most wholesome effect upon our Georgia friends." And if Hart decided to renew his case in Washington, then, "I believe the decision of our court, knowing as it does all the facts and circumstances, would have a great weight with the United States Supreme Court." His words reflected good legal sense but would be proved

---

<sup>51</sup> The procedural history is found in *Madison v. Ducktown Sulphur, Copper & Iron Co.*, 113 Tenn. 331, 337- 347, 83 S.W. 658, 659-661 (1904). The author's examination of court filings and docket sheets revealed that as of 1904, Madison filed three actions for damages and was party to four different injunction actions as either a plaintiff or defendant. Farner had three claims for damages, and McGhee had two.

disastrously wrong as hot sulfur fumes from the new pyritic blast furnaces reheated political pressures upon Georgia's attorney general.<sup>52</sup>

\*\*\*

Fifty years of open heap roasting in the Ducktown Basin were at an end. The fires at Ducktown Sulphur, Copper & Iron roast yards died on August 16, 1902. They continued another two years at the Tennessee Copper Company, finally ending in August, 1904. Both companies increased production thanks to the speed of pyritic smelting and to the capital expansion of their smelting works. The Tennessee Copper Company doubled its plant as it made the mandated conversion from open roasting. Four new blast furnaces rose next to the older three. The new furnaces were the largest copper furnaces in the nation. A massive complex of smelters now spread atop a bluff above the Ocoee River at the company's Copperhill works. They had an aggregate capacity of two thousand tons of ore per day, with a potential production of twenty to twenty-four million pounds of copper per annum. The Tennessee Copper Company never fully achieved that rate, but between it and its Isabella rival, annual copper production in the Ducktown District more than doubled from 8,103,534 lbs. in 1902, to 19,475,119 lbs. in 1907.<sup>53</sup>

Pyritic smelting allowed the companies to channel smelter smoke via flues into central chimneys. The ever greater volume of smoke generated by expanding production exited from the stacks in a concentrated form at great heat and high pressure. The Tennessee Copper Company built a 125 foot stack at Copperhill, and replaced it 1905 with a huge 325 foot smokestack. At Isabella, the DSC&I stack rose only 70 feet, but it sat at a higher elevation than the TCC works

---

<sup>52</sup> James B. Parks to W. H. Freeland, 3 December 1904, DBM.

<sup>53</sup> "Tennessee Copper: Capacity Will Be Increased to 24,000,000 Pounds," *Wall Street Journal*, 10 January 1905, 5. The production figures are from the United States Bureau of Mines, quoted in James W. Taylor, "Ducktown Desert: A Study of the Impact of Industrial Culture Upon the Physical Development of a Secluded Area of the Southern Appalachians," M. A. Thesis, Syracuse University, 1947, 51.

along the river. All of the smokestacks failed as the means for dispersing smelter smoke beyond the Copper Basin, for the simple reason that whether the stacks were short or tall, the Basin's mountain rim was even higher. The smokestacks did disperse smoke, but "the concentrated volume of smoke reached out to hitherto untouched regions" within the Basin. Formerly, smelter smoke tended to fall upon the area close to the smelters or to crawl up and down the valleys of the area's major streams, where, unfortunately, the best farm lands in the district were to be found. Now, the stacks carried smoke up and over the rumpled landscape within the mountain bowl to trouble upland farms and timber stands.<sup>54</sup>

Instead of reducing the number of smoke claims, dispersion created more claims from an expanding pool of property owners. The differing heights of the stacks became a point of tension in their formerly cooperative efforts toward a joint defense against smoke suits. The Tennessee firm at first bristled in response to DSC&I's early adoption of pyritic smelting, knowing that the change gutted the defense of open roasting as the state of the art smelting technology. Now, as more farmers and timber owners filed their claims against both companies, the Ducktown firm realized that its shorter smokestack served to shift the blame for the broader dispersal of smoke upon the tall stack at Copperhill. W. H. Freeland contended that the spreading smelter fumes came from the tall stack of the other company, not from the shorter chimneys at Isabella, where the "smelting plant is located in a hollow or ravine below the mean level of the region...surrounded by nearby hills and ridges that are much higher than the tops of said stacks." The argument failed to persuade individual smoke suitors.<sup>55</sup>

---

<sup>54</sup> Barclay, *Copper Basin*, 7, 40, 80-81; Quinn, "Industry and Environment," 590-91.

<sup>55</sup> Affidavit of W. H. Freeland, 13 November 1905, *Georgia v. Tennessee Copper Co.*, U. S. Supreme Court, No. 13 Original.

Pyritic smelting boosted production and increased profits as hoped by company managers and shareholders. It did nothing to abate sulfur dioxide emissions. Whether roasted on open fires or processed inside blast furnaces, the goal remained the same: the expulsion of sulfur from raw ore into the atmosphere. More sulfur smoke, not less, rose above the works because of the speed of pyritic smelting coupled with plant expansion. Dr. John T. McGill, a Vanderbilt University chemist, considered the problem in a 1916 study performed at the request of the Supreme Court. He determined that the new process eliminated the wood smoke from the roast heaps, but the amount of sulfur escaping from the smoke stacks “was very slightly, if any, less than in treating the same amount of ore by roasting and charcoal smelting.” This was an understatement. Using local production figures, he estimated what the two companies released before and after the end of roasting. In 1902, before either company ceased roasting, they processed a combined 335,864 tons of ore and expelled 184 tons of sulfur into Ducktown skies *per day*. Five years later in 1907, when both companies fully employed pyritic smelting, they processed 557,950 tons of ore and released 286.6 tons of sulfur per day (or more than 100,000 tons per annum). Sulfur dioxide emissions thus increased 55.7 percent between 1902 and 1907.<sup>56</sup>

Later studies provide special insight about the volume of Ducktown smelter smoke during the period. Researchers drew samples from trees in the Cades Cove section of the Great Smoky Mountain National Park, about fifty-five miles from the TCC smelters at Copperhill. Testing revealed that tree growth declined at a rate corresponding to the worst years of Ducktown smelter emissions. The samples also showed a marked increase in iron in the same pattern due to the high iron content in Ducktown sulfide ores. Another researcher determined

---

<sup>56</sup> Report of John T. McGill, 1 January 1916, *Georgia v. Tennessee Copper Co.*, No. 1 Original, October Term, 1914. Sources concur that greatest period destruction occurred after the industry’s revival in 1891: Nora Lynn Foehner, “The Historical Geography of Environmental Change in the Copper Basin,” M. S. Thesis, University of Tennessee, Knoxville, 1980, 25-50 (setting it from 1891-1946); Taylor, “Ducktown Desert,” 46-60 (from 1890-1904); Quinn, “Industry and Environment,” 580-599.

that acid from Ducktown smelter smoke caused tombstones to deteriorate up to fifty times faster in the Copper Basin than in other location in the Southeast. Sulfuric acid caused gravestones to become “so structurally weakened by granular disintegration and so many have been removed (only their pedestals remain) that even the high measured rates are underestimates.”<sup>57</sup>

Pyritic smelting failed as the fix for Ducktown smoke, and in fact, made the problem worse. No significant reduction in sulfur dioxide emissions could occur until the copper companies conquered the next engineering hurdle by devising and building acid plants to convert the fumes into marketable sulfuric acid. The new process was a significant step toward that goal, but standing alone, did nothing to abate the smoke—or the attendant lawsuits and political controversies.

\*\*\*

In the meantime, smelter smoke from the expanded industry combined with other factors to complete the formation of the Ducktown Desert that would characterize the Basin for most of the twentieth century. Estimates of its size varied among observers depending upon how they defined it. The Tennessee Valley Authority conducted extensive surveys during World War II to determine the extent of the heavily eroded areas. A 1945 TVA report with supporting maps determined the area to be 23,000 acres (35.93 sq. mi.), divided into zones of varying severity. The 7,300 acres (11.4 sq. mi.) of the inner zone were closest to the smelters. The lands within that zone “are practically denuded and intensely gullied.” The middle zone of 6,000 acres (9.37 sq. mi.) was also heavily gullied but had a partial cover of sedge grass on the surfaces between the gullies. The outer zone of 9,700 acres (15.15 sq. mi.), “supports a fair cover of grass and

---

<sup>57</sup> C. F. Baes and S. B. McLaughlin, “Trace Elements in Tree Rings: Evidence of Recent and Historical Air Pollution,” *Science*, 224, no. 4648 (May 4, 1984): 494-497; Thomas C. Meierding, “Marble Tombstone Weathering and Air Pollution in North America,” *Annals of American Geographers*, 83, no. 4 (December 1993): 568-588.

scrubby trees, but occasional bare spots and active gullies.”<sup>58</sup>

The great expanse of barren land, exposed as it was to more than fifty inches of rain each year, shed soil in amounts measured by the acre-foot, defined as a volume of dirt covering a one acre surface to the depth of one foot (1,633.33 cubic yards). A TVA forestry investigator pointed to the Ocoee No. 3 power dam to put in into perspective. The authority built the unit in 1942 with a storage capacity of 14,300 acre feet of water. In only eight years, 4,455 acre-feet of silt washed downriver from the Ducktown Desert to reduce that capacity by a third. Silt eventually filled 80 percent of the reservoir’s capacity. Another measure was even more dramatic: sixteen vertical feet of soil and subsoil had washed away in the areas of the worst erosion.<sup>59</sup>

The badlands stretched so far across the Basin that they produced special micro-climatic effects. Researchers determined that “wind velocity was thirteen times greater” in the desert portions than in the nearby forests, and the average soil surface temperature was twenty-two degrees hotter.” As described in his 1951 article for *Natural History*, Edwin Way Teale set a thermometer beside an anthill in April and observed a surface temperature of 115 degrees, causing him to wonder, “What would a mid-summer reading be?” He explained that, “without the balance wheel of vegetation, the bare hills of the Copper basin heat up rapidly under the sun and cool off just as rapidly with the coming of night.” The differential in September was as much as 35 degrees, a phenomena familiar to inhabitants of geographical deserts, but unusual to the humid South. Loss of vegetation hastened evaporation. The Forest Service determined that

---

<sup>58</sup> Tennessee Valley Authority, “A Proposal for Erosion Control and Restoration of Vegetation in the Copper Basin,” (September 1945), 1-5, 22, TVA Library, Knoxville, Tenn.

<sup>59</sup> Jack S. Rothacher, “Soil Erosion in the Copper Basin,” *Journal of Forestry* 52, no. 1 (January 1954): 41; Jesse C. Burt, “A Desert in the Appalachians,” *Nature Magazine* 49 (November 1956): 486-488, 499; Tennessee Valley Authority, Water Quality Department, “Status of the Ocoee Reservoirs: An Overview of Reservoir Conditions and Uses,” (Chattanooga, Tenn: Tennessee Valley Authority, Water Quality Department, 1991, OSTI ID: 5641599; DE91015961); John Nolt, *A Land Imperiled: The Declining Health of the Southern Appalachian Bioregion* (Knoxville: University of Tennessee Press, 2005), 86-87.

evaporation was five times greater in the denuded areas than on the forests beyond the zone of smoke damaged.<sup>60</sup>

An area of damaged forests extended even further beyond the badlands. Dr. McGill noted that the treeless area extended east to the North Carolina line, west to Little Frog Mountain, and several miles south of the Georgia border. Beyond that, forest cover was thin because of logging to supply the copper companies. Wherever standing timber could be found, he noticed that trees with dead or dying tops seem more numerous than is usually seen under similar soil and climactic conditions elsewhere.” This condition he said, “extends to the rim of the Ducktown Basin and perhaps farther.”<sup>61</sup>

McGill’s 1916 observations and the later TVA studies pointed to sulfur dioxide smoke and wide-scale logging as the chief causes of the desert and the damaged forests around them. The two factors reinforced each other. Loggers leveled fifty square miles of timber for use in construction and as fuel for the roast heaps during Ducktown’s first era. The temporary end of logging and smelting during the 1880s allowed a modest second growth to occur. That quickly fell to the axe when mining resumed in the 1890, and sulfur fumes from the roast heaps killed standing growth farther and farther away from Isabella and Copperhill. When roasting ended, residents continued to rely on wood for use in cook stoves and fireplaces. The workers who lived in the barren zone near the mines found it hard to come by. An old miner, named Wallace, recalled chopping up stumps to get firewood during a spell of sub-zero weather in 1905. Others no doubt did the same, thus causing erosion to advance at an even faster pace. When James

---

<sup>60</sup> Jesse C. Burt, “A Desert in the Appalachians,” *Nature Magazine* 49 (November 1956): 486-488, 499. Edwin Way Teale, “The Murder of a Landscape: Shortsighted Exploitation Poisoned and Denuded the Hills, and 100 Square Miles of Southern Countryside have Become an Almost Hopeless Desert,” *Natural History*, 60 (October 1951): 352-356; C. R. Hursch, *Local Climate in the Copper Basin of Tennessee as Modified by the Removal of Vegetation*, U. S. Department of Agriculture, Circular 774 (Washington, D. C.: Government Printing Office, 1948).

<sup>61</sup> McGill Report, 26-27.

Smallshaw heard the story thirty years later, he noticed an absence of stumps in the barren area. Close examination revealed that “only fragments of roots remain in the center of the barren area and occasional rotted stumps in the outlying sections.”<sup>62</sup>

A cluster of environmental factors compounded the effects of smoke and logging. M. L. Quinn pointed to environmental conditions that made the Basin especially susceptible to damage. The idea was that local circumstances can render an activity more harmful in one place than might otherwise be in a different one. At Ducktown, the list of factors began with reliance on sulfide ores and the topography of the mountain bowl that trapped sulfur smoke. The area’s extreme isolation left it totally dependent upon local forests for construction and fuel until the arrival of rail access in 1890. Weather was significant. Frequent light winds and dead calms created temperature inversions that held smoke close to the ground. Abundant rain and persistent mountain fogs hastened precipitation of acid rain onto vegetation. Summer cloud bursts loosened top soil and swept it away from naked slopes.<sup>63</sup>

Soil factors added to the list. Local soil was shallow and flaky, due to the large amounts of pyrites within it. When exposed to moisture, it oxidized “to ferric sulfate and sulfuric acid, forming acid sulfate soils” that “can impede or even prevent vegetation growth.” The natural chemistry of pyretic soils was hastened by massive load of sulfuric acid precipitated by smelter smoke. Most land within the Basin was steeply sloped and all the more prone to erosion.<sup>64</sup>

The impact of these factors can be appreciated by comparison to the Lake Superior copper district on Michigan’s Keweenaw Peninsula. Miners there extracted eleven billion pounds

---

<sup>62</sup> James Smallshaw, “Denudation and Erosion in the Copper Basin of Tennessee,” (Knoxville: Tennessee Valley Authority, 1939), 5.

<sup>63</sup> M. L. Quinn, “The Appalachian Mountains’ Copper Basin and the Concept of Environmental Susceptibility,” *Environmental Management* 15, no. 2 (March/April, 1991): 179-194.

<sup>64</sup> *Ibid.*, 185-86.

of copper from the 1840s to the 1960s. They left their mark on the landscape by digging up hillsides, clear cutting forests, and filling in harbors with silt, but came nowhere near to creating another Ducktown Desert. Lake Superior ore consisted of native copper with little sulfur. Frequent weather fronts and constant lake winds blowing over lower terrain kept the air much fresher. Forests eventually recovered with little help from humankind.<sup>65</sup>

Richard Wood, an erosion specialist with the TVA, pointed to another unique factor of Ducktown. He argued that “frequent fires and unrestricted grazing have always been detrimental to the natural re-vegetation of the Copper Basin. The two go hand-in-hand.” Ducktown’s open, cutover landscape and the sedge grass growing in the outer zones attracted livestock owners. Thanks to the Basin’s law of open range, herdsman brought in cattle and allowed them run free to graze at will. Sedge grass became course and tough during the late summer and fall so people set fire to the range during the winter and early spring to encourage fresh growth. The practice did encourage better grazing, but at the cost of declining soil fertility. It also killed off new trees. Overall, grazing and burning combined to expand the zones of heavy erosion for decades after the copper companies began extracting sulfur dioxide from the stacks.<sup>66</sup>

Kenneth Seigworth nicely summarized the immediate causes of the Ducktown Desert: “the axe, deadly sulfur fumes from open smelting kilns, forest fires, cloudburst rains upon unprotected slopes, alternate freezing and thawing, and grazing have all contributed to its devastation.” David Lilienthal, the first chairman of the Tennessee Valley Authority reframed the causal factors in economic terms. He called the Basin “the dead land,” an especially dramatic

---

<sup>65</sup> For discussion of the environmental impact of Lake Superior mining, see Larry Lankton, *Beyond the Boundaries: Life and Landscape at the Lake Superior Copper Mines, 1840-1875* (New York: Oxford University Press, 1997), 205-212.

<sup>66</sup> Richard Wood, “Erosion Control and Reforestation of the Copper Basin,” (Tennessee Valley Authority, Watershed Protection Division, Department of Forestry Relations, 1942), 7-8; R. E. Barclay, “Introduction to the Copper Basin,” (pamphlet), TSLA, Barclay Papers, reel 8.

example of the devastation that occurred throughout the South because of its status as a “colonial region.” The colonial economy deprived the South of wealth because the income earned for its resources paled against the valued earned and added by manufactures outside the region. Worse, the lack of a broad manufacturing base in the South led to the single-minded exploitation of certain marketable resources at the cost of others. In Ducktown, he wrote, “copper has been developed. But all its other resources had been destroyed in the process.” The same dynamic occurred with other southern products. “If a region depends...almost entirely upon the income from cutting the timber or growing cotton” without also manufacturing products from those resources, “then the pressure to mine the fertility of the soil, to devastate the forest for lumber, to deplete...the coal reserves becomes very great indeed.” The answer lay in the diversification of the southern economy, primarily by expansion of local manufacturing.<sup>67</sup>

Lilienthal sounded important themes and committed the TVA to the construction a huge system of hydroelectric projects to provide the necessary power for economic diversification. Yet his comments about Ducktown overlooked key points. Local conditions and the limitations of available technology made Ducktown mining and smelting inherently destructive if it was to be done at all. Better timber practices and grazing management might have limited the extent of damage in the Basin, but sulfide ores required roasting until the invention of the pyritic process. Even then, other technological developments were needed to collect and process sulfur dioxide from the smoke stacks. Copper was, and remains, an essential mineral for modern civilization. Ducktown was by far the South’s greatest source of copper, and it became an established

---

<sup>67</sup> Kenneth J. Seigworth, “Ducktown – A Postwar Challenge,” *American Forests* 49, no. 11 (November, 1943): 521-523, 558; David Eli Lilienthal, *TVA: Democracy on the March*, (New York: Harper, 1944). For a more recent approach to the South’s colonial economy, see Gavin Wright, *Old South, New South: Revolutions in the Southern Economy Since the Civil War* (Baton Rouge: Louisiana State University Press, 1986), 156-197.

industry before development of the great mining centers in the West – which had significant smelter pollution troubles of their own.<sup>68</sup>

The TVA chairman also failed to address the human ecology of the Ducktown community. The vast majority of the people most exposed to smelter pollution at Ducktown were those who depended directly upon copper mining for their livelihoods. Mining began there only a dozen years after the Cherokee Removal and remained the greatest employer in the region for more than one-hundred-fifty years. Population in the district rose and fell with the fortunes of the industry. It rose to 5,000 in Capt. Raht's time and collapsed to less than 500 after the industry shut down in 1878. The population recovered and expanded with the industry's recovery. By 1934, 10,000 lived in the Copper Basin, "practically all of whom derive their living from the copper and chemical companies operating the Basin."<sup>69</sup>

\*\*\*

Dora Galloway, the daughter of a Ducktown miner, added a personal perspective to these points in a charming memoir she wrote in 1964 for her granddaughter, Charlotte. Most of the Ducktown population came from the mountains of Tennessee, North Carolina, and Georgia, so

---

<sup>68</sup> The TVA came under severe criticism from environmentalists for its own activities. Its Tellico dam project threatened a tiny fish, the snail darter, provoking a spectacular national controversy over the Endangered Species Act. Foes of nuclear power and advocates of wild and scenic rivers also added their criticisms. See for example, William Bruce Wheeler and Michael J. McDonald, *TVA and the Tellico Dam, 1936-1979: A Bureaucratic Crisis in Post-Industrial America* (Knoxville: University of Tennessee Press, 1986) and Erwin C. Hargrove, *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1990* (Princeton, NJ: Princeton University Press, 1994), 155-241. For environmental problems at western copper mines, see Donald MacMillan, *Smoke Wars: Anaconda Copper, Montana Air Pollution, and the Courts, 1890-1924* (Helena: Montana Historical Society Press, 2000); Stephen W. Charry, "Defending the Great Barbecue: W. Lon Johnson and the 1921 Northport Smelter Pollution Suits," *Pacific Northwest Quarterly* 91, no. 2 (2000): 59-69; John E. Lamborn and Charles S. Peterson, "The Substance of the Land: Agriculture v. Industry in the Smelter Cases of 1904 and 1906," *Utah Historical Quarterly* 53, no. 4 (1985): 308-25; John D. Wirth, *Smelter Smoke in North America: The Politics of Transborder Pollution* (Lawrence: University of Kansas, 2000) (regarding the international dispute between the United States and Canada concerning the Trail Smelter in British Columbia, 1927-1941).

<sup>69</sup> Brief and Argument of the Ducktown Sulphur, Copper & Iron Company, Limited on the Final Hearing, *Georgia v. Tennessee Copper Co.*, United States Supreme Court, No. 5 Original (1905), p. 21; R. E. Barclay, "The Great Copper Basin," *The L & N Employee's Magazine* 10, no. 9 (November, 1934): 4-7.

her recollections spoke for many. She was born on a Christmas day, “unannounced, unregistered, and unattended by a physician” in a one-room log cabin in the mountains of western North Carolina. She, her parents, and two brothers then moved fifty miles from their heavily wooded homestead to Ducktown in 1906, when it was already a place of smoke and desolation. “After leaving those mountains with the pure pine-scented air, it must have been a severe trial of adjustment for my parents to settle in this place...filled with the foul smell of sulfur dioxide.” If they missed the woods, they also considered the move a release from sharecropping on a mountain farm to a place where “a man can work for a wage,” even though the wage was a dollar a day for twelve hour shifts, six days a week.<sup>70</sup>

The family rented a company house in Cole Town, one of the many villages scattered about the Basin within easy walking distance of the various mines. Their house, which eventually sheltered a brood of nine children, was made of unpainted rough lumber and wood shingles that provided imperfect protection against cold, wind, and rain. Construction was so loose that snow blew through the cracks onto bedcovers and “the cat could come and go at will under the kitchen door.” Some of the outside wall was missing because “planks were sometimes yanked off to be used as firewood in the cook stove.” That was quite a change for a family that once had a limitless supplies of standing timber outside their old mountain cabin.<sup>71</sup>

Though softened by time and her gentle spirit, Dora’s account was one of a hard life, lived by proud people in strange land, a place different from anywhere else in the Appalachians. She could see trees on the rim of the surrounding mountains, but nearby, on a barren hill across the creek from her home, was a more arresting sight:

---

<sup>70</sup> Dora T. Galloway, *Little Girl in Appalachia* (Newport, KY: n.p., 1964), 5-10.

<sup>71</sup> Ibid.

On the opposite hill...stood a living monument of the past...the oak tree. It was tall and straight. The trunk was too large for a boy to climb, and the lower branches too high for them to reach. Despite its badly exposed roots, in due season year after year, it put forth those beautiful green leaves. To my knowledge, this is the only tree within the entire Ducktown Basin to survive the onslaught of the copper industry, and its acorns never took root where they fell.

The memory of that tree remained with her always, a part of the mental map of her thirty years in the Basin. At the far end of her life, while living in the much different environs of Lexington, Kentucky, she sketched a map to fix those memories for her granddaughter. The oak tree appears prominently in the center, in a larger scale than any other feature, as is fitting for the only tree in the only desert east of the Mississippi.<sup>72</sup>

---

<sup>72</sup> Ibid., 11, the sketch map appears as the frontispiece. Another Ducktown resident said there were two trees near Isabella, see Smallshaw, "Denudation and Erosion," 5. Either way, the celebration of a specific tree or pair of trees is remarkable in a once densely wooded land.

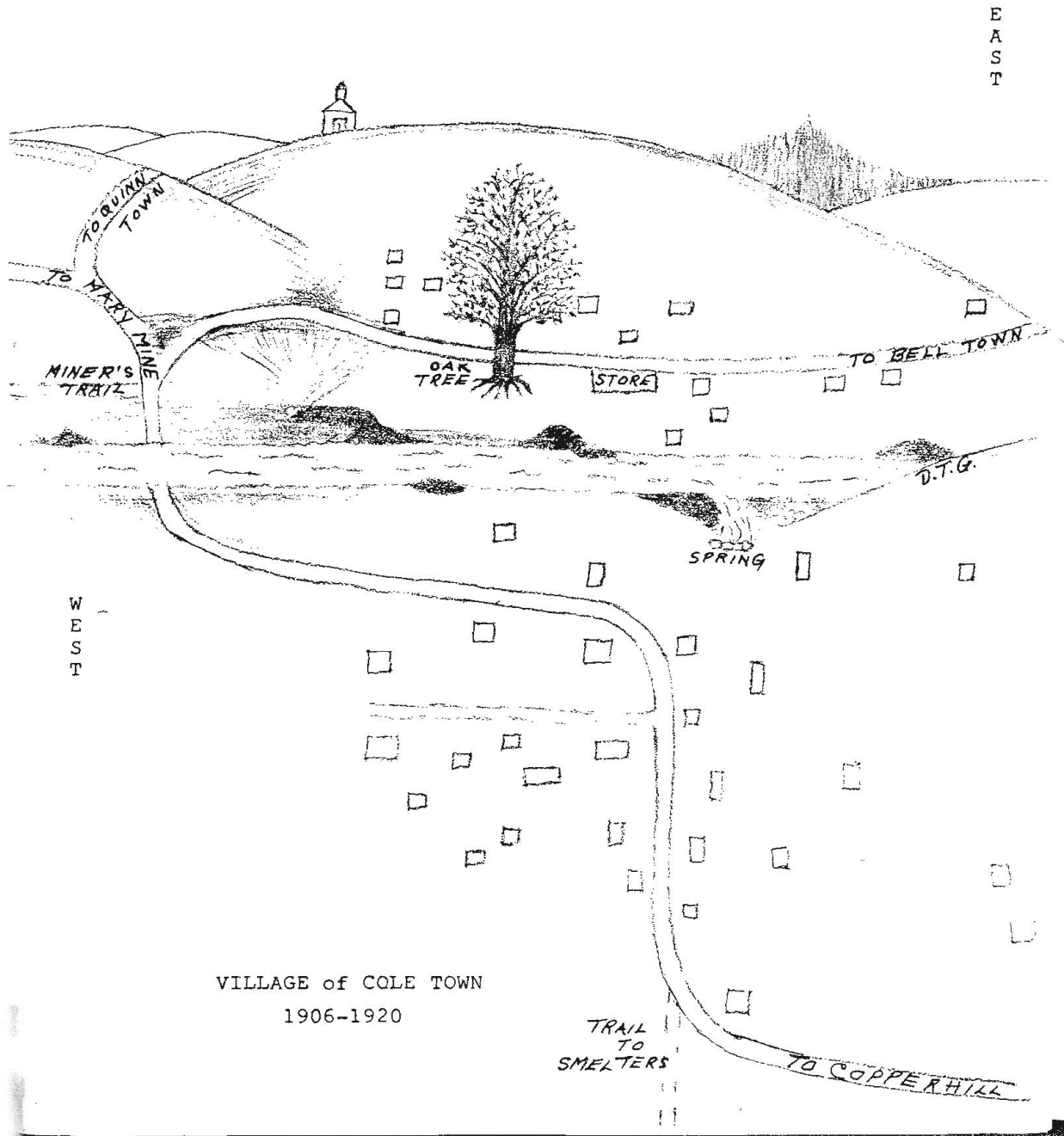


Figure 2. Sketch of a mining village in the Ducktown Basin. The sketch, by Dora T. Galloway, depicts the home of her youth in Cole Town, near the Tennessee Copper Company's Mary Mine. The oak tree at top center illustrates what she called "the only tree in Ducktown." Source: Dora T. Galloway, *Little Girl in Ducktown*, 1964.



Figure 3. An aerial photograph of the Ducktown Desert. Courtesy of the Tennessee Valley Authority.



Figure 4. Another aerial photograph of the Ducktown Desert. Note the streams clogged by silt washed from the hills. Courtesy of the Tennessee Valley Authority.

## CHAPTER 6

### “A WIRY, UNTIRING, AND RESOURCEFUL CHAP”: WILL SHIPPEN, FORESTERS, AND GEORGIA’S SECOND SMOKE SUIT

Ducktown farmers returned to their fields in the spring of 1904 as warmer weather and lengthening days loosened the grip of another mountain winter. They were by nature a hopeful group of men and women and were willing, as true of all farmers, to pit their labors against the natural vagaries of drought and killing frosts. But year after year they plowed their fields, sowed their crops, and pruned their orchards only to see their work thwarted by man-made clouds of toxic smelter smoke. Maybe this year would be different—if there was anything to the settlement reached the previous February between the state of Georgia, the Tennessee Copper Company, and the Ducktown Sulphur, Copper & Iron Company.

Attorney General John C. Hart negotiated the agreement in the belief that adoption of the newly invented pyritic method for smelting sulfide copper ore would end the damage to vegetation caused by the old method of open heap roasting. Events proved otherwise. Smelter smoke generated by the new method was just as thick and toxic to budding fruit and early ears of corn as in other years. And now the use of blast furnaces and smokestacks spread the fumes farther to bedevil more and more farms.

Gases vented from the furnaces entered the atmosphere through smokestacks at high temperature and under great pressure compared to the lazy clouds that rose from the old roast heaps. The smoke was bad in 1904, a year of transition in which the Ducktown company fully employed pyritic smelting (it ended roasting in August, 1902) while the Tennessee firm was completing the changeover to the new method (it ended open heap roasting in August, 1904). It

worsened in 1905. Though both companies smelted all of their ore by the new process, they were smelting greater amounts of it than before. Conditions deteriorated still further in 1906 after completion of a TCC's giant 325 foot smokestack at Copperhill. Farmer A. B. Dickey spoke for his neighbors when he complained, "the smoke we have now is a great deal worse than the smoke was from the roast heaps." At the height of the growing season, "there come up a smoke over on the 18<sup>th</sup> of July...it just bit everything we have growing on the farm and from all appearances the timber is just about finished."<sup>1</sup>

A sheaf of similar complaints reached the desk of Attorney General Hart in Atlanta, and he knew that legislators from the mountain counties were receiving more of the same. The recent settlement was beginning to shrivel and curl like the smoke-burnt leaves of Ducktown apple orchards. Hart wrote TCC's lawyers on August 4, 1904, saying, "I feel much concerned about this on account of the sufferers in Georgia as well as the disappointment which your own people must feel if the new process has proved a failure." It went deeper than that. He had pushed for the settlement, and as an elected official, he felt politically exposed to complaints from angry voters. It was only a matter of time before voters goaded the General Assembly to force renewal of the state's United States Supreme Court case. With that pressure in mind, Hart continued, "this is personal...I am writing confidentially to ask of you to investigate and see if the injury is the result of failure in the new process or of negligence in its use."<sup>2</sup>

Hart needed allies if, as likely, the settlement collapsed and another round of Supreme Court smoke litigation ensued. He found those allies in an unexpected letter from Asheville, North Carolina, written on stationery bearing the letterhead, "United States Department of Agriculture, Bureau of Forestry." Harold Day Foster, a Bureau forester, advised that while

---

<sup>1</sup> A. B. Dickey to James G. Parks, 7 August 1905, DBM.

<sup>2</sup> John C. Hart to Cornick, Wright & Frantz, 22 August 1904, DBM.

studying the timber industry in the southern Appalachians, he met with W. H. (Will) Shippen, a prominent timber man from Gilmer County, Georgia. Shippen spoke about smoke damage in the Ducktown area and urged Foster to make an investigation and also to contact the attorney general. Foster did both. He made what he called “a hasty survey” and then wrote Hart to volunteer his services. “Of course it is out of my province to enter into the legal side of the case, but in such a study as mine, it is not out of order to note and report on the effect of any agency destructive to forest growth in the region.” Hart grasped at the offer, explaining that, “I should be very much pleased to have a report by a competent and disinterested person.” And to emphasize the point, he added, “It is part of your duty to do that.”<sup>3</sup>

The initiative by Foster and Shippen to Hart marked the remarkable convergence of copper mining, industrial logging, and forest conservation in turn-of-the-century Ducktown. The Shippens were part of a wave of highly capitalized timber operations that penetrated the Southern Appalachians in the 1890s. Foster was a member of one of the federal teams sent to assess the health of southern mountain forests and to evaluate the related problems of deforestation and erosion so dramatically demonstrated by the creation of the Ducktown Desert.

As they worked in the mountains surrounding the Basin, loggers and foresters found common cause in their belief that sulfur smoke threatened an important natural resource. The Shippens and their competitors filed lawsuits against the two great copper companies for damage to their timber holdings. Their entry into the smoke litigation added economic and political power to a struggle that had been borne for a decade by mountain farmers at unequal odds. For their part, scientists from the Bureau of Forestry and related agencies provided badly needed intellectual footing to a cause that had so far rested more upon the anecdotes of smoked-out

---

<sup>3</sup> Harold Day Foster to John C. Hart, 1 October 1904; John C. Hart to Harold Day Foster, 5 October 1904, both from GDAH RG 9-1-1, Box 1, Folder 10.

highlanders than upon empirical and experimental science. Together, loggers and foresters shaped the course of Georgia's return to the Supreme Court.

\*\*\*

Will and Frank Shippen were born and bred to the timber industry, but their ancestors moved in the highest circles of Philadelphia society from early colonial times. Their forbearers included prominent merchants, physicians, judges, and politicians. During the Revolution, one served in the Continental Congress; another was chief physician in Washington's army. There was also a notorious black sheep, Peggy Shippen, who married Benedict Arnold and followed him to England when he turned traitor. Will and Frank's branch of the family eventually moved to western Pennsylvania to pursue logging in the Alleghany Mountains. The brothers cut four hundred million feet of timber there; and when that was gone, they moved to Kentucky to operate sawmills and a retail lumber business. The retail trade did not suit the brothers, so they surveyed timber across the continent—from the Deep South to the Pacific Northwest and from Canada to Mexico—to determine where to resume commercial logging.<sup>4</sup>

They found, as did other commercial loggers, that the Southern Appalachians presented attractive opportunities. The mountains contained extensive stands of mixed species suitable for a variety of uses. Carl Alwin Schenck, a German forester who would play a major role in Ducktown timber litigation, described those uses in his 1912 technical manual, *Logging and Lumbering or Forest Utilization: A Textbook for Forest Schools*. Magnificent yellow poplars (also known as tulip poplars) grew like columns with long straight trunks that often rose a

---

<sup>4</sup> Randolph Shipley Klein, *Portrait of an Early American Family: The Shippens of Pennsylvania Across Five Generations* (Philadelphia: University of Pennsylvania Press, 1975); Deposition of Will H. Shippen, 20 August 1914, 317-346, Deposition of Frank Shippen, 21 August 1914, 393-429, both in Transcript of Evidence, vol. 1, Georgia v. Tennessee Copper Co., No. 1 Original, October Term 1914, (herein Transcript (1914)). Will Shippen recounted his career in timber in "Mr. W. H. Shippen Will Maintain His Long Residence in Gilmer," *Ellijay Times-Courier*, 6 January 1939, 1.

hundred feet before branching out. The largest specimens were almost two hundred feet high and a dozen feet in diameter. Its smooth-grained wood took paint well and was easily shaped by wood-working machines. It found use for the sides of railroad cars and wagons, moldings for doors and windows, furniture panels, and boxes. The strength of red and white oaks made them useful for wheels and chassis in wagons, mine timbers, hardwood flooring, and barrels.<sup>5</sup>

Bark from the chestnut tree provided tannin for curing leather, and its durable wood was excellent for outdoor use as fences and railroad ties. Eastern white pine was another forest giant that often exceeded one-hundred fifty feet and occasionally topped two-hundred. It was treasured for masts during the era of wooden ships. Commercial loggers put it to less romantic uses as construction lumber, building siding, box parts, and as excelsior shavings to cushion freight in the days before Styrofoam packing peanuts. Highly-figured woods such as walnut, cherry, maple, and red oak supplied the needs of the South's furniture and paneling industries.<sup>6</sup>

The letterhead of the Shippen Bros. Lumber Co. listed several species as featured products. The firm dealt in poplar, white pine, and oak, and listed specialties in "oak flooring, yellow poplar bevel siding and moldings." There was also the curious phrase, "box shooks," on the letterhead. Shooks were pre-cut parts for wooden boxes and crates, sold in disassembled sets to shippers. The corrugated cardboard box, invented by Robert Gair in 1890, did not come into widespread use until well into the twentieth century when developments in the pulpwood industry made it economically attractive. Before then, the nation's goods moved in wooden boxes, crates, and barrels. Demand for wooden containers was so great that the box and container industry was the second greatest use of American lumber until World War II. As long as that

---

<sup>5</sup> C. A. Schenck, *Logging and Lumbering, or, Forest Utilization: A Textbook for Forest Schools* (Darnstadt, Germany: L. C. Wittich, 1912), 97-110.

<sup>6</sup> Ibid.

demand remained, lumbermen hewed the giant white pines and tulip poplars of the southern mountains into box slats to move everything from canned goods and shoes to farm equipment and pianos.<sup>7</sup>

Abundant timber was one draw to the Southern Appalachians. The low price of Georgia mountain forestland was another. The brothers arrived in 1895 with cash in their pockets at a time when the South struggled through bad economic times in the wake of the Panic of 1893. They were also in the vanguard of the logging industry's assault on the mountains, when bargains were especially good. These factors allowed them to buy their first tract of 40,000 acres in fee simple, plus timber rights for another 20,000 acres, with a sawmill included, for a total of only \$65,000, or roughly a dollar per acre. Land prices increased with demand and the return of better times. The brothers paid \$4.00 per acre for a 30,000 acre tract in 1905. Even then, the purchase price was but a fraction of its real value. Frank Shippen testified in 1914 that their 1905 purchase nearly quadrupled in value in less than a decade. Overall, the Shippens acquired 128,000 acres of timber in North Georgia, roughly two-thirds in fee simple and the remainder as timber rights.<sup>8</sup>

Logging was a part of mountain life all the way back to Cherokee times as Indian farmers and then white settlers cleared the bottom lands and lower slopes for their farms. Iron and copper miners consumed vast areas of timber in the form of charcoal to fuel smelters. Fifty square miles of Ducktown forest ended up as charcoal for the copper industry before the new railroad began to haul cheap coal to the mines in 1890. Yet despite the demands of farms and local industry, the

---

<sup>7</sup> For their letterhead, see Will H. Shippen to Governor Jos. M. Brown, 9 April 1912 (DBM); Mary Elizabeth Johnson, "Box and Container Industry," in Richard C. Davis, ed., *Encyclopedia of American Forest and Conservation History*, vol. 1 (New York: Macmillan, 1983), 45-47.

<sup>8</sup> Deposition of Frank Shippen, Transcript (1914), 411

formidable upper slopes resisted wide-scale logging until expensive steam technology made it possible toward the end of the nineteenth century.

Any strong person with a good axe and a crosscut saw could cut down a tree. The challenge was getting the log down out of the mountains to the mill, sawing it into marketable products, and then transporting the sawn timber to distant markets. Schenck's manual showed how it was done, with great attention to engineering principles and unit costs. Livestock, gravity and water provided much of the necessary force. Yokes of oxen dragged logs in some places. On steeper slopes, gravity sent timber down chutes and flumes. Horses pulled logs down greased slides in others, a maneuver that took nimble timing and sure-footedness by horse and horseman lest runaway logs dragged both to their deaths. A small tumbling mountain stream could be made to carry big logs with the use of a temporary splash dam. The dam held water back until deliberately breached with dynamite to allow the resulting flood to carry logs pell-mell down the mountain. The resulting destruction to streambeds was rarely a concern to loggers.<sup>9</sup>

Though gravity, water, and the hard labor of man and beast did the work of logging since colonial times, it was the later arrival of steam power that made industrial-scale logging a post Civil War phenomena in the mountains. Specially designed locomotives, such as the Shay and Climax engines, used geared drive wheels to climb slopes too steep and curving for ordinary engines. The larger operators laid arrays of narrow gauge track up every cove and hollow within a watershed to bring logs down to the mills. Steam-powered derricks lifted huge logs onto rail cars. Steam-powered sawmills and wood-shaping machinery hastened timber processing. Overall, steam power greatly increased the economies of scale in every aspect of logging except

---

<sup>9</sup> Schenck, *Logging and Lumbering*, 17-34.

for the initial felling of the trees—that would await the invention of a practical gasoline chain saw after World War I.<sup>10</sup>

Steam also carried processed lumber to market. The Shippens and their nearby competitors enjoyed the advantage of two major railroads that ran on either side of the mountains of Fannin, Gilmer, and Polk counties. On the west side, the Louisville & Nashville ran up the Tennessee Valley from Chattanooga to Knoxville and points north. On the east, the Atlanta, Knoxville & Northern Railroad (formerly the Marietta and North Georgia Railroad) ascended up and over the Blue Ridge via the Ellijay Valley. Built to serve the Ducktown copper mines, it also made practical the shipment of mountain timber to Atlanta and other cities. The line's promoters pointed to timber as one of the many resources it would carry, saying “as for hardwood timber, there is no end to it all along the line, including almost every variety” and “the best white oak in the world.” The Shippens had a practical measure for the importance of rail transport: timberland increased in value in proportion to its proximity to the track.<sup>11</sup>

Land, labor, livestock, locomotives, and logging equipment of all kinds required a large capital outlay that made industrial logging a venture for the wealthy or well-capitalized. Schenck computed with almost numbing detail. At a time when workmen were often paid a dollar a day, a six-and-a-half foot long crosscut saw cost \$2.25 and axe heads cost \$8 per dozen. Costs rose rapidly after that. A proper splash dam might cost from \$1,000 up to \$3,000; a geared locomotive went from \$2,500 to \$10,000 depending upon size, not including the cost of purchasing and laying track. A well-equipped industrial sawmill cost even more. The Shippens

---

<sup>10</sup> Ibid., 61-88, 111-126. For industrial logging circa 1920 on the Basin's southwestern rim, see Daniel M. Roper, “Logging the Cohutta Wilderness,” *Georgia Backroads* 1, no. 1 (Spring, 2002): 6-18.

<sup>11</sup> “A Great Country, Which is Growing Greater Every Day,” *Atlanta Constitution*, 8 July 1888, 14; Deposition of Frank Shippen, Transcript (1914), 411.

spent \$60,000 to build a new one after the original mill burned down. They eventually had six sawmills in operation.<sup>12</sup>

The high costs of commercial logging made the major timber operators quick to perceive smoke damage from the Ducktown copper smelters as a major threat to their operations. Their motivations differed from the first wave of smoke suitors. Most of the first wave litigants were small-scale mountain farmers who saw themselves as fighting to preserve their livelihoods, their quality of life, and their ability to remain on the farm. The timber barons, many of whom lived hundreds of miles away from Ducktown, sued to protect capital investment and profits. Their smoke suits began around 1902, about seven years after the first of the claims from local farmers. Some filed in the Polk County courts where their suits added to the already lengthy docket of farmer-initiated claims. Others filed in the federal circuit court in Chattanooga, where the dockets were shorter. Unlike most farmers, they could afford the added costs of suit in a distant venue.<sup>13</sup>

The local timber plaintiffs included George Peabody Wetmore, Paul E. Stephenson, Rosine Parmentier, J. P. Vestal Lumber Company, Shippen Brothers, and the Ocoee Timber Company. Some were absentee owners who delegated operations and litigation to their managers and attorneys. George Peabody Wetmore was a New England blueblood educated at Yale and Columbia. He served two terms as Rhode Island's governor and was in the United States Senate during the smoke suits. Rosine Parmentier was a society figure in Brooklyn, New York. Before the Civil War, she bought fifty thousand acres along Sylco Creek in the Ocoee Gorge to create an experimental colony for European immigrants. She called it Vineland in the hope that her wine-

---

<sup>12</sup> The figures are found throughout Schenck, *Logging and Lumbering*; Deposition of Frank Shippen, Transcript (1914), 411.

<sup>13</sup> For removal of timber suits to federal court see, Charles Seymour to James G. Parks, 2 September 1902; James G. Parks to Howard Cornick, 1 April 1904, both DBM; Deposition of J. P. Vestal, Transcript (1914), 161-186.

drinking colonists would establish profitable viticulture in a region better known for corn liquor. As Jack Daniels and George Dickel later proved, bourbon whiskey trumped Beaujolais wine as the spirit of choice for Tennesseans. Ms. Parmentier returned to New York when the colony failed but retained most of the land for the remainder of her long life. At the end of the century, she divided her interests between her Tennessee forests and an array of New York Catholic charities.<sup>14</sup>

The Shippen brothers differed from Wetmore, Parmentier, and their ilk by living and working amidst their mountain timber holdings in the mountains of Gilmer County, Georgia. Their homes and their largest lumber mill were in the county seat of Ellijay, then a small town of less than a thousand souls. Though they were outsiders from Pennsylvania, the brothers came to know most of the local citizens by virtue of being the largest employer in the county. As hands-on owners of a large timber company, Will and Frank demonstrated the adaptability needed to function comfortably and effectively in radically different settings, from a mountaineer's cabin to the governor's office.<sup>15</sup>

Andrew Gennett, a contemporary and rival of the Shippens, explained how this was done in his lively memoir, *Sound Wormy* (the title refers to a grade of chestnut timber). Gennett grew up in Nashville, Tennessee, and by turns eventually developed a major timber company in western North Carolina. He often stayed in mountain cabins and ate meals of corn bread and

---

<sup>14</sup> For Wetmore, see Marquis Who's Who on the Web, q.v. George Peabody Wetmore, (accessed 10 September 2007); "Wetmore Estate Valued at \$4,809,054," *New York Times*, 22 September 1922, 12. For Parmentier, see Ben H. McCrary and LeRoy P. Graf, eds. "Vineland in Tennessee, 1852: The Journal of Rosine Parmentier," *East Tennessee Historical Society Publications* 31 (1959): 95-111; Susan Hill Landis, *You Have Stept Out of Place: A History of Women and Religion in America* (Louisville, Ky: Westminster John Knox Press, 1996), 200. For local timber companies, see Roy G. Lillard, *History of Polk County, Tennessee* (Benton, Tenn.: Polk County Historical and Genealogical Society, 1999), 147-150.

<sup>15</sup> George Gordon Ward, *The Annals of Upper Georgia, Centered in Gilmer County* (Carrollton, Ga.: Thomasson Print & Office Equipment Co., 1965), 382, 393.

pork when cruising timber. He lived and worked among rough men in the logging camps. Yet the scale of his business required frequent travel to New York and other commercial cities where he enjoyed fine dining and elegant hotels while negotiating with bankers and industrialists. He was a risk taker who invested heavily in a cut-throat commodity business closely tied to the rise and fall of the nation's business cycles. He litigated constantly over land titles and broken contracts. (Gennett recounted with amusement about how he bested the Shippens in two Georgia title suits.) He was used to wielding influence and had no hesitation about meeting in Washington with the Secretary of Agriculture if it served his business interests.<sup>16</sup>

If Will Shippen had left a memoir, he could have matched Andrew Gennett story for story. As it happened, Shippen employed the wide-ranging social and political skills of the hands-on timber baron through his constant activity in the Ducktown smoke litigation. A man of influence in his own right, he pressed political levers to gain appointment to the 1905 legislative commission charged to investigate Ducktown smoke damage. He then maintained a steady correspondence with the many governors and attorneys general holding office during the long history of the case. He used his familiarity with mountaineers (strengthened by his standing as their frequent employer) to organize their opposition to the copper companies. Whenever the two companies had their workers and local merchants sign petitions against a smoke injunction, Shippen rallied the farmers and loggers in Ellijay and Blue Ridge to sign a pro-injunction petition drafted by his own hand. James G. Parks wrote his fellow copper lawyer, Howard Cornick, about one of those petitions: "It reads to me very like one of Mr. Shippen's lurid literary productions. If it is, it must be plain that he is trying to force us to a settlement by

---

<sup>16</sup> Andrew Gennett, *Sound Wormy, Memoir of Andrew Gennett, Lumberman*, ed. Nicole Hayler (Athens: University of Georgia Press, 2002).

bringing legislative and official pressure to bear.” Parks continued by describing Shippen as “a wiry, untiring, and resourceful chap.”<sup>17</sup>

The timber man made no secret why he was so untiring: he had a huge financial stake in Ducktown smoke litigation. The state sought injunctive relief, not damages, so a Georgia victory would not directly result in payment to the Shippens and other claimants. Yet evidence proffered in the state’s case could prove useful in their own case against the copper companies, and the ongoing threat of a Supreme Court injunction forced TCC and DSC&I to take the claims of the timber barons more seriously. The converse was also true. A defeat in the Georgia case would weaken all the suits for damages. Shippen made this point in a blunt 1913 letter to Warren Grice, one of Hart’s successors. The logger offered his assistance in procuring favorable witnesses and then pressed for action by stating, “my corporation is vitally interested in the outcome of the state’s suit, since our case against the D.S.C. & I Company either succeeds or fails with yours.”<sup>18</sup>

The Ducktown company’s general manager, W. H. Freeland, wrote of another, more cynical, reason behind their opponent’s ardor for a smoke injunction: “one of the Shippens is said to have remarked that if we are shut down, they would get labor for fifty cents per day” from among the throng of unemployed miners. Freeland sought an end to Will’s multi-faceted role as litigant, ringleader, rural agitator, and political gadfly. Reasoning that peace could be had for a price, he instructed Parks to offer a \$10,000 settlement on terms that “will make it impossible for him at any future time to annoy us in any way.” Shippen could be enticed to settle, but not at that price. His firm eventually settled with the Tennessee Copper Company in 1908 for \$50,000 (and in reality for a great deal more paid directly to the brothers as would be revealed later). The

---

<sup>17</sup> James G. Parks to Howard Cornick, 11 July 1907, DBM.

<sup>18</sup> Will H. Shippen to Warren A. Grice, 29 October 29 1914, DBM.

refusal of DSC&I to make a commensurate offer meant that Will Shippen would remain a “wiry, untiring, and resourceful” opponent of the company—and ally of Georgia’s attorneys general for the remainder of the litigation.<sup>19</sup>

\*\*\*

The January 28, 1905 issue of the *Atlanta Constitution*, like other newspapers of the day, often assembled short unrelated articles in a grab-bag column, such as what appeared on page six under the headline “Condemned to Gallows Hilburn Seeks Liberty—Interesting Appeal Made to Prison Commission—State Chemist Makes Report—Judge Hart’s Narrow Escape—State Capitol Gossip.” The first item concerned an African-American man tried and condemned for the murder of a white man. Though the reporter did not find the conviction surprising, he was struck by the condemned’s apparent effrontery in seeking a full pardon instead of commutation to a life sentence. “As a usual thing a murderer condemned to the gallows asks no more of the prison commission and the governor than a commutation...and they generally feel the luckiest in the world if they get that.” Then, with only a sub-head for a transition, the column jumped to an announcement from the State Chemist that his office tested an unprecedented amount of fertilizer the previous year. The next two items involved Attorney General Hart, one personally and the other in relation to the Ducktown case.<sup>20</sup>

The first of the Hart paragraphs described his narrow escape from death in the wreck of the No. 39 train outside of Danville, Virginia. The Judge was on the return trip to Atlanta after arguing a business tax case before the Supreme Court in Washington. It was early in the morning, and insomnia kept him awake in his sleeping berth. He tossed and turned, ending up

---

<sup>19</sup> W. H. Freeland to James G. Parks, 13 November 1905 (unemployed miners); W. H. Freeland to James G. Parks, 9 February 1913 (settlement offer), both DBM. For the TCC settlement, see Will Shippen Deposition, Transcript (1914), 329-335, 512-555.

<sup>20</sup> “Condemned Man to Gallows, Hilburn Seeks Liberty,” *Atlanta Constitution*, 28 January 1905, 6.

with his feet pointing towards the engine. That is what saved him when his train collided head-on with another: his feet and legs absorbed the blow against the forward wall of his berth instead of his skull and neck.<sup>21</sup>

Railroad travelers at the time endured a level of risk that would be intolerable for the modern commercial air traveler. And Danville was acquiring a special notoriety because of a wreck that happened there a year-and-a-half earlier when the No. 97 train jumped the tracks while trying to make up for lost time on a mail run. The incident inspired a famous train ballad, “The Wreck of the Old 97,” with verses such as,

It’s a mighty rough road from Lynchburg to Danville,  
And the lie was a three-mile grade,  
It was on that grade that he lost his air brakes,  
And you see what a jump that she made.

The song, the first American record to sell a million copies, became a country and bluegrass standard recorded by Woody Guthrie, Johnny Cash, and the duo, Flatt and Scruggs. Hart’s train wreck was not memorialized with a ballad, so his claim to fame would have to rest on his achievements as attorney general. Instead, the wreck of his No. 39 train and that of the Old 97 gave him reason to dread the many future train trips to Washington when the Ducktown case made its inevitable return to the Supreme Court.<sup>22</sup>

It was news of that case that led to the fourth item in the grab-bag column: “To Investigate Ducktown.” The segment noted that Attorney General Hart had received conflicting reports about smoke damage, and that he wrote the Bureau of Forestry “asking that an expert be

---

<sup>21</sup> Ibid.

<sup>22</sup> For the lyrics and background of the ballad, see Blue Ridge Institute & Museum, “The Wreck of the Old 97,” <http://www.blueridgeinstitute.org/ballads/old97.html> and <http://www.blueridgeinstitute.org/ballads/old97song.html> (accessed August 11, 2007).

sent...to investigate and report just what damage, if any, is being done.” The attorney general specifically requested a “forestry expert” to report on the matter. The news paragraph, three notches below the murder story and two below the state chemist’s report on fertilizer, made official Hart’s intention to link forestry science to his case about Ducktown smoke damage. It was a humble announcement to what would prove a major, even controlling, theme of case. And to the few who knew the background story, it reflected the initiative of Will Shippen and Harold Day Foster.<sup>23</sup>

The Bureau of Forestry (renamed the U. S. Forest Service in 1905) honored Hart’s request by sending Alfred Chittenden, Assistant Forest Inspector. The inspector’s report, prepared after the transition to pyritic smelting, sounded the theme that “areas that have hitherto remained untouched are now being damaged by the fumes” spread over a much wider area by tall chimneys. “The sulfur fumes can be plainly smelt at a distance of over fifteen miles if the wind is in the right direction.” Abnormally high tree death was observed twenty miles from the smelters, and “timberland owners within thirty miles are deeply concerned.”<sup>24</sup>

Chittenden noted that extent of tree death from sulfur fumes varied by species and by their preferred habitats. Conifers (white pine, yellow pine, and hemlock) suffered because their foliage remained year-round to absorb the fumes. The great height of the white pine made it vulnerable because “extending above the tops of other trees, it is more exposed.” Yellow poplar was the most resistant, though whether this was because of inherent resistance or because of its

---

<sup>23</sup> “Condemned Man to Gallows, Hilburn Seeks Liberty.”

<sup>24</sup> Alfred K. Chittenden, “Report on a Preliminary Examination of the Effects of the Ducktown Sulphur Fumes on the Forests of Polk County, Tennessee,” attached as Ex. F. to Original Bill of Complaint, 29-35, *Georgia v. Tennessee Copper Co.*, U. S. Supreme Court, No. 13 Original, October Term 1905. The forestry unit of the U. S. Department of Agriculture experienced three name changes, beginning as the Division of Forestry in 1881 when Franklin Benjamin Hough’s forestry office, opened in 1876, gained congressional recognition as a distinct government unit. Renamed the Bureau of Forestry in 1901, it became the U. S. Forest Service in 1905. The latter two names straddle the time span of Georgia’s smoke suit and will be used interchangeably.

preferred environment within sheltering coves, he could not determine. Of the hardwoods, hickory and chestnut oak fared worst because they grew on the upper slopes and ridges most exposed to smoke-bearing winds.<sup>25</sup>

Apart from variations of species and habitat, Chittenden judged “from the absolute lack of vegetation in the immediate vicinity of Ducktown, that no species of forest tree can resist the smoke of long or constantly exposed to the full fumes.” Even when dispersed over the distance of twenty miles, with long exposure to the fumes, “destruction of forest growth seems certain.” And on the salient question of whether pyritic smelting improved or worsened conditions, the scientist bluntly stated, “The old method of open roast heaps has already destroyed all vegetation in the immediate neighborhood; the new method will extend the damage.”<sup>26</sup>

Chittenden’s report answered Attorney General Hart’s question, but not without evidence of the increasingly heavy hand of Will Shippen. Toward the end of his report the scientist included an extensive quotation from a December 22, 1904 letter by Shippen: “The situation...is appalling in the extreme, and certainly merits the action of both Federal and State aid in its suppression.” The logger asserted that “the present process is far more destructive than the old one ever was,” so much so, that “I have known whole districts here to be blighted in a single night.” Shippen was not alone. The report also mentioned overtures to the Bureau by Charles Seymour, attorney for Wetmore, Stevenson, and the Oconee Timber Company in their smoke suits.<sup>27</sup>

---

<sup>25</sup> Ibid., 31-34.

<sup>26</sup> Ibid., 32, 34.

<sup>27</sup> Ibid., 34-35.

\*\*\*

The overt influence of local timber barons in the Chittenden report worked against the air of impartiality desired by Hart. That would have been a problem if it was a the only report bearing on Ducktown woodlands. It was not. The study was but a small part of a much larger body of research conducted by the federal government on threats to the forests of the Southern Appalachian Mountains. And in turn, the studies in the southern mountains reflected the burgeoning growth of forest conservation policy at state and national levels. The American forest conservation movement preceded Georgia's smoke suit, reached its formative peak during the litigation, and ultimately provided the winning rationale for the case.

Though the antecedents of conservation extend back to the nation's colonial past, it coalesced as an organized movement after the Civil War as shrinking forests led to fears of an impending timber famine. Timber resources declined rapidly throughout the nineteenth century under the impact of agriculture and logging. Farmers cleared over 150 million acres from the eastern forests for cropland and pasture before 1860. Loggers fed the country's insatiable demand for wood products. Demand grew each year so that by 1909, the industry produced 44.5 billion board feet of sawn lumber and processed vast numbers of other trees for use as utility poles and railroad ties. Carl Schurz, a former Secretary of the Interior, warned in 1889, "If the present destruction of forests goes on for twenty-five years longer, the United States will be as completely stripped of their forests as Asia Minor is today." At the 1908 White House Conference of Governors, Theodore Roosevelt urged, "We are over the verge of a timber famine in this country" and insisted that "it is unpardonable for the Nation or the States to permit any

further cutting of our timber save in accordance with a system which will provide that the next generation shall see the timber increased instead of diminished.”<sup>28</sup>

Impending timber famine was one only one of the concerns behind the forest conservation movement. Forest fire was a major consequence of poor logging practices. In 1871, the Peshtigo fire in Wisconsin destroyed 1.5 million acres and killed over 1,200 people. The 1881 Thumb fire in Michigan torched a million acres and killed 300. Many made the link between shrinking forests and the decline of fish and game. Some farmers linked the problem to reduced soil fertility. Others said feared a negative impact upon public health on the theory that forests somehow purified the miasmatic vapors still commonly blamed for disease before the advent of germ theory. Soaring above these specific concerns was the argument made by George Perkins Marsh in *Man and Nature* (1864), that deforestation led to floods, drought, infertility, and climate change. The doctrines of Marsh, which Georgia entomologist, Wilmon Newell, followed so closely in his 1903 report to Governor Terrell, provided the conceptual argument for conservation that combined readily with the statistical argument about timber famine.<sup>29</sup>

In response to the many threats, the American Association for the Advancement of Science (AAAS), the newly formed American Forestry Association, lumbermen, bureaucrats, sportsmen, and nature lovers all urged federal protection of woodlands, though to somewhat inconsistent ends. Some, such as John Muir, Cornelius Hedges, and George Bird Grinnell, sought

---

<sup>28</sup> For the statistics, see Michael Williams, *Americans and Their Forests: A Historical Geography* (New York: Cambridge University Press, 1989), 118-20 (farm clearing); Thomas Cox and others, *This Well-Wooded Land: Americans and their Forests from Colonial Times* (Lincoln: University of Nebraska, 1985), 111-12 (lumber production). The timber famine quotations appear in Henry Clepper, *Professional Forestry in the United States* (Baltimore: Johns Hopkins, 1971), 135-136. See also, Donald J. Pisani, “Forests and Conservation, 1865-1890,” *Journal of American History* 72, no. 2 (September 1985): 340-359 (for discussion of the timber famine as impetus of the forest conservation movement).

<sup>29</sup> These factors are surveyed in Donald J. Pisani, “Forests and Conservation, 1865-1890” 344-355. The challenge to Marsh’s stream-flow theories will be considered later in this chapter.

preservation of forests in areas of spectacular natural beauty for their aesthetic value, and as places where urban dwellers could restore their jangled psyches. Their efforts led to the creation of Yellowstone, Yosemite, Glacier, and other components of the National Park Service. Gifford Pinchot and many others wanted government-managed forests to provide for a sustainable timber harvest and to protect mountain watersheds. Their efforts culminated in the creation of a system of national forests administered by what became the U.S. Forest Service. It is the latter agency that bears upon the story of Ducktown smoke.<sup>30</sup>

The Forest Service originated with the appointment of Franklin B. Hough as the first federal forestry agent in 1876, after a speech he made to the AAAS on “The Duty of Governments in the Preservation of Forests.” A gifted statistician and researcher, Hough established the empirical basis for government forestry in his multi-volume *Report on Forestry* (1878-1884). His work culminated in the formal creation of the Division of Forestry in 1881. Hough served as its first chief, and was succeeded by Bernhard Eduard Fernow, a native of Germany, a graduate of its forestry schools, and the first professionally trained forester in America. Fernow assumed office in 1886 and from that post campaigned for passage of the 1891 Forest Reserve Act and the 1897 Forest Management Act (Organic Act). The 1891 law authorized creation of forest reserves (later renamed national forests in 1907) from federal lands

---

<sup>30</sup> The framework of the paragraph is drawn from Williams, *Americans and Their Forests*, chap. 12 “Preservation and Management, 1870-1910,” 393-424. The literature on American forests is extensive. Representative works in addition to those already cited, include Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920* (Cambridge: Harvard University Press, 1959) (presenting forest conservation as an exemplar of progressive ideology and method); Roderick Nash, *Wilderness and the American Mind*, 4<sup>th</sup> ed. (New Haven: Yale University Press, 2001), 122-81 (comparing John Muir’s wilderness preservation to Gifford Pinchot’s sustainable use); Chris Bolgiano, *The Appalachian Forest* (Mechanicsburg, PA: Stackpole Books, 1995 (a regional and social perspective).

in the West. The 1897 law mandated use of the reserves “for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber.”<sup>31</sup>

Gifford Pinchot, became Fernow’s successor in 1898. Pinchot, a New Englander born to wealth, went to college at Yale and then trained at the French school of forestry in Nancy. He began his career by serving as forester on Vanderbilt’s Biltmore Estate where he conducted the first systematic program of forest management in America. The experience gave him extensive first-hand knowledge of the much-abused woodlands of the Southern Appalachian Mountains. That knowledge served him well as his Bureau of Forestry furthered the cause of creating federal forest reserves in the East.<sup>32</sup> Creation of federal forests reserves in the West was easy from a legal perspective. The federal government, as owner of the vast public domain in that half of the country, simply set aside certain forest tracts to prevent their disposition to private owners. In the East, almost all forest land belonged to private owners, with the exception of the New York State Forest Reserve created in 1885 from state and private land in the Adirondacks. A forest reserve from private lands required compensation to the owners, in keeping with the prohibition in Fifth Amendment prohibition against the taking of private property for public use without just compensation. This in turn required enabling legislation and appropriations from Congress.<sup>33</sup>

---

<sup>31</sup> Harold K. Steen, *The U. S. Forest Service, A History* (Seattle: University of Washington Press, 1976), 3-102 (an institutional history with emphasis on the conservation movement). Useful essay collections on the forest service include, Char Miller, ed., *American Forests: Nature, Culture, and Politics* (Lawrence: University of Kansas Press, 1997); Harold K. Steen, ed., *The Origins of the National Forests: A Centennial Symposium* (Durham, NC: Forest History Society, 1992). Critiques of the Forest Service include Paul W. Hirt, *A Conspiracy of Optimism: Management of the National Forests Since World War II* (Lincoln: University of Nebraska Press, 1994); and Nancy Langston, *Forest Dreams, Forest Nightmares: The Paradox of Old Growth in the Inland West* (Seattle: University of Washington Press, 1995).

<sup>32</sup> Gifford Pinchot, *Breaking New Ground* (New York: Harcourt Brace, 1947); Steen, *The U. S. Forest Service*, 47-102, Char Miller, *Gifford Pinchot and the Making of Modern Environmentalism* (Washington, D. C.: Island Press/Shearwater Books, 2001).

<sup>33</sup> Williams, *Americans and Their Forests*, 406-407. For a revisionist view on the Adirondack Forest Reserve with a focus on the consequences to those who used the woods as a commons, see Karl Jacoby, *Crimes Against Nature*:

The idea of a forest reserve in the Southern Appalachians has been traced back to 1885 when a Boston physician, Henry O. Marcy, presented a paper before the American Academy of Medicine lauding the healthful benefits of the North Carolina mountains. The movement then gained the imprimatur of the great arborist, Charles S. Sargent, author of the fourteen-volume *Silva of North America* (1891-1902), and of Gifford Pinchot, the newly appointed chief of the Division of Forestry. It gained organizational support in an 1899 meeting hosted by the Asheville Board of Trade. The meeting led to an organized congressional campaign involving an array of national groups including the Appalachian Mountain Club of New England, the Appalachian National Park Association of the South Atlantic States, the American Forestry Association, the AAAS, and numerous commercial groups from Atlanta, Knoxville, and elsewhere. Georgia's legislature supported by passing six acts and resolutions between 1900 and 1918 to that end. The first was a resolution in 1900 expressing its willingness to cede state jurisdiction to the federal government for reserve to "forever protect the sources of the rivers that furnish our water-powers and navigation facilities," to "demonstrate...how such forest-covered areas can be managed and perpetuated," and to provide a "great national resort."<sup>34</sup>

Congress responded in 1901 with a \$5,000 appropriation for a study by Secretary of Agriculture James Wilson "to investigate the forest conditions in the Southern Appalachian

---

*Squatters, Poachers, Thieves, and the Hidden History of American Conservation* (Berkeley: University of California Press, 2001), 11-80.

<sup>34</sup> Charles Dennis Smith, "The Appalachian National Park Movement, 1885-1901," *North Carolina Historical Review* 37, no. 1 (January 1960): 38-65; William E. Shands, "The Lands Nobody Wanted: The Legacy of the Eastern National Forests," in *Origins of the National Forests: A Centennial Symposium*, 19-44; Ronald D. Eller, "Land as Commodity: Industrialization of the Appalachian Forests," in *The Great Appalachian Forest: An Appalachian Story*, Barry M. Buxton and Malinda L. Crutchfield eds. (Boone, NC: Appalachian Consortium Press, 1985), 15-23. For Georgia resolutions and enabling legislation for a southern national forest reserve see, Resolution of 18 December 1900, no. 182, 1900 *Ga. Laws*, vol. 1, 500-01; Act of 18 December 1901, no. 68, 1901 *Ga. Laws*, vol. 1, 84-85; Resolution of 16 August 1910, no. 288, 1910 *Ga. Laws*, vol. 1, 1279; Resolution of 15 August 1916, no. 338, 1916 *Ga. Laws*, vol. 1, 1045-46; Act of 18 August 1917, no. 51, 1917 *Ga. Laws*, vol. 1, 182-83; Act of 17 August 1918, no. 73, 1918 *Ga. Laws*, vol. 1, 206-08.

Mountain Region of western North Carolina and adjacent states.” Ducktown’s location at the common border of western North Carolina, Tennessee, and Georgia was well within the study’s scope. That is what brought Harold Day Foster, Alfred Chittenden, and their fellow government experts to the Basin.<sup>35</sup>

The completed study, with a cover letter from President Roosevelt, was issued in 1902 under the clunky title, *Message from the President of the United States Transmitting a Report of the Secretary of Agriculture in Relation to the Forests, Rivers, and Mountains of the Southern Appalachian Region*. Better known as the Wilson Report, it contained almost two hundred heavily illustrated pages based primarily on the field work of H. B. Ayres and W. W. Ashe showing the horrendous effects of erosion from denuded mountain slopes. Most of the damage occurred from poor farming and logging practices that left land exposed to the impact of the region’s torrential rains.<sup>36</sup>

Farming in the level bottom lands was relatively benign when the slopes remained forested. Level plow land on valley floors eroded much more slowly than plowed areas on slopes. Bottomlands also had the benefit of being far more fertile and easier to work than the sides of hills and mountains, which is why both Cherokees and their white successors prized them. Early white settlers claimed the bottom lands, forcing later settlers and later generations to

---

<sup>35</sup> Smith, “The Appalachian National Park Movement,” 59-62 (discussion of the funding bill, H. R. 10538).

<sup>36</sup> The report, *Message from the President of the United States Transmitting a Report of the Secretary of Agriculture in Relation to the Forests, Rivers, and Mountains of the Southern Appalachian Region* (hereinafter the Wilson Report) was originally published as Senate Document 84, Fifty-seventh Congress, 1902, and reprinted separately under the same title by the Government Printing Office in 1902, see, United States Department of Agriculture., U.S. Forest Service., U.S. Geological Survey, and U.S. Weather Bureau. *Message from the President of the United States Transmitting a Report of the Secretary of Agriculture in Relation to the Forests, Rivers, and Mountains of the Southern Appalachian Region. December 19, 1901. Read, Referred to the Committee on Forest Reservations and the Protection of Game and Ordered to Be Printed. Senate Document No. 84. 57<sup>th</sup> Congress* (Washington: Government Printing Office, 1902). Ayres and Ashe revised and republished their 1901-1902 fieldwork as H. B. Ayres and W. W. Ashe, *The Southern Appalachian Forests*, U. S. Geological Survey, Professional Paper no. 37 (Washington, Government Printing Office, 1905).

attempt agriculture on steeper slopes, from ten to as much as thirty degrees or more in slope. Such fields had a short useful life, typical of swidden or slash-and-burn agriculture. “The underbrush is destroyed, the trees are girdled, and for one, two, or three years such a field is planted in corn, then a year in grain, then one or two years in grass, then the grass gives place to weeds, and weeds to gullies.” As each field wore out, another was cleared to repeat the cycle. Thus, in an exchange for a few years of crops, “a soil which is the accumulation of a thousand years has been cleared, cultivated, abandoned, and is on the downward road to the sea within less than a decade.”<sup>37</sup>

Destructive logging practiced on an industrial scale was the other great human factor. Steam powered locomotives, derricks, and mills opened remote coves to logging. The earlier practice of select cutting of certain species gave way to cutting of all merchantable species at once. “In these operations there has naturally been no thought for the future.” Loggers dropped trees and hauled them away without regard to remaining trees and saplings. They let logs roll down the steeper slopes in a manner that crushed everything in the way. Tops and branches, instead of being safely burned in piles in controlled conditions, were “left scattered among the adjacent growth to burn when driest, and thus destroy or injure everything within reach.”<sup>38</sup>

Denudation causes erosion in most environments but was especially destructive in the southern mountains because of its high rainfall. Secretary Wilson wrote, “upon these mountains descends the heaviest rainfall of the United States, except for the North Pacific Coasts,” and the rain often fell with “extreme violence, as much as 8 inches...in eleven hours” and “31 inches in a month.” Falling on denuded slopes, it caused soil to wash “in enormous volume into the

---

<sup>37</sup> Wilson Report, 26.

<sup>38</sup> Ibid., 24-25 63-64.

streams, to bury such of the fertile lowlands as are not eroded by the floods, to obstruct the river, and to fill up the harbors.” Photographs showed gullied slopes upstream and once fertile bottomlands covered with boulders and dunes of deposited silt, even on lands two hundred miles downstream from the mountains.<sup>39</sup>

The U. S. Geological Survey provided the statistical foundation to support the visual impact of the photographs. A significant portion of the Wilson Report described the hydrologic study conducted by the U.S.G.S. on every major river flowing from the Southern Appalachians and on over a thousand tributaries. They established fifty-four river gauges on the major streams. Their findings were then offered in support of the conclusion that “if the forests are wantonly cut, when all of the soil and vegetation will be washed from the mountain sides,” then, “nothing will remain but the bare rock.”<sup>40</sup>

Secretary Wilson and President Roosevelt insisted that only healthy forests could prevent the evils of erosion. Given the market realities of logging, and the population pressure that led to more new farms on steep slopes, only a government forest reserve could limit future harm, and work to repair past damage. Proper forest management was essential to control stream flow and to provide for sustainable timber harvests. Without prompt action, they warned that “within less than a decade every mountain cover will have been invaded and robbed of its finest timber” and the last “remnants of these grand primeval woods will have been destroyed.”<sup>41</sup>

George Perkins Marsh was not cited in the Wilson Report, but his doctrines about the impact of deforestation were central to its methodology and findings. The link he made between deforestation and erratic stream flow, and hence to the problems of erosion, infertility, and

---

<sup>39</sup> Ibid., 32-34

<sup>40</sup> Ibid. 128-137, the quotation is at 129.

<sup>41</sup> Ibid., 3-5, 25, 35-36, 38-40.

flooding, were employed as established truths. President Roosevelt and the congressional supporters of the movement to create an Appalachian Forest Reserve had other reasons for embracing the same tenets. They needed to establish constitutional authority to expend federal money to purchase the private lands needed to create a forest reserve in the East. This was not easily done because there was nothing in the Constitution about forest reserves. The Fifth Amendment power of eminent domain had been traditionally limited to accepted public uses such as roads, bridges, schools, government buildings, and military installations. The expenditure of federal funds to buy private lands for forest reserve required a broad view of congressional and executive authority at a time when congressmen held to ideas of strict construction and limited powers. Speaker of the House, Joseph G. “Uncle Joe” Cannon, declared his opposition to the reserve with the pithy declaration, “not one cent for scenery!”<sup>42</sup>

Roosevelt and his congressional allies seized upon stream-flow to provide the necessary rationale. They argued that erosion and erratic stream flow hindered navigation in the South by clogging ship channels and harbors with silt and causing rivers levels to rise and fall erratically. It followed, they said, that the forest reserve was necessary to maintain and improve navigation. Issues of navigation were clearly embraced by the Commerce Clause, and thus Congress had constitutionally authority to create the reserve. Congress eventually accepted the argument and passed the Weeks Act in 1911 authorizing the purchase of private lands “for the purpose of conserving the navigability of navigable rivers.”<sup>43</sup>

Passage of the Weeks Act proved to be timely because by 1911, Marsh’s stream flow doctrines were beginning to come under sustained attack led by H. M. Chittenden of the Army

---

<sup>42</sup> The famous quote encapsulated opposition to the conservation movement. Gifford Pinchot repeated it in his memoirs; see Gifford Pinchot, *Breaking New Ground* (New York: Harcourt Brace, 1947), 243.

<sup>43</sup> Act of 1 March 1911, *U. S. Statutes at Large* 36, Part 1, Chap. 186, 961-63.

Corps of Engineers. Marsh looked to mountain forests to regulate stream flow. The Corps preferred to regulate stream flow with man-made locks and dams. In the battle for congressional dollars, funding for forest reserves thus stood at cross-purposes with funding for engineering projects. Chittenden focused his attack upon Marsh in a 1909 article under the carefully worded title, "Forests and Reservoirs in Their Relation to Stream Flow with Particular Reference to Navigable Rivers." Though it surfaced during the debates on the Weeks Act, the two-year old article came too late to overcome the half-century embrace of Marsh's 1864 work, *Man and Nature* by Gifford Pinchot, Theodore Roosevelt, Secretary of Agriculture James Wilson, Georgia's Wilmon Newell, and the huge plurality of working foresters and conservation scientists. Nor would Chittenden's article be in time to play a role in Georgia's fight against the copper companies.<sup>44</sup>

\*\*\*

The report did not mention Ducktown or sulfur dioxide pollution. The explicit link between sulfur pollution and the larger conservationist agenda for the southern mountain forests occurred in Alfred Chittenden's 1905 report, made at the request of Gifford Pinchot. Research and testimony by other federal experts strengthened that link. The most important was that of J. K. Haywood, a chemist with the U. S. Department of Agriculture's Bureau of Chemistry.

Haywood studied sulfur dioxide pollution from the Mountain Copper Company in Northern California before coming to Ducktown. Fumes from Mountain Copper's huge complex near Mt. Shasta destroyed timber on federal lands from which Theodore Roosevelt created the Shasta National Forest in 1905. The Department of Agriculture sent Haywood to study the

---

<sup>44</sup> Gordon B. Dodds, "The Stream-Flow Controversy: A Conservation Turning Point," *Journal of American History* 56, no. 1. (June 1969): 59-69.

matter. His report, *Injury to Vegetation by Smelter Fumes*, and his field studies at Ducktown became the scientific foundation of Georgia's case.<sup>45</sup>

Haywood's report first addressed causation. He observed that "for each pound of sulfur burned" in furnace smelting "two pounds of sulfur dioxide are formed and given off into the atmosphere." Sulfur dioxide then combined with oxygen to form a transitory substance, sulfur trioxide. That substance then combined with moisture in the air or on leaves "to form the highly corrosive compound sulfuric acid, which in its turn acts upon the delicate foliage."<sup>46</sup>

He next considered the concentrations and periods of exposure that caused damage to vegetation. German scientists began that line of research in the 1860s and 1870s as they studied damage to forests downwind from the huge mining and steelmaking operations in the Ruhr district. Their experiments established that significant injury occurred from short exposure at a level of one part SO<sub>2</sub> to 100,000 parts of air, and from longer exposure at a reduced level of 1:1,000,000. Haywood conducted his own experiments using a sealed glass cabinet, roughly the shape of a telephone booth, in which he exposed plants to SO<sub>2</sub> gas for measured periods. The tests resulted in visible damage to foliage. Chemical analysis showed a marked increase in sulfur trioxide within the plant tissues. He then confirmed those results in the field by testing plant samples gathered near the Mountain Copper smelters.<sup>47</sup>

Haywood supplemented his earlier work with two visits to Ducktown in 1905 and again in 1906. There, he performed calculations to determine that in a single day, the two companies generated so much sulfur dioxide that "the atmosphere for a thickness of 100 feet would be

---

<sup>45</sup> J. K. Haywood, *Injury to Vegetation by Smelter Fumes*, United States Department of Agriculture, Bureau of Chemistry, Bulletin No. 89 (Washington: Government Printing Office, 1905).

<sup>46</sup> *Ibid.*, 9

<sup>47</sup> *Ibid.*, 10-17.

contaminated for 520 square miles,” equivalent to the area within a circle with a radius of thirteen miles in every direction from the smelters. He expected the zone of damage to expand with increased production and the erection of the taller chimneys. Moreover, “with each zone of timber killed...the carrying power of said fumes is increased, inasmuch as the destruction of timber and vegetation permits the fumes to travel further before being absorbed.” His return visit in 1906 confirmed both predictions. He found that the zone of damage had advanced fifteen to eighteen miles further in a single year from the vicinity of the town of Blue Ridge in Fannin County southwards to and beyond Ellijay in Gilmer County.<sup>48</sup>

The Forest Service directed Forester J. S. Holmes and Assistant Forest Inspector A. B. Patterson to make additional surveys of the Ducktown Basin to document the extent of smoke damage to local woodlands. Holmes found extensive damage in 1905. Pinchot sent Patterson to make another survey the following year at the request of the state of Georgia. Patterson determined that the injured area expanded 592 percent from 1905 to 1906. It now extended through the gaps of the Blue Ridge Mountains on the southern rim of the Basin into the Ellijay and Coosawatee river valleys. Charles Keffer, formerly assistant chief under Pinchot and then professor of forestry at the University of Tennessee, found damage on the Cartecay River, thirty miles south of Ducktown.<sup>49</sup>

Governor Terrell and the state’s lawyers appreciated the importance of forestry to the case. The Governor attended the 1906 National Forestry Congress in Charlotte, North Carolina,

---

<sup>48</sup> J. K. Haywood, Affidavit of 27 November 1905 and Affidavit of 17 September 1906.

<sup>49</sup> A. B. Patterson, Affidavit of 24 September 1906; Charles Keffer, Affidavit of 18 September 1906. Patterson stated in his affidavit that he “acted in his official capacity and under the orders of the Forest Service.” Hart acknowledged that the Service detailed Patterson at the state’s request, see Memorandum of Argument for Complainant Upon Final Hearing, filed 25 February 1907, 8 (herein Georgia Brief on Final Hearing. Keffer acknowledged that he made his report at the request of Charles Seymour, attorney for three great timber owners, Wetmore, Stephenson, and the Ocoee Timber Company.

“to consult with some of the experts on forestry...regarding the situation in the counties of North Georgia.” Hart sent Ligon Johnson to Washington with instructions to comb the Bureau of Forestry for additional supportive studies, reports, and government bulletins. This was more than a matter of case strategy for the young lawyer; he became a true believer in forest conservation. Soon after the current round of litigation, he helped to organize the Appalachian National Forest Association and served as its first president. He also served as the southern regional director for the American Forestry Association. From these offices, he lobbied extensively for legislation to create the Appalachian Forest Reserve, and received the personal thanks of Theodore Roosevelt for his efforts.<sup>50</sup>

Johnson summarized his forest philosophy in an impassioned half-page article in the *Atlanta Constitution* under the headline, “Vast Importance to South of Forest Reserves.” He argued that professionally managed timberlands were necessary “so that the entire wood crops are made available and utilized to their fullest extent but upon scientific principles.” The necessary expertise was available thanks to “Forester Pinchot” and his “government foresters” who “conserve every use and element of value in the national forest.” Johnson then addressed the arguments articulated by George Perkins Marsh and embraced by the federal government as the rationale for the Wilson Report. Forest conservation was necessary to prevent “the failure of water supply and power, the irregularity of stream flow, the washed and ruined lowland farms, the dangerous and damaging floods and freshets, the clogged and chanted channels of navigable streams, debris and mud filled harbors and similar harmful consequences.”<sup>51</sup>

---

<sup>50</sup> “Governor Goes to Charlotte – Will Attend National Forestry Congress Today,” *Atlanta Constitution*, 3 March 1906, 7; “Knotty Issue in Arbitration,” *Atlanta Constitution*, 16 October 1905, 6. Johnson’s forestry advocacy appears in a series of *Atlanta Constitution* articles: “Association Formed to Preserve Forests,” 8 December 1907; “Save Forests—Roosevelt,” 14 January 1908; “Governors Are Asked to Send Delegations to Fight for Forests,” 17 January 1908; “Adamson’s Plea for Anti-Jug Law,” 1 February 1908 (bottom paragraph).

<sup>51</sup> “Vast Importance to South of Forest Reserves,” *Atlanta Constitution*, 1 December 1907, E3.

Both Johnson and Attorney General Hart recognized that Secretary Wilson's regional report and the many supplemental studies specific to the Ducktown Basin went far towards repairing the greatest weakness in the state's lawsuit: the need to establish a state interest independent of the private claims of smoked-out Georgians. That was the crux of the legal challenge raised by the copper companies against the state's claim of original jurisdiction. The copper firms argued that the state had no interest of its own in the controversy and that it "is simply lending its name to prosecute the suit for and in behalf of a few of its citizens." Attorney General Hart and Ligon Johnson now had a credible response with the imprimatur of President Roosevelt and his government experts. They could now argue that the state was entitled to the grant of Supreme Court original jurisdiction to protect its forests and watersheds from the damaging consequences of sulfur dioxide fumes in furtherance of federal and state conservation principles. This was a much stronger footing than the state's speculative property interest claims about lost tax income and road damage from smoke damage. Whether caused by reckless farming on steep slopes, haphazard logging practices, or sulfur dioxide pollution, the train of destructive consequences from forest loss, denudation, and erosion remained the same.<sup>52</sup>

\*\*\*

Hart publicly thanked Secretary Wilson, Gifford Pinchot, and the Bureau of Forestry in his 1906 Annual Report "for aid given the State." It was well that he did because their work enabled the state to move quickly on the case when the General Assembly reconvened in the summer of 1905. State Senator G. W. Phillips and Representative J. C. Powell, both from Fannin County, introduced resolutions calling for another investigation of conditions in Ducktown, and

---

<sup>52</sup> Brief and Argument of the Ducktown Sulphur, Copper & Iron Company, Limited on Final Hearing, p. 3 (herein DSC&I Brief on Final Hearing).

for resumption of the state's lawsuit against the copper companies. An article in the *Atlanta Constitution* announcing the introduction of the resolutions gave a paragraph to Sen. Phillips, followed by a seven paragraph statement from Will Shippen.<sup>53</sup>

The phrase, "talking points" is a common usage among present day politicians, lobbyists, and business people. Sinclair Lewis used it in his 1922 novel, *Babbitt* in reference to a real estate broker "who understood Talking Points, Strategic Values, Key Situations...and the Psychology of Salesmanship."<sup>54</sup> Whether Shippen used the phrase in 1905 is not known, but he certainly understood the concept. His statement provided the talking points for the renewal of Georgia's case. The first talking point was acid: "as every chemist knows, just as soon as dioxide of sulfur comes in contact with moisture sulfuric acid is the result." The case was no longer just about smoke. It was about dangerous substance for "it is this sulfuric acid that does the terrible damage." Next was the phrase "forty miles," the idea that the zone of vegetative death extended that far from the copper works, citing the U. S. Bureau of Forestry for authority. It was no longer a case of damage in the immediate vicinity of the smelters.<sup>55</sup>

Shippen then defined the issue as "whether we will quietly submit when we see valuable timber and farming lands made valueless...when the trouble could be so easily remedied." How? He said "one of the best known chemists in the south" (another expert) offered to build a plant to "take those fumes and turn them into an article of merchandise, that is, sulfuric acid." And yet

---

<sup>53</sup> John C. Hart, *Fifth Annual Report of John C. Hart, Attorney-General of Georgia* (Atlanta: Franklin-Turner, 1907), 12-13. For *Atlanta Constitution* coverage on the resolutions see: "Ducktown Case to be Re-opened – Resolution on Subject Goes to the Senate Today," 14 July 1905, 7 (senate resolution); "Prohibition Bill Appears in House," 15 July 1905, 7 (Powell's house resolution); "To Investigate Ducktown Plant, Resolution Providing for Commission Introduced in Senate," 15 July 1903, 7.

<sup>54</sup> Sinclair Lewis, *Babbitt* (New York: Harcourt, Brace, 1922; reprint, New York: Penguin, 1996), 42 (page citation is to the reprint edition).

<sup>55</sup> "Ducktown Case to be Re-opened"

the copper companies refused. Sulfuric acid, forty miles, U.S. Bureau of Forestry, a likely technological cure (this time acid plants), and corporate resistance: these were the points that would be repeated again and again by the state.<sup>56</sup>

Talking points, favorable press coverage in the *Atlanta Constitution*, and a mid-session legislative junket to Ducktown accomplished the desired end. The resolution easily passed and the legislature named all five members of the commission, including Will H. Shippen from Gilmer County. He now had an official platform from which to pursue his personal and public campaign against the copper companies.<sup>57</sup>

The 1905 commission acted with greater dispatch than its 1903 predecessor, this time arriving at Ducktown in August during the growing season instead of late in fall. As a whole, it found that “the signal destruction to young and old timber and almost all vegetation was appalling in the extreme, and impressed all as we journeyed through the stricken district.” Conditions were worse than in 1903 (the state geologist and state chemist were members of both commissions). The already desperate problem would soon worsen when the Tennessee Company’s four new furnaces came on line to double its smelting capacity. Local farmers “expressed themselves as being determined to abandon their further attempts to grow crops...until the nuisance is abated.” The commissioners then fleshed out their report with frequent references to the Wilson report and J. K. Haywood’s sulfur dioxide studies.<sup>58</sup>

---

<sup>56</sup> Ibid.

<sup>57</sup> Resolution No. 17, “In Relation to Injuries from Copper Mines at Ducktown, Tenn.” 1905 Ga. Laws 1250; “Gossip at the Capitol,” *Atlanta Constitution*, 17 August 1905, 6.

<sup>58</sup> Report of the 1905 Legislative Commission, 30 August 1905, attached as Exhibit G to Plaintiff’s Bill of Complaint, *Georgia v. Tennessee Copper Co.*, U. S. Supreme Court, No. 13 Original, October Term 1905; “Will Look into Sulfur Ovens, Georgia Commission Departed Yesterday to Investigate Ducktown Problem,” *Atlanta Constitution*, 29 August 1905, 7.

The report appeared in the *Atlanta Constitution* the day after completion. Governor Terrell ordered renewal of the suit in September. The Tennessee Copper Company sent its president, J. Parke Channing, and counsel, Howard Cornick, to meet with Hart in Atlanta to forestall renewal of the suit, but by then the smoke damage was too great and political pressures too powerful to permit delay. Hart then risked life and limb on another train journey to the Supreme Court in Washington where he filed Georgia's second injunction suit on October 23, 1905. The first case lasted just a few weeks before reaching a tenuous settlement in February, 1904. Thirteen years would pass before the second suit reached its effective end with a settlement between the state and DSC&I.<sup>59</sup>

\*\*\*

Like prize fighters facing off for a repeat bout, each party in the second Supreme Court case knew the strengths, weaknesses, and strategy of the opponent. All of the arguments asserted in 1903 reappeared in 1905. And beyond that, the parties had reference to a decade of smoke litigation in the Tennessee courts. Litigation involves the determination of facts and the application of those facts to the law. A competent advocate must be able to wield both law and fact in court, but like a boxer with a stronger punch in one arm than the other, the lawyer often has a stronger position on the facts than on the law in a given case, or vice versa. That is the

---

<sup>59</sup> "North Georgia is Devastated, Legal Steps Urged to Abate the Sulfur Nuisance," *Atlanta Constitution*, 31 August 1905, 7; Order of Governor J. M. Terrell, 21 September 1905, attached as Exhibit H to Plaintiff's Bill of Complaint, *Georgia v. Tennessee Copper Co.*, U. S. Supreme Court, No. 13 Original, October Term 1905; "No Franchise, Says Board in the Bull Sluice Case—Discuss Ducktown Case," *Atlanta Constitution*, 14 October 1905, 6; "Knotty Issues in Arbitration—The Ducktown Case," *Atlanta Constitution*, 16 October 1905, 6. The case reached a formal, as opposed to effective, end when the Supreme Court dismissed it with prejudice on May 16, 1938, *Georgia v. Tennessee Copper Co.*, U. S. Supreme Court, No. 1 Original, October Term 1937.

realities behind the old courtroom adage, “when you have the facts on your side, argue the facts. When you have the law on your side, argue the law. When you have neither, holler.”<sup>60</sup>

The state’s lawyers elected to argue the facts. Hart and Johnson anchored their case on evidence from federal experts: the Wilson Report, J. K. Haywood’s toxicology study, U.S. Department of Agriculture bulletins on erosion, and the several field reports from government foresters. Federal entomologists discounted insect infestation as the cause of tree death in Ducktown. Government mapmakers determined the zones of smoke damage. The lawyers also used state experts to supplement the federal evidence. Together, expert testimony by federal and state scientists allowed Hart and Johnson to move their factual case beyond the realm of anecdote and conjecture to the much stronger scientific rationale based upon the findings of government experts employing the latest methods of conservation science.

It was a matter of fortuitous timing for the two lawyers because they gained the benefit of the first generation of forest conservation science in the United States. The European discipline of sustained-yield forestry was less than a century old (while benefiting from many practical techniques developed over the ages). It was even younger in the United States. Only forty years had passed since the publication of *Man and Nature* by George Perkins Marsh in 1864. Most of the founding figures of American silviculture—B. E. Fernow, Carl Alwin Schenck, Gifford Pinchot, John Singer Sargent, and Henry Solon Graves—were alive and actively expanding the field at the time of Georgia’s Ducktown case. Fernow, Schenck, and Pinchot all played significant parts in the suit, though as will be seen, not on the same side of it. Very little of the scientific evidence employed by Hart and Johnson would have been available to the state of

---

<sup>60</sup> The quoted version of the adage is from Albert Gore, Jr. in the *Washington Post*, July 23, 1982, quotation no. 1527, *The Columbia World of Quotations*. New York: Columbia University Press, 1996. [www.bartleby.com/63/](http://www.bartleby.com/63/) (accessed August 19, 2007).

Georgia had it attempted a similar smoke suit during the first era of the Ducktown copper industry under Capt. Raht.

In addition to federal experts, Attorney General Hart offered the affidavit and reports of John M. McCandless, Georgia's state chemist, and a member of both legislative commissions. McCandless mirrored J. K. Haywood's work and then used his own expertise to comment on Tennessee Copper's 325 foot tall stack. He noted that a 375 foot stack was in use with some success on New York Bay near Staten Island. It was on an advantageous site surrounded by water, and where the prevailing winds carried most of the smoke to the open ocean. These factors kept the smoke away from land and allowed it to descend into the sea to dissolve without harm. None of those factors pertained in landlocked, mountain-rimmed Ducktown. No benefit could be expected "unless the chimney is tall enough to overtop" the surrounding mountains that rose above the smelters.<sup>61</sup>

Will Shippen, Frank Shippen, L. D. Rogers and four other industry loggers and foresters added their observations to those from the government foresters. Both brothers took care to frame their affidavits in conservation terms. Will stated, "We are practicing forestry, cutting out only the mature timber and letting the young trees grow." Frank added "the forests are not destroyed by cutting of such timber but, on the contrary...grow much more rapidly after the old timber is cut away." Will asserted that even though his company operated six large sawmills, "our timber would reproduce itself faster than we could grow it" if left unharmed by the smoke.

---

<sup>61</sup> John M. McCandless, Affidavit of November, 1905, *Georgia v. Tennessee Copper Co.*, U. S. Supreme Court, No. 13 Original, October Term 1905. All affidavits cited in this chapter are from this case and will be cited hereafter simply by name and date.

Then Frank finished the argument with his observation that “the sulfur fumes, however, not only destroy the mature timber, but kills the young as well, and make re-forestation impossible.”<sup>62</sup>

The copper companies responded with testimony from their own foresters, notably Bernhard Eduard Fernow and Carl Alwin Schenck. Fernow was justly honored in American silviculture for his service as the long-time chief of the U. S. Division of Forestry and as founder of the school of forestry at Cornell University. He testified that loss of forest cover did not lead to soil runoff and impaired water flow “except in the steepest places.” This was true in Europe where healthy grassy slopes covered the Alps. Fernow then qualified his testimony by adding, “provided that the lower soil cover and underbrush is not also destroyed by fire or otherwise, or reproduction to replace the old growth is not prevented.” Unfortunately, he failed to support his general observations with adequate field work at Ducktown to determine if the harmful conditions listed in his proviso were at work in the Basin.<sup>63</sup>

Carl Schenck, another German forester, earned his doctorate in forestry at the University of Giessen and then served under England’s leading forester, Sir Dietrich Brandis, before coming to America to succeed Gifford Pinchot as forester to the Biltmore Estate. There, he established the Biltmore Forestry School in 1898, now considered by many to be the “Cradle of American Forestry.” The opinionated Schenck eventually fell out with the equally opinionated and vastly more wealthy George Vanderbilt, leading to his dismissal in 1909. He returned to Germany,

---

<sup>62</sup> Will H. Shippen, Affidavit of 13 April 1906; Frank E. Shippen, Affidavit of 10 November 1905; L. D. Rogers, Affidavit of 21 August 1906. The extent to which they actually employed conservationist methods in the logging business is subject to question.

<sup>63</sup> Fernow’s testimony appears in the Brief and Argument of the Defendant Tennessee Copper Company on Final Hearing, p. 18-19; (herein TCC Brief on Final Hearing). The grassy Alpine pastures are a familiar site to viewers who can recall Julie Andrews singing the title song in the film, *The Sound of Music* (1965).

fought for the Kaiser in World War I, and practiced forestry in his homeland for the remainder of his long life.<sup>64</sup>

Schenck kept abreast of the literature on the toxic effects of sulfur dioxide. He set forth his thoughts on the subject in his 1909 work, *Forest Protection*, a set of lectures first delivered to his students at the Biltmore Forestry School. He agreed that SO<sub>2</sub> was toxic to plants, especially in humid conditions, but cautioned that “a number of injurious influences (frost, heat, desiccation of soil, insects, [and] fungi) bring about, within the leaves and needles, identical or similar alterations.” Death from sulfur fumes could be assumed only when there was “death visible to the naked eye, no other plausible cause of death,” and chemical analysis proved that “contents of SO<sub>3</sub> in the leaves...are unmistakably increased.” He assumed that a tree died from some cause other than fumes unless those three tests were met.<sup>65</sup>

Dr. Schenck’s 1909 lectures echoed his 1906 testimony in the Ducktown case. He minimized testimony about smoke damage by decrying the tendency among North Georgians to attribute all timber death to sulfur fumes. Instead, he and his three assistants determined that “in a large majority of cases the deterioration of the timber lands is due to carelessness on the side of the owner...to the axe and the saw; to gradual desiccation of the soil; to forest pasture; to forest fires; to insects; and to pathological diseases.” These findings deserved some respect as being product of a careful scientific mentality, but they were contradicted by the state and federal entomologists.<sup>66</sup>

---

<sup>64</sup> Carl Alwin Schenck, *The Biltmore Story* (St. Paul: Minnesota Historical Society, 1955); Harley E. Jolly, “The Cradle of Forestry, Where Tree Power Started,” *American Forests* 76 (October, 1970): 16-21.

<sup>65</sup> Carl A. Schenck, *Forest Protection: Guide to Lectures Delivered at the Biltmore Forest School* (Asheville, NC: The Inland Press, 1909), 141-152, 144.

<sup>66</sup> DSC&I Brief on Final Hearing, 23.

Schenck reduced the value of his evidence when addressing the value of local timber. He thought little of it, writing that “the timber in the region under observation, in primeval times, must have been of a very poor description, perhaps of the poorest description anywhere in the Appalachian region.” His views reflected the experience of and expectations of a forester trained in the highly managed forests of Germany. American lumberman and the U.S. Forest Service saw things differently. For them, the unmanaged forests of the Southern Appalachian Mountains, for all of their ills, remained one of the nation’s most valuable remaining stands of timber.<sup>67</sup>

\*\*\*

The state’s next factual argument involved proof of a commercially viable method for processing the sulfur fumes. Failure to do so would allow the copper companies to defeat an injunction with the argument that their methods represented the state of the mining and smelting arts. The president of the Tennessee Copper Company, J. Parke Channing, effectively made the argument for the state through statements he made in the June 12, 1905 edition of the *Engineering and Mining Journal*. Channing lauded the cost savings and increased yield in copper realized from pyritic smelting and then added that “we found that the gases from the furnace are so rich in SO<sub>2</sub> that we can make acid from them by the chamber process.” It would “give us a by-product, which will be of great value in the South for the purpose of making fertilizers,” while at the same time “reducing the volume of gases to the atmosphere.” Best of all, the sale of acid to the fertilizer industry “will prove a source of considerable income.”<sup>68</sup>

Channing testified his company “always had in view the possibility of utilizing the waste gases...and its conversion into merchantable sulfuric acid.” The company began testing acid

---

<sup>67</sup> Ibid., 24; see also TCC Brief on Final Hearing, 34-36.

<sup>68</sup> J. Parke Channing, quoted in the *Engineering and Mining Journal*, 12 June 1905, and discussed in Georgia Brief Upon Final Hearing, 62-63.

conversion when success with pyritic smelting in furnaces made it possible to collect and process the fumes. Successful results led to construction of a chamber acid plant in 1906, the year after Georgia filed its second lawsuit. Channing realized that these developments destroyed the state of the art defense. Instead, he hoped to discourage an injunction on the reasonable point that they were working hard to meet the state's chief goal. In the meantime, he and company treasurer, John H. Sussman wiggled for legal breathing room by testifying that acid conversion was still an experiment in progress. Of all the copper smelting plants in North America, "not one of such works is producing commercial sulfuric acid."<sup>69</sup>

Channing and Sussman also warned there might not be a market for all the acid they could produce. Hart and Johnson responded with a fist full of affidavits and reports from experts in the fertilizer industry, the Georgia state chemist, the commissioner of agriculture, and the U. S. Census. Together, they established the pressing need for sulfuric acid to convert the South's abundant supply of phosphate rock into useable super phosphate fertilizer for the region's worn-out cotton fields. Two Atlanta fertilizer manufacturers, D. B. Osborne of the Armour Fertilizer Works, and H. A. Rogers with the Swift Fertilizer works, testified that they currently relied on sulfur pyrite rock imported at great cost from Spain to serve as the source of the needed acid. Both firms were eager to acquire low cost sulfuric acid in car-load lots from nearby Ducktown.<sup>70</sup>

The state's evidence on acid conversion, coupled with TCC's all-out effort to construct an acid plant at Copperhill, placed the Ducktown Company in an awkward legal position. Tennessee Copper effectively abandoned the state of the art defense while the Ducktown firm persisted with an increasingly dubious claim to the Supreme Court that acid conversion was not

---

<sup>69</sup> Affidavits of John H. Sussman, 29 September 1906; J. Parke Channing, 24 April 1906.

<sup>70</sup> Affidavits of R. F. Sams, September 1906; D. B. Osborne, 1 September 1906; H. A. Rodgers, September 1906; and A. A. Smith, 25 September 1906.

possible. James B. Parkes argued that the district's monosulfide ores "have never been successfully used on a commercial scale in the manufacture of sulfuric acid." That was true, but was not the same as saying that it could not be done, nor did it explain why Tennessee Copper was busily constructing a plant to do just that with the same kind of ore. He then noted that gases from the DSC&I furnaces contained only 3.7 percent sulfur dioxide by volume, less than the needed 4.0 percent, and even less than the 6.0 percent rate yield from the Tennessee Copper chimney. This failed as an excuse because it proved that existing technology could achieve the required yield.<sup>71</sup>

Attorney Parks and General Manager Freeland realized that their company no longer moved in lock step with TCC against the state of Georgia. The firm at Copperhill already produced three times the copper produced in Ducktown's Isabella work, and thus the major portion of the smoke in the Basin. Freeland and Parks noted that the Isabella works lay three miles away from the Georgia line compared to smelters at Copperhill situated less than a half-mile from the border. Ducktown's smoke stacks rose only 60 feet, and that from within a valley. The first stack at Copperhill was 125 feet, the second climbed 325 feet, and both were on top of a river bluff next to the border. Given these factors, Ducktown began to shift the blame, and hence, the exposure to injunction, over against Tennessee Copper. All of this was to suggest that if an injunction were granted, then it should fall upon Tennessee Copper, not the Ducktown Company.<sup>72</sup>

---

<sup>71</sup> DSC&I Brief on Final Hearing, 27-37.

<sup>72</sup> DSC&I Brief on Final Hearing, 81-84; Affidavit of W. H. Freeland, 15 November 1905.

\*\*\*

The third prong of the state's factual case consisted of citizen statements. They offered fifteen hundred affidavits from local farmers and residents setting forth their suffering under the clouds of sulfur smoke, followed by another set of over two thousand statements about the worsening conditions in 1906. Testimony from the farmers provided endless repetitions of how the smoke burned and shriveled the leaves on fruit trees, vegetables, and field crops as if bitten by a killing frost. A dealer in farm implements spoke of how his wife's sweet peas and other flowers "growing upon fragile stalks are particularly susceptible to the fumes." The husband's real concern was for their livelihood, because he could not sell equipment to smoked-out farmers.<sup>73</sup>

Thirty-five hundred affidavits represented a considerable portion of the vox populi in the Ducktown Basin. The copper companies responded with over six hundred witnesses representing another large segment of the population, the workers and merchants who wanted to keep the mines open to preserve their jobs and their trade. Company operatives conducted a mass meeting of supposed Georgia citizens at the Harper Town Store House in Fannin County. The resolution adopted there warned that an injunction, if granted, "will work a calamity" upon the region and "there will be thousands of people thrown on starvation, without food and without shelter." Other affiants denied the damaging effects of smoke. F. M. Jones, a merchant at McCays (later renamed Copperhill), J. B. Witt, a local banker, and James Akin, a teamster, all said that

---

<sup>73</sup> See for example, the Affidavits of O.F. Chastine (sic), 17 November 1905, J. W. Abercrombie, 17 November 1905, Charley A. Shell, 18 September 1906.

vegetation was green and thriving close to the Tennessee Copper smelting complex thanks to the newly installed tall smokestack.<sup>74</sup>

The many statements from citizen witnesses for and against the injunction marked Georgia's smoke suit as a regional conflict that impacted, one way or another, nearly every one of the ten thousand people in the Copper Basin. The trouble was that the opposing voices tended to cancel each other out. Each side challenged the credibility of the affidavits and resolutions tendered by the other side. The state sent observers to the rally at the Harper Town Store. Those observers then matched the signatures on the resolution against the local tax digest and determined that "the greater number of said employees...who attended said mass-meetings are persona who have no permanent residence or citizenship anywhere, for the reason that they reside at no one place long enough to obtain either."<sup>75</sup>

Tennessee Copper responded with affidavits from Georgians recanting their pro-injunction affidavits on the basis that they did not know what they were signing. W. R. Early, presumably illiterate because he signed with an "x," said he did so "because if he did not sign it he would never be able to get damages" against the copper companies. He said he was told that the affidavit was only to require the companies to condense acid from the smoke and had no idea that "it was for shutting down the mines." G. G. Hyatt, an attorney for the Ducktown Company, submitted his affidavit describing his attendance at a "smoke meeting" in Ellijay, the seat of

---

<sup>74</sup> Resolution from Harper Town Store, 3 February 1906; affidavits of F. M. Jones, 10 September 1906; J. B. Witt, 10 September 1906; James Akin, 11 September 1906.

<sup>75</sup> For the number of the affidavits see Georgia Brief Upon Final Hearing, filed February 25, 1907, p. 10-11, 33-34. For challenges to pro-company local witnesses, see affidavits by J. A. Tipton, 4 April 1906, W. A. Daves, 3 April 1906, W. F. Hampton, 19 March 1906; Sherman Martin, 12 April 1906.

Gilmer County. There, “the only persons who were taking an active interest in the prosecution of the suit against the mining companies at Ducktown were the Shippen Brothers.”<sup>76</sup>

The most embarrassing challenge to the state’s citizen affidavits came from Martin H. Vogel, general counsel for the Tennessee Copper Company at its New York City headquarters. His affidavit reads like a legalese version of Saul Steinberg’s famous cartoon in *The New Yorker*, “The World as Seen From New York’s 9<sup>th</sup> Avenue,” in which Manhattan looms in large detail and everything beyond the Hudson River is a vague, empty hinterland. Vogel left the company offices on Broadway to journey through North Georgia, which he described as a land where “the territory is wild and mountainous, the roads are rough and narrow, the soil is thin and poor” and “the mountaineers live in a crude fashion in the poorest sort of farmhouses miles from each other.” In scenes that must have presented a combination of high legal purpose and low social comedy, the corporate lawyer traveled the dirt roads of Fannin and Gilmer counties to interview farmers about their affidavits. Some expressed confusion about the purpose of the affidavits. Others said they signed “because they were requested to by parties who were trying to stir up agitation against the copper companies.”<sup>77</sup>

Vogel discovered that one of those agitators was Ligon Johnson, the state’s special counsel. Johnson had an unusual flyer posted in towns, hamlets, and crossroads stores throughout North Georgia. The poster urged citizens to sign affidavits about their smoke damage by appearing before any one of a number of named local politicians, judges, postmasters, and justices of the peace who stood ready to help them. In bold uppercase letters, the flyer stated “IF THESE CITIZENS WILL FURNISH THE TESTIMONY AS TO SAME...AN EARLY

---

<sup>76</sup> For anti-injunction challenges see affidavits of W. R. Early, 22 September 1906; G. G. Hyatt, 25 September 1906; G. C. Stepp, 22 September 1906.

<sup>77</sup> Affidavit of Martin Vogel, October 1, 1906. Saul Steinberg’s cartoon appeared on the cover of *The New Yorker*, March 29, 1976.

RELIEF MAY BE CONFIDENTLY HOPED FOR.” Then in lower case, he explained, “the state is acting for the benefit of her citizens.” (This was a very dangerous assertion in light of the anticipated challenge to the state’s claim for original jurisdiction.) He ended his cry for justice with more uppercase text: “HAVE YOU GIVEN YOUR TESTIMONY?” With Johnson’s flyer in his satchel, Martin Vogel returned to Manhattan full of tales from the southern highlands to share with members of his Manhattan social set.<sup>78</sup>

\*\*\*

The muddled voice of the people gave little real support for either side of the case. If the state chose to argue facts from its expert witnesses, Howard Cornick, trial counsel for Tennessee Copper, and his counterpart, James G. Parks, for the Ducktown company, elected to argue the law. The companies asserted four key legal defenses. The first was the attack on the state’s claim of original jurisdiction. This was the gateway issue that, if granted, would end the case at the outset. If that failed, they had three other defenses aimed at preventing the grant of injunctive relief.<sup>79</sup>

The arguments about original jurisdiction were the same as those asserted in Georgia’s first case, though presented with a better evidentiary base in the second. The copper companies asserted jurisdictional test from *Louisiana v. Texas* (1899) which required Georgia to show “that the controversy to be determined is a controversy arising directly between the State of Louisiana and the State of Texas, and not a controversy in the vindication of grievances of particular persons.” Georgia responded with dubious claims that smoke damage directly impacted the state’s property interests. It argued that state tax revenues declined with the growing number of

---

<sup>78</sup> The flyer is attached to Vogel’s affidavit.

ruined and abandoned farms, that erosion from denuded hillsides damaged state roads, and that smoke threatened the health of its citizens.<sup>80</sup>

Copper lawyers effectively countered each allegation. Tax records showed that revenues actually rose substantially with the return of the copper industry. That made sense because the local population rose from a few hundred during the industry's suspension to almost ten thousand with its return, and land values tended to rise with population. The road issue failed with the simple observation that there were no state-owned highways in Fannin and Gilmer counties, only local roads maintained at the local level. All were unpaved dirt lanes and subject to constant disrepair from locally heavy rains, with or without the consequences of smoke damage, as was true throughout the North Georgia mountains. The health issue failed for lack of a creditable scientific basis. Yet the original jurisdiction defense appeared increasingly shopworn as the case progressed. As in the first case, the Supreme Court granted the state leave to file its bill of complaint in the second. It then rejected the most complete statement of the defense by overruling the demurrers of the copper companies. The Court thus rejected the challenge to original jurisdiction on three separate occasions by the time the case entered the final hearing.<sup>81</sup>

If the original jurisdiction defense failed, it was then likely that the Supreme Court would find sulfur dioxide pollution from the copper smelters to be actionable nuisance, as the Tennessee Supreme Court did in *Ducktown Sulphur, Copper & Iron Co. v. Barnes* (1900). Such a finding would lead either to an injunction or an award of damages. Though the copper

---

<sup>80</sup> *Louisiana v. Texas*, 176 U.S. 1, 24 (1899); TCC Brief on Final Hearing, 82-99; Georgia Brief on Final Hearing, 52-58.

<sup>81</sup> "Ducktown Case Ordered Filed," *Atlanta Constitution*, 24 October 1905; DSC&I Brief on Final Hearing, 4-16; TCC Brief on Final Hearing, 10-16, 21-26. Order overruling demurrers without prejudice, 5 November 1906. The procedural history is summarized in the DSC&I Brief on Final Hearing, 1-2.

companies wanted neither, an injunction was their least favorite alternative. They raised three equitable defenses to avoid that result.<sup>82</sup>

Two of these defenses rested upon ancient maxims of the law of equity. The defense of laches, or inexcusable delay, was an equitable doctrine analogous to a statute of limitations. The applicable maxim stated “equity aids the vigilant, not those who slumber upon their rights,” because to do otherwise might work an unfairness upon the defendant. As Howard Cornick phrased it on behalf of Tennessee Copper, “the State of Georgia, by sleeping upon her rights...has allowed a community to become built up” and “has allowed thousands of people to acquire their homes and make their investments and establish their family ties...” The Ducktown firm and the Pittsburgh and Tennessee Copper Company (predecessor to TCC) both began smelting in the Basin in 1891. A Georgia defeat for its laches was a real possibility.<sup>83</sup>

Another maxim stated that an injunction will not be granted where there is an adequate remedy at law, meaning the right to recover damages. The argument worked on two levels. The copper companies argued that the state’s case was a mere subterfuge to advance the claims for damages asserted by its citizens. Those citizens had, by 1907, broken through the procedural barriers that delayed their claims for damages. Now, nearly every term of the Polk County Circuit Court resulted in another batch of monetary verdicts to Georgia citizens. It followed, so the defendants argued, that no injunction should be granted. Apart from alleged subterfuge, the copper companies contended that if Georgia suffered loss to state property interests, the loss should be adjusted by payment of damages, not by issuing an injunction.<sup>84</sup>

---

<sup>82</sup> Ducktown Sulphur, Copper & Iron Co. v. Barnes, 60 S. W. 593 (Tenn, 1900).

<sup>83</sup> TCC Brief on Final Hearing; 107-119 (quotation at 109); DSC&I Brief on Final Hearing, 73-81.

<sup>84</sup> DSC&I Brief on Final Hearing 3-4, 14-16.

The best hope of both companies lay with the application of the balancing of interests test, under which a court weighed the economic harm of the injunction against the harm caused by the sulfur dioxide pollution. It was this test that defeated the injunction suits filed by William Madison, Isaac Farner, Avery McGhee, and their fellow farmers in *Madison v. Ducktown Sulphur Copper & Iron Co.* (1904). There, the Tennessee Supreme Court refused to grant an injunction for the farmers when that would destroy a huge industrial complex employing thousands of workers in order to protect “several small tracts of land, aggregating in value less than \$1,000.” The Court’s use of the test was mandated by a statute adopted by the state legislature at the prompting of the copper companies and their corporate allies in heavy industry.<sup>85</sup>

The United States Ninth Circuit Court of Appeals expressly followed the *Madison* balancing test to reverse the grant of an injunction in another copper smelter case, *Mountain Copper Co. v. United States* (1906). The case involved the federal government’s attempt to enjoin sulfur dioxide pollution in Northern California. The court of appeals acknowledged the toxic effects of fumes upon nearby trees but found that damage to 4,000 acres of government trees growing upon land “mountainous in character, with little or no soil” and “practically worthless for agriculture” did not warrant closure of a mining complex that produced 10,000 tons of copper per annum and employed over a 1,000 workers.<sup>86</sup>

The court added two holdings that troubled the souls of Attorney General Hart and Ligon Johnson. It held that the Tennessee balancing of interests statute made no difference to the *Mountain Copper* decision because the same rationale could be supported on traditional

---

<sup>85</sup> *Madison v. Ducktown Sulphur, Copper & Iron Co.*, 113 Tenn. (5 Cates) at 339, 363-366, 83 S.W. at 659, 666-667; Act of April 17, 1901, ch. 139, 1901 Tenn. Pub. Acts 246.

<sup>86</sup> *Mountain Copper v. United States*, 142 F. 625, 640-642 (9th Cir., 1906).

equitable principles without reference to the act. In short, the *Madison* balancing test was not limited to cases tried under Tennessee law. Second, the court rejected the government's contention that Mountain Copper should extract sulfur fumes to make sulfuric acid. "That it is possible to convert the sulfur fumes into acid is...conceded," but it was economically impractical because of the "enormous cost of such production" and the "impossibility of disposing of such product" on the market.<sup>87</sup>

Either holding, if followed by the Supreme Court, was fatal to Georgia's Ducktown case as the lawyers on both sides well knew. Tennessee Copper's lawyer, Howard Cornick, gleefully wrote Ducktown's counsel, James G. Parks, to say that the *Mountain Copper* opinion "is a daisy, and we are pleased to note follows pretty closely the *Madison* case." Hart and Johnson knew that their star scientific witness, J. K. Haywood, wrote his monograph on "Injury to Vegetation by Smelter Fumes" for the failed California case. The failure of his evidence to sway the Ninth Circuit in *Mountain Copper* gave the Georgia lawyers reason to fear that Haywood's visits to Ducktown and the mountain of other forestry evidence assembled for the case might be wasted effort in a similar lost cause.<sup>88</sup>

Lawyers for the copper companies gained additional legal encouragement when the Supreme Court refused to grant an injunction in *Missouri v. Illinois* when the case was decided upon the merits in 1906.. The Court issued two major opinions in the case, the first in 1901 and the second in 1906. In the 1901 opinion, the Court granted original jurisdiction to the state of Missouri in its action for an injunction against the state of Illinois to stop the diversion of Chicago sewage into the Mississippi River via the Chicago Sanitary and Ship canal. Georgia's

---

<sup>87</sup> Ibid., 638, 641-643.

<sup>88</sup> Howard Cornick to James G. Parks, 16 April 1906 (DBM).

lawyers relied heavily upon the first opinion because it established a vitally important precedent for the application of original jurisdiction to problems of trans-border pollution. But that is all it did. Though Missouri won the point on jurisdiction and thus gained the right to bring its case before the Supreme Court, the justices reserved their decision on whether the facts warranted issuance of an injunction. Both parties were asked to prepare an evidentiary record for use in a later trial on the merits.<sup>89</sup>

When the case returned to the Supreme Court in 1906, the justices refused to grant Missouri its desired injunction. Missouri's case suffered, as recently argued by Robert Percival, from two weaknesses. First, its proof of actual disease consequences from Chicago's diversion of polluted waters was weak. Everyone agreed that the diversion occurred. The question was whether it caused a significant outbreak of disease downstream in Missouri. Writing for the majority, Justice Oliver Wendell Holmes found "the now prevailing scientific explanation of typhoid fever to be correct." Acceptance of germ theory came at a subtle price: Holmes noted that a case built upon microscopic "depends upon an inference of the unseen." In effect Missouri's proof rested upon statistical rather than visual impacts. The Court then found the numbers wanting.<sup>90</sup>

Second, Missouri placed itself in an awkward equitable position by allowing local cities to dump sewage into the state's own rivers. A party suing in equity for an injunction is held to a standard of fairness expressed as the doctrine of "unclean hands." The doctrine, a corollary of the fundamental principle that "those seeking equity must do equity," acts to deny an injunction to a party if it comes before the court with hands dirtied by the same sort of conduct which it accuses

---

<sup>89</sup> Compare *Missouri v. Illinois*, 180 U.S. 208 (1901) (herein Missouri I) to *Missouri v. Illinois*, 200 U.S. 496 (1906) (herein Missouri II).

<sup>90</sup> Robert V. Percival, "The Frictions of Federalism: The Rise and Fall of the Federal Common Law of Interstate Nuisance," University of Maryland, Pub-Law Research Paper No. 2003-02, available at <http://ssrn.com/abstract=452992>, 4-15. Missouri II, 52-23 (quotations).

the defendant of doing. The Court would not enjoin Illinois and Chicago from the same sewage practices that Missouri tolerated by its own citizens.<sup>91</sup>

The 1906 opinion in *Missouri II* was legally fresh news as lawyers for the state of Georgia and the copper companies returned to the Supreme Court in 1907 in their smelter pollution case. Would Georgia be granted original jurisdiction as in *Missouri I*? If so, would the Court refuse to issue an injunction as it did in *Missouri II*? And what role would Justice Holmes play in the copper case?

Overall, Georgia's strong factual punches and the equally strong legal counterpunches of the copper companies made for a closely matched bout. The state's evidence of widespread smoke damage was persuasive and compelling. Yet jurisdiction defense and the balancing of interests test could preclude the Court's consideration of the damage and bar injunctive relief. Appreciation of the close odds led Hart to offer additional delays to test other technological cures. The state agreed to waive the December, 1905, hearing for a preliminary injunction, to allow for evaluation of the impact of Tennessee Copper's new giant smokestack. Hart's lawyerly prudence became a point of mockery among the defendants. Writing to J. G. Gordon, the English general counsel for DSC&I, James G. Parks compared Attorney General Hart to the grand old Duke of York of the nursery rhyme: he climbed the hill with an offer to do battle and then "marched down the hill again" without landing a blow.<sup>92</sup>

Hart's reluctance to wield injunctive power rested upon his assessment of the greater good for North Georgia citizens, not on personal or professional timidity. "The state has no desire to shut down these costly works and thus deprive thousands of people of employment," he

---

<sup>91</sup> Ibid.

<sup>92</sup> J. G. Gordon to James G. Parks, 18 December 1905 (DBM)

again proclaimed in 1906. Yet, “the state does insist...that the companies so conduct their operations as not to injure the property interests of the state.” When settlement talks and smokestack technology proved unavailing, he braved another train trip to Washington and girded his loins for battle in the Supreme Court.<sup>93</sup>

\*\*\*

The two-day final hearing took place in February, 1907. Ligon Johnson opened for the state, and Hart gave the closing argument. Both were peppered with questions on jurisdiction with attention to the difference between the state’s case and the individual smoke suits. Hart argued that even though Georgians had the right to press their individual claims in the Tennessee courts, the state had the right to original jurisdiction in the Supreme Court to protect its own domain. Parks concluded afterwards that the copper companies “had the best of the argument,” though not without misgivings. He wrote a candid letter to W. H. Freeland expressing his hope for a win on jurisdiction. He then added his warning that “if jurisdiction should be taken, then I think the result would be doubtful” because there was “no case on record where the injury has been so wide-spread.” And thanks to the government experts, there was no case where the damage was so thoroughly documented.<sup>94</sup>

The Supreme Court rendered its judgment on May 13, 1907 in a unanimous opinion written by Mr. Justice Oliver Wendell Holmes, with a concurrence by Mr. Justice John Marshall Harlan. It was a typically brief opinion for Holmes. Thousands of pages of evidence resulted in an opinion that was only four pages long, apart from the head notes, syllabus, and recitation of counsels’ arguments. Brief as it was, it fulfilled the worst fears of James G. Parks: the Court

---

<sup>93</sup> John C. Hart, *Sixth Annual Report of John C. Hart, Attorney-General of Georgia* (Atlanta: Franklin-Turner, 1906), 3-6.

<sup>94</sup> “Ducktown Case With the Court – How Judge Hart Answered Question as to State’s Right to Bring Suit,” *Atlanta Constitution*, 2 March 1907; James G. Parks to W. H. Freeland, 7 March 1907 (DBM).

affirmed Georgia's claim to original jurisdiction and then granted it the right to an injunction to abate the sulfur smoke.<sup>95</sup>

From the opening sentence, Holmes carefully framed the case as a state-level action concerning cross-border air pollution. It was filed, he wrote, "in pursuance of a resolution of the legislature and by direction of the Governor of the State," for the purpose of seeking an order to "enjoin the defendant Copper Companies from discharging noxious gas from their works in Tennessee over the plaintiff's territory." The second sentence described the scope of the harm: "a wholesale destruction of forests, orchards and crops is going on, and other injuries are done and threatened in five counties of the State."<sup>96</sup>

It followed that the case was not an ordinary suit in nuisance. He observed, "the case has been argued largely as if it were one between two private parties, but it is not." Georgia's claim of damage to its property interests was "merely a makeweight" because "the State owns very little of the territory alleged to be affected," and the monetary damage directly suffered by the state was possibly small." The allegations of washed-out highways and lost tax revenues from abandoned farms were, as the copper companies vigorously argued, insufficient to uphold its claim to original jurisdiction. But that was not what the case was about. Instead, he declared,

This is a suit by a State for an injury to it in its capacity as a quasi-sovereign. In that capacity the State has an interest independent of and behind the titles of its citizens, in all the earth and air within its domain. It has the last word as to whether its mountains shall be stripped of their forests and its inhabitants shall breathe pure air.

---

<sup>95</sup> *Georgia v. Tennessee Copper Co.*, 206 U.S. 230 (1907).

<sup>96</sup> *Ibid.*, 236.

The case was not about highways and tax revenues, nor was it a mere subterfuge to advance the private smoke damage suits of its citizens. It was about Georgia's sovereign right to protect the natural resources within its dominion. Georgia's claim of injured sovereignty received resounding vindication.<sup>97</sup>

The third and fourth paragraphs addressed the jurisdictional issues. Again, the distinction between an action by a state compared to one by a private party was crucial. He began the section by naming *Missouri v. Illinois* (1901) (*Missouri I*), the case about diversion of polluted water from Chicago to the section of the Mississippi River fronting St. Louis, as the relevant standard for original jurisdiction. It was the only case he cited in the opinion. He made no mention at all of *Louisiana v. Texas*, the strongest jurisdiction case for the copper companies. The citation to *Missouri I* established that Georgia concerns over polluted air from copper smelters were analogous, for purposes of original jurisdiction, to Missouri's complaint about polluted water. It was the first time that the Supreme Court declared interstate air pollution to be a constitutional issue.<sup>98</sup>

Holmes worked through the jurisdiction analysis along the lines considered by Attorney General Hart and Special Counsel Johnson in 1904. The matter turned on fundamental concepts of dual federalism in which each state surrendered its right to make war upon a sister state (or that state's citizens) in exchange for access to the Supreme Court under Article III of the Constitution. The Justice wrote, "When the States by their union made the forcible abatement of outside nuisances impossible to each, they did not thereby agree to submit to whatever might be done." They retained the right to make "reasonable demands on the ground of the still remaining

---

<sup>97</sup> Ibid., 237.

<sup>98</sup> *Missouri v. Illinois*, 180 U.S. 208 (1901); *Louisiana v. Texas*, 176 U.S. 1 (1899).

quasi-sovereign interests.” The only constitutionally permissible way to enforce those interests was in federal court, since “the alternative to force is a suit in this court,” citing *Missouri I* for a second time.<sup>99</sup>

State sovereignty precluded the wooden application of nuisance remedies devised for private litigants. As Holmes commented, “some peculiarities necessarily mark a suit of this kind.” For one thing, “if the state has a case at all, it is somewhat more entitled to specific relief [i.e. an injunction] than a private party.” The state “is not lightly to be required to give up quasi-sovereign rights for pay.” Again, the remedies framed by the common law of nuisance had to be tailored to the requirements of federalism, because “the States, by entering the Union did not sink to the position of private owners subject to one system of private law.” It followed that the Court “has not quite the same freedom” to apply the balance of interests test that would weigh the harm of an injunction against the copper companies against the harm to the state caused by smelter emissions. For the same reason, he asserted “we cannot give the weight that was given to them in argument to other common factors of equity jurisprudence” such as “the commercial possibility or impossibility of reducing fumes to sulfuric acid,” or to the “special adaptation of the business” to its locale. All of the lawyers recognized the careful phrasings for what they were: a veiled criticism of the Ninth Circuit’s application of the balancing test and commercial viability considerations to bar the federal government’s claim for injunctive relief in the *Mountain Copper v. United States* smelter case. Holmes did not mention the case by name, nor did he need to in order to make his point.<sup>100</sup>

---

<sup>99</sup> *Georgia v. Tennessee Copper Co.*, 237.

<sup>100</sup> *Ibid.*, 238.

The Justice concluded his constitutional analysis by making a powerful affirmation of a state's right to protect its natural resources from interstate pollution:

It is a fair and reasonable demand on the part of a sovereign that the air over its territory should not be polluted on a great scale by sulfurous acid gas, that the forest on its mountains, be they better or worse...should not be further destroyed or threatened by the act of persons beyond its control, that the crops and orchards on its hills should not be endangered from the same source.

As a matter of federal constitutional law, states always had the right to control natural resources within their boundaries. Now they had the constitutional right to seek redress in federal court to protect their resources from pollution emanating from outside their borders.<sup>101</sup>

Having addressed the constitutional issues, Holmes turned to the factual proof of alleged harm from smelter fumes. This he accomplished in a mere five sentences, the first of which was "The proof requires but a few words." The second and third sentences acknowledged what the copper companies effectively conceded: that they generated large amounts of destructive sulfur dioxide, that sulfur dioxide transformed in the atmosphere to an acidic form, and that the toxic mass flowed over the border into Georgia. The mass of reports, affidavits, maps, and experimental data by chemists, entomologists, geologists, and Gifford Pinchot's foresters convinced the Court that, "on the evidence the pollution of the air and the magnitude of that pollution are not open to dispute." Moreover, damage from the fumes was "on so considerable a scale to the forest and vegetable life, if not to the health, within the plaintiff state as to make out

---

<sup>101</sup> Ibid., 238.

a case within the requirements of *Missouri v. Illinois*.” This was Holmes’s third citation to the 1901 decision in his terse opinion.<sup>102</sup>

In short order, Holmes demolished most of the legal and factual defenses raised by TCC and DSC&I. The last legal defense, laches, fared no better. Georgia had not slept on its rights. It filed suit in 1904 when smoke damage became intolerable, and then in a settlement with the copper companies, entered a dismissal without prejudice to assess pyritic smelting and tall stack technologies. It then re-filed the case only when damage from new methods proved to be even worse.<sup>103</sup>

Holmes made no reference to the opinion he wrote the previous year in *Missouri II*. That left the copper companies wondering why Georgia won the right to an injunction where Missouri failed. Georgia succeeded by avoiding the two weaknesses of the Missouri case. Georgia lacked a significant smelting industry of its own, so it was not subject to the doctrine of unclean hands. It also enjoyed the advantage of being able to present the tremendous visual impact of sulfide dioxide pollution upon local vegetation. Where Holmes struggled with “the inference of the unseen” in *Missouri v. Illinois*, he seized upon the photographs and other depictions of the miles of naked gullies in the Ducktown Basin to declare that “the pollution of the air and the magnitude of that pollution are not open to dispute.” In a very real way, the arresting landscape of the Ducktown Desert secured Georgia’s victory.”

Upon reading the opinion, Howard Cornick’s partner, John H. Frantz, grouched to James B. Parks that “the Court dodged every question in the case and has decided it upon a ground which never occurred to anybody on either side of the case.” There was a certain amount truth to

---

<sup>102</sup> Ibid., 238-39.

<sup>103</sup> Ibid., 239.

his comment in the way that the Court brushed aside all of the tried and true legal defenses so often applied in private nuisance litigation. Yet the opinion confirmed that for all of their frantic grasping, the state's lawyers had managed to fix upon the two key elements of the case: state sovereignty and natural resources. John C. Hart and Ligon Johnson stressed the sovereignty issue, and in particular the *Missouri v. Illinois* opinion in their earlier briefs. Their choice of the invasion metaphor was well founded. And they successfully linked the state's case to the national drive for natural resource conservation. The brief exchange between Will Shippen, the logger, Harold Day Foster, one of Gifford Pinchot's government foresters, and Attorney General Hart, at the outset of Georgia's second Supreme Court case had ramifications far beyond the expectations of any of them.

None of the lawyers knew which justice would be assigned the duty of drafting the opinion after the trial. The decision in *Missouri II* gave Georgia's lawyers reason to dread another opinion by Justice Holmes. The state was nonetheless fortunate that the task was assigned (or perhaps co-opted) by Holmes. His rulings arose from the legal philosophy he articulated twenty-six years earlier in his 1881 volume, *The Common Law*. There he wrote, "the life of the law has not been logic: it has been experience." He added, "the felt necessities of the time, the prevalent moral and political theories, intuitions of public policy...even the prejudices which judges share with their fellow-men, have a good deal more to do than the syllogism in determining the rules by which men should be governed." Lawyers for the Tennessee Copper Company and the Ducktown Sulphur, Copper & Iron Company understandably embraced the powerful logic of nuisance law as developed over centuries of private disputes. They had the *Mountain Copper* opinion and many other favorable cases on their side. Hart and Johnson struggled to present a viable plaintiff's case within the framework of those principles while

recognizing that traditional nuisance law failed to encompass cross-border pollution on the regional scale manifested in Ducktown.<sup>104</sup>

The genius of their advocacy lay in their wholehearted embrace of the national movement for natural resource conservation. Their brief on final hearing revealed the real heart of their case. The document contained only two case references. Instead of the usual copious legal citations, almost every one of its sixty-eight pages quoted the testimony of the experts to present Ducktown smoke as a conservation nightmare that threatened timber supplies in the Southern Appalachian forests, and which imperiled one of the nation's great watersheds with the manifold evils of denudation and erosion. In so doing, they aligned Georgia's claim with one of "the felt necessities of the time" for conservation, and with the watershed protection doctrines of George Perkins Marsh that, by 1907 had become one of the "prevalent moral theories" shaping the mission of the Bureau of Forestry. By welcoming government technical expertise of every sort, the two Georgians covered the Ducktown story with the "intuitions of public policy" that animated Theodore Roosevelt's administration. Justice Holmes was a Roosevelt appointee and could not be expected to be "wholly free of the prejudices which judges share with their fellow-men."

\*\*\*

There remained the question of a suitable remedy. The Court's ruling that Georgia was entitled to an injunction came with a heavy note of reluctance. Holmes wrote, "Whether Georgia, by insisting upon this claim is doing more harm than good to her citizens is for her to determine," adding that, "the possible disaster to those outside the State must be accepted as a consequence of her standing upon her extreme rights." With those concerns in mind, the Court

---

<sup>104</sup> Oliver Wendell Holmes, Jr., *The Common Law* (Boston: Little, Brown, 1881), 1.

declined to issue the injunction immediately. It instead ordered Georgia to return five months later in October with a proposed decree of injunction “after allowing a reasonable time to the defendants” to complete the acid plants “to stop the fumes.”<sup>105</sup>

Georgia won the legal battle by gaining the terrible power to shut down the copper companies. With it came the power to destroy thousands of jobs and a major portion of the North Georgia economy. That power would embroil Hart and his successors in a vigorous political war for another decade.

---

<sup>105</sup> Georgia v. Tennessee Copper Co., 206 U.S. at 239.



Figure 5. Photograph showing housing for mining families in the Ducktown Basin. The image, which bears the caption, “Five miles of hills denuded of all vegetation,” was submitted in evidence by the state of Georgia to the Supreme Court for the 1907 hearing of *Georgia v. Tennessee Copper Co.* Courtesy of the National Archives, Washington, D. C.

## CHAPTER 7:

### THE SEARCH FOR A REMEDY: ATTORNEY GENERAL HART, THE NATIONAL FARMERS UNION, AND SULFURIC ACID, 1907-1910.

Some legal victories bear the sweet sense of finality. The criminal defense attorney who wins an acquittal for a murder suspect can celebrate with the added pleasure that comes from closing a file. Other lawyers, especially those paid on an hourly or incremental basis, are happier when a file remains open ad infinitum. The chancery case at the center of Charles Dickens's *Bleak House* lasted for the duration of his nine-hundred page novel as lawyers on both sides milked the estate for their fees. The case ended only when the drain of fees exhausted the assets of the estate, rendering the litigation moot. Attorney General John C. Hart won a great legal victory for the state in *Georgia v. Tennessee Copper Co.* but enjoyed neither the sense of finality nor the financial rewards of an ongoing case.<sup>1</sup>

There was a time when Georgia's attorneys general received fees for court appearances. That ended when the state constitution of 1877 placed the office on a salaried basis. Hart earned \$2,000 per annum from the state, a handsome salary compared to the earnings of laborers at the time, but a pittance compared to the large fees received by the corporate lawyers he regularly bested. His income bore no relationship to his case load. Georgia's constitution mandated that his

---

<sup>1</sup> *Georgia v. Tennessee Copper Co.*, 206 U.S. 230 (1907).

understaffed office handle every appeal of capital cases and every civil claim to which the state was a party. As his case load increased, his income remained flat.<sup>2</sup>

The situation would have been a little more tolerable if his victory in *Tennessee Copper* allowed him to close that voluminous file. It did not. The Supreme Court's decision of May 13, 1907 granted the state the right to an injunction to abate sulfurous smelter smoke released at the works of the Tennessee Copper Company in Copperhill, and at the Ducktown Sulphur, Copper & Iron operations at Isabella. Yet, the Court reset the case for the following October to determine the form of the injunction, while at the same time openly questioning the wisdom of ordering an injunction at all. In his 1907 opinion, Justice Oliver Wendell Holmes wrote, "Whether Georgia by insisting upon this claim is doing more harm than good to her own citizens is for her to determine." He then warned, "The possible disaster to those outside the state must be accepted as a consequence of her standing upon her extreme rights." His note of reluctance and the six-month delay before the next hearing on the case left Hart and Georgia's entire political establishment open to pressure from all sides about the course to be taken by the state.<sup>3</sup>

The opinion established Georgia's right to an injunction to abate sulfur smoke generated by the copper companies, though without determining the nature and form of the injunction. The general principles of equity left considerable room for judicial creativity in devising the terms of an injunction. It could limit the amount of ore processed or the amount of sulfur dioxide released. The court could mandate use of smoke abatement technology. It could, with a view to farming interests, limit the amount of smelting conducted during the growing season. Or, it could ban production altogether. Whatever it did, the parties were aware that if the injunction was too

---

<sup>2</sup> Hart's compensation is discussed in "Attorney General Hart and His Important Work," *Atlanta Constitution*, 20 November 1904, A5.

<sup>3</sup> *Ibid.*, at 239.

draconian, it could force closure of the copper mines and cause economic collapse in the Ducktown region, similar to that which occurred when the mines closed for other reasons in 1878. If too mild, the zones of smoke damage could extend ever further to encompass more farms and timberlands to the harm of farmers and timber owners. And there remained the question of who, if anyone, would advocate for the health of nature for nature's sake.<sup>4</sup>

The search for a remedy was more than a matter of jurisprudence. It was a political struggle fought at the local, state, and national levels for over a decade. Smoked-out mountaineer farmers massed their voices to insist upon an injunction, often with the active encouragement of timber magnate, Will Shippen. Others, fearing the unemployment and economic collapse that would follow if the mines became subject to an onerous injunction, insisted upon forbearance. As the issue dragged on year by year, the National Farmers Union entered the dispute. Underneath the competing voices lay the practical issue of what needed to be done, and indeed, what could be done, in terms of technology, to stem additional smoke damage.

\*\*\*

As spring advanced toward summer, Georgia's growing ambivalence to the case soon became apparent. The *Atlanta Constitution*, normally a reliable advocate for the state in the smoke wars, published two different assessments of the decision on succeeding days. On May 14, 1907, the headline read, "Copper Plants are Nuisances—Supreme Court Makes Ruling in Case—Georgia Wins Great Fight." The reporter described the case as a "notable victory" that "will put a prompt and emphatic end" to the smoke damage. In the next day's paper, the headline declared "Copper Plants Are Given Time—Court Decision Allows Opportunity to Change

---

<sup>4</sup> For a historical view of the flexibility of injunctive remedies, see Peter Charles Hoffer, *The Law's Conscience: Equitable Constitutionalism in America* (Chapel Hill: University of North Carolina Press, 1990). As will be seen in Chapter 8, such flexibility would be demonstrated by the Supreme Court in 1915 when it issued an injunction specifying limits upon the permissible amounts of sulfur dioxide releases during and after the growing season.

Methods—Great Expense Involved.” The author acknowledged the victory, while stating “it does not seem to go the extent that the state would like.” The Supreme Court’s six-month delay before the next hearing allowed the copper companies “to continue the dissemination of these gases” while granting them time for construction of acid collection plants. If the plants were successful, “it is believed the requirements of the Court will be met.” If not, “it is expected the plants may have to close down,” with dire consequences: “the entire copper industry of the nation would be crippled, thus affecting the world’s copper market,” with personal suffering to the five thousand people employed in the Ducktown copper belt.<sup>5</sup>

News of a smelter case in Utah gave all parties in the Georgia case added concern about the effect of an injunction against the copper industry in Ducktown. In *Godfrey v. American Smelting & Refining Co.* (1906), a group of over four hundred farmers led by James Godfrey joined suit in the Federal District Court of Utah against American Smelting (ASARCO) and four other smelting firms that operated in the Salt Lake Valley. The court noted the impact of pervasive sulfur dioxide and arsenic pollution upon local crops and livestock. It then refused to apply the balancing test used in *Madison v. Ducktown Sulphur, Copper & Iron, Co.* (1904) on the grounds that the test was peculiar to Tennessee law because it was based upon that state’s authorizing statute, rather than a common principle of equity applicable to other states. Then, on November 6, 1906, the court issued a decree against all of the smelting firms, “enjoining the defendants from the further roasting or smelting of sulfide ore carrying over 10 percent sulfur” and also prohibited “the further discharging into the atmosphere of arsenic.” The five smelting firms were given leave to apply in the future for modification of the decree if they could show that new technology or changing conditions no longer warranted the injunction. In the meantime,

---

<sup>5</sup> “Copper Plants are Nuisances,” *Atlanta Constitution*, 14 May 1907, 5; “Copper Plants are Given Time,” *Atlanta Constitution*, 16 May 1907, 6.

the decree effectively shut down the smelting industry in the Salt Lake Valley. Unless and until reason for modification could be shown, the injunction effectively shut down the smelting industry.<sup>6</sup>

The *Godfrey* decision had serious implications for both sides of the Georgia case. The Ducktown copper industry relied upon copper ore containing 25 percent or more sulfur, far in excess of the 10 percent limit set for Utah smelters in *Godfrey*. It followed that if a similar decision were rendered by the Supreme Court in the Georgia case, then the Tennessee Copper Company and Ducktown Sulphur, Copper & Iron Company would have to close their operations. For their part, Attorney General Hart and fellow Georgia officials had reason to be concerned about the backlash that *Godfrey* generated against Utah farmers. The injunction against the five Utah smelting companies eliminated thousands of industrial jobs in Salt Lake City area. Some of the smelters closed permanently; others relocated, forcing their workers to uproot or find other work. Only one, ASARCO, sought and achieved modification of the decree to continue operations at its existing location. The *Salt Lake Tribune* observed that “it began to dawn on

---

<sup>6</sup> The decree of the trial court is quoted from the appeal to the United States Circuit Court of Appeals, *American Smelting & Refining Co. v. Godfrey*, 158 F. 225, 228 (8<sup>th</sup> Cir, 1907) (affirming the injunction). The court’s view of the Tennessee balancing test as a statutory construction was at odds the growing trend of American courts, see for example, Joel Franklin Brenner, “Nuisance Law and the Industrial Revolution,” *Journal of Legal Studies* 3 (1974): 403-33; Peter C. Hoffer, *The Law’s Conscience: Equitable Constitutionalism in America* (Chapel Hill: University of North Carolina Press, 1990), 147-79; Paul M. Kurtz, “Nineteenth-Century Anti-Entrepreneurial Nuisance Injunctions—Avoiding the Chancellor,” 17 *William & Mary Law Review* 17 (Summer, 1976): 6211-70; John P. S. McLaren, “Nuisance Law and the Industrial Revolution – Some Lessons from Social History,” *Oxford Journal of Legal Studies* 3 (1983): 155-221; D. M. Provine, Balancing Pollution and Property Rights: A Comparison of the Development of English and American Nuisance Law,” *Anglo-American Law Review* 7 (January/March, 1978): 761-821; Christine Rosen, “Differing Perceptions of the value of Pollution Abatement across Time and Place: Balancing Doctrine in Pollution Nuisance Law, 1840-1906,” *Law and History Review*, 11, no. 2 (Autumn, 1993): 303-381; Christine Meisner Rosen, “Knowing Industrial Pollution: Nuisance Law and the Power of Tradition in a Time of Rapid Economic Change, 1840-1864,” *Environmental History* 8, no. 4 (October, 2003): 565-97.

many of the affected communities...that the smoke nuisance had its advantages as well as disadvantages, that the permanent removal of the plants would stop their source of revenue.”<sup>7</sup>

As in Utah, the Georgia case was a high stakes contest that pitted mine owners and workers against farmers and timber interests. The politically contentious issues made the fate of the copper case an open question when the Georgia General Assembly convened in July for the 1907 annual session. Prohibition of alcoholic beverages was the dominant issue for the Baptist dominated legislature, but the Ducktown matter also required attention. The legislature initiated Georgia’s suit by passing resolutions in 1903 and 1904 requiring the investigation of smoke damage in the Ducktown Basin and directing the governor and attorney general to file suit if necessary to fight the problem. Now that the Supreme Court granted the state the right to an injunction, attention returned to the General Assembly to determine what instructions it would issue, if any, as to whether and how the state should proceed when the matter came up before the Supreme Court in October.<sup>8</sup>

The copper companies sought to influence the legislature by preparing and circulating petitions against the injunction. J. G. Gordon, managing director of DSC&I at its London headquarters, instructed the company’s general manager in Ducktown, W. H. Freeland, and local counsel, James G. Parks, “to take some pain (and expense if necessary) in getting petitions signed both in Georgia and Tennessee, setting forth the great loss and suffering which would be caused by the discharge of the employees of the Companies.” The notion of a company petition

---

<sup>7</sup> *Salt Lake City Tribune*, 28 December 1906, quoted in John E. Lamborn and Charles S. Peterson, “The Substance of the Land: Agriculture v. Industry in the Smelter Cases of 1904 and 1906,” *Utah Historical Quarterly* 53, no. 4 (1985): 308-25 (quotation at 321); see also Michael A. Church, “Smoke Farming: Smelting and Agricultural Reform in Utah, 1900-1945,” *Utah Historical Quarterly* 72, no. 3 (Summer 2004): 196-218 (discussing *inter alia* the use of bag house technology to scrub heavy metals from smelter smoke in the wake of the Godfrey decision.

<sup>8</sup> Coverage in the *Atlanta Constitution* on both matters appears in the following articles: “Committees of House Pass Busy Afternoon, 17 July 1907, 6; “Large Delegation Here for Ducktown Hearing,” 17 July 1907, 4; “Test Votes Tell Story in House—Prohibition Forces Shown to Be in Full Control of the Lower Branch,” 20 July 1907, 1.

was in itself no surprise since competition between the state and the industry for control of public opinion was a major factor in the Supreme Court litigation. It is doubtful that the General Assembly knew that the instructions for the latest petition came from the pen of an Englishman writing across the Atlantic on the ocean liner *Lucania*. That information might have added a jingoist fervor to the always present anti-corporate attitudes of the pro-injunction forces.<sup>9</sup>

W. A. Daves, a probate judge in Fannin County, wrote Attorney General Hart on behalf of the anti-copper crowd to warn about the company petition and to request that “the petition be not considered until the citizens of our county who are effected by the fumes can be fully heard on the matter.” Hart declined the request and sought to position himself above the political fray: “I consider that I am proceeding under instructions heretofore given by the General Assembly,” adding, “I shall take no part in the political side of this law suit. That is to say that I shall not advocate, nor oppose any action which the Legislature may see fit to take.”<sup>10</sup>

Hart’s response may be read as either the principled statement of a legal advocate awaiting directions from his client or as an expression of his wish that the legislature take the political heat on the injunction issue. If the latter, he was soon disappointed. Legislators heard from lawyers, company officials, and citizens speaking for and against the injunction and then washed their hands of matter. They passed Resolution No. 1, “insisting upon the state’s right to a final decree of injunction (a nod to Georgia’s mountain farmers and timber interests), but also “recognizing and realizing the vast interests involved to the copper companies and to the people dependent thereon” (another nod, this time to Georgia’s mine workers and merchants in the Ducktown District). The competing interests required that the state “act in a spirit of wisdom,

---

<sup>9</sup> J. G. Gordon and Lewis Mortimer to W. H. Freeland, per S. S. *Lucania*, 11 June 1907, DBM.

<sup>10</sup> John C. Hart to W. A. Daves, 1 July 1907; and to similar effect, John C. Hart to J. M. Clement, 2 July 1907, both GDAH, RGS 9-1-1, Box 1.

justice, and moderation,” the virtues embossed on the great seal of the state. Therefore, and “having every confidence in her Attorney-General,” the lawmakers resolved, “that the matter of final procedure is left entirely to his discretion.” They further recommended, “that he proceed liberally in the matter, to the end that no unnecessary hardship shall be imposed upon the copper companies.” Yet, “no unnecessary time shall be allowed them to complete the structures they are now building to stop the fumes, to the damage and injury of the citizens of Georgia and to her public domain.” Hart was thus forced out of the role of single-minded legal advocate acting at the behest of his government client. The lawyer was now a policy maker, a Solomon forced to decide the fate of two antagonistic parties. He and his successors had lost their political cover and were now exposed to incessant pressure from both sides for the duration.<sup>11</sup>

\*\*\*

The copper companies had reason to be pleased with the resolution because Hart had a well-established pattern of delaying action in the case in hope of gaining a technological cure for Ducktown’s sulfurous smoke. He did so in 1904, when he withdrew the state’s first smoke suit, only a few weeks after it was filed, to assess whether the new pyritic smelting process would yield any improvement. When the new process failed to abate the smoke, he filed the state’s second smoke suit and then waived a hearing for a preliminary injunction to see whether Tennessee Copper’s huge three-hundred-twenty-five foot smoke stack would disperse sulfur fumes out of the Ducktown Basin. That also failed. Now, the prospect of a viable method for extracting sulfur dioxide gases, SO<sub>2</sub>, from smelter gases and converting them into sulfuric acid, H<sub>2</sub>SO<sub>4</sub>, caught the attention of the Supreme Court, the General Assembly, and Hart.<sup>12</sup>

---

<sup>11</sup> Resolution of 27 July 1907, 1907 Georgia *Laws*, v. 2, 991.

<sup>12</sup> Georgia v. Tennessee, 194 U.S. 629 (1904) (granting motions for leave to file amended bill, to dismiss state of Tennessee, and for leave to file stipulation of settlement); “Will Not Press Suit of State,” *Atlanta Constitution*, 10

The idea was not new. John Roebuck invented the lead chamber process around 1740, and Peregrine Phillips devised the contact process ninety years later. Though the chemistry and sequencing of the processes differed, they each had to accomplish three key tasks: the cleansing of furnace gases to remove soot and other contaminants, the chemical transformation of sulfur dioxide into usable sulfuric acid, and the collection and processing of the resulting acid at desired concentrations. Both processes worked in small-scale experiments under controlled conditions. The challenge was to do the same thing on a massive industrial scale using dirty gases discharged from blast furnaces. It was a problem of industrial chemistry on a massive scale. Among the problems was the creation of a container that could process the acid without being corroded by it. Early experimenters worked with glass. Large scale efforts required a bigger, less fragile container. That is why Roebuck used lead chambers. With enough lead, he could make a durable, non-corroding chamber of any size to receive and condensate the transformed gases. English chemists provided the method, though without solving the technical problems of applying it to the smelting of sulfide ores. If solved, there were potential riches to be earned from a byproduct that at present drained company resources in endless smoke litigation.<sup>13</sup>

The profit to be realized by capturing waste gases and converting them for sale in the form of sulfuric acid might have been the motive for building acid plants in Ducktown, but Robert Edward Barclay, Ducktown's leading historian and the long-time treasurer at TCC, argued otherwise. TCC started construction of the first local acid plant in 1906, in the middle of Georgia's second smoke suit. DSC&I followed with its own plant a year later. Barclay wrote that

---

February 1904, A3; "Ducktown Case Out of Court," *Atlanta Constitution*, 19 April 1904, 5; John C. Hart, *Sixth Annual Report of John C. Hart, Attorney-General of Georgia* (Atlanta: Franklin-Turner, 1906), 3-6.

<sup>13</sup> David M. Kiefer, "Sulfuric Acid: Pumping Up the Volume, An 18<sup>th</sup>-century English Physician's Lead Cathedrals Helped Launch a Chemical Industry," *Today's Chemist at Work*, 10, no. 9 (September 2001): 57-58.

“production of copper and the attendant waste of sulfur would have gone on so long as copper showed a profit.” Tennessee Copper built the first plant “because the citizens of Georgia had the industry here all but shut down because of alleged smoke damages, and the plant was erected in order that the production of copper might be continued.”<sup>14</sup>

Yet the plants could not have been built much sooner than they were. Smelter gases had first to be collected before sulfur dioxide could be removed for processing into acid, and this could not be done until DSC&I discovered the pyritic smelting in 1902. The question was not whether the companies could have built acid plants sooner, but whether they would have delayed building them for years to come without the pressure of Georgia’s lawsuit. It is on this point that the Tennessee Copper Company and the Ducktown Sulphur, Copper & Iron Company began to diverge in their responses to the suit.

For TCC, less than two years elapsed between the implementation of pyritic smelting and the start of construction for the new acid plant. And once it committed to the project, whether in response to legal pressure, for business opportunity, or both, it did so on a colossal scale. The new chamber acid plant erected atop the knoll at Copperhill was the largest in the world at the time, with a capacity of 300 to 400 tons of acid production per day, or about 100,000 tons per annum. It contained 26 large chambers, each 50x50 feet at the base and 75 feet high, and another 72 smaller ones of 10x10x50, with a total volume of 2.1 million cubic feet. Every interior surface of the chambers was lined with 8,000,000 pounds of half-inch thick lead sheets. P. J. Falding a young chemical engineer who had yet to establish his reputation, solved most of the technical problems posed by use of the chamber process on such a scale. He succeeded in proving his ideas, but at the cost of his health. One account states, “for a week he stayed night and day at the plant, watching the machinery with eagle eye, testing every valve, pipe, screw and compartment

---

<sup>14</sup> Robert Edward Barclay, *The Copper Basin, 1890 to 1963* (Knoxville? Tenn.: by the author, 1975), 39-40.

of the great venture until he broke down, a nervous wreck.” The company sent him on vacation and brought in Utley Wedge to solve the remaining problems.<sup>15</sup>

Officials from Tennessee Copper stated that “when the company began construction of the plant, it had primarily in mind the relieving of the injury to the vegetation,” and that “it was skeptical about the profits to be earned.” The statement elevated altruism (or its cynical cousin, litigation avoidance) over the profit motive to a dubious level. The enormous size of the TCC plant when compared to the ten ton plant DSC&I built in 1907 suggests that the English company was the far more skeptical and cautious of the two firms.<sup>16</sup>

The Ducktown company refused to authorize an acid plant until forced to do so by the Supreme Court’s May 1907 decision. The ruling forced an emergency board meeting in London. The directors realized that failure to build an acid plant at Isabella, when TCC was already building one at Copperhill, would be construed by Georgia and the Court as corporate defiance that warranted injunctive remedy. The board instructed Freeland to proceed with the construction of a modest ten ton acid plant using the contact method.<sup>17</sup>

The DSC&I board made its decision without any confidence that acid condensation from sulfur smoke was practicable or profitable. A larger plant with a capacity of a hundred or more tons would make better economic sense, but the board did “not feel justified under any circumstances, in taking the risk of erecting a large sized contact plant...before they have had an

---

<sup>15</sup> “Tennessee Copper Co.,” *Wall Street Journal*, 14 May 1907, 5; “\$1,000,000 Spent by Tennessee Copper Company to Keep Sulphur Fumes from Injuring Vegetation,” *Atlanta Constitution*, 24 July 1910, B7; “Conservation of Injurious Gases of Ducktown Copper Plants Results in Enormous Benefits to Farmers of the South,” *Atlanta Constitution*, 2 August 1911, 5.

<sup>16</sup> “Conservation of Injurious Gases,” *Atlanta Constitution*.

<sup>17</sup> J. G. Gordon and Lewis Mortimer to W. H. Freeland, 11 June 1907; W. H. Freeland to J. G. Parks, 12 June 1907, both DBM.

experimental plant at work for some time.” General Manager Freeland thought otherwise from his office in Tennessee and had so informed the board. That earned him a stern rebuke: “we wish to say that we are disappointed that you take such a strong line in your letter...as to the possibilities of making even a moderate profit out of this product, and to tell you that we do not in this matter agree with you at all.” The reprimand, harsh on its face, must have been all the worse, coming as it did from directors who were three thousand miles and an ocean away from the great acid plant Tennessee Copper was building only three miles from Freeland’s office.<sup>18</sup>

If the lawsuit was the immediate impetus for the construction of the acid plants, the great scale of the TCC project suggested that it had confidence in the economic potential of the venture. Its New York directors sensed a business opportunity that the more remote London directors of DSC&I failed to appreciate or were too conservative to embrace. Tennessee Copper gambled big with new technology at great expense and stood ready to reap the profits that soon followed. As reported in one article, “scarcely had it decided upon building the plant, when offers to purchase the acid began to arrive from all parts of the surrounding country.”<sup>19</sup>

\*\*\*

Sulfuric acid was (and is) the most important industrial chemical used in fertilizer, petroleum refining, metal processing, automobile batteries, explosives, dyes. It is also a key feed stock for the production of a wide array of chemical products. Its use in the manufacture of phosphate fertilizers made sulfuric acid a bonanza product for the Tennessee Copper Company, and eventually for the Ducktown company. The application of sulfuric acid made in the

---

<sup>18</sup> Ibid., 3, 8.

<sup>19</sup> Conservation of Injurious Gases,” *Atlanta Constitution*.

Ducktown Basin to the South's abundant deposits of phosphate rock produced superphosphate, a potent fertilizer readily absorbed by cotton and most other crops.<sup>20</sup>

The South made cotton its king, but the king imposed a heavy tax in the form of soil depletion, especially in the Piedmont uplands of the southeastern states. Planters constantly cleared new fields on their plantations to replace worn-out older fields. When all the tillable land on a given farm was exhausted, owners took their slaves with them and moved west to repeat the cycle on virgin lands. Soil infertility from cotton monoculture impelled westward expansion across the southern tier of America, all the way from the Atlantic Ocean to Texas, and in turn, proved to be a major factor in the national debate over the expansion of slavery. James Henry Hammond of South Carolina lamented, "Our most fateful loss, which exemplifies the decline of our agriculture, and the decay of our slave system, has been owing to emigration."<sup>21</sup>

Edmund Ruffin, a Virginia agronomist and editor of the *Farmers Register*, devoted a major portion of his life's energies to the replenishment of southern soil with the use of marl (calcium carbonate from fossilized seashells) and various organic substances. His methods achieved success in the fields, but planters generally believed that the use of slave labor to clear new cotton land yielded a higher return on investment than labor expended to replenish older acreage. The disappointed Ruffin then turned from agronomy to become one the South's leading secessionists. A famous photograph depicted him as a grim-faced elderly man with a shock of shoulder-length white hair, posing in a military uniform with musket in hand. He achieved dubious fame as the one who commenced the Civil War by firing the first shot at Fort Sumter,

---

<sup>20</sup> For the superphosphate industry, see Lewis B. Nelson, *History of the U.S. Fertilizer Industry* (Knoxville: Tennessee Valley Authority, 1990), 55-96.

<sup>21</sup> James Henry Hammond quoted in Steven Stoll, *Larding the Lean Earth: Soil and Society in Nineteenth-Century America* (New York: Hill and Wang, 2002), 160. Stoll's work is a survey of soil amendment strategies (or lack thereof) in antebellum America, with attention to their social and political implications.

and then by committing suicide with another shot, this time to the head, after the South's surrender at Appomattox.<sup>22</sup>

The Civil War ended slavery, and settlement of the South's cotton lands eliminated westward expansion as a viable response to soil infertility. Farmers in the region were now more receptive to the use of fertilizer to restore their existing lands. Phosphate had long been valued as a fertilizer long before agriculturalists understand its chemistry and the science of plant nutrition. It is one of the three primary nutrients listed on every bag of fertilizer, the others being nitrogen and potassium. On a bag of 10-10-10 fertilizer, phosphate is the middle number. The substance is an essential component of all forms of plant and animal life and is found in trace amounts within every living cell. Phosphate can thus be obtained from biological remains. A German, Hennig Brandt, discovered elemental phosphorous in 1669 by boiling down urine.<sup>23</sup>

By the late seventeen hundreds, Europeans obtained phosphate fertilizer by grinding the bones of animals—and humans. Justus von Liebig, a pioneering agricultural chemist, noted England's aggressive effort to import bones for its fertilizer mills: "Already in her eagerness for bones, she has turned up the battlefields of Leipzig, and Waterloo, and of the Crimea; already from the catacombs of Sicily she has carried away the skeletons of many successive generations." England annually imported a supply of bones "equivalent of three million and a half of men...Like a vampire she hangs from the neck of Europe." American bone mills acquired much of their supply, for a time, from the bone pickers who roamed the Great Plains to gather

---

<sup>22</sup> William M. Mathew, *Edmund Ruffin and the Crisis of Slavery in the Old South: The Failure of Agricultural Reform* (Athens: University of Georgia Press, 1988); Stoll, *Larding the Earth*, 150-165. Marl was more useful to adjust soil acidity than as a source of nutrients.

<sup>23</sup> Arch Fredric Blakey, *The Florida Phosphate Industry: A History of the Development and Use of a Vital Mineral* (Cambridge, Mass.: Harvard University Press, 1973), chap. I, "The Search for Phosphorus: Historical Background," 1-12.

millions of buffalo skeletons left in the wake of hide hunters. The gigantic piles of bones stacked along railroad tracks for shipment back to the East stood as mute testament to the former herds.<sup>24</sup>

Bones alone could not meet the South's pressing need for fertilizer. Farmers turned to other sources of nutrients such as guano, the deposited droppings of seabirds. It proved an even better fertilizer than bone meal because it contained significant amounts of nitrogen in addition to phosphorous. A fine fertilizer, it was also expensive because it was mined in the Pacific Ocean on desert islands off the shore of Chile and Peru and then shipped around Cape Horn to American ports. Another fertilizer, cottonseed oil, was a home grown product. Hundreds of Georgia fertilizer dealers dealt in both substances by the end of the nineteenth century, as reflected in company names such as Davisboro Cotton Oil and Fertilizer Co. and Elberton Guano Co. Nonetheless, limited supplies and high prices left tenant farmers and landowners with a shared longing for a cheaper source of plant nutrients, knowing that fertilizer was a major expense for each growing season.<sup>25</sup>

The discovery of enormous deposits of phosphate rock in South Carolina, Florida, Tennessee, and North Carolina gave promise of local fertilizer that was easy to mine and cheap to ship. The rock was full of fossil bones—an 1870 visitor to a South Carolina mine said, “very often well defined bones are found, heads of giant mastodons, teeth of sharks, ribs, etc.”—leading to the accurate surmise that it contained the same nutrient as bone meal. Yet it was also hard to apply because the insoluble nature of phosphate rock kept nutrients from reaching plants. Sir John Bennett Lawes, an Englishman, and Sir James Murray, an Irish physician, discovered

---

<sup>24</sup> von Leibig quoted in Nelson, *History of the U.S. Fertilizer Industry*, 11; Andrew C. Isenberg, *The Destruction of the Bison: An Environmental History, 1750-1920* (Cambridgeshire: Cambridge University Press, 2000), 123-163.

<sup>25</sup> Affidavit of T. G. Hudson, Georgia Commissioner of Agriculture, September, 1906, *Georgia v. Tennessee Copper Co.*, United States Supreme Court, October Term 1906.

that mixing crushed bones with sulfuric acid produced superphosphate that was readily absorbed by plants. The process also worked upon phosphate rock. (Each inventor received an English patent for the process on the same day, May 23, 1842, a coincidence giving rise to years of litigation to determine primacy of invention.)<sup>26</sup>

The South had phosphate rock and its cotton industry promised a huge market for superphosphate fertilizer. The *Atlanta Constitution* gave regular coverage as early as 1869 to superphosphate and numerous schemes to manufacture it. The missing component for commercial success was a cheap and abundant supply of sulfuric acid. Fertilizer manufacturers first turned to sulfur mined in a relatively pure state from the bowels of Sicily's volcanoes. They also imported pyrite ores from Spain, Norway, and Portugal for conversion into acid. Both European demand for acid and shipping costs elevated the price of acid, and hence fertilizer in America. It would have been cheaper to make acid in Europe and ship it in liquid form, rather than shipping rocks to America for reduction there, but as Dr. N. P. Pratt, a chemist from Roswell, Georgia, noted, "this acid is the troublesome component. It is dangerous to handle, expensive to transport, and must be made on the spot where it is to be used."<sup>27</sup>

Dr. Pratt, like many others, cast wishful eyes to the abundant supplies of iron pyrites and copper pyrites to be found at Ducktown. In 1882, a promoter for construction of a rail line to Ducktown boosted his project by pointing to the great deposits of pyrites found there: "The sulfur for the making of sulfuric acid which is now so enormously used in the treatment and preparation of fertilizers made from phosphates found in the southern states, and which was

---

<sup>26</sup> Blakey, *The Florida Phosphate Industry*, 7, see generally 1-12; "A Visit to the Phosphate Wells of South Carolina," *Atlanta Constitution*, 24 March 1870, 1

<sup>27</sup> Nelson, *History of American Fertilizer*, 84-88. Early articles on superphosphate and acid in the *Atlanta Constitution* include, "The Atlanta Acid and Fertilizing Company," 19 March 1869; "Fertilizer—Georgia State Agricultural Society," 28 December 1873, 3 (price quote); "State Agricultural Convention," 11 August 1875, 3; "A Big Bonanza—Fertilizers—How to Make Them," 17 April 1879, 1 (Dr. Pratt).

formerly wasted, is worth more than the copper.” The sulfur, “is alone sufficient to pay for the mining of both.” It was a prescient comment that became reality in the twentieth-century. The Tennessee Division of Geology reported in 1966 that “sulfuric acid is the most important product of the copper mining industry in Tennessee, exceeding copper in dollar value.”<sup>28</sup>

\*\*\*

Where the Tennessee Copper Company saw a valuable new product line, Attorney General Hart hoped that that acid conversion would prove to be the happy end to his long search for a technological remedy to the smoke problem. Acid conversion had a powerful logic to recommend it. All agreed that sulfur dioxide was the prime toxic agent in smelter smoke. If companies could remove sulfur dioxide from the fumes, and then convert it to acid, then the smoke would be cleaner and less damaging. And the production of sulfuric acid might benefit Georgia farmers by reducing the price of superphosphate fertilizer.

TCC officials and their counsel did all they could to encourage Hart’s favorable view of the new plants. As the October, 1907, Supreme Court hearing on the terms of the injunction approached, they actively courted his favorable view of recent developments. They encouraged his visit to the TCC works at Copperhill in September, carefully coordinating schedules so that he would be escorted by P. J. Faulding, the brilliant young chemical engineer in charge of constructing the acid plant. And upon arrival, they presented him a detailed letter setting forth the economic importance of TCC to the citizens and economy of Georgia. A total of 2,125 men worked for the company during the first eight months of 1907: many full-time, and others “who lay off on their own accord” to tend to farming and other interests. Three-fifths of them of the company’s employees came from Georgia. As for purchasing, “this entire region is very closely

---

<sup>28</sup> Robert J. Floyd, *Tennessee Rock and Mineral Resources*, Tennessee Department of Conservation, Division of Geology, Bulletin no. 66 (Nashville, Tenn., 1966), 50.

related to the State of Georgia in a commercial way,” with “by far the larger part of the supplies consumed here by the population coming from the State of Georgia.”<sup>29</sup>

The great size of the acid plant under construction at Copperhill made a strong impression upon Hart. The smaller test facility underway at the DSC&I works in Isabella was not so convincing, but at least it was in progress. TCC promised to have its plant in operation by December 1, and DSC&I would soon follow. The Attorney General returned to Atlanta the following day, September 28, 1907, and announced to the press that, “I was more than pleased with the progress that is being made in this direction, and I am satisfied that these companies are consciously and earnestly endeavoring to equip their plants so as to prevent any further damage.” He then declared his intention to leave the question of the injunction open when the Supreme Court convened the following month. That would allow for completion of the plants and time to assess their impact upon the smoke problem.<sup>30</sup>

Hart’s visit was notable for another train incident, this time a wreck that he prevented. A portion of his inspection tour occurred on a company train that ran over the extensive local rail network serving the mines. The train stopped when a fire at the plant attracted the attention of most of his party. Hart remained at the train with an Englishman, a director from DSC&I. He then noticed that another mine locomotive was pushing a flatcar with twenty-five mine workers toward his stationary train. It was dark. The engineer of the oncoming train did not see Hart’s train (it had no lights). He grabbed a lantern, and the Englishman handed him some matches. He struck a match just in time for the engineer to see it and stop the train. Had they collided, the

---

<sup>29</sup> Howard Cornick to John C. Hart, 3 September 1907 (invitation and arrangements regarding Hart’s visit); B. Britton Gottsberger, Asst. Mgr. to John C. Hart, 27 September 1907 (2,125 employees, of which 1,275 came from Georgia), both GDAH, RGS 9-1-1, Box 1

<sup>30</sup> “Copper Mines Do Good Work,”

twenty five men on the flat car could have been killed. Though Hart “modestly refused to discuss the incident,” others gladly did so.<sup>31</sup>

Hart’s action at the train showed quick thinking. His decision about the injunction was the result of slow deliberation that sought to balance the needs of Georgia smoke victims with the needs of the Georgia mine workers and merchants who depended upon the copper companies. It was good politics and good economics if it worked. It was also good legal thinking under the principles of equity. As would any competent lawyer, he had to anticipate what the Supreme Court might do at the injunction hearing. The Court was sitting as a court in equity, and as such, had broad discretion to frame an injunction ranging from permissive to punitive, and more likely something in between. Hart’s decision to postpone an injunctive remedy represented his best guess about the Court’s next move.

The opinion by Justice Holmes strongly hinted that he and the Court wanted to fashion a remedy that served both sides. The Court supported Georgia’s right as a sovereign state to have “the last word as to whether its mountains shall be stripped of their forests and its inhabitants shall breathe pure air.” It also delayed its final order to allow the companies “to complete the structures they are now building.” Though it was too soon to tell if the acid plants would work, the pace of construction evidenced a cooperative spirit by the copper companies. The Court would be loathe to punish their present good behavior with a harsh injunction. Hart’s decision to postpone the state’s request for a remedy did no more and no less than the Court would have done on its own. The Court wanted a technical solution to the smoke problem as much as he did.

---

<sup>31</sup> Ibid.

And having made the decision himself, he preserved the good opinion of the Court that would have been lost had he requested severity before plants were finished.<sup>32</sup>

With these thoughts in mind, Hart filed his Motion for Leave to Postpone Entry of Final Decree. He declared that Georgia continued to “stand upon her rights,” and to adhere “to her determination that the fume injury within her territory shall be remedied,” but would not “unduly press her rights for an injunction” in light of recent work on the acid plants. He then wisely recited the 1907 General Assembly Resolution for political support, before making his formal request for an order “preserving complainants’ full rights herein but postponing the entry of decree for injunction,” for an indefinite time, “until further application by complainant.” It was so asked, and so ordered, bringing the case to another temporary pause.<sup>33</sup>

\*\*\*

The threat of a federal injunction from the United States Supreme Court was dormant for the moment, and there was no realistic prospect of an injunction from the state courts. The Tennessee Supreme Court removed that threat with its 1904 decision in *Madison v. Ducktown Sulphur, Copper & Iron Co.* The Tennessee decision upheld a recent statute, adopted at the behest of the copper companies, that required application of the balance of interests test which required local judges to weigh the economic impact of the proposed injunction against the harm suffered by the smoke victims. The Tennessee justices held that damage to the farms of William Madison and his fellow mountaineers, “all thin mountain lands, of little agricultural value,” failed to warrant an injunction that would “blot out two great mining and manufacturing enterprises, destroy half the taxable values of a county, and drive more than 10,000 people from

---

<sup>32</sup> *Georgia v. Tennessee Copper Co.*, 206 U.S. 230, 237, 239 (1907).

<sup>33</sup> Motion for Leave to Postpone Entry of Final Decree, 21 October 1907, *Georgia v. Tennessee Co.*, No. 1 Original, October Term, 1907. The order was granted on 28 October 1907.

their homes.” Two hundred citizens banded together in September, 1910 to file one last state-level injunction suit against both companies. They hoped that the cumulative worth of their properties, estimated at \$300,000 would tilt the balance of interests test in their favor. The effort soon collapsed. The Polk County Chancery Court granted TCC’s motion for dismissal four months later, and later dismissed the suit against DSC&I for want of prosecution.<sup>34</sup>

Elimination of the immediate fear of injunction allowed trial counsel for both companies to turn their attention to the scores of pending suits for smoke damages filed by local farmers and timber owners. The law of nuisance allowed plaintiffs to select their desired remedy. The state of Georgia chose to pursue the equitable remedy of injunction in the United States Supreme Court. Most private smoke victims filed actions at law for monetary damages, seeking compensation for losses sustained to their crops and timber caused by sulfur smoke. After the *Madison* decision, suits for damages were the only viable remedy that private citizens could seek.

Cases for smoke damage during the first decade of litigation, roughly 1895-1905, were stymied by confusion on the part of plaintiffs’ lawyers as they learned how to frame and litigate a suit that would stand on appeal. They learned in *Padgett* (1896) to be alert for defective summons and return of process. The *Barnes* decision in 1900 confirmed that they could establish a substantive case in nuisance for smoke damage, thanks to the court’s ruling that smelter smoke was an actionable nuisance. In *Fain* (1902), farmers defeated the Ducktown company’s favorite tactic of enjoining suits at law on the grounds of vexatious litigation and collusive multiplicity of actions. The *Jones* decision in 1902 taught them to be careful to join spouses as co-plaintiffs when the spouses held title to the damaged tracts. And in *Swain* (1903), plaintiffs learned the

---

<sup>34</sup> *Madison v. Ducktown Sulphur, Copper & Iron Co.*, 113 Tenn. 331, 339, 666, 83 S.W. 658, 659, 666 (1904). *Davenport v. Tennessee Copper Co. and Ducktown Sulphur, Copper & Iron Co.*, Polk County Chancery Court, no. 474; “Seek to Enjoin Copper Company—Two Hundred Georgia Citizens File Bill.” *Atlanta Constitution*, 3 September 1910, 2.

hard way to file suits separately against each copper company rather than joining them as co-defendants in one action.<sup>35</sup>

As plaintiffs learned to dodge the pitfalls, defense attorneys lost their ability to delay trials. James G. Parks acknowledged that, “the delays hitherto have not been the result of continuances from term to term, but by injunction. It is plain that we have about exhausted this means.” Both companies grudgingly accepted that each term of the Polk County District Court would result in the award of damages to several more farmers. Parks wrote in 1909 that “we have tried so many of these smoke suits that the trials have become largely a matter of routine. It is seldom that any question of law comes up that amounts to anything.” That state of affairs allowed for quick trials of cases involving the typically small mountain farms. They averaged about one per day, and “of the smaller cases we sometimes try more than one a day—generally about three every two days.” Jury verdicts were usually small, from \$50 to \$300, rarely more. Many suitors chose to settle out of court for small amounts once the community became familiar with the range of recoveries. James Parker, a farmer in the community of Postelle wrote an anguished letter to TCC’s Howard Cornick on September 16, 1908, asking compensation for his farm that “no one wants to buy as all or about all the timber is killed.” He offered to settle with both companies less than a week later for a mere \$112.00 (about \$2,500 in year 2006 dollars) and a permanent smoke easement that barred future suits for damage to the property.<sup>36</sup>

---

<sup>35</sup> Padgett v. Ducktown Sulphur, Copper & Iron Co., 97 Tenn. 690, 37 S.W. 698 (1896); Ducktown Sulphur, Copper & Iron Co. v. Barnes, 60 S.W. 593 (Tenn., 1900); Ducktown Sulphur, Copper & Iron Co. v. Fain, 109 Tenn. 56, 70 S.W. 813 (1902); Jones v. Ducktown Sulphur, Copper & Iron Co., 109 Tenn. 375, 71 S.W. 821 (1902); Swain v. Ducktown Sulphur, Copper & Iron Co., 111 Tenn. 430, 78 S.W. 93 (1903).

<sup>36</sup> James G. Parks to Howard Cornick, 13 February 1903 (“exhausted this means”); James G. Parks to W. B. Miller, 23 January 1909 (“matter of routine”); James Parker to Howard Cornick, 16 September 1908; James G. Parks to Howard Cornick, 16 December 1908, all DBM. The present worth calculation is based upon the Consumer Price Index as was computed using the modernworth.com website.

One Georgia smoke suitor sought to escape the pattern of delayed and paltry judgments in the Tennessee courts with a novel strategy to bring his case before a Georgia judge. All agreed that Georgia courts could not obtain personal jurisdiction over the two copper companies because they did their business in Tennessee and were incorporated in distant jurisdictions (TCC in New Jersey and DSC&I in London). A plaintiff named Williams sought to establish jurisdiction on a different basis. Personal jurisdiction depended upon the location of a person (whether an actual human or the accepted legal construction of a corporation as a person). Williams realized that *in rem* jurisdiction turned upon the location of the defendant's property. He studied the flow of TCC wagons making deliveries back and forth across the Georgia border and then had a Fannin County sheriff garnish one of them with its contents on the Georgia side of the line. Copper lawyers for TCC and DSC&I probably admired a clever legal turn when they saw one but considered it "a bad precedent, in that it will educate Georgia claimants to make a special study of the ways and means by which they can obtain jurisdiction for their courts."<sup>37</sup>

Unwanted jurisdiction in Georgia was one problem. Another was that the tactic might hinder the movement of goods by company wagons, and worse, the movement of company product, whether sulfuric acid or copper, by rail. The copper companies faced a Hobson's choice: if they shipped sulfuric acid into Georgia, they subjected themselves to Georgia jurisdiction on the smoke suits, and conversely, if they avoided Georgia jurisdiction by refusing to ship acid into the state, they would lose a major market for their new product. Parks devised a solution even more clever than Williams's jurisdiction by garnishment strategy. The attorney borrowed a principle from the law of sales and counseled the copper companies to revise their sales contracts to read "FOB Copperhill" or "FOB Isabella." The term FOB—free on board—

---

<sup>37</sup> James G. Parks to W. H. Freeland, 22 October 1908, DBM.

determined the point at which title for the goods transferred from the seller (the copper company) to the buyer (the purchaser of acid). If the sales contract read FOB Copperhill or FOB Isabella, then title to the acid transferred to the buyer at the acid plants on the Tennessee side of the border. The upshot was that the acid no longer belonged to the copper companies when it crossed over the border into Georgia and could no longer be garnished as copper company property. That solved the shipping problem for TCC and DSC&I, and compelled Georgians to litigate their smoke suits in the Tennessee courts.<sup>38</sup>

The typically small judgments awarded in the Polk County Circuit Court were absorbed by the copper companies as an item of overhead given that copper mining was booming and acid production promised a new source of wealth. Profits at the Tennessee Copper Company tripled from 1905 to 1906, and that was before its new acid plant was finished. Suits from the more prosperous farmers and from the timber companies were matter of a much greater concern.<sup>39</sup>

The best farms in the Ducktown Basin were along Hot House Creek as it ran through Georgia and North Carolina. Parks advised DSC&I General Manager Freeland that “these farmers have been pretty badly injured.” Their claims would yield higher jury verdicts because of the extent of damage, the quality of the farms, and the communal standing of the owners. “We have thus far obtained very low verdicts in nearly all our suits. We may reasonably expect heavier damages in this lot of cases.” Parks and his TCC counterpart, Howard Cornick, wavered about settlement. An agreed resolution lowered the risk of excessive awards by runaway juries, but would “serve as a precedent in other suits thereafter to be tried.” In plainer speech, “there

---

<sup>38</sup> W. H. Freeland to James G. Parks, 26 October 1908; James G. Parks to W. H. Freeland, 27 October 1908, both DBM.

<sup>39</sup> “Tennessee Copper—Profit and Loss Surplus Increased \$447,000 in Past Calendar Year,” *Wall Street Journal*, 1 March, 1907, 7.

will be trouble in undertaking to settle with people who are really injured—there will be a swarm of others who think they might just as well have a little “something” while it is going.”<sup>40</sup>

Parks engaged in lengthy settlement correspondence with A. B. Dickey on behalf of his Hot House neighbors, T. J. Willson, John J. Withrow, J. W. Anderson, F. M. Harper, J. M. Witherow, J. T. Fry, and W. L. Harper. The plaintiffs demanded settlements as high as ten thousand dollars. The companies balked and instead prepared for trial by sending inspectors to the farms and by comparing the demands to listed valuations of the properties on local tax registers. When the cases reached trial in 1908, jurors awarded Willson only \$1,090 upon a final demand of \$4,200. Withrow received \$1,200 on his demand for \$10,000, and their leader, A. B. Dickey won only \$1,065 after demanding \$9,000. Parks concluded, “we were fortunate in the outcome of the Hot House cases,” and “the plaintiffs were certainly very badly disappointed.”<sup>41</sup>

\*\*\*

Ducktown’s attorney considered the Hot House cases as “a kind of skirmish line beyond which it is not likely that we shall have any heavy suits, except from owners of large bodies of timber land lands, such as Shippen Bros., Vestal Lumber Company and such people.” Suits by the large timber companies posed risks of a greater magnitude. The great timber barons and their companies, George Peabody Wetmore, Paul E. Stevenson, the Shippen Brothers, Rosine Parmentier, J. P. Vestal Lumber Co., Ocoee Timber, Alaculsy Lumber, Conasauga Lumber, and

---

<sup>40</sup> James G. Parks to W. H. Freeland, 24 January 1908; James G. Parks to W. H. Freeland, 10 September 1908 (“a little something”), both DBM.

<sup>41</sup> James G. Parks to Howard Cornick, 7 December 1908. See letters from James G. Parks to A. B. Dickey dated 4 July 1908 (two of the same date), 11 July 1908, 17 July 1908, 9 October 1908, and 30 October 1908; and letters from A. B. Dickey to James G. Parks dated 10 July 1908, 15 July 1908, and 21 August 1908, all DBM. See also Howard Cornick to James G. Parks, 13 July 1908 (forwarding tax digests), James G. Parks to Howard Cornick, 21 September 1908 (inspectors); James G. Parks to Howard Cornick, 9 October 1908 (final demands) both DBM. The demand and recovery figures for each plaintiff combine the separate figures for the paired actions against TCC and DSC&I.

others held enormous tracts of valuable standing timber. Many holdings exceeded 50,000 acres and a few, such as that of the Shippens, were more than 100,000 acres. It followed that smoke damages, if proven, could be vastly greater than the amounts awarded to mountaineer farmers, even the substantial farmers of Hot House Creek. Jury awards in the first wave of timber suits proved this to be true. Stevenson won \$7,000 (equivalent to \$155,000 in year 2006), and Parmentier won \$6,000. Stevenson's award was roughly equal to the total of the Hot House cases. The next wave of suits promised to be much larger.<sup>42</sup>

With recoveries such as those, the timber cases could not be handled in the same routine manner as ordinary farmer suits, even though suits by both types of plaintiffs involved the same legal principles. The copper companies expected to lose on the issue of liability, so they turned their focus upon limiting the amount of damages. They needed solid expert testimony to know the number of trees that died from sulfur smoke compared to other causes such as fire, insects, and fungal diseases. They also needed to know when the trees died, for purpose of the statute of limitations. Last, they needed to determine the value of trees lost to smoke damage, a question that required knowledge of the value of various species at various ages. Mature poplar saw-timber, for example, was worth far more than immature cordwood. To answer these questions, they once again engaged the services of the German forester, Dr. Carl Alwin Scheck, at the Biltmore School of Forestry. His services did not come cheaply. He tendered a bill in the amount of \$9,065.74, which the two companies promptly paid.<sup>43</sup>

---

<sup>42</sup> James G. Parks to W. H. Freeland, 23 January 1908, DBM. The present day value was computed according to the Consumer Price Index using the conversion function on the [modernworth.com](http://modernworth.com) website.

<sup>43</sup> Howard Cornick to James G. Parks, 3 June 1908 (invoice); Howard Cornick to James G. Parks, 9 June 1908 (survey issues), both DBM.

It all came down to the problem of how to count trees on huge tracts of mountainous land with a combined area of over 400,000 acres. Many homeowners cannot accurately recall the number of trees are on their suburban lot. Schenck had to make a defensible estimate covering more than 625 square miles. The plaintiffs' experts, W. D. Hale and John Williams, neither of whom had any formal forestry training, advocated the sample acre method by which they would count the number of living and dead trees on small plots representing forest of north slopes, south slopes, cove and ridgeline. Schenck objected that "no such thing as a sample acre exists." Moreover, the copper companies shared the reasonable suspicion that the plaintiffs would select only the best sample plots from which to calculate their losses. Instead he argued for the strip method, used by Gifford Pinchot's Division of Forestry, by which each member of his trained crew measured trees within a strip one chain (sixty-six feet) in width and followed the strip over whatever terrain it crossed. The results of a coordinate pattern of strip surveys were then averaged. The method came with the recommendation of Henry Solon Graves, an American forester trained in Germany, and Pinchot's chief assistant. Graves described it in his 1906 treatise, *Forest Mensuration* (mensuration being derived from the Latin for measurement).<sup>44</sup>

Schenck acted according to the state of the forestry art, yet Park and Cornick both requested what they called "practical saw-mill men" to accompany the survey and assist in courtroom testimony. Schenck no-doubt bristled at the phrase since he prided himself upon establishing the first American school for industry foresters. He was wise enough to appreciate that what the lawyers really wanted was someone who could identify with jurors from East Tennessee a little more readily than a German forest scientist with a doctoral degree. As he wrote to Cornick, "cooperation of practical saw mill men with our cruisers would be advisable,"

---

<sup>44</sup> C. A. Schenck to Howard Cornick, 3 June 1908; James B. Parks to W. B. Miller, ?? February 1908, DBM; Henry Solon Graves, *Forest Mensuration* (New York: John Wiley & Sons, 1906), 202-09.

because their views “are more forcible (convincing to a jury) than those of trained cruisers, scientists, and timber surveyors.”<sup>45</sup>

Parks and Cornick pursued other defenses against the timber barons as Schenck’s men walked their measured strips through the Southern Appalachians. The lawyers never lost sight of fundamental issues such as jurisdiction and ownership. Cornick defeated J. Harvey Ladew and George Peabody Wetmore in the United States Supreme Court for their failure to establish diversity jurisdiction as required for suit in federal court in Chattanooga. (Neither the plaintiffs nor Tennessee Copper were citizens of Tennessee; the company was chartered in New Jersey.) Parks and the Ducktown company attacked the validity of timber options claimed by the Shippens. They could not claim damages for the loss of lumber they did not own.<sup>46</sup>

On another tack, Cornick attempted to suppress evidence from federal foresters, a tactic stirred by bitter memories of the powerful impact of government experts in Georgia’s Supreme Court injunction case. He wrote Parks, “we are endeavoring to prevent the foresters from giving evidence and hope to succeed.” J. K. Haywood was Cornick’s special target. Haywood wrote a government report, *Injury to Vegetation from Smelter Fumes*, which Attorney General Hart cited to great effect in the Georgia case. Cornick told Parks that Haywood intended to publish another bulletin for the Bureau of Chemistry “explaining the situation, with even greater details.” If published, “it will be quasi evidence,” so “we are attempting to prevent its publication.” The

---

<sup>45</sup> C. A. Schenck to Howard Cornick, 18 June 1908, DBM.

<sup>46</sup> Ladew v. Tennessee Copper Co., 218 U.S. 357 (1910); Wetmore v. Tennessee Copper Co., 218 U.S. 369 (1910). James B. Parks to W. H. Freeland, 18 January 1908; James B. Parks to W. B. Miller, ?? February 1908, 13, both DBM.

effort failed. Haywood published another USDA bulletin, *Injury to Vegetation and Animal Life by Smelter Fumes*, in 1908 (revised in 1910) and shorter articles on the same topic in 1907.<sup>47</sup>

Both lawyers remained alert for tree diseases that could explain tree loss in the local forests. Parks discussed the white pine blight with Schenck after reading about it in a Department of Agriculture bulletin. Cornick noticed a learned article by William Alphonso Murrill about the chestnut blight, a fungal disease discovered three years earlier in the New York Botanical Gardens. Writing to Parks, Cornick promised to send Murrill's article and expressed his intention to take Murrill's deposition. This was good defense work. It was also a sad portent of the biological havoc the chestnut blight would soon bring to the eastern hardwood forests. Its impact would become more apparent in the later stages of the smoke litigation as it advanced from New York City to the forests of Ducktown.<sup>48</sup>

Clever defense work and the best of forestry science combined to defeat some timber suits and to limit the monetary awards in others. Copper lawyers also suffered stinging defeats. Executors for Paul E. Stevenson won \$32,371.11 against TCC in 1911. The old timber baron's last smoke suit was his best one. And his living rivals in the industry were eager to win even greater amounts.<sup>49</sup>

---

<sup>47</sup> J. K. Haywood, *Injury to Vegetation from Smelter Fumes*, U.S. Department of Agriculture, Bureau of Chemistry, Bulletin no. 89 (Washington: Government Printing Office, 1905); Howard Cornick to James G. Parks, 9 November 1907; also Howard Cornick to James G. Parks, 22 October 1907, both DBM. Haywood's other publications on smelter smoke include, J. K. Haywood, *Injury to Vegetation and Animal Life by Smelter Wastes*, U.S. Department of Agriculture, Bureau of Chemistry, Bulletin no. 108 (Washington: Government Printing Office, 1908, revised and expanded under the same title but as Bulletin 113, Washington: Government Printing Office, 1910); J. K. Haywood, "Injury to Vegetation and Animal Life by Smelter Fumes," *Journal of the American Chemical Society* 29, no. 7 (July 1907): 998-1009; J. K. Haywood, "Smelter Smoke," *Science* 26, no. 667 (October 1907): 476-78.

<sup>48</sup> Howard Cornick to James G. Parks, 9 November 1907, DBM. For the article, see William Alphonso Murrill, "A Serious Chestnut Disease," *Journal of the New York Botanical Garden* 7, no. 78 (June 1906): 143-53.

<sup>49</sup> "Wins \$32,371 Verdict from Copper Company," *Atlanta Constitution*, 26 February 1911, 12.

\*\*\*

As a remedy, actions for monetary damages rarely accomplished much for smoke victims. Some, though not all, of the timber barons recovered a great deal of money. Most of the mountain farmers received very little. The award of a couple of hundred dollars was small compensation for those whose farms lay in the most heavily damaged areas; the money could not replace a way of life made impossible by sulfur smoke.

Suits for damages were also inefficient. A court of law could only award damages for past smoke damage, not for prospective harm. The statute of limitations made it necessary to periodically file new lawsuits for subsequent damages. The *Swain* decision required separate actions against each company rather than joining them as co-defendants. As a result, scores of local farmers and timber owners filed two, three, and sometimes even four smoke suits.<sup>50</sup>

And most of all, actions for monetary damages did little to stop the destructive impact of smelter smoke in the Ducktown Basin. The two copper companies learned to accept verdicts in ordinary smoke suits as a cost of doing business. Copper lawyers succeeded in keeping verdicts low in the Hot House cases, dampening the litigation ardor of the more prosperous farmers. Only the timber suits truly hurt the firms, but huge awards to the logging interests were too few in number to force production changes to reduce the amount of sulfurous smoke.

Georgia's Supreme Court injunction case had proved to be the only effective means of compelling the Tennessee Copper Company and Ducktown Sulphur, Copper & Iron Co. to change their operations in the hope of reducing smoke. So it was to the state, and specifically to Attorney General Hart, that frustrated smoke suitors turned in their search for a different remedy. Hart had the discretionary and power to renew the application for a final decree of injunction. He was the only one who could end the smoke by moving to shut the plants down. Some smoke

---

<sup>50</sup> See Chapter 2 herein.

victims viewed his power as a source of relief from the fumes. Others, particularly timber owners and plaintiffs' lawyers, considered his power more for the potential boost it gave to the value of claims for damages. Either way, a large segment of the Basin's population, particularly Georgia's farmers and timber owners, wanted action from Hart to improve their situation in the smoke wars. And many more, those most closely tied to the copper industry for their livelihoods, feared his power to destroy the industry. He heard from both sides in a daily stream of letters and petitions that covered his desk in the State Capitol in Atlanta.

\*\*\*

Smoke suitors wanted action. Hart counseled patience. He insisted that time be given to complete the acid plants and to assess their effectiveness in reducing sulfur fumes. The wait-and-see approach was difficult for many because until the plants became operational, both companies continued to emit untreated sulfur smoke at historically high volumes into the Ducktown skies. Property owners continued to sustain damage throughout the 1907 growing season while the plants were under construction at both companies. Construction delays extended emission of untreated sulfur fumes into the 1908 growing season. It was the second growing season after Harts May, 1907 Supreme Court victory, so patience was wearing thin.

Hart withheld publication of his 1907 annual report until the next summer in hope of being able to share positive news about the acid plants. To that end, he sent Dr. John M. McCandless, the state chemist, to investigate matters in Ducktown. The report was only mildly encouraging. The Ducktown plant was not yet online. The TCC plant was operational, though at just three-fifths capacity. That meant that TCC condensed only 30.5 percent of sulfur dioxide gases it generated by smelting. The rate would improve to 50.1 percent when the plant was fully operational. In the meantime, "there will continue to be discharged into the atmosphere 347.2

tons of sulfur dioxide from the Tennessee Copper Company, and...166 tons from the works of the Ducktown Sulphur, Copper & Iron Co., who as yet, are doing nothing to actually relieve the situation.” McCandless concluded that “we still have a total of five hundred thirteen tons of sulphur dioxide being daily discharged into the atmosphere from the stacks of the two copper reduction companies.” Ducktown counsel, James G. Parks, wrote Hart an apologetic letter about delays on the company’s small ten-ton capacity plant promising the first test run in 1908. He added that they would soon commence construction of a second plant of two hundred ton daily capacity. Neither development provided any immediate encouragement. The first plant was too small to do much good even when it came on line, and the proposed larger plant was a distant dream.<sup>51</sup>

Slow progress at the plants increased the volume of angry mail to Hart from smoke victims, legislators, and members of Congress. Though he usually exercised courtly manners toward others, his patience was also wearing thin. When a Fannin County judge complained of smoke damage to his garden, the Attorney General responded with heavy sarcasm: “I note with much sorry the destruction of your sage bush...This of itself is very sad, but the blight of smoke has not even spared your honey suckle vine. This is distressing...and in this severe loss you have my profound sympathy.” And then, “I do not however exactly feel...the fact that your sage bush and honey suckle vine had been killed could be plead as complete justification” for throwing “five thousand people out of employment.”<sup>52</sup>

---

<sup>51</sup> John M. McCandless, “Report of Dr. Jno. M. McCandless to Hon. Jno. C. Hart, Attorney General of Georgia,” 1 May 1908, in John C. Hart, *The Sixth Annual Report of John C. Hart, Attorney-General of Georgia* (Atlanta: Franklin-Turner, 1908), 10-18; James G. Parks to John C. Hart, 7 March 1908, GDAH, RGS 9-1-1.

<sup>52</sup> John C. Hart to Judge J. R. Chastain, 19 March 1908, GDAH, RGS 9-1-1, Box 2.

\*\*\*

The Attorney General's correspondence included mail from a new petitioner that required far more careful handling: the National Farmers Union (NFU). Mountaineer farmers who formerly acted alone or in ad hoc coalitions now began to speak as organized political groups through their county chapters of the NFU. The Farmers Union of Fannin County, Georgia, and its sister chapter in Gilmer County both wrote Hart to urge an end to his policy of patience.<sup>53</sup>

Hart held a state-wide elected office, and as a politician, appreciated the rising power of the National Farmers Union in Georgia. The Farmers' Union arose in Texas in 1902 out of the ashes of the Farmers' Alliance and the Populist Party after those movements self-immolated in the election of 1896. As a new organization, the NFU inherited the goal of framing an economic and political response for its members caught in the web of market forces governing southern cotton and western wheat. Links between the Union and the Alliance were strong: both organizations arose in the cotton country of central Texas, and most of the Union's founding officers were Alliance veterans. The Union naturally borrowed heavily from the old Alliance gospel to preach a message of farm cooperatives, reform of cotton finance and marketing, corporate regulation, and agricultural education. The unusually low dues structure of the Union encouraged its growth among smaller farmers of middling status. Politically, the Union sought to avoid a repetition of the Alliance's disastrous entry into third party politics. Union president, Charles Barrett, advocated lobbying and endorsement within the existing two-party structure.<sup>54</sup>

---

<sup>53</sup> J. M. Hackney to John C. Hart, 9 July 1908 (Fannin); J. T. Deweese to J. G. Hart, 11 September 1908 (Gilmer), both GDAH, RGS 9-1-1, Box 2.

<sup>54</sup> Charles S. Barrett, *The Mission, History and Times of the Farmers' Union* (Nashville, Tenn.: Marshall and Bruce, 1909), 45-48, 97-121; Commodore B. Fisher, *The Farmers' Union*, University of Kentucky, Studies in Economics and Sociology, no. 2 (Frankfort, Ky.: State Journal Co., 1920), 8-18; John A. Crampton, *The National Farmers Union: Ideology of a Pressure Group* (Lincoln: University of Nebraska Press, 1965), 3-22, 55-60. Crampton demonstrates that with the end of Barrett's long presidency and the post-World War I decline of cotton prices, the

Union organizers found a receptive audience among cotton farmers, especially in Georgia, where by 1908, R. F. Duckworth established units in 135 of the state's 147 counties. The Gilmer County chapter organized on June 20, 1907, a few months after the Supreme Court decision in *Georgia v. Tennessee Copper Co.* The state became the center of the movement. Duckworth and a native Georgian, Charles S. Barrett of Atwater, served as national presidents, with Barrett holding office from 1906 to 1928. Barrett moved the national headquarters to Union City, Georgia in the heart of the Piedmont cotton belt. Duckworth also moved to Union City where he edited the *Farmers' Union News*.<sup>55</sup>

The Union's headquarters were just south of Atlanta, close enough to monitor politics in the state's capitol while far enough in the countryside to foster ties with the farmers. Its rapidly growing membership and Barrett's rise to national prominence on farm issues drew the public support of Georgia's leading politicians. Governor Hoke Smith and Rebecca Latimer Felton both addressed state conventions. Tom Watson, Georgia's Populist leader, provided the introduction to Barrett's history of the movement, rejoicing that the Farmers' Union allowed farmers to come together again, for alone, "a naked swimmer, trying to make shore through a swarm of man-eating sharks would have just about as good a chance for his life as a Southern cotton grower has to prosper under the present conditions." Watson was a frequent plenary speaker at NFU state and national conventions. He devoted a monthly column to the group in his *Watson's*

---

Union faded in the South and established its current concentration among the grain farmers of the Midwest and Plains states.

<sup>55</sup> Barrett, *The Mission, History and Times of the Farmers' Union*, 153-155, 213-222. George Gordon Ward, *The Annals of Upper Georgia Centered in Gilmer County* (Carrollton, Ga.: Thomasson Printing and Office Equipment Co., 1965), 399.

*Jeffersonian Magazine*. Hart knew that with support like that, he needed to act carefully in his dealings with the Union.<sup>56</sup>

Cotton dominated the Farmers' Union agenda, with Barrett calling the crop "the absolute commercial despot of civilization." The organization devoted its energies to the concerns of beleaguered cotton farmers by focusing upon market reform, crop warehousing, and cooperative supply ventures. The Union's membership in the North Georgia mountains had different concerns. Few of them grew any cotton at all. They remained largely untouched by King Cotton and its burdensome system of crop liens, supply furnishing, tenant farming, and falling markets. Even so, NFU leaders knew that the organization's strength lay in the size of its membership, a policy reflected in the low cost of members' dues, and so had no hesitation raising chapters outside the cotton regions. The Union's membership canvassers were paid on a per capita basis, so they had monetary motive to wave the flag in the mountain counties.<sup>57</sup>

Despite the economic differences between the mountaineers and the Farmers' Union core constituency of cotton farmers, the organization grew strong among the farmers of Gilmer and Fannin counties because it provided the organizational support, lobbying, publicity, and legal counsel needed to elevate their role in the Ducktown smoke litigation. The letters received by

---

<sup>56</sup> Barrett, *The Mission, History and Times of the Farmers' Union*, 16 (Watson quotation), 213-222 (Georgia details). Columns under the title "Farmers' Union Department," appeared in *Watson's Jeffersonian Magazine*, beginning with v. 1, no. 2 (February 1907) through v. 2, no. 2 (February 1908). The NFU presence at Union City is described in "Union City is Growing Daily," *Atlanta Constitution*, 1 August 1909, 7.

<sup>57</sup> Barrett, *The Mission, History and Times of the Farmers' Union*, 49-53. For a description of the Gilmer and Fannin farming and economy see: George Gordon Ward, *The Annals of Upper Georgia, Centered in Gilmer County* (Carrollton, GA: Thomasson Printing, 1965), 350 – 390; Ernest Parker, *Days Gone By: Early Gilmer County, Georgia* (Ellijay, GA: Gilmer County Genealogical Society, 1999), 326-332. Barrett was a plenary speaker at the 1910 Southern Conservation Congress, see "First Meeting on Conservation," *Atlanta Constitution*, 7 October 1910, 1, but there is otherwise no mention of the smoke suits or conservation issues in general in early NFU records. The topics were not reported in extent conventions records. Still, it is an argument from silence because research on the matter is hindered by the paucity of NFU records. Records from Barrett's long tenure were never transferred to NFU archives despite repeated pleas from the organization. In 1957, the NFU librarian wrote, "We have never been able to ascertain what records Mr. Barrett may have left behind him." See Phoebe F. Hayes, Librarian to Genevieve Pyle Demme, 19 February 1957 NFU I-1-2; C. E. Huff to Charles A. Barrett, 8 October 1957, NFU II-1-1.

Hart in 1908 from the Fannin and Gilmer chapters only marked the beginning of NFU's role in the case, a role that would last so long as the case remained active. Jesse A. Drake, the Union's state counsel for Georgia, and C. T. Ladson, the Union's general counsel, participated directly in the litigation by serving as plaintiffs' counsel for their constituent farmers.<sup>58</sup>

Historians have debated the impetus for farm movements. Some argued shared economic concerns, others geographical and class cohesions, and another thought the binding factor was shared but irrational "complex of fear and suspicion" rooted in nativism and Jeffersonian nostalgia. Robert C. McMath provided the answer that best explains NFU success in Fannin and Gilmer counties. It built upon existing interlocking rural social networks of kinship, church, shared work, and face-to-face trade and held the group together with the "expectation of relief for its members." The farmers already shared communal ties, strengthened during the early years of smoke litigation. They embraced the NFU because it promised to give them the legal and political power they needed against the copper companies and to goad the Attorney General.<sup>59</sup>

There remains the question of whether the Farmers' Union had a stake in the smoke litigation beyond the desire to serve the needs of its mountain constituents. Extent reports from its national conventions and issues of its national newspaper, the *National Field*, failed to reveal significant devotion to conservationist issues, at least until 1914, when it took a position solidly in favor of Gifford Pinchot and his campaign to build the Hetch-Hetchy dam and reservoir in Yosemite National Park. Plans to construct the project within one of America's earliest and most

---

<sup>58</sup> Barrett, *The Mission, History and Times of the Farmers' Union*, 299 (Drake), 307-08 (Ladson).

<sup>59</sup> John D. Hicks, *The Populist Revolt: A History of the Farmers' Alliance and the People's Party* (Minneapolis: University of Minnesota Press, 1931), 95, 405, 404-423; C. Vann Woodward, *The Origins of the New South: 1877-1913* (Baton Rouge: Louisiana State University Press, 1955, 1971), 175-205, 235-264; Richard Hofstadter, *The Age of Reform: From Bryan to F.D.R* (New York: Knopf, 1955), 62, 82; Lawrence Goodwyn, *Democratic Promise: The Populist Moment in America* (New York: Oxford University Press, 1976), 537, 539; Robert C. McMath, Jr., *American Populism: A Social History, 1877 – 1898* (New York: Hill and Wang, 1993), 16-17, 42, 40-42.

spectacular national parks generated a heated national debate between advocates of wilderness preservation, led by John Muir and the Sierra Club, and conservationists led by Pinchot, who sought to make what they considered the wise use of natural resources.<sup>60</sup>

The Farmers Union aligned with Pinchot and the pro-dam interests through editorial support in the *National Field*. In January 1914, the editors set aside the debate between preservationists and conservationists to recast the issue as a populist anti-corporate campaign. The dam, to be constructed on federal park land, would provide a publicly-owned water supply for San Francisco, allowing “over 400,000 citizens out of the grip of private water concerns.” The NFU was fundamentally opposed to “giving any private corporation a franchise which would enable it to gouge the consumers of a vital necessary [sic].” Hydro-electric power from the project would enhance the city-owned trolley system “so as to put the old United Railroads gang out of business.” With cheap power from Hetch-Hetchy, “the town can give its citizens transportation, light and power service at the actual, nominal cost. Pinchot adopted a similar approach in his letter of thanks to the editors. The Hetch-Hetchy issue was, he said, “just one phase of the great issue in the whole conservation controversy.” The issue was “whether the public welfare shall be made subservient to the profits of the magnates, or whether the natural resources shall be used primarily for the benefit of all the people.”<sup>61</sup>

The Hetch-Hetchy fight was three miles away from Ducktown and occurred several years after the NFU’s entry into Georgia’s suit against the copper companies. The two battles were

---

<sup>60</sup> The Hetch-Hetchy fight was one of the seminal events in the formation of natural resource policy in America. For an overview of the struggle between Muir and Pinchot, see Roderick Nash, *Wilderness and the American Mind* (New Haven: Yale University Press, 1967), 161-181; Robert W. Righter, *The Battle Over Hetch-Hetchy: America’s Most Controversial Dam and the Birth of Modern Environmentalism* (New York: Oxford University Press, 2005); John W. Simpson, *Dam! Water, Power, Politics, and Preservation in Hetch Hetchy and Yosemite National Park* (New York: Pantheon Books, 2005).

<sup>61</sup> *The National Field*, 1 January 1914 (editorial) and 12 February 1914 (Pinchot’s letter to the editors and, in the same issue, a laudatory article on Pinchot, complete with portrait.

also distinct in terms of ownership issues. Hetch-Hetchy involved the use of public property; the Ducktown litigation arose from damage to private farms and woodlands. Yet, as the Supreme Court declared in 1907, the Georgia case was ultimately a resource issue that concerned the state's (and hence the public's) right to determine "whether its mountains shall be stripped of their forests and its inhabitants shall breathe pure air." The Ducktown case was never a preservationist battle. It was a conservation issue to maintain the health of fields and forests for the benefit of many farmers and loggers who depended upon them for their livelihoods. With an eye towards the stream-flow theories of George Perkins Marsh, it was also an effort to protect the rivers that flowed from the great Southern Appalachian watershed for the benefit of the multitudes who depended upon them for drinking water, navigation, and power.<sup>62</sup>

For the National Farmers' Union, the Ducktown litigation, like Hetch-Hetchy, was yet another battle against abusive corporate power, one that impacted its mountain constituents in Fannin and Gilmer and its larger constituency of southern cotton farmers. The key was fertilizer. The NFU recognized fertilizer costs as one of the two greatest expenses born by cotton farmers, and worked to reduce prices by building a cooperative phosphate fertilizer plant at Union City. The two copper companies were the chief source of the sulfuric acid necessary to manufacture the product. The combination of Ducktown acid and NFU fertilizer manufacturing might have promised a mutually beneficial business relationship, one that Hart could serve for the greater good of all concerned by his careful management of Georgia's lawsuit. Instead, relations between the NFU and the

---

<sup>62</sup> Georgia v. Tennessee Copper Co., 206 U.S. 230, 237 (1907).

copper industry proved to be an aspect of the agrarian populist battle against the fertilizer trust. Attorney General Hart would soon be crushed between the combatants.<sup>63</sup>

\*\*\*

In 1908, the Farmers Union threw its weight in favor of a resolution by Fannin legislator, William Butt, requiring Hart to seek a final decree of injunction. The Attorney General opposed the measure. Debate turned upon the familiar complaints of crop and tree damage, and the newer theme of the promised benefits of the acid industry in the form of reduced fertilizer prices. The debate had a technical aspect as each side considered the percentage of sulfur dioxide the plants would remove when operating at designed levels. Rep. Butt's resolution failed on a 12-5 vote in committee and a 97-12 vote in the House.<sup>64</sup>

Hart's opposition to the measure placed him in alignment with the copper companies, for which he came under attack at the *Blue Ridge Post*. "This censure is undeserved," he wrote. "The only difference between the people of Fannin County and myself is that of procedure." They wanted to close the mines and force people of work, "while my idea is to preserve the interests of Fannin County without doing irreparable injury to other interests." What Hart saw as a principled stand for a balanced remedy actually distanced him further and further from his mountain constituents. He complained to TCC's Howard Cornick in October 1908, saying that Georgians "have made it very embarrassing for me this summer and have annoyed me greatly." Even well-meaning Georgians failed to grasp his vision. When one wrote for suggestions about making a

---

<sup>63</sup> The NFU's Union Phosphate Plants received regular coverage in the *Atlanta Constitution*: "Union Farmers Form a Fertilizer Company," 19 November 1907, 7; "Phosphate Plant of Union Opened," 16 October 1911, 5; "Farmers Saved Immense Sums—Through the Operations of Union Phosphate Co.," 17 October 1910, 5; "Enlarge Plants for Ga. Farmers—Union Phosphate Co. Will Develop Phosphate Holdings," 21 June 1911, 6.

<sup>64</sup> The resolution received extensive coverage in the *Atlanta Constitution*: "Want to Close Copper Plants," 17 July 1908, 3; "Gases Still Ruining Crops," 22 July 1908, 9; "Ducktown Copper Mines Before House This Week," 27 July 1908, 5; "Copper Plants in Status Quo," 29 July 1908 (committee tally); James B. Parks to W. H. Freeland, 10 August 1908, DBM (House vote).

smoke claim, Hart responded in dry legalese, “the State’s suit does not contemplate recovery for individuals but suppression of the nuisance complained off.” He received more support from James Parks, a Tennessee attorney, and W. H. Freeland, a naturalized Englishman, than from fellow Georgians. But the only support he wanted from the copper companies was in the tangible form of fully operational plants. As he told Cornick, “I sincerely trust that before another season rolls around that the companies will...have the matter in hand,” adding, “I trust and believe you...appreciate my position and to avoid a repetition of criticism and abuse of me that you will make an extra effort to take care of the situation.”<sup>65</sup>

The next year, 1909, did see real progress. Tennessee Copper brought its first plant to full capacity and set about building another one just as large. The Ducktown Company completed its full size acid plant on May 6, 1909, almost two years from the date of the 1907 Supreme Court decree. Still, Hart’s correspondence on smoke matters ranged from the mild to the antagonistic, tending mostly to the latter. The Attorney General’s position as holder of the injunction weapon, placed him in the ridiculous position of fielding inquiries as to whether Mr. Dean’s cabbage patch or J. D. Northcutt’s apples succumbed to smoke or to other agencies. These he foisted onto experts for their considered opinion. The state’s chief attorney was responsible for life and death issues in murder cases. He now spent time reading letters about unhealthy vegetables. A typical letter from the state’s entomologist informed him that “a careful examination of the bean which you submitted me show that is affected with a common bean disease known as bean anthracnose, technically known as *collectrichum lindemuthianum*,” a condition unrelated to smoke damage. It was not a role that the framers of Georgia’s constitution had in mind for the office of Attorney

---

<sup>65</sup> John C. Hart to Editor Blue Ridge Post, 12 September 1908; John C. Hart to W. B. James, 28 September 1908; James G. Parks to John C. Hart, 29 September 1908; W.H. Freeland to John C. Hart, 14 May 1909; John C. Hart to Howard Cornick, 8 October 1908, all GDAH, RGS 9-1-1, Box 2.

General, but in the absence of an environmental paradigm, much less the scientific bureaucracy to implement it, his was the office where such matters landed.<sup>66</sup>

Apart from vegetables, Hart engaged in an increasingly heated exchange with the National Farmers Union that carried into 1910. J. T. DeWeese, leader of the Gilmer Union, complained of “the present increasing damages done to our farms and farm products by the continuation of the poisonous fumes.” W. T. Buchanan, leader of the Fannin chapter, insisted that Hart act to “relieve our people from the distressing and dangerous situation and to restore to us our rights under the law.” NFU attorneys, C. T. Ladson and Jesse Drake, announced that they were retained by “four score people” in their smoke suits against the copper companies. Further pressure came from the Farmers’ Union’s state and national headquarters in Union City. Drake made formal inquiries to Hart. The Attorney General forwarded the same to the copper companies for their response, along with a note saying, “the Farmers Union is a large and respectable organization and I desire to treat it with the utmost courtesy and consideration.”<sup>67</sup>

Political deference fell to the wayside when R. F. Duckworth attacked him through the *Farmers’ Union News* at the approach of the 1910 General Assembly. Hart once again ignored advice attributed to Mark Twain: “never pick a fight with a man who buys ink by the barrel.” He wrote a four page letter justifying his stance and pointing to the reduction in fertilizer prices caused by the abundant supply of Ducktown acid. His argument failed to persuade Duckworth.

---

<sup>66</sup> Progress on the plants appears H. F. Wierum to John C. Hart, 3 May 1909; W. F. Freeland to John C. Hart, 25 June 1909, both GDAH, RGS 9-1-1, Box 2. A published description of the DSC&I appears in W. H. Freeland and C. W. Renwick, “Smeltery Smoke as a Source of Sulphuric Acid,” *The Engineering and Mining Journal* 89 (May 28, 1910): 1116-120. John C. Hart to Howard Cornick, 1 July 1909 (cabbage patch); Howard Cornick to John C. Hart, 26 August 1909; E. L. Worsham to John C. Hart, 26 June 1909 (beans), all GDAH, RGS 9-1-1, Box 2.

<sup>67</sup> W. T. Buchanan to John C. Hart, June 30, 1909; J. T. DeWeese to John C. Hart, Sept. 4, 1909, both GDAH, RGS 9-1-1, Box 2. For the suits, see C. T. Ladson to Cornick, Wright & Frantz, 1 February 1909, DBM; Jesse A. Drake to John C. Hart, 27 October 1909 GDAH, RGS 9-1-1, Box 2; John C. Hart to W. H. Freeland, 2 November 1909; John C. Hart to Cornick, Wright & Frantz, 2 November 1909, both GDAH, RGS 9-1-1, Box 2.

NFU officials knew more about fertilizer and acid pricing than did Hart. Duckworth advised Hart that fertilizer dropped from two to five dollars per ton, but not because of the falling cost of acid. Prices for acid remained flat despite production at TCC and DSC&I. Worse, the NFU knew from published accounts that Tennessee Copper Company contracted to sell its entire acid output to the Independent Fertilizer Company, a trust created “to absorb independent fertilizer companies in the South.”<sup>68</sup>

An even larger fertilizer trust, International Agricultural Corporation (IAC), soon absorbed Independent and acquired the acid contract in the deal. It was a master stroke for IAC because it was the largest miner of phosphate rock in Florida and now had now secured all of the acid produced at Ducktown needed to process it. After the merger, TCC granted IAC a ten-year extension on the original contract made with Independent Fertilizer. None of the acid produced in the Ducktown District could be put to use at the Union Phosphate Plant without first passing through IAC as middleman. The arrangements between TCC and the fertilizer trusts were thus considered an anti-competitive thrust at the cooperative ethic that animated the Farmers Union and the entire agrarian populist movement.<sup>69</sup>

Duckworth thundered, “The Farmers Union has made a fight on two lines of corporation, both using products produced by these plants; one using copper, the other using sulfuric acid; the one being the Rail Roads, the other being the Fertilizer Company.” In that light, Attorney General Hart’s policy of continued patience was counterproductive because it served the NFU’s corporate enemies without alleviating the suffering of southern farmers. Duckworth closed his

---

<sup>68</sup> John C. Hart to Editor of the Farmers Union News, 15 June 1910; “Copper and Acid Deal—Tennessee Copper Company Makes a Contract with a Fertilizer Company,” *New York Times*, 24 November 1908, 11; “Morgan to Finance Merger—Banking House Expected to Underwrite the New Fertilizer Company,” *New York Times*, 2 April 1909, 11.

<sup>69</sup> For IAC see “Takes Entire Acid Output—Agricultural Corporation to Get 150,000 Tons A Year from Copper Company,” 21 January 1911, 20. Blakey, *The Florida Phosphate Industry*, 56.

rebuttal to Hart, saying, “the Farmers’ Union had insisted that the Copper Companies pay damages or that they be shut down. But they have refused to pay all damages and you have so far refused to shut them down.” Therefore, “we are pursuing the only course left for us, that of making a fuss about it.”<sup>70</sup>

That was Hart’s last exchange on the matter. He resigned two weeks later on June 29, 1910, and left the fate of Georgia’s Supreme Court smoke litigation to Governor Joseph M. Brown and future attorneys general. Hart’s work on the pre-eminent case of his career ended on a bitter note. His increasingly defensive spirit was that of a legal warrior made weary by a case that seemed to have no end. His fervent desire to accomplish smoke reduction without shutting the plants left him politically isolated and often despised. His friendly supporters among the lawyers and managers at the copper companies could do him no good in Georgia, especially after he antagonized the National Farmers Union and the smoke suitors within its membership. He had become a political liability to Brown’s administration.<sup>71</sup>

Yet his accomplishments in *Georgia v. Tennessee Copper Company* surpassed those of any other Georgian affiliated with the case before or after. He won a landmark decision that established the state’s sovereign right to protect its people and resources from interstate air pollution. The copper companies were still roasting ores on open heaps when he entered office in 1902. His legal skills (and those of his chosen assistant, Ligon Johnson) forced them to end the practice. The ongoing threat of an injunction compelled the companies to build acid condensation plants that promised to extract at least some of the fumes and convert them into a valuable product for farmers. Every tank car full of acid that rolling out of the Ducktown Basin

---

<sup>70</sup> R. F. Duckworth to J. C. Hart, June 17, 1910, both GDAH, RGS 9-1-1, Box 3.

<sup>71</sup> John C. Hart to Jos. M. Brown, Governor, 29 June 1910.

on the L&N rails represented tons of harmful sulfur dioxide removed from the sky and transformed into useful fertilizer for the worn-out cotton fields of Georgia and the South.<sup>72</sup>

---

<sup>72</sup> Most considered the conversion of SO<sub>2</sub> into fertilizer to be an unambiguous boon to farming, conservation, and the economy. Timothy LeCain noted that the conversion was not environmentally cost-free because overuse of phosphate fertilizer led to algae blooms and eutrophication of water bodies. See, Timothy J. LeCain, "When Everybody Wins, Does the Environment Lose? The Environmental Techno-Fix in Twentieth-Century American Mining," in Lisa Rosner, ed. *The Technological Fix: How People Use Technology to Create and Solve Problems* (New York: Routledge, 2004): 137-154. LeCain is correct about eutrophication and the larger principle that technology rarely provides an environmental solution without creating an environmental problem. However, a more nuanced view would encompass the soil conservation problems caused by millions of acres of abandoned, nutrient-poor cotton lands. It is the latter problem that led to the creation of the Soil Conservation Service during the New Deal. Ducktown acid conversion must be considered, overall, as a net gain for the improvement of agricultural lands and as a measure towards abatement of further environmental damage in the Ducktown Basin.

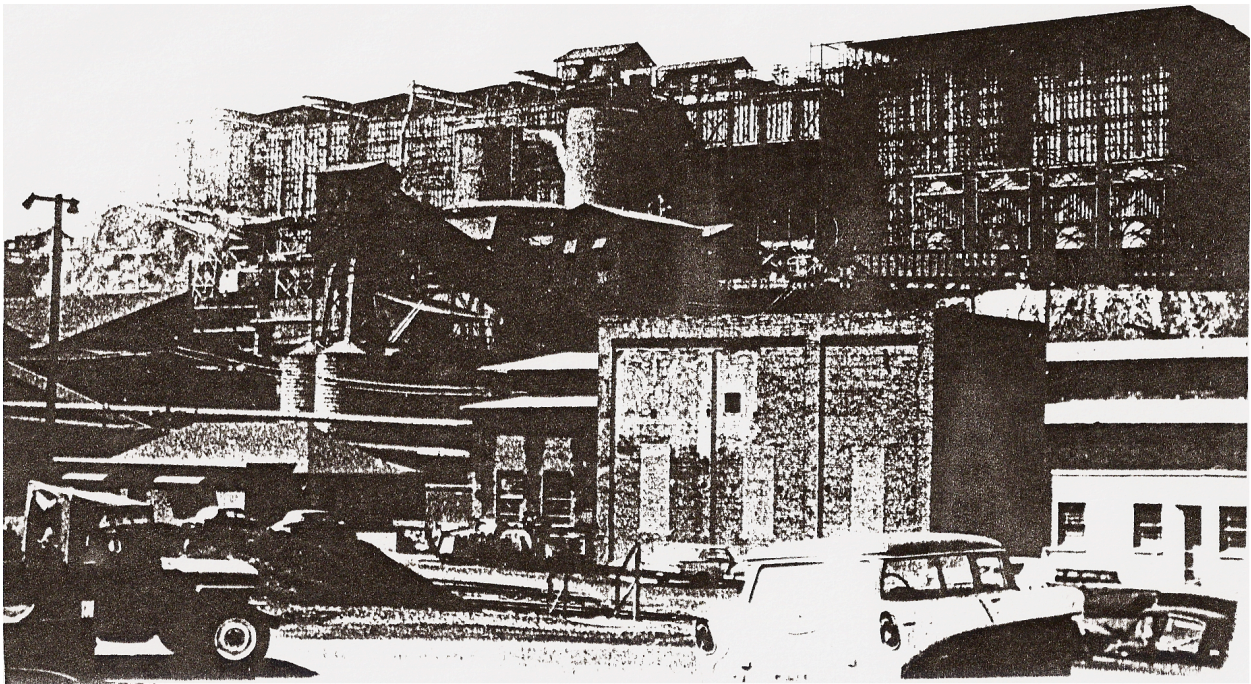


Figure 6. Photograph of the acid plant at Tennessee Copper Company at Copperhill, Polk County, Tennessee, circa the 1950s. Courtesy of the Tennessee Valley Authority.

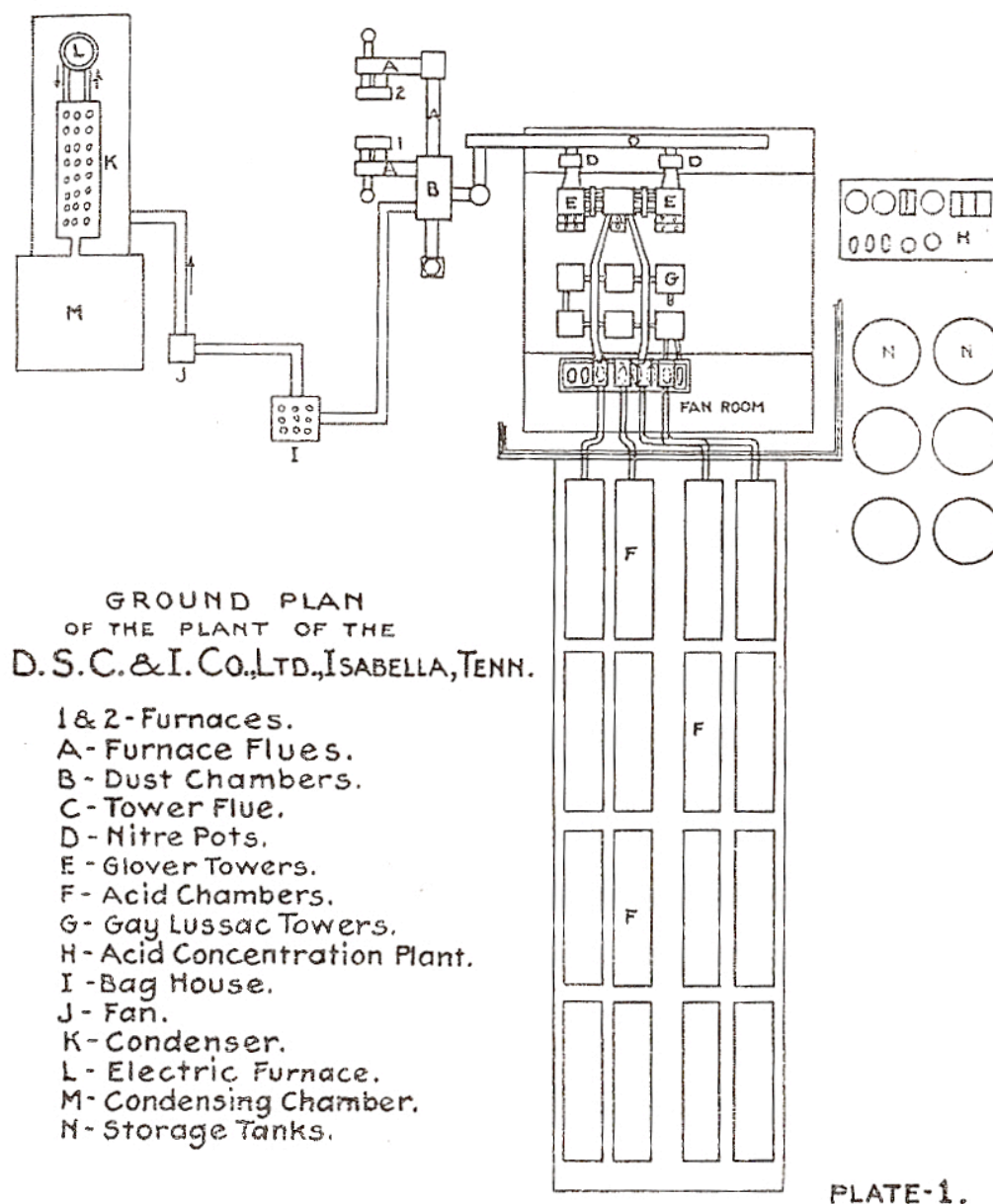


Figure 7. Plan of the acid plant at Ducktown Sulphur, Copper & Iron Co., Ltd. The plan was in illustration in the Report of John T. McGill, 1 January 1916, *Georgia v. Tennessee Copper Co.*, No. 1. Original, October Term 1914. Courtesy of the National Archives, Washington, D.C.

## CHAPTER 8

“LIKE THE POOR, THIS CASE WILL BE WITH US ALWAYS”:

### THE DENOUEMENT OF DUCKTOWN SMOKE LITIGATION

When the Supreme Court issued its ruling in *Georgia v. Tennessee Copper Co.* (1907), it suggested that the copper companies be given six months to complete their acid condensation plants before it acted upon the final decree of injunction. Attorney General John C. Hart allowed the six months to stretch into three years. He did so because of his deep reluctance to destroy the industry and its thousands of jobs. The entire thrust of his eight years on the case had been to force adoption of technologies to abate sulfur fumes while leaving the industry viable. Acid condensation was the latest and best hope. If it worked, the process would extract harmful sulfur dioxide from smelter emissions and convert it into sulfuric acid, a chemical needed for the phosphate fertilizer industry. Hart stated the matter in his Annual Report for 1909: “It means a great deal not only to the people of Georgia in the immediate vicinity of these works, but the entire State, and the South...especially the agricultural interests, to develop this industry.” Besides, there were no other technological cures on the horizon.<sup>1</sup>

The rationale for Hart’s strategy of patience toward the copper companies ended with his tenure in office. By 1910 both companies had completed construction of their respective acid plants. The Tennessee Copper plant, which came on line in 1907, was capable of producing 200 tons of acid daily. The DSC&I plant became operational in 1909 with a daily capacity of 160 tons. The great volumes of acid produced each day left no doubt that the process worked.

---

<sup>1</sup> John C. Hart, *The Eighth Annual Report of John C. Hart, Attorney-General of Georgia* (Atlanta: Chas. P. Byrd, 1910), 29.

A new set of questions now governed Georgia's smoke suit: how much sulfur dioxide was still entering the Ducktown skies now that all three plants were in use? Acid condensation was a money maker for the copper companies. Was it also an effective remedy for long-suffering smoke victims? The controversies over these questions plagued Hart's successors in court, at the General Assembly, and in their offices as they worked through piles of correspondence and petitions for and against an injunction over the next eight years. Attorney General Clifford Walker, Hart's fourth successor, spoke for himself and his predecessors by paraphrasing the gospel of Matthew: "this litigation, like the poor, we have with us always."<sup>2</sup>

\*\*\*

The controversy over injunctive relief spilled over into 1910 Fannin County elections. Pro-copper Republicans turned out all of the anti-copper Democrats except one. The lone exception was J. R. Kincaid, a Democratic state senator who owed his victory to voters in the others counties of his district. It was the first time in twenty five years that Republicans controlled the county. The sweep required explanations. Fannin was the Georgia county closest to the copper works and suffered the worst of the smoke damage. At the same time, it had the most to lose if an injunction ended the flow of copper dollars into the local economy. All of the Republican candidates were well known businessmen and professionals who may have seen their livelihoods at risk. Democrats explained the election by pointing to rampant vote buying, notably at the Hot House district where several leading smoke suitors lived. One witness spoke of the pitch he received from a Republican, "This is a mighty juicy apple. And here's the ticket you ought to vote. After you vote, eat that apple." The voter did as he was told and discovered that "inside that apple was a five dollar bill." Another life long Democrat switched his vote when

---

<sup>2</sup> Clifford Walker, *Reports and Opinions of the Attorney-General of Georgia from June 15, 1917 to December 31, 1918* (Atlanta: Byrd Printing Co., 1919), 3; the paraphrase is to Matt. 26:11.

offered thirty dollars and the cancellation of his promissory note held by a bank in Copperhill.

All that money had to come from somewhere, so Democrats quickly pointed fingers to the several senior mining officials currently under indictment for creating a public smoke nuisance.<sup>3</sup>

Whether or not the allegations were true, the injunction issue was politically volatile. The 1910 General Assembly considered resolution for action in the Supreme Court case. The Farmers Union lobbied for passage through its attorneys, C. T. Ladson and J. A. Drake. Tennessee Copper lawyers and officers responded with an excursion to Ducktown for the House Judiciary Committee. The legislators toured the new plants, became favorably impressed, and then tabled the resolution upon their return to Atlanta. A newspaper headline summarized their conclusion: “No Fumes Now at Ducktown.”<sup>4</sup>

Governor Joseph M. Brown and his new attorney general, Hewlette Hall, were not convinced, nor were they ready to dismiss the concerns of the powerful Farmers Union. Hall selected William M. Bowron, a consulting engineer from Chattanooga, Tennessee to make the investigation. It was an inspired choice. Heretofore, the state usually turned to chemists, geologists, biologists, and foresters who examined the sulfur smoke for its impact upon the Ducktown landscape. Bowron was an engineer. He spent little time looking at crops and trees for smoke damage. Instead, he studied sulfur smoke as a matter of production statistics, a deductive problem answered with mathematics, not an empirical study based upon field observations. Bowron framed the study by asking four questions. First, how much sulfur entered the smelting system? That was easily answered by knowing the amount of ore smelted and the sulfur content

---

<sup>3</sup> “Fannin Stirred by the Victory of Republicans—Only the Senator Saved from the Political Revolution of October—Mass Indictments for Buying of Votes,” *Atlanta Constitution*, 21 November 1910; “Use Apples to Buy Votes,” 22 November 1910, *New York Times*, 1.

<sup>4</sup> For pertinent coverage in the *Atlanta Constitution*, see “To Ask Tennessee to Take Action,” 14 July 1910 (NFU initiative); “Committee Kills Ducktown Probe,” 20 July 1910; “No Fumes Now At Ducktown,” 21 July 1910 (report on the junket).

of the ore. Second, where did the sulfur go once it entered the system? Specifically, how much was captured and condensed to acid, compared to the amount released up company smokestacks? Third, how did the amount of sulfur released in 1910 compare to 1903 when the state filed its first case? And fourth, what production and economic factors explained the amount of sulfur released in 1910?<sup>5</sup>

His answers to the four questions changed the course of the case. Most of the report concerned the Tennessee Copper Company, by far the larger of the two copper producers in the district. On a monthly basis, using October, 1910 figures, the company processed 39,000 tons of ore containing 22.5 percent sulfur, yielding 8,775 tons of sulfur. Of the 8,775 tons of sulfur, 2,574 tons went to acid and 6,201 tons went into the air. In short, 70 percent of the daily intake of sulfur entered the atmosphere notwithstanding use of the acid plants. Annualized, escaping sulfur amounted to over 74,000 tons in 1910 compared to 34,056 tons released in 1904 when none of the sulfur was condensed to acid.<sup>6</sup>

Bowron explained his findings in two ways. TCC simply mined and smelted far more ore in recent years than in the past. Production doubled from 241,855 tons in 1904, at the start of the case, to 439,365 tons in 1909. It followed that even if the acid plants captured a portion of the increased amount of sulfur, a far greater amount, nonetheless, entered the air. The second explanation related to the first. Acid condensation could capture most of the sulfur, but only if plant capacity corresponded to the amount of sulfur gases generated by smelting. Bowron determined that TCC “deliberately increased their production year by year with the full knowledge that the acid plant that they were erecting could not at best collect the acid fumes

---

<sup>5</sup> Report of William M. Bowron to Governor Joseph M. Brown, \_\_ November 1910, GDAH, RGS 9-1-1, Box 3.

<sup>6</sup> Bowron, 4-5, 10-14

even then made.” He further asserted, “these gentlemen have not acted in good full faith in attempting to remove the poisonous gases.” The imbalance could be corrected either by increasing the capacity of the acid plants, or by reducing the amount of ores smelted. TCC did neither. It was content to waste sulfur into the air because copper was profitable without the added income from acid condensation. Bowron then pointed to the shared interests between TCC and the International Agricultural Corporation. (Headquarters for both were at the same address, 61 Broadway, New York City.) TCC declined to increase acid production, he suggested, because “if more acid were made than is the case at the present, it would demoralize the fertilizer market.” And lest that happen, the copper company determined, “it pays to run the risk of possible penalties and adverse verdicts from the courts.”<sup>7</sup>

Governor Brown reinforced the report with a more conservative report by R. E. Stallings, the state chemist. Stallings determined the percentage of escaped gas to be 55 percent of the sulfur content of smelted ores, rather than the 70 percent calculated by Bowron. Still, that yielded a daily release of “191 tons of sulfur, equivalent to 381 tons of sulfur dioxide.” The findings of both reports substantiated the concerns of the National Farmers Union. Acid condensation worked but only to a point. The rest of the fumes entered the air as always. The claim, “No Fumes Now in Ducktown,” fell under the weight of the numbers.<sup>8</sup>

---

<sup>7</sup> Ibid., 7-8. As will be seen later in this chapter, TCC would build another acid plant in 1916 when World War I increased demand for acid in the munitions industry. See Robert E. Barclay, *The Copper Basin, 1890 to 1963* (Knoxville? Tenn.: by the author, 1975), 42. In general, desire of smelting companies to recover sulfur dioxide was sensitive to perceived demand and pricing. Montana companies were much less likely to adopt sulfur extraction out of concern that their distance from agricultural markets would make increase transportation costs to the point that their product would be non-competitive. See Timothy J. LeCain, “When Everybody Wins Does the Environment Lose? The Environmental Techno-Fix in Twentieth-Century American Mining,” in *The Technological Fix: How People Use Technology to Create and Solve Problems*, ed. Linda Rosner, New York: Routledge, 2004, 137-154.

<sup>8</sup> R. E. Stallings to Jos. M. Brown, 9 November 1910; R. E. Stallings to Hewlette Hall, 10 December 1910, both published in H. A. Hall, *The Annual Report of H. A. Hall, Attorney-General of Georgia* (Atlanta: Chas. P. Byrd, 1911), 10-13.

\*\*\*

Attorney General Hall sent both reports to Tennessee Copper counsel, Howard Cornick, on December 10, 1910. Cornick and the company's officers immediately grasped the implications of Bowron's and Stallings's numbers and elected to settle the Georgia case. The terms of agreement centered on the issue of overproduction identified by Bowron. TCC agreed to limit smelting during the growing season, from May 20 to August 31, to a level that matched the capacity of the acid plant. During the season, the company "shall not operate more green ore furnaces than are necessary to permit of operating its sulfuric acid plant at its normal full capacity." It also promised to verify compliance by submitting monthly production reports to the state during the season. In exchange, the state agreed to suspend proceedings against the company until the October, 1913 term of the Supreme Court.<sup>9</sup>

The terms of the agreement reflected several key principles that underpinned Georgia's smoke suit. Sulfur dioxide toxicity to crops, forests, and other vegetation lay at the heart of the suit, as reflected in the limitations applicable to the growing season. A seasonal approach would not have made sense if public health concerns were prominent to the suit since people, unlike most mountain plants, did not go dormant in cold weather. The settlement was also an acknowledgement of the mismatch between ore production capacity and the capacity of the acid plant to remove sulfur dioxide. TCC had just built the largest acid plant in the world at great expense, but it was not enough to condense all of the smoke produced in the company's furnaces. The mismatch could be addressed in only two ways: reduce production, or increase the capacity to condense sulfur dioxide by enlarging the acid operations. Immediate expansion acid production was considered unlikely or unreasonable so soon after completion of the first acid

---

<sup>9</sup> Hewlett Hall to Howard Cornick, 12 December 1910, GDAH, RGS 9-1-1, Box 3; "Terms and Stipulations of Consent Agreement," filed 27 February 1911, *Georgia v. Tennessee Copper Co.*, No. 1 Original.

plant. The parties opted instead for the limitation of production during the growing season when the smoke did its greatest harm to vegetation.

The agreement stabilized the shaky truce that had existed since 1907. It also raised the prospect of a permanent settlement along similar terms. When the 1911 General Assembly convened in July, the company practiced another successful round of junket diplomacy to prevent passage of any resolutions calling for resumption of the Supreme Court case. It also placed lengthy illustrated news articles to win over popular opinion during the session. The full page headline of one read, “Conservation of Injurious Gases of Ducktown Copper Plants Results in Enormous Benefit to Farmers of the South.”<sup>10</sup>

During the same summer, Ducktown Sulphur, Copper & Iron Co. felt no need for settlement talks or a public relations campaign. The Bowron report dealt lightly with the company, citing its smaller operations and the closer ratio between the amount of ore smelted and the volume of acid produced. The company had only two blast furnaces compared to TCC’s seven so the company produced far less smoke, whether processed or not. Bowron noticed several partially constructed acid chambers that, if finished, would allow for increased production of acid. Company managers told him that, “their English directors did not want to assume the expense of finishing them...with an injunction from the Supreme Court of the United States hanging over their heads.”<sup>11</sup>

The Ducktown Company completely misread the import of the Bowron report and also failed to understand political tensions in Georgia. The cordial relations established between Attorney General Hart and Ducktown counsel, James G. Parks, began to deteriorate when both

---

<sup>10</sup> “\$1,000,000 Spent by Tennessee Copper Company to Keep Sulfur Fumes From Injuring Vegetation,” 24 July 1910 *Atlanta Constitution*, B7; “Conservation of Injurious Gases of Ducktown Copper Plants Results in Enormous Benefit to Farmers of the South,” *Atlanta Constitution*, 2 August 1911.

<sup>11</sup> Bowron, 30.

men left the case for reasons of resignation and ill-health. Hart's second successor, Thomas Felder, was politically ambitious and worked under the aggressive leadership of Governor Brown. Parks's successor, W. B. Miller made a poor impression with Felder from the outset. Miller considered the Bowron report to be an exoneration of DSC&I and from that posture insisted upon the right to cross-examine, before trial, anyone giving an anti-copper affidavit to the state. Felder bristled at this infringement of a citizen's right of petition. "I have no right to require anyone who sees fit to send an affidavit to this office to submit themselves to cross-examination, and of course I would not do so." Matters worsened from there at all levels between the state and the company.<sup>12</sup>

Political tensions increased over the smoke issue during 1912 and into 1913. The timber baron, Will Shippen, the Farmers Union, and North Georgia legislators all pressed for action against DSC&I and found Governor Brown to be responsive. Felder requested cooperative action from the company on several occasion, each time receiving refusal couched as denials of harmful activities. The Company's response caused the Attorney General to survey his options. An injunction was the likely option because more patience was becoming politically impossible, especially after the Tennessee Copper settlement. Felder then wanted to know if there were any other technological cures to be considered. He wrote Ligon Johnson about the matter.

Johnson's brilliant work as John C. Hart's special counsel in the earlier stages of *Georgia v. Tennessee Copper Co.* gained the notice of Theodore Roosevelt and his attorney general, Charles Joseph Bonaparte (Napoleon's grand-nephew). The government had several pending smelter cases involving damage to national forests in the western states. They needed a lawyer with Johnson's experience and invited him to serve in the Department of Justice. Johnson

---

<sup>12</sup> W. B. Miller to Thomas S. Felder, 23 September 1911; Thomas S. Felder to W. B. Miller, 28 September 1911, both GDAH, IV-12-1.

accepted the offer and remained in his post when William Howard Taft succeeded Roosevelt. Johnson's service as lead counsel in a series of federal smelter case smelter cases against Mountain Copper, Anaconda, Mammoth Copper, and Balakalali Copper, among others, made him thoroughly familiar with every sort of technology employed in the copper industry.<sup>13</sup>

Based on that knowledge, he advised Felder, "Up to the present time we have been unable to ascertain anything which now offers any real remedy, other than concerting the fumes into acid." Georgia was more fortunate in this regard than was the federal government. "The chief use of acid is in fertilizer and the fertilizer industry...is centered in the South and within reach of the smelter plants of Tennessee." By contrast, there was no appreciable market for fertilizer anywhere near the Anaconda Company smelters in Butte, Montana. Accordingly, the federal government refused to force Anaconda to install acid plants. Johnson explained that, "the government has not asked the company to do the impossible nor is it the policy of the government to close down the plant." <sup>14</sup>

In the meantime, Tennessee Copper's two-year settlement came up for renewal in 1913. TCC was eager to extend the arrangement. It sweetened the deal by agreeing to participate in regular arbitration to resolve citizen claims for smoke damage, and further agreed to tender \$16,500 per annum to fund payment of approved claims. Governor Brown and Attorney General Felder were delighted. So was the General Assembly. It passed a resolution authorizing

---

<sup>13</sup> Johnson's work is summarized in a letter supporting his request to the Department of Justice for attorney fees. See Ligon Johnson to W. J. Hughes, Department of Justice, 21 August 1914, NARA, Dept. of Justice Central Files, Box 540.

<sup>14</sup> See for example, Report of Ligon Johnson to Attorney General Charles Joseph Bonaparte, 25 January 1909; Theodore Roosevelt to Charles Joseph Bonaparte, 4 February 1909 (responding to Johnson's report), both NARA, RG 60, Box 540. Ligon Johnson to T. S. Felder, 21 June 1912, GDAH, RGS 9-1-1, Box 4. Johnson later pioneered the path of many a modern environmental lawyer by leaving government service to defend other smelting firms against farmer lawsuits. He was industry counsel in the 1916 Utah case, *Anderson v. ASARCO*. See Michael A. Church, "Smoke Farming: Smelting and Agricultural Reform in Utah, 1900-1945," *Utah Historical Quarterly* 72, no. 3 (Summer 2004): 196-218,

acceptance of the new TCC agreement and another resolution with an ultimatum to DSC&I. The second measure instructed the Governor to offer settlement with the Ducktown Company on the same terms as those offered by Tennessee Copper, “or to take a decree of injunction.” Ducktown dithered in its response to the Governor (now John M. Slaton—the administration changed on the eve of the session). Slaton in turn, crisply informed Felder “I presume it means a refusal to comply with the terms of the resolution,” and then authorized renewal of the suit.<sup>15</sup>

The Ducktown Company’s refusal to settle was a colossal legal blunder that occurred for several reasons. The company consistently overestimated the strength of its legal position in the smoke litigation. It wrapped itself in the now three-year-old pages of the Bowron report, becoming convinced that it had no liability exposure for the smoke. DSC&I also took strength from a recent victory, “rendered in favor of the company on all points,” in a recent timber suit brought by J. P. Vestal. In a letter to Governor Slaton, the company claimed the win as a major reason against settlement with the state. It was a bad political move for an English-owned corporation to crow to the Governor about a victory over a prominent Georgian. It was worse as an exercise in legal analysis. DSC&I lawyers completely failed to recall the state sovereignty rationale in *Georgia v. Tennessee* (1907). When the Supreme Court granted the state’s right to an injunction, Justice Oliver Wendell Holmes took pains to emphasize that Georgia’s smoke suit rested upon a different footing than a private action for nuisance. Georgia sued “for an injury to

---

<sup>15</sup> J. R. Kincaid and C. T. Owens (both state senators) to Joseph M. Brown, 4 April 1912; Will H. Shippen to Joseph M. Brown, 9 April 1912; Joseph M. Brown to T. S. Felder, 13 April 1912 (requesting meeting regarding Kincaid, Owens, and Shippen), all GDAH, RGS 9-1-1, Box 4. Thomas S. Felder to DSC&I, 11 October 1912; C. W. Renwick to Thomas S. Felder, 15 October 1912 (the new DSC&I general manager); Thomas S. Felder to DSC&I, 12 April 1913, all GDAH, RGS 9-1-1, Box 4. The 1913 TCC settlement appears in Motion for Leave to File and Agreement and Stipulation and the Cause be Continued to October Term 1916, 20 October 1913, *Georgia v. Tennessee Copper Co.*, No. 1 Original, October Term 1913. For the resolutions, see Resolution of 6 August 1913, no. 2, 1913 *Georgia Laws*, v. 2, 1295 (TCC agreement); Resolution of 19 August 1913, no. 16, 1913 *Georgia Laws*, v. 2, 1293 (ultimatum). Victor Lamar Smith to John M. Slaton, 15 September 1913 (DSC&I response via counsel), GDAH, RGS 1-1-5, Box 204; John M. Slaton to T. S. Felder, 23 December 1913, GDAH, RGS 9-1-1, Box 4.

it in its capacity as a quasi sovereign,” who “was more entitled to specific relief than a private party might be.” The company’s success in a private suit by a timber baron did not speak to the company’s exposure in a suit brought by a sovereign state.<sup>16</sup>

Beyond its legal position, the Ducktown Company’s refusal to settle was typical of its conservative business philosophy. DSC&I had a ten-year head start over the Tennessee Copper company when it began mining in 1891. Its directors squandered the company’s lead with a policy of cautious financing and moderate growth. They wanted proof of a profitable return before committing large sums, which is why their first acid plant had only a ten-ton capacity. The Tennessee Copper Company arrived in the Ducktown Basin determined to dominate the local industry. In the space of just four years, it had seven blast furnaces compared to DSC&I’s two. It was first to build an acid plant, and took the risk of building a two-hundred ton facility with unproven technology, and would build another just as big in 1916. TCC’s directors gambled big on business but were not inclined to gamble on a possibly fatal lawsuit when it could be resolved at a tolerable cost without interrupting the stream of profits to the shareholders. Reduced production in the summer months and placing an ante of \$16,500 on the arbitration table was a small price to pay to avoid an injunction. The DSC&I directors in London, being confident in the law, considered the money an unwarranted drain on earnings.

It was the distance between Atlanta and London that explained the third reason for rejecting the state’s offer. The London management of the Ducktown Company was deaf to the political voices in North Georgia and in Atlanta and instead rested upon its legal and factual defenses. Ducktown had logic on its side regarding the smoke: its generated only half the amount of smoke made by TCC; it was three miles from the state line compared to TCC’s location just a

---

<sup>16</sup> Victor Lamar Smith to John M. Slaton, 20 December 1913, GDAH9-1-1, Box 4; *Georgia v. Tennessee Copper Co.* 206 U.S. 230, 237 (1907).

few hundred yards away; the DSC&I smoke stacks were short; and TCC's rose more than three hundred feet to cast smoke throughout the Basin. Those facts had some bearing in the courtroom but did not matter in the political arena. The better lawyers know that while logic alone may prevail in court or on a bar exam, it often leads to bad results for a real client when the contextual realities of politics are ignored.

TCC's American officers and directors settled because they understood that Georgia's politicians needed to deliver a victory to their mountain constituents. Voters wanted a tangible remedy. Hart provided a partial one with his 1907 win that led to construction of the acid plants, but that was six years ago and matters had yet to proceed to an injunction. The politicians needed to deliver fresh proof of their commitment to constituents. They needed and wanted to hunt big political game. Will Shippen, the Farmers Union, and mountain legislators were happy to serve as the guides. Tennessee Copper saw the hunters coming and settled while it could on terms that amounted to a consensual injunction during the summer months and a politically saleable, well-funded arrangement to promptly settle new claims through arbitration. With that accomplished, the hunters pointed their guns at DSC&I as the only remaining target. And the stubborn company refused to dodge the bullet.

\*\*\*

The case of *Georgia v. Tennessee Copper Company* returned the Supreme Court. This time the caption was a misnomer because Tennessee Copper was out of the action by virtue of the settlement. Only the Ducktown company faced injunction. On the plaintiff's side, the state of Georgia and the National Farmers Union joined forces. Attorney General Warren A. Grice, the latest of Hart's successors, appointed NFU attorney, Jesse A. Drake, as special counsel. That placed Drake at the center of events where he could monitor the state's case for its impact upon

the scores of smoke damage claims they handled for NFU members. At the same time, the move transformed the role of the Farmers Union from that of an outside critic to a comrade in arms. The NFU and the state would share the praise or share the blame, however the case turned out.<sup>17</sup>

Drake sat through the hundreds of depositions from foresters, engineers, timber owners, miners, merchants, and farmers, a task that combined high-stakes legal practice with mind-numbing tedium. Each property spoke about his or her experience of the smoke and stated the distance in “air miles” from the farm to the smelters. This is when B. S. Seabolt, the elderly farmer of a 110 acres in the Blue Ridge Mountains of Fannin County, gave his testimony. The lawyers first stipulated that he lived eight miles from the TCC works at Copperhill and ten-and-a-quarter miles from the DSC&I smelters at Isabella. He was then asked his age, to which he said, “Going on seventy-eight years old; if I live until next Christmas, I will be seventy-eight.”

Though mention of his age went without discussion, it bears mention here because his life embraced the entire chronological span of Ducktown’s copper industry. Seabolt was born in 1836, at the end of President Andrew Jackson’s administration. He was a toddler at the time of the Cherokee Removal in 1838. He survived the Civil War, and then began farming his mountain spread around 1870, years before the railroad penetrated the mountains on its way to Ducktown. He lived in the Basin through the twelve-year suspension of the copper industry following 1878, and remained when it revived in 1890. He saw the renewed industry grow year by year, and the smoke extend further and further southward until it reached his home. And now as an old man, he was a witness in the Supreme Court’s first air pollution suit, speaking of smoke damage to his garden of peas, beans, potatoes, cabbage, and corn. In response to questions from Jesse A.

Drake, a lawyer for the National Farmers’ Union (and special counsel for Georgia), the farmer

---

<sup>17</sup> Warren A. Grice, *Report and Opinions of the Attorney General for the Year 1914* (Atlanta: Byrd Printing, 1915), 16-18.

spoke of how the smoke caused his garden to “parch it up like a frost,” and then, “I will tell you how it does: you take fire and hold it close to it, and it would draw it up and turn a sorter brown color like fire would, if you hold it close to the stuff.”<sup>18</sup>

Defense attorneys then cross examined Seabolt and every plaintiff’s witnesses about the times they had sued the copper companies or testified on behalf of another claimant. This proved a source of embarrassment to Will Shippen when he made his familiar appearance as star witness. Ducktown’s lawyers had examined records of his many lawsuits and business dealings, and with documents in hand, portrayed him as plaintiff who led public opposition to the copper companies as a means of personal gain. Shippen was forced to acknowledge an affidavit in a shareholder suit in which he boasted of his services to the company as a ringleader in the smoke wars. In the customary third person tone of affidavits he said, “After almost numberless appeals to the public authorities, to the newspapers, to scientific magazines, and using every influence in the world,” he and his brother, Frank, “finally got the movement into a compact, well-organized condition where it presented a formidable front to the further infliction of the damage.” Further, his work behind Hart’s 1907 victory boosted company stock values: “I consider the Shippen Brothers Lumber Company worth 25 percent more today than it was with this thing going on.” Written documents established that Tennessee Copper settled with Shippen Brothers Lumber for \$50,000, which was not terribly surprising, and in addition, “paid myself and my brother \$175,000 for stock in our company.” Ducktown counsel could now argue that Shippen and TCC

---

<sup>18</sup> Transcript, 265-72, quotations at 266-267, Deposition of B. S. Seabolt, 1914, *State of Georgia v. Tennessee Copper Co.*, U. S. Supreme Court, No. 1 Original, October Term, 1937.

were in league as fellow shareholders and that Will's personal claim against DSC&I was, in effect, a subterfuge for TCC's attack upon its rival.<sup>19</sup>

Three federal foresters, Dr. W. T. Hedgecock, H. L. Johnson, and E. B. Clarke, testified for the state. Most of their testimony consisted of the same sort of surveys about the geographic extent of tree damage. This time the foresters spoke from the perspective of a neighboring landowner. By virtue of the 1911 Weeks Act, the federal government now owned over 25,000 acres of forestland in the Unaka Mountains near Ducktown, the beginnings of what is now the Cherokee National Forest. The act authorized the federal government to buy privately owned land to create national forest reserves in the eastern half of America. It was the legislative fruit of the 1902 Wilson Report on the forests of the Southern Appalachian region, which Attorney General Hart quoted so extensively in the 1907 Supreme Court hearing. The government was not a party to the Ducktown case, but with its closest holdings only four miles from the DSC&I Isabella complex, it now had an interest in Ducktown sulfur smoke.<sup>20</sup>

In addition to the new forest reserve on the edge of the Basin, the federal government retained an ongoing scientific interest in the Ducktown as a portent of erosion problems in the Southern Appalachians. The U. S. Geological Survey conducted a regional study of forest loss and erosion that culminated in a book-length report written by Leonidas Chalmers Glenn,

*Denudation and Erosion in the Southern Appalachian Region and the Monongahela Basin*

---

<sup>19</sup> Transcript 514-515, 523, 533. and generally, 512-555, Deposition of Will H. Shippen, 1914. Two clever Georgia smoke suitors revived the jurisdiction by garnishment strategy when they attached TCC's shares in Shippen Brothers Lumber Co., "Two Suits Are Filed Against Ducktown Co.—Attachment Proceedings Are Filed on \$224,000 of Stock for Alleged Damages," *Atlanta Constitution*, 7 October 1914, 11.

<sup>20</sup> For the Weeks Act. see Act of 1 March 1911, Chap. 186, *U.S. Statutes at Large* vol. 36, Part I, 961-63. The report, *Message from the President of the United States Transmitting a Report of the Secretary of Agriculture in Relation to the Forests, Rivers, and Mountains of the Southern Appalachian Region* (hereinafter the Wilson Report) was originally published as Senate Document 84, Fifty-seventh Congress, 1902, and reprinted separately under the same title by the Government Printing Office in 1902.. The government's holdings are described in Transcript, E. B. Clarke Deposition, \_\_ August 1914, 436, *Georgia v. Tennessee Copper Co.* United States Supreme Court, No. 1 Original, October Term 1914 (herein Transcript).

(1911). Ducktown was described at length with numerous full sized photographic plates. Glenn stated that “Any small flood plain [the bottom lands prized by farmers] that my have previously existed along the streams has been buried beneath the rapid accumulation of waste from the hillsides, so that both hill slope and flood plain have been destroyed, the one by erosion and the other by sedimentation or aggradation.” Though annual rainfall remained heavy, “very little of the rainfall now soaks into the ground to feed the springs.” Then, as predicted by George Perkins Marsh, “abnormal denudation and erosion has also affected the underground water level in the region.” He reported that “during the last few years wells have been doing dry,” and “a number of springs, some of which supply water to the miners’ families, flow less than formerly.”<sup>21</sup>

This was but one example of Glenn’s regional findings that “the regimen or normal habit of flow of the streams has been changed,” wherever “mountain stream basins in the southern Appalachians have been extensively cleared.” On Potato Creek, which ran through the heart of the mining district, silt accumulated so rapidly that “telephone poles have been buried almost to their cross-arms, and highway bridges, roadbeds and trestles have either been buried by the debris or have been carried away by the floods.” The normal flow of the creek was now “half as large as it used to be.” Downstream on the Ocoee, every large flood clogged the river with silt “as to prevent the running of the two ferries at the smelter until the river has had time to scour its channel again.” Glenn concluded that, “The Ducktown region is, then, not only an impressive object lesson, but an emphatic warning of the extent and character of the disaster that may result in these southern mountains from the thorough destruction of the forests.”<sup>22</sup>

---

<sup>21</sup> Leonidas Chalmers Glenn, *Denudation and Erosion in the Southern Appalachian Region and the Monongahela Basin*, U. S. Geological Survey, Professional Paper 72 (Washington, D.C.: Government Printing Office, 1911), 24-25, 78.

<sup>22</sup> *Ibid.*, 25, 77-79.

Lumbering and smelting were not the only threats to local forests. The chestnut blight, a pathogen discovered in 1904 on a specimen plant at the New York Zoological Park, was beginning to sweep southwards down the Appalachian chain. It was a terrible scourge that “in less than fifty years...killed an estimated 3.5 billion trees, the equivalent of over 9 million acres of pure chestnut stands.” Chestnuts once comprised about a fourth of the Southern Appalachian forests. Their loss was disastrous for the eastern forests, and equally so for the mountaineers who depended upon the chestnut as a mainstay of their life and economy. Chestnuts were valued for their edible nuts, rot-resistant wood, and for tanbark. The nuts were gathered and sold, providing a source of cash income. Hogs grew fat on the nuts, or mast, left on the forest floor.<sup>23</sup>

The blight had been noticed in the southern mountains at the time Georgia renewed its Supreme Court case in 1914. The disease thus became a factor in litigation because trees killed by the blight could not be attributed to smoke damage. J. A. Fowler, a DSC&I defense attorney, cross-examined each forester about the disease. Dr. Hedgecock, a plant pathologist, knew a great deal about it because his office was studying the disease. In less than a decade it had spread from New York City, where William Alphonso Murrill described it in 1906, to the Southern Appalachians. The witnesses knew of its presence near Knoxville, Tennessee, and in Western North Carolina, but did not yet detect it in the forests around Ducktown. The answer

---

<sup>23</sup> Ralph H. Lutts, “Like Manna From God: The American Chestnut Trade in Southwestern Virginia,” *Environmental History* 9, no. 3 (July 2004): 497-525 (quotation at 497); Ana Ronderos, “Where Giants Once Stood: The Demise of the American Chestnut and Efforts to Bring it Back,” *Journal of Forestry* 98, no. 2 (February 2000): 10-11; David M. Smith, “American Chestnut: Ill-Fated Monarch of the Eastern Hardwood Forest,” *Journal of Forestry* 98, no. 2 (February 2000): 12-15; Robert L. Youngs, “Right Smart Little Jolt: Loss of the Chestnut and a Way of Life,” *Journal of Forestry* 98, no. 2 (February 2000): 17-21; Gary J. Griffin, “Blight Control and Restoration of the American Chestnut,” *Journal of Forestry* 98, no. 2 (February 2000): 22-27 .

disappointed Fowler, so he then asked Hedgecock whether sulfur fumes would help chestnut trees by acting as a fungicide. The scientist replied crisply, “I doubt it very much.”<sup>24</sup>

Neither sulfur fumes nor anything else could stop the path of the disease. By 1950, it wiped out the entire stand of native American chestnut trees. Only a very few of the trees survive in the field, each considered a scientific marvel for its very survival. But in 1914, the blight was not so advanced that it seriously impacted the case. Logging and sulfur dioxide ruined Ducktown forests before arrival of the blight.

The Ducktown company argued the chestnut blight before the Supreme Court but placed greater reliance upon two other arguments. The first was to dispute the extent of recent damage to vegetation by virtue of the somewhat cleaner smoke released after being scrubbed by its acid conversion plant. This involved technical evidence about the composition of current smoke emissions and a battle of biological experts about the nature and amount of plant damage. The company relied upon Professor S. M. Bain, a University of Tennessee botanist and the author of “The Action of Copper on Leaves, With Special Reference to the Injurious Effects of Fungicides on Peach Foliage.” The Georgia attorneys countered with Dr. Hedgecock and his assistants from the U. S. Forest Service. Both sides offered abundant and thoroughly contradictory from lay witnesses.<sup>25</sup>

The second approach was its blame-thy-neighbor defense, framed thus in legalese: “Whatever injuries are now, or have been for the last five years, done by sulfur fumes to the forests, crops, gardens, and all other forms of vegetation in North Georgia, are being and have

---

<sup>24</sup> Transcript, George W. Hedgecock Deposition, 12 August 1914, 18; 42-44; Transcript, E. B. Clarke Deposition, 446. William Alphonso Murrill, “A Serious Chestnut Disease,” *Journal of the New York Botanical Garden* 7, no. 78 (June 1906): 143-53;

<sup>25</sup> For Bain’s findings, see “Brief and Argument on Behalf of the Defendant, Ducktown Sulphur, Copper & Iron Company, Ltd. on Motion for Final Decree, filed 5 April 1915, Georgia v. Tennessee Copper Company, U. S. Supreme Court, no. 1 Original, October Term, 1914 (herein DSC&I 1915 Brief), 19-23,

been produced by smoke escaping from the plant of the Tennessee Copper Company, and not by smoke emitted by the furnaces of this defendant.” This involved the now familiar argument comparing the relative size of the two companies and their respective distance from the Georgia border. This was a version of the tactic known by lawyers as the “empty chair” defense in which blame is cast upon a party that is not in court. The defense is often successful, and plaintiffs’ attorneys usually seek to name as many potential claimants as they can to prevent its application. The problem for the Court was its inability to factually distinguish between the smoke generated by one firm from that created by the other firm as the source of smoke damage to Georgia fields and forests. Both companies processed sulfide copper ores (though they varied somewhat in their composition) and both produced basically the same sort of smoke. Their proximity within a mountain bowl allowed the smoke of both firms to frequently blend into an undifferentiated whole.<sup>26</sup>

The Court was disinclined to wade through the competing expert and lay testimony. Mr. Justice James Clark McReynolds expressed the Court’s frustration, writing that the evidence “does not disclose with accuracy the volume or true character of the fumes which are being given off daily.” Still, the weight of government testimony, the proven toxicity of sulfur dioxide to vegetation, and the dramatic reality of the ever-expanding Ducktown Desert prompted the justices to decide in favor of the state of Georgia. The need for action was evident; and DSC&I was the only defendant before the Court, and thus the only one to become subject to its injunction power. The Court declared that though the present evidence made it “impossible...to ascertain with certainty the reduction in the sulfur content of emitted gases necessary to render the territory of Georgia immune from injury...” the state was entitled to relief. Once again,

---

<sup>26</sup> Ibid., 75.

Ducktown Sulphur, Copper & Iron Company had to pay for the folly of its refusal to settle with the state when it could.<sup>27</sup>

The Court accomplished this by limiting DSC&I production in two ways. The company “shall not permit the escape into the air of fumes carrying more than 45 percent of the sulfur contained in the green air.” Next, “It shall not permit escape into the air of gases the total sulfur content of which shall exceed 20 tons during one day from April 10th to October 1st of each year or exceed 10 tons in one day during any other season.” (The amounts rose to 40 tons and 20 tons, respectively, when the signed decree was issued on June 1, 1915.) The vote was six to three. Justice Charles Evans Hughes dissented, saying only, “I do not think that the evidence justifies the decree limiting production as stated.” He was joined by Chief Justice Edward Douglass and Justice Oliver Wendell Holmes. Justice Holmes gave warning of his reluctance about an injunction in 1907, and now made good on the warning with his dissent in 1915.<sup>28</sup>

The Court addressed the statistical weakness of the case by appointing Dr. John T. McGill, a Vanderbilt University chemist, to conduct a six month study of sulfur emissions by Ducktown and to assess its effect upon vegetation. McGill conducted the most detailed study to date in the region, using a variety of approaches including analysis of production statistics, systematic air sampling, and field studies of vegetation damage. He substantiated the state’s arguments about the persistent escape of gas. Daily tests documented that the company was generally compliant with the new limits. He made no attempt to allocate historical damage between the two companies. He did leave an intriguing remark about the current wave of private smoke suits from Georgians. After comparing the list of suitors to the locations claimed to be

---

<sup>27</sup> Georgia v. Tennessee Copper Co., 237 U.S. 474, 478-79 (1915)

<sup>28</sup> Georgia v. Tennessee Copper Co., 237 U.S. 474 (1915) (opinion); 237 U.S. 678 (1915) (decree).

within the vicinity the DSC&I plant, he concluded, “that no visible injury of any consequence was done to vegetation on these lands by the smoke of the Ducktown Company’s smelter during the period of our investigation.” The Court accepted McGill’s report and slightly increased the daily limits from 20 tons to 25 tons during the growing season, and from 40 tons to 50 tons in other seasons.<sup>29</sup>

The Tennessee Copper Company gambled on business and won. The Ducktown Sulphur, Copper & Iron Co. gambled on the law and lost—heavily. The court-imposed limitations upon it were much more severe than the limits TCC accepted in its voluntary settlement. The telling difference was the type of limitations under which each operated. TCC merely agreed to match smelting input to acid conversion capacity during the growing season. There was no fixed limit upon sulfur emissions during the summer; TCC could legally double production so long as it increased capacity of its acid operations in proportion. And in other seasons, TCC had no production limits at all. The Supreme Court decree placed Ducktown under year-round limitations with one fixed limitation for the growing season and another for the remainder of the year. In effect, DSC&I could not increase production unless it invented some new technology that harvested more than 45 percent of sulfur fumes. The company already employed state-of-the-art techniques, so it could not operate any more efficiently than it already was. Tennessee Copper was free to grow larger, even if that meant greater releases of sulfur fumes, so long as it honored the proportionality rule during the summer. Production at the Ducktown Company was capped and would remain so unless and until the Supreme Court altered the injunction.

---

<sup>29</sup> *Georgia v. Tennessee Copper Co.*, 240 U.S. 650 (1916) (final, post-McGill decree); Report of John T. McGill, 1 January 1916, 58, *Georgia v. Tennessee Copper Co. No. 1 Original*, October Term 1914.

\*\*\*

In 1916, the Tennessee Copper Company was free of an injunction but not free of political troubles in Georgia. Renewal of its settlement agreement with the state of Georgia was in serious doubt because of continued complaints of smoke damage and anger about the claims arbitration system. The 1913 settlement at first met with great approval, especially regarding the terms relating to the arbitration program and the \$16,500 paid by the company to fund it. Claimants were generally satisfied with the size of the awards issued in the program's first year. Most were in the range of \$100 to \$500, with a surprising number tending to the higher end of the range. The payments matched or exceeded those that farmers could expect to recover at trial in the Polk County Circuit Court. Plaintiffs' attorneys were also happy because the Governor consented to send settlement checks directly to the lawyers rather than the clients. This made it easier for the lawyers to collect their fees. The trouble came in the following years when the amount and number of awards plunged. Claimants were especially upset when the arbitrators failed to allot the entire annual settlement fund of \$16,500.<sup>30</sup>

Claimants directed most of their furor at one of the arbitrators, J. J. Brown, at a level that jeopardized renewal of the agreement. The arbitration system provided for three arbitrators, one for Tennessee Copper, another for the smoke claimants, with Brown filling the third slot as umpire to resolve differences between the other two. J. F. Holden, a Fannin County banker, wrote Governor Nat Harris on the eve of the 1916 General Assembly saying advising that "settling damages by arbitration is an absolute farce." Holder added, "Umpire Brown has used his position from beginning to end to give the Copper Company the long end of the deal." This

---

<sup>30</sup> For early arbitration awards see, B. L. Smith to J. M. Slaton, Governor 15 December 1913; Thomas H. Crawford to John M. Slaton, 16 December 1913; Allison S. Prince to John M. Slaton, 18 December 1913, all GDAH, RGS 1-1-5, Box 207.

presented a difficult political problem for the Governor. His predecessor had appointed J. J. Brown to the panel because of Brown's stature as the current state president of the National Farmers Union. He was supposed to be politically and socially aligned with the farmers, especially the farmers in the highly organized NFU chapters in Fannin and Gilmer counties. Now, the farmers rejected their spokesman and wanted Harris to fire him. Adding to the difficulty was J. J. Brown's status as Tom Watson's protégé. Watson was perhaps Georgia's most powerful politician and a man that elected officials offended at their peril. Every political figure in the state knew that Hoke Smith won the governorship in 1906 with Watson's backing. They also remembered that Smith then lost in 1908 when Watson transferred his support to an opponent after becoming miffed over Smith's refusal to help a personal friend. Watson was the king maker. To make matters even worse, Brown was running for Commissioner of Agriculture with Watson's backing.<sup>31</sup>

Will Shippen did all he could to raise the level of political heat by engaging in a noisy exchange of column-length letters in the *Atlanta Constitution* and other Georgia newspapers. He published a column that initially lauded Brown as the editor of Watson's populist magazine, *The Jeffersonian*. That said, Shippen then criticized Brown's performance as umpire in the smoke arbitration and alleged that he was in the pay of Tennessee Copper Company. Brown retaliated that Shippen was maneuvering to take his umpire job. Shippen countered that "everyone who knows me knows that I am not a \$125-a--month man, the known salary that the copper company pays Mr. Brown each month." He added that, "Mr. Brown is evidently a \$125-a-month man, as shown by the grim hold he retains on his present little position." This was to suggest that

---

<sup>31</sup> J. F. Holden to Nat E. Harris, 16 June 1916, GDAH, RGS 9-1-1, Box 6. The story is told in C. Vann Woodward, *Tom Watson, Agrarian Rebel* (New York: Macmillan, 1938), 320-342. Brown's close political relationship with Watson is the theme of a book by Brown's son, Walter J. Brown, *J. J. Brown and Thomas E. Watson, Georgia Politics 1912-1928* (Macon, GA: Mercer University Press, 1989).

Shippen's reputed wealth placed him above monetary motives. Brown retaliated with evidence from the recent Supreme Court proceedings establishing that Shippen had received \$50,000 from Tennessee Copper. And so it continued, tit for tat.<sup>32</sup>

At the local level, one account reported "a mass meeting of farmers and citizens" was held in the Fannin County seat at Blue Ridge where a resolution in favor of renewing the settlement agreement and retaining Brown as umpire prevailed on a vote of 171 to 1. Homer Legg of nearby Morganton responded with a letter to the editor alleging that the meeting was "a huge joke" because "the farmers of Fannin County knew practically nothing of any such meeting." Instead, the meeting "was reported to have been composed almost entirely of employees of the Tennessee Copper Company who were rushed into Blue Ridge by the car loads to dominate this meeting." Legg added that "the company not only paid their railroad fare, but their time as well." In Gilmer County, the local chapter of the National Farmers Union petitioned Governor Harris for Brown's removal saying, "there is a time when patience is no longer a virtue." Continuing, they said, "our mountain people are as independent and spirited as any in our good state, and we fail to understand why our chief executive should delay a moment in affording us the relief," which the Supreme Court "has repeatedly said we are entitled to receive." Even the Gilmer County Board of Education condemned Brown.<sup>33</sup>

---

<sup>32</sup>See the *Atlanta Constitution*: "Governor to Visit Big Copper Plants—He Will Seek First-Hand Knowledge of the Alleged damages to Georgia Crops—Shippen Answers Brown," 9 June 1916, 4; "Shippen Charges Branded as False—J. J. Brown Writes Letter to Governor on Copper Company Situation and Gives It Out for Publication," 10 July 1916, 9; "Every Foul Charge False, Says Shippen—Still Another Spicy Document Added to the Ducktown Controversy," 17 June 1916, 10.

<sup>33</sup> See the *Atlanta Constitution*: "Favor Continuing Smoke Contract—Only One Voter in Fannin Meeting Favors Cancelling Agreement with Copper Company," 18 June 1916, 12; Homer Legg, "Says it Was Copper Co. Employees Who Voted for Brown, Not Fannin Farmers," 22 January 1916, 8; "Governor Charged With Temporizing by Gilmer People—Such Conduct Makes for Mob Violence in Our Fair State, Declares Petition Passed by Famers' Union," 11 June 1916, E1; "North Ga. Teachers Back Gilmer Farmers," 9 July 1916, 4.

In the General Assembly, attorney John D. Little lobbied for TCC while J. A. Drake and Lamar Hill acted in their many capacities as special counsel for the Attorney General, as counsel for the National Farmers Union, and as private counsel for scores of private farmers (and NFU members) to make the argument against renewal. On the floor, A. H. Burtz of Gilmer County aligned with Shippen against the measure, and W. Y. Gilliam of Fannin spoke for renewal on behalf of TCC. More charges of interest were exchanged. Gilliam challenged Burtz for representing Shippen in a large smoke damage suit. Burtz retaliated by noting that Gilliam was vice president of the Bank of Copperhill which handled the payroll account for TCC.<sup>34</sup>

In the executive offices, Attorney General Felder wanted to end the settlement agreement. He wrote Governor Harris on June 26, 1916, advising that notice of termination be issued to TCC. Governor Harris probably faced the same temptation to let the unpopular settlement agreement die, rather than renew it at the price of firing Brown. He instead chose a more subtle approach. He made an inspection tour to Ducktown to demonstrate his interest and reviewed petitions from both sides. When all counseled immediate action, he opted for patience to allow events to sort out the issues, willing to suffer accusations of temporizing and waffling. Then, in his annual message to the General Assembly, he acknowledged public dissatisfaction with the agreement and said he was leaving it to the Assembly's disposal, though not without hinting in favor of renewal. Without an agreement, he warned, Georgians "will be left to their remedies in the Tennessee courts." The state would have to move for an injunction against TCC with all the risk of disaster to Georgia mineworkers and the fertilizer industry if TCC were to be shut down. As to the umpire issue, Governor Harris knew that Brown was in the race for commissioner of

---

<sup>34</sup> *Atlanta Constitution*: "Copper Company Probe is Opened," 11 July 1916, 12; "House Votes Today on the Usury Bill—Spirited Debate Ended by Adjournment on Tuesday, Renewal of Copper Company Contract Is Favored After Stormy Session," 2 August 1916, 9.

agriculture and was confident that he would win it (which he did). If so, the duties of Brown's new office would force him to resign from the arbitration panel, and Harris could pick a replacement without making Tom Watson angry. As the political dust settled, the General Assembly renewed the Tennessee Copper contract, allowing the threat of injunction to quietly die another death. For all of their hostility to the settlement agreement, farmers responded by submitting 1,040 claims to the arbitrators at the end of the 1916 growing season, in amounts ranging from \$10 to \$3,000.<sup>35</sup>

\*\*\*

World War I may have been another element tilting toward renewal of the settlement agreement with the Tennessee Copper Company. By 1916, the England, France, and Russia had been at war with Germany for two years, and signs were growing that the United States would become involved as a supplier of war goods, as a combatant, or as both. The two local copper companies produced two kinds of valuable war materiel. Their copper was used in its pure form as wiring for anything electrical and for communications. As brass, copper became bullet casings, artillery shells, and uniform belt buckles. As bronze, copper was cast into propellers that moved ships and their cargoes to the Allies. Sulfuric acid, Ducktown's second major contribution to the war, was key to the manufacture of explosives.

All of this meant that demand and prices for Ducktown products would be high. On August 20, 1915, the *Copper City Advance* happily declared, "Big War Order for the South—Copper Basin Gets 17 Million Dollars' Worth—Every Portion of the South Busy Making Contracts and Filling Orders."<sup>36</sup>

---

<sup>35</sup> Nat E. Harris to Annual Message of Nat E. Harris, 28 June 1916, 1916 *Georgia House Journal*, 77; "1,040 Claims Are Made by Owners of Property Against Copper Company," *Atlanta Constitution*, 13 October 1916, 9

<sup>36</sup> "Big War Orders for the South," Copperhill, Tenn., *Copper City Advance*, 20 August 1915, 1.

The sky was the limit, unless contracts and court orders dictated otherwise. In 1915, the Dupont company needed 1,000,000 tons of acid to make explosives. Tennessee Copper wanted to fill it, but was bound by its long-term fixed contract with International Agricultural Company. That enabled IAC to fill Dupont's order by reselling TCC acid at a handsome markup. IAC profits were enormous: according to the *New York Times*, "the contract calls for a price of \$4.81 a ton to paid by the Tennessee to the International," which it in turn "then sold again above \$25 a ton." IAC ran operations through its Atlanta office, so some of the Dupont money was bound to flow into the state.<sup>37</sup>

Tennessee Copper was determined to reap profits for itself. It built another large acid plant in 1916 to increase production from 210,000 of acid per year to 300,000 tons. Over 5,000 new people moved into the Basin to work on all the new construction. A salesman, Virgil Hyatt, reported that, "There is one of the biggest building booms going on up there you ever saw." "Everybody is excited," he said, "just like the old gold fever days." The company also began to process sulfide ore brought in from other mines outside the company. This generated a fight as IAC claimed rights to all of the acid from whatever the source, but the opportunity for great gains made the venture worth the risk of litigation. As for copper, TCC was free to produce and sell all it could make, subject only to its agreement to reduce production in the growing season.<sup>38</sup>

Over in Isabella, the Ducktown Company suffered in two ways. Like TCC, it was subject to the IAC contract for acid. That meant that all the war profits for the acid would remain with

---

<sup>37</sup> "Large War Orders Will Be Supplied By Atlanta Firms," *Atlanta Constitution*, 15 August 1915, 1; "Maker and Seller in War Acid Snarl—Tennessee Copper and International Agricultural See Shutdown Differently—Big Profits in Contract," *New York Times*, 8 January 1916, 13.

<sup>38</sup> Ibid.; "Copper Output All Sold," *New York Times*, 28 April 1916, 15; "Ducktown District Takes on Big Boom," *Atlanta Constitution*, 14 May 1916. TCC also entered into an agreement to manufacture and sell trinitrotoluol (TNT - another product made from sulfuric acid) to the Russian Imperial Government. The project collapsed along with Russia's military fortunes and the fall of the Tsar to the Communists, but nonetheless remained in litigation for years to come. See, "Russia Sues U. S. Company," *Washington Post*, 6 March 1917, 14.

the corporate middleman. Worse, it was bound by the production limits imposed by the Supreme Court. DSC&I could not increase production to serve the profitable war effort without violating the terms of the injunction. The terms of the injunction prevented it from expanding production like its neighboring rival. Nothing would change unless the terms of the injunction were modified by the Court or by an agreement with the state of Georgia.

The state had no reason to negotiate. It was content with the terms of the Supreme Court injunction and so were the voters. The new attorney general, Clifford Walker, inherited a victory obtained by his predecessors. He had nothing to gain politically, and much to lose, if he voluntarily relaxed the terms of the injunction. The same was true for Governor Harris and the General Assembly. The matter could have settled three years ago in 1913 on the same terms accepted by Tennessee Copper, but now it was too late.

The Ducktown Company's lawyers, W. B. Miller and James A. Fowler, tried and failed to have the Supreme Court dismiss the case. They then began to work the political side of the matter by asking Tennessee's Governor Tom C. Rye and Attorney General Frank M. Thompson to intervene. The request came with petitions signed by many in Polk County. Tennessee's motion to intervene was more than a little ironic. In 1903, at the outset of Georgia's case, Tennessee's Governor Frazier disclaimed any legal authority to compel abatement of smoke from the copper companies. It then remained outside of the litigation for the next twelve years. Now, in 1916, Georgia's attorneys asserted that "if the state of Tennessee ever had any right to intervene, it has forfeited such right," because "it has waited until the court has handed down a final decree before taking any action in the matter." Even J. A. Fowler, co-counsel for the Ducktown company conceded, "it is rather difficult for the state to set for ...legitimate grounds

to become a party in the litigation.” Georgia’s hard won injunction decree remained intact through 1916 and into the next year.<sup>39</sup>

America’s declaration of war on April 6, 1917, then opened a new approach, a new theme, to the smoke litigation: patriotism. The argument was simple. American industry needed to mobilize for the war effort just like its soldiers. Copper and sulfuric acid were needed for the war effort, thus it was a patriotic duty to maximize production to fight the Germans. President Woodrow Wilson created the War Industries Board, led by Bernard Baruch, to coordinate a wide array of industries to that end.

Baruch brought sulfuric acid within his scope. He received weekly reports from the Advisory Commission of the Council of National Defense, Committee on Chemicals. On August 11, 1917, the committee surveyed sulfuric acid supplies and then noted “evidence of approaching shortage increases,” adding, “Plant capacity already insufficient and all should be operated all the time.” War hindered the movement of raw materials from overseas. The committee observed, “Prior to 1917, over 60 percent of the acid in the country had been made from Spanish ore.” Now, it was necessary to increase domestic pyrite production.<sup>40</sup>

W. B. Miller realized that the War Industries Board provided a new layer of influence and a new, national agenda that could prove useful in freeing DSC&I from the injunction. He had finally realized that political power was a force equal to or greater than the law alone. His letter of January 9, 1918, to NFU counsel, Jesse Drake, revealed the change in his methods.

---

<sup>39</sup> Petition of the State of Tennessee for Leave to Intervene, filed 5 June 1916, *Georgia v. Tennessee Copper*, October Term 1915, no. 1 Original; Clifford Walker, *Reports and Opinions of the Attorney-General of Georgia from June 15, 1915 to December 31, 1916* (Atlanta: Index Printing, 1917), 5-7; “Tennessee Enters the Ducktown Case—Intervention Seeks to Nullify Completely Every Victory Won in Long Legal Battle,” *Atlanta Constitution*, 3 June 1916, 1; J. A. Fowler to W. B. Miller, 1 June 1916, DBM.

<sup>40</sup> Advisory Commission of the Council of National Defense, Committee on Chemicals to B. M. Baruch, Chairman, Committee on Raw Materials, 11 August 1917, 1, 7, NARA RG 61, Entry 1D1, Box 89. and Entry 21A-A4.

Instead of arguing the law, he devoted the first four paragraphs to a description of his meetings with Tennessee's congressional delegation, the War Industries Board, and the Commission on Car Service (which controlled the movement of railroad tank cars for acid). Not until the fifth paragraph did he mention, "The Government is making such heavy demands of this Company—we should show the War Department the possibilities of increasing our output if restrictions were removed." He then closed by saying, "I would rather approach the matter from a purely patriotic viewpoint." Miller's February 7 letter to Georgia's Attorney General Walker showed further advances in his new-found political technique. He mentioned a visit to the Fuel Administration and then to the Secretary of the Navy in Washington. "The possible modification of the injunction was laid out before the Navy Department, supplemented by explanatory letters from our two Senators. It seems the Government is in extreme need of acid, and course requires copper." <sup>41</sup>

Miller's Washington lobbying resulted in a letter dated February 14, 1918 from Secretary of the Navy Josephus Daniels to Georgia's Attorney General Clifford Walker. The Secretary opened by saying, "It has been brought to my attention that the country's production of sulfuric acid and copper will be materially increased if arrangements can be made so that the Ducktown Sulphur, Copper & Iron Co. and the Tennessee Copper Company can operate at their maximum capacities." The Secretary added, "Anything which can reasonably be done to increase production cannot fail to be a distinct national service." Walker sent the letter to Governor Hugh M. Dorsey on several occasions, the second time with a new letter from Miller saying that the

---

<sup>41</sup> W. B. Miller to Jesse A. Drake, 9 January 1918; W. B. Miller to Clifford Walker, 7 February 1918, both GDAH, RGS 9-1-1, Box 8.

federal Department would file a motion to intervene in the Supreme Court case, “as a war measure.”<sup>42</sup>

It was not a bluff. The Solicitor General, John W. Davis, filed an *amicus curiae* (friend of the court) brief in the Ducktown case on May. The brief contained the text of letter revealing a three-way correspondence between Secretary of the Navy Daniels, Bernard Baruch, and the nation’s Attorney General—all to the end of securing modification of the injunction. Davis ended the brief with a request to the Court that if Georgia objected to the requested modification, “it should be overruled, because any possible damage that could result from the slight modification asked ought not to weigh against the need of the Nation, in its hour of peril, to use its resources for the common good and the safety of the country.”<sup>43</sup>

W. B. Miller’s skillful Washington lobbying transformed *Georgia v. Tennessee Copper Co.* in much the same way that the state of Georgia transformed the private nuisance actions in the Tennessee courts. On both occasions, the status quo was upended by inserting new themes and new players into the story. Ducktown smoke litigation began as a mismatched contest between less than a dozen small mountain farmers against two powerful corporations. The copper lawyers, P. B. Mayfield, James G. Parks, and Howard Cornick, befuddled the mountaineers in the courts and in the Tennessee General Assembly until time and persistence taught the claimants and plaintiffs lawyers how to file a successful suit. That is not to say that the farmers were powerless. The three smoke injunction cases gathered under the caption, *Madison*

---

<sup>42</sup> Josephus Daniels to Clifford Walker, 14 February 1918; W. B. Miller to Clifford Walker, 6 May 1918, both GDAH, RGS 9-1-1, Box 8.

<sup>43</sup> Brief of the Solicitor General as Amicus Curiae and in Behalf of the United States, *Georgia v. Tennessee Copper Co.*, No. 1 Original, October Term 1917; “Ducktown Contract Charges Are Asked—Government Demands Abrogation of Clause Limiting Capacity of Plant,” *Atlanta Constitution*, 17 May 1918, 5; “Copper Company Injunction Changes Are Fought,” *Atlanta Constitution*, 18 May 1918, 9.

*v. Ducktown Sulphur, Copper & Iron Co.* nearly shut the industry down. The farmers won at every level until reversed by the Tennessee Supreme Court.

Georgia entered the smoke wars in 1903 at a time when the cases were local affairs in Tennessee courts tried as private actions for nuisance. Governor J. M. Terrell and Attorney General Hart wielded the sovereign powers of the state to move the focus from Polk County to the Supreme Court in Washington, D.C. Hart and his assistant, Ligon Johnson, then aligned the case with the values of the national conservation movement, so that the case became an issue of natural resources as opposed to reduced tax revenue or other property claims.

W. B. Miller accomplished another transformation by aligning sulfur production to the war effort. He then brought the case to the attention of some of the nation's powerful leaders. Governor Dorsey and Attorney General Walker knew they were unlikely to prevail in the Supreme Court against the triumvirate of Bernard Baruch, Josephus Daniels, and John W. Davis. Georgia's insistence upon preserving the terms of the DSC&I injunction began to look petty and unpatriotic.

\*\*\*

News of the letter from Secretary of the Navy found its way to the newspapers, alerting all stakeholders to the proposed modification of the injunction. The gist of the modification was to allow Ducktown Sulphur, Copper & Iron to sign a contract like that under which the Tennessee Copper Company operated. In effect, DSC&I wanted to sign the settlement that it rejected five years earlier in 1913. Will Shippen had his lawyer write an eighteen page brief for Governor Dorsey and Attorney General Walker advising them that they lacked the authority to agree to a modification of the injunction decree. Walker agreed and advised that "the applicants

be referred to the Legislature if they desire to take any action before the convening of the Supreme Court.” Neither of them was eager to decide the matter on their own.<sup>44</sup>

Will Shippen wrote yet another column in the papers, this time arguing that the federal government should be thanking Georgia instead of pressing for modification of the injunction. He reasoned that “not one atom of commercial sulfuric acid would doubtless ever have been made at these copper furnaces,” if Georgia had not acted “to compel them to stop the wholesale destruction of vegetation. DSC&I demonstrated its new-found skill at public relations with its own column in response. Its new general manager, W. F. Lamoreaux, made two simple points. The first was that TCC was now able to act at highest efficiency for the war effort, free of the injunction constraints upon DSC&I. The second was a somewhat disingenuous assertion that “The request for modification...was made under solicitation of the War and Navy departments to the United States Supreme Court, and now awaits the affirmation of the Governor and Attorney General of the state of Georgia.” That was true, but failed to mention the substantial lobbying conducted by W. B. Miller and the Tennessee congressional delegation.<sup>45</sup>

The issue then made its inevitable way to the 1918 General Assembly where it was presented in separate bills for and against modification of the injunction.” The Fannin and Gilmer chapters of the National Farmers Union waged a battle of petitions. Citizens sent mail bags full of letters, often written in pencil on lined tablet mailed from rural post offices such as Higdon and Oasis. Business people and professionals spent the extra dollars necessary to send

---

<sup>44</sup> Will Shippen to Governor Hugh M. Dorsey and Attorney General Clifford Walker, “Memorandum for Shippen Brothers Lumber Company in the Matter of Petition of Ducktown Sulfur, Copper & Iron Company to Enter into a Contract with the State of Georgia” 7 June 1918, GDAH, RGS 1-1-5, Box 253; Clifford Walker to Hugh M. Dorsey, 28 June 1918, GDAH, RGS 9-1-1, Box 7.

<sup>45</sup> Will H. Shippen, “Ducktown Companies Want an Edict of the U. S. Supreme Court Set Aside,” *Atlanta Constitution*, 18 June 1918; W. F. Lamoreaux, “Copper Companies Declare Move to Increase Output Requested by Government,” *Atlanta Constitution*, 19 June 1918. Shippen wrote another column to similar effect, Will H. Shippen, “Says Time to Call a Halt in Copper Company Litigation,” *Atlanta Constitution*, 16 July 1918, 6.

stacks of telegrams. All of the familiar arguments were made once again about smoke damage or the lack thereof, and the needs of farmers versus the needs of mineworkers and merchants. The more insightful participants realized that they need to respond to the argument of patriotism injected by DSC&I counsel, W. B. Miller. Lina Pack, self identified as a “country girl about 16 years old,” reframed the issue for the benefit of the farmers: “help make food for the boys who are fighting for me.” She insisted the injunction remain intact, imploring the Governor “to do all you can to help keep off the smoke so we can help the boys who are fighting and striving and doing their best.”<sup>46</sup>

Thomas A. Brown and William Butt were both prominent figures from Fannin County though on opposite sides of the issue. Butt was a local counsel for DSC&I. He joined efforts with the firm’s Atlanta counsel, Little, Powell, Smith & Goldstein to prepare a thirty-six page brief in favor of the modification. The document was carefully written, printed, and then distributed to the entire General Assembly. Brown, a Fannin County state senator, filed a minority report in the House in which he touched on the loophole enjoyed for so long by TCC: “The resolution here reported contains no limitation whatever upon the output, but it will, if adopted, permit the Ducktown Company to emit an absolutely unlimited quantity of sulfurous acid.” The Committee on Mines and Mining read both documents and then voted. Brown’s minority resolution failed 11 to 27. Butt’s substitute resolution for modification and settlement carried 28 to 10.<sup>47</sup>

The resolution for modification passed in both houses, and on August 20, 1918, Ducktown signed the settlement agreement it had refused five years earlier. It agreed to reduce production in the growing season to a level commensurate with the capacity of its acid plant,

---

<sup>46</sup> Linda Pack to Hugh M. Dorsey, \_\_ August 1918, GDAH, RGS 1-1-5, Box 254.

<sup>47</sup> Minority Report In the Matter of Senate Resolution No. 82, Thursday, 25 July 1918, *1918 Georgia Senate Journal*, 351-367.

with a daily cap on sulfur emissions set at 40 tons during the period. The cap on summer emissions was peculiar to the DSC&I contract; there was no counterpart to it in the Tennessee Copper deal. Its presence represented a compromise on the Supreme Court injunction decree by preserving an upper limit during the growing season while raising the limit from 25 tons as set by the Court to the present 40 tons. During the rest of the year, the company was free to smelt copper without the quantitative or qualitative limitations set by the Court. DSC&I was no longer obligated to limit emissions to 45 percent of sulfur processed. All of this was just as Thomas A. Brown warned.<sup>48</sup>

The company also agreed to participate in the arbitration plan. Being the smaller firm, its annual funding was set at \$8,500, about half of TCC's \$16,500. That meant that the two companies set aside a combined \$25,000 per annum for claims. The funds were probably enough to cover the small farmers, provided the arbitrators were willing to actually award the money. There was a safeguard. Arbitration was voluntary for the claimants; so if the system failed, they retained the right to avoid procedure and pursue their claims in the Polk County Circuit Court. The state added one more clause to benefit the claimants. The agreement provided that "it shall not be necessary for the claimant to specify or prove which of said companies is legally responsible" for alleged damage. Essentially, the Ducktown Company waived its longstanding argument that the larger Tennessee Copper was to blame for the sins of the area's copper industry. The clause simplified matters for claimants because upon proof of loss, the companies paid the claim together on a split of 1/3 by DSCI and 2/3 by TCC.<sup>49</sup>

---

<sup>48</sup> Agreement between the State of Georgia and the Ducktown Sulphur, Copper & Iron Co. Ltd., signed 20 August 1918 by Hugh M Dorsey, Governor for the state and by W. F. Lamoreaux, General Manager and William Butt, Attorney for the company, Georgia v. Tennessee Copper Co., United States Supreme Court, No. 1 Original, October Term 1918.

<sup>49</sup> Ibid.

The Supreme Court approved the settlement and continued the case for the three-year term of the agreement. As a point of law, Georgia reserved the right to renew the litigation. It never did. The parties only returned to the Court as necessary to file renewals of the settlement agreements and to request further continuances. The case remained open on the Supreme Court docket until 1937, when the Court requested dismissals with prejudice from the parties. Yet, for all practical purposes, the case of *Georgia v. Tennessee Copper Co.* ended in 1918.

\*\*\*

Attorney General Clifford Walker quipped that “This case, like the poor, will be with us always.” It certainly seemed that way. Active litigation in the Georgia case began in 1904 and lasted until 1918, a span of fifteen years, actually sixteen, if events leading to the General Assembly’s initial 1903 resolution are counted. The time span for all of the smoke suits was actually much longer. The Ducktown smoke cases began around 1895 with the private lawsuits filed by mountaineers such J. H. Barnes, Margaret Madison, and her son William. Individual cases came and went but as a whole, the great wave of private law suits lasted more than a quarter century before fading away.

Continuity is a key to understanding why the Ducktown smoke litigation did not resume in later years. The matter was handled from first to last as a lawsuit. As its participants withdrew for whatever reason, the cause lost the forward momentum necessary to keep it going beyond 1918. Only Will Shippen, of all the figures in the Supreme Court case, remained active for its duration. James B. Parks, DSC&I trial counsel, was right, Shippen was “a wiry, untiring, and resourceful chap.” He injected more energy and more continuity into Georgia’s federal litigation

than any other person. Yet by 1922, the company he fought so hard to protect was in receivership. He liquidated his Gilmer County holdings in 1926 and moved to Atlanta.<sup>50</sup>

In a 1933 to the editor of the *Ellijay Times-Courier*, Shippen recited his lumbar career and his many years as a leader in the Ducktown smoke wars. He claimed credit for the 1903 General Assembly resolution the launched the Georgia case saying, “I got busy and put a bill through our legislature that appointed a commission of which I was chairman to investigate this fume damage.” He also “personally solicited and obtained U.S. Government experts, took them to my Ellijay home and into the woods, and qualified them to testify for the state.”<sup>51</sup>

As for his business, he said, “When I first started my fight on the Copper Companies, some of my good friends told me that I did not realize just what I was going up against” and was warned that “they were most powerful and would eventually put us out of business.” The warnings came true, he said, when the Tennessee Copper Company “bought stock in the Lumber Company and in 1915 united to other and voted my brother and self out active management.” (He failed to mention the \$50,000 settlement that brought TCC into his business affairs in the first place.) Then, as many a deposed corporate leader has said, “I knew well that they were going to wreck the company.”<sup>52</sup>

With Shippen’s departure and the passing of a generation, the population of the Basin adjusted to present realities. The Ducktown Basin became the Copper Basin. Those who could farm under the conditions established in the settlement agreements continued to do so. Those who could not moved on. Mountain farming was a dying way of life, with or without the problems of sulfur smoke. The national rail network and rapidly improving means of food

---

<sup>50</sup> James G. Parks to Howard Cornick, 11 July 1907, DBM; George Gordon Ward, *The Annals of Upper Georgia Centered in Gilmer County* (Carrollton, Ga.: Thomasson Print & Office Equipment, 1965), 431, 474.

<sup>51</sup> “Mr. W. H. Shippen Will Maintain His Long Residence in Gilmer,” *Ellijay Times-Courier*, 6 January 1933, 1.

<sup>52</sup> Ibid.

processing and preservation transformed farming from a local farm-to-market business to a nationwide concern dominated by growing agribusinesses. Small, hardscrabble farms found it hard to compete with products from large mechanized farms in the Midwest and elsewhere. Though owners of the best mountain farms often remained, more and more of the marginal farmers left full time agricultural and drifted into part-time and full time wage work. The pool of potential smoke claimants slowly shrank with the decline of the farming population.<sup>53</sup>

Most of those who remained in the Basin were tied to copper as mineworkers, or as the merchants and contractors that served the industry. Ducktown life eventually bent around the industry and most were content to leave it that way. It was not a bad way of life for those who were used to it. The pay was unusually good and steady in a region lacking sufficient employment at a living wage. Residents enjoyed the close-knit mining community. They shared pride in doing a hard job well, and in making their life in a bizarre but strangely beautiful landscape. Locals enjoyed the ever-changing light as it shone across the barren hills. And they took a puckish glee in being free from the mosquitoes, chiggers, and snakes so common in the farms and forests of the southern mountains. It was not an ecologically sensitive viewpoint, but it reflected their pride of place.<sup>54</sup>

Georgia's elected leaders were tired of the case and glad to see it end. The case had been handled by five Georgia attorneys general and nine gubernatorial administrations. The only

---

<sup>53</sup> The decline of Appalachian farming is considered in Ronald D. Eller, *Miners, Millhands, and Mountaineers: Industrialization of the Appalachian South, 1880-1930* (Knoxville: University of Tennessee Press, 1982), 225-237; Paul Salstrom, *Appalachia's Path to Dependency: Rethinking a Region's Economic History, 1730-1940* (Lexington: University Press of Kentucky, 1994), 60-82. The transformation of local agriculture into national networks of processing and distribution for meat and grain is described in William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W. W. Norton, 1991).

<sup>54</sup> From casual conversations with life-time residents during my visits to the Ducktown Basin Museum. See M. L. Quinn, "Tennessee Copper Basin - a Case for Preserving an Abused Landscape," *Journal Of Soil And Water Conservation* 43, no. 2 (1988): 140-144.

remaining matters were the periodic renewals of the settlement agreements and the claims arbitration system that continued to function well into the 1940s. Governors occasionally received citizens' complaints about smoke problems or disappointing treatment by the arbitrators, but never enough to stir a renewal of action against the copper companies—or rather the company. Tennessee Copper Company swallowed the Ducktown Company in 1935.

The farmers of the NFU chapters in Fannin and Gilmer counties waived the National Farmers Union flag in Georgia's smoke case from 1907 to 1918. They relied upon the organization's political and legal backing in every courtroom and legislative battle during that period. Then, low post-war cotton prices and the boll weevil demoralized most of the Georgia membership, causing the Georgia's Farmers Union to die soon after the 1918 settlement with Ducktown. The organization moved its headquarters away from Union City, Georgia. It is now located in Denver, where it serves the interests of western grain farmers.<sup>55</sup>

\*\*\*

Ducktown smoke litigation also faded away because as an effort to combat air pollution, it was several generations ahead of its time. The cases, at both the state and federal level, were fought with old law by political leaders without the backing of a functioning environmental bureaucracy. As a tort case sounding in nuisance, the focus was reactive, as parties searched for a remedy responsive to damage already done. Modern environmental law is pro-active. The Environmental Protection Agency and its state-level counterparts is a rule-making body that sets pollution standards with the guidance of its scientists, and then enforces them. In Ducktown, the only rule-making during the twenty-five years of litigation was by the Supreme Court in 1915,

---

<sup>55</sup> Carole E. Scott and Richard D. Gynn, "The Disappearance from Georgia of the Farm Union," accessed at <http://www.westga.edu/~bquest/1997/farmer.html> (accessed May 19, 2004).

when it imposed production standards upon the Ducktown Company. It was making rules in a field beyond its competence.<sup>56</sup>

Modern environmental law enjoys the continuity provided by powerful agencies with great institutional momentum. Public interest environmental activist groups have a similar institutional continuity. The Sierra Club and Audubon Society are both more than a century old. In Ducktown, momentum rested upon local residents and elected officials. For the latter, Ducktown was always a side interest to be squeezed into the normal responsibilities of office. Governor John Slaton, for example, did what he could on the smoke suit, but was preoccupied by the notorious Leo Frank murder case. He could handle critical letters from Ducktown litigants. Death threats and the armed mob surrounding the Governor's Mansion after he commuted the defendant's death sentence were an altogether different matter. (The mob later forced its way into the state prison to abduct and lynch Frank.)<sup>57</sup>

A useful comparison can be found in a 1972 smoke dispute between the state of Georgia and Cities Service Company in Copperhill (Cities Service acquired TCC in 1963). As in the past, Fannin County citizens wrote the Governor (Jimmy Carter) to complain about noxious sulfur dioxide fumes from the company's operation at Copperhill. Governor Carter wrote the customary response to the constituents. He then delegated the complaints to air quality specialists working in the Georgia Department of Natural Resources, Environmental Protection Division. Georgia's specialists collaborated with their counterparts in the Environmental Protection Agency (at the Agency's regional office in Atlanta), and in Tennessee's environmental units. Everyone worked with baseline ambient air quality standards established by scientists, though

---

<sup>56</sup> In future cases, the Supreme Court would lament its lack of scientific and technological competence in pollution cases. In a 1971 majority opinion refusing to grant original jurisdiction, Justice John Marshall Harlan expressed the "sense of futility that has accompanied this Court's attempts to treat with the complex technical and political matters that inhere in all disputes of this kind." *Ohio v. Wyandotte Chemicals Corp.*, 401 U.S. 493, 502 (1971).

<sup>57</sup> Leonard Dinnerstein, *The Leo Frank Case* (New York: Columbia University Press, 1968).

Georgia's standards were somewhat tougher than national standards set by the EPA. Cities Services Company cooperated with the investigation and resolution of the matter, for reasons both altruistic and practical. It had no other choice under federal and state environmental laws. The company agreed to make necessary improvements without the need for a lawsuit.<sup>58</sup>

When compared to modern practice, the successes achieved in Ducktown seventy-five years earlier become all the more impressive. The state of Georgia successfully extended the nuisance law to establish a state's sovereign right for injunctive remedy against interstate pollution. Attorney General Hart, Ligon Johnson, and their successors made maximum use of conservationist expertise from federal scientists. Georgia's success in the Supreme Court forced the copper industry to adopt acid condensation technology. Acid condensation was far from perfect, but it did remove millions of tons of sulfur dioxide from Ducktown skies for conversion into beneficial by-products. The state implemented an arbitration program to resolve smoke damage claims without litigation. And to the relief of the thousands who relied upon the Ducktown Sulphur, Copper & Iron Co. and the Tennessee Copper Company for their livelihoods, the industry remained viable and continued to operate for most of the twentieth century. All of this was accomplished without modern environmental laws, modern environmental agencies, modern environmental science, and indeed, without an environmental paradigm. From a legal perspective, it was a remarkable outcome for litigation started by mountaineer farmers a decade before Henry Ford produced his first Model T car. Viewed a different way, in terms of the landscape, the damage had been done. The Ducktown Desert was now the most prominent feature of the Basin's landscape and would remain so for several generations.

---

<sup>58</sup> John A. Allen, Jr. to Rafael A. Ballagas (both in the Georgia Environmental Protection Division), 6 June, 1974; Robert A. Collom, Jr., Chief, Air Protection Branch, Georgia Environmental Protection Division to Paul Traina, Director, Enforcement Division, EPA, Atlanta office, 3 October 1975; Robert A. Collom, Jr. to J. Leonard Ledbetter, Director Environmental Protection Division, 17 May 1976, all GDAH 1-1-4.21.

## EPILOGUE

### THE VIEW FROM THE MOUNTAIN

In 1860, Hardin Taliaferro stood on a mountaintop and saw the clouds of heavy black smoke rising from the heaps of roasting ores. With the eyes of a prose stylist, he described them as “huge columns of smoke ascending towards heaven, spreading out at top like vast sheaves” that combined to cover “the heavens with a smoky pall.” Half a century later, Dr. John T. McGill stood on a mountaintop at the request of the United States Supreme Court to study smelter smoke from a scientist’s perspective. By then, the roast heaps were gone and the smoke entered the atmosphere from the tops of the smokestacks attached to the blast furnaces at the Tennessee Copper Company and the Ducktown Sulphur, Copper & Iron Company.<sup>1</sup>

The smoke McGill saw no longer rose in sheaves. Instead, he noted that it pulsed with the rhythms of an industry shaped by the adoption of pyritic smelting methods adopted, to a large degree, in response Georgia’s smoke litigation. He observed “a considerable amount of smoke escapes from the furnace whenever it is charged—and this happens more than a hundred times a day.” It varied further as the damper was “raised or lowered to regulate the amount needed for the sulfuric acid industry.” And once it left the stack, it escaped human agency and became subject to the wind. McGill and his staff chased it over the Basin in an automobile full of collecting jars and other scientific apparatus. When they judged the winds correctly, “it was not unusual in the field for men with the collecting bottles to wait for the coming of the denser smoke seen approaching.”

---

<sup>1</sup> Hardin E. Taliaferro, "Ducktown, By "Skitt," Who Has Been "Thar"," *Southern Literary Messenger* 31 (November 1860).

Ducktown sulfur dioxide emissions continued to enter the Basin's skies for decades to come. Acid condensation, though successful as a commercial venture, achieved only partial success as a means of controlling sulfur fumes. When the Supreme Court issued its 1915 injunction against the Ducktown Company, the escape into the air of 45 percent of the sulfur liberated from green copper ores was considered acceptable. The air would have been much worse without acid condensation, since removal of half of the pollutants is better than removal of none. Even so, the amount allowed to escape continued to suppress vegetation in the Basin.<sup>2</sup>

An observer in the 1980s would have seen a much cleaner copper industry thanks to new technologies installed pursuant to the 1970 Clean Air Act and other modern environmental legislation. Yet the costs of compliance added to the problems arising from the exhaustion of local ores, and competition from the global market for copper and chemicals. Miners dug down three thousand feet into the bowels of the earth in the search for copper. (The head of Shaft "A" at the Calloway Mine was at 1,640 feet above sea level and descended more than 1,400 feet below sea level.) Mining costs increased with depth and finally became prohibitive. Ducktown's mines closed for good on July 31, 1987. The sulfur-based chemical industry continued for another decade, using sulfur hauled into the Basin as a substitute for the sulfur stock that once came from Ducktown ores. Like the mines, the chemical works largely closed in 1999, putting an end to 150 years of mining and chemical processing at Ducktown.<sup>3</sup>

---

<sup>2</sup> *Georgia v. Tennessee Copper Co.*, 240 U.S. 650 (1916).

<sup>3</sup> Cities Service Company, "Calloway Mine Ventilation Proposal," circa 1975, DBM. For the end of mining see, Karen Daniels, *Tennessee's Historic Copper Basin Area: An Overview* (Benton, Tenn.: Polk County Publishing Co., 1985; Polk County Publishing Co., *Polk County Scrapbook: A Tribute to the Miners, Copper Basin Ore Mining 1843-1987* (Benton, Tenn.: Polk County Publishing Co., 1989); Polk County Publishing Co., *Polk County Scrapbook: 150 Years of Memories* (Benton, Tenn.: Polk County Publishing Co., 1989); Polk County Publishing Co., *Polk County News: Reprints of Articles Relating to the History of Polk County* (Benton, Tenn.: Polk County Publishing Co., 1990).

Smoke no longer fills the skies from the smokestacks at the DSC&I smelting works at Isabella or the mammoth TCC complex at Copperhill. An observer can now view the entire Ducktown Basin, weather permitting, from any mountaintop on the rim without seeing any smoke. A panoramic vista may be had at the top of the hill once occupied by the Burra Burra Copper Mine, now the home of the Ducktown Basin Museum. At the south edge of the parking lot, the hill ends with an abrupt cliff created when the hillside sheared off because of sub-surface mining. At the bottom of the cliff is pool of water stained with the telltale greenish blue color of copper compounds. To the south, the view extends all the way across Fannin County to the Blue Ridge as it cuts across Gilmer County. To the east, expensive vacation homes now dot the slopes of Angelico and Pack Mountains, a phenomenon unthinkable in the days of heavy smoke. To the west, the great summits of Big Frog and Little Frog Mountains are covered with hardwood forest mixed with conifers. Most of the western rim of the Basin is federally protected as part of the Cherokee National Forest and federal wilderness areas.<sup>4</sup>

\*\*\*

The legal significance of *Georgia v. Tennessee Copper Co.* has lasted longer than the industry it threatened a century ago. It was the first air pollution case brought before the Supreme Court, and the first case in which the Court granted injunctive relief against any form of pollution. *Missouri v. Illinois*, the water pollution suit regarding diversion of Chicago sewage into the Mississippi River, was filed four years before the Georgia suit, yet the state of Missouri lost to its sister state of Illinois when the case returned to the Supreme Court in 1906 for

---

<sup>4</sup> The major atmospheric pollutants in the Ducktown area and the Southern Appalachians are now nitrogen oxides and sulfur dioxide from automobile exhaust and distant coal fired power plants. See, Southern Appalachian Man and the Biosphere Cooperative, *The Southern Appalachian Assessment: Prepared by Federal and State Agencies Coordinated Through the Southern Man and the Biosphere Cooperative*, vol. 5, *Atmospheric Technical Report* (Atlanta: U. S. Forest Service, Southern Region, 1996).

argument on the merits. It was not until the following year, when Attorney General Hart and Ligon Johnson prevailed in the Georgia case, that the Supreme Court actually granted a state the right to an injunction in a pollution case (never mind that the injunction was not actually issued until 1915 against DSC&I).<sup>5</sup>

Georgia's legal victory proved influential far beyond the Ducktown Basin. Ligon Johnson used many of the same strategies when hired by the administrations of Theodore Roosevelt and William Howard Taft to handle government cases against other smelter companies for damage caused to national forests in the West. Johnson rescued the government's losing cause against Mountain Copper. He then litigated new actions in Montana against the Anaconda and Washoe smelters, and in Northern California against Mammoth Copper, Balaklala Copper, Bully Hill Copper, and Engels Copper. In each case, Johnson demonstrated the same mastery of scientific evidence and knowledge of technological remedies that led to his victory in the Georgia case.<sup>6</sup>

Johnson's experience with federal scientists in the Georgia case established his firm belief in the importance of scientific evidence to establish liability. As he later explained, his work required a strong working knowledge of "plant pathology, entomology, agronomy, toxicology, veterinary medicine, and other technical matters." Johnson knew, for example, that horses suffered from "roaring" from lead fumes. He also knew that consumption of "too much dry food, particularly the first crop of alfalfa, will paralyze the vagus nerve and produce

---

<sup>5</sup> *Missouri v. Illinois*, 200 U.S. 496 (1906).

<sup>6</sup> "Ligon Johnson is Appointed—Atlanta Attorney is Named Special United States Attorney," *Atlanta Constitution*, 1 August 1907, 4. A summary of Johnson's federal litigation appears in Ligon Johnson to W. J. Hughes, Department of Justice, 21 August 1914, NARA Department of Justice Central Files, Box 540, Correspondence. See Donald MacMillan, *Smoke Wars: Anaconda Copper, Montana Air Pollution, and the Courts, 1890-1920* (Helena, Mont.: Montana Historical Society Press, 2000), 145-256. MacMillan's work on the Anaconda litigation also addresses the role of Johnson in the federal smelter litigation in California and Montana.

conditions similar to fume poisoning.” Thus, every claim of fume poisoning required him to first examine pasture and feeding positions.<sup>7</sup>

This approach represented a fundamental change in the way smelter suits and other pollution cases were litigated. The farmer lawsuits that initiated the smoke wars in Ducktown in the 1890s turned largely upon anecdotal evidence by lay witnesses testifying about the appearance of smoke damage to crops and trees. In the pivotal Tennessee decision of *Ducktown Sulphur, Copper & Iron Co. v. Barnes* (1900) the farmers succeeded in winning a declaration that local smelter smoke was a nuisance per se in a case in which little scientific evidence was offered by either side. Their victory provided the foundations for the hundreds of damage suits that followed in the Ducktown smoke wars. Nationally, farmers would rarely experience such a happy outcome when relying upon anecdotal evidence against other smelting companies; the industry soon realized that the high stakes of injunction cases required the use of sophisticated scientific evidence.<sup>8</sup>

In *Georgia v. Tennessee Copper Co.* both sides presented extensive scientific evidence, with each side offering testimony from prestigious experts. Hart and Johnson demonstrated that when a government was the plaintiff, it could make compelling use of its own experts in forestry, chemistry, entomology, and other sciences. Such experts enjoyed the institutional support of their respective agencies, as when J. K. Haywood used Department of Agriculture laboratories to conduct his glass-case experiments concerning the effect of sulfur dioxide upon vegetation. Government experts came with the added advantage of being available at a low cost since they were already on a government payroll. Smelting companies spent heavily to counter government experts by hiring experts of their own from leading universities. In the state of Washington,

---

<sup>7</sup> Ibid.

<sup>8</sup> *Ducktown Sulphur, Copper & Iron Co. v. Barnes*,

Woodson Lon Johnson (no relation to Ligon Johnson) made masterful use of scientific evidence to defeat farmer suits against Northport Smelting and Refining Co.<sup>9</sup>

Few individual claimants had the funds needed to wage an effective battle of the experts. Western farmers tried, with mixed success, to meet the problem by litigating in the name of associations formed to pool resources to hire the needed experts. The approach enabled the Shasta County Farmers Protective Association to win an injunction against Mammoth Copper and Balaklala Copper in Northern California. In Montana, the deep coffers of Amalgamated Copper (Anaconda) allowed it to outspend and defeat the Deer Valley Farmers Association.<sup>10</sup>

When litigating on behalf of the federal government, Ligon Johnson combined his skillful use of expert witnesses with knowledge about state-of-the-art technology for the abatement of smelter smoke. He knew courts demanded evidence of technical and commercial feasibility before exercising injunction power to compel the installation of smoke technology. In *Georgia v. Tennessee Copper Co.*, he and Attorney General Hart relied on engineering evidence to show that sulfur dioxide could be extracted from fumes and converted into sulfuric acid. They then offered testimony from experts in the fertilizer business to establish the existence of a viable market for the product.

Johnson put the same techniques to use in the Anaconda case. The company contended that it could neither successfully convert its furnace fumes into acid, nor could it profitably sell the product because of the high freight charges and the limited fertilizer market in the West. The company lobbied the White House on both points, arguing that it would be forced to close if

---

<sup>9</sup> Stephen W. Charry, "Defending the Great Barbecue: W. Lon Johnson and the 1921 Northport Smelter Pollution Suits," *Pacific Northwest Quarterly* 91, no. 2 (Spring 2000): 59-70.

<sup>10</sup> Donald MacMillan, *Smoke Wars*, 101-124 (Deer Valley Farmers Association); Ligon Johnson to George W. Wickersham, 8 November 1911, NARA, R. G. 60, Box 540 (Shasta County Farmers Protective Association).

compelled to install unprofitable new smoke technology. Roosevelt was sufficiently concerned to withhold permission to file suit until persuaded that the industry was wrong on both points. He advised Attorney General Bonaparte that “My directions in connection with the Anaconda smelter matter are that we shall look carefully before we leap,” because if industry contentions were correct, “tens of thousands of working men would be completely thrown out of employment, and half the State of Montana suffer seriously.” Roosevelt wanted to know if the expense of smoke improvement technology would result in a shut-down, or “whether it merely represents a heavy necessary expense which can and should be borne which will allow the work to be done, but only under conditions that prevent its being noxious to the vegetation round about.”<sup>11</sup>

Having answered similar questions in the Georgia case, Ligon Johnson prepared a detailed report for the President, demonstrating the technical and economic viability of four different approaches. He noted that abundant phosphate rock was located along a railroad near Anaconda. He then surveyed freight rates and determined the need for fertilizer in the West. With those factors in mind, he advised that Anaconda had four viable options. First, it could build an acid extraction plant like those used by the two companies in Ducktown. Second, it could convert the fumes into another form of fertilizer, ammonium sulfate, as was now being done at the Mountain Copper smelter in California. Third, Anaconda could adopt the wet method of copper extraction as used in the Rio Tinto mine in Spain. The process, also known as flotation smelting, liberated sulfur from copper ore without using furnaces. Ore was instead pulverized and then oxidized by controlled exposure to air and water. (The Ducktown Sulphur, Copper & Iron Company installed a flotation mill in 1920; Tennessee Copper followed with its own mill in

---

<sup>11</sup> Theodore Roosevelt to Charles Joseph Bonaparte, 9 December 1908, NARA, R.G. 60, Box 539, Dept. of Justice Central Files.

1923.) The fourth alternative was to move the Anaconda smelting to a treeless expanse in Montana where it would cause less trouble. With careful research and frequent citation to technical journals, Johnson's thirty-one-page report accomplished its goal. On February 4, 1909, Roosevelt advised, "in view of your report... we shall have to proceed with the suit to compel the Anaconda smelter people to do their duty along the lines you suggest."<sup>12</sup>

The technological and evidentiary techniques that Johnson acquired in *Georgia v. Tennessee Copper* produced a string of government successes in the federal suits out West. In the Mountain Copper case, he salvaged a defeat suffered by earlier government counsel and won an agreement whereby the company paid damages, deeded a valuable piece of land to expand the Shasta National Forest, and "ceased the discharge of the injurious fumes." The company then relocated its operations to a site far from the national forest.<sup>13</sup>

Johnson also obtained financial settlements from Mammoth Copper and Balaklala Copper. His efforts on behalf of the federal government were parallel to the separate litigation initiated by the Shasta County Farmers Protective Association in which it sought and won an injunction against the same companies. The victory enabled Johnson to negotiate agreements for the installation of new technology. Mammoth Copper installed a bag house that successfully removed a significant portion of smelter pollution.<sup>14</sup>

---

<sup>12</sup> Report of Ligon Johnson to the Attorney General (Charles Joseph Bonaparte), 25 January 1909; Theodore Roosevelt to Charles Joseph Bonaparte, 4 February 1909, both from NARA, R.G. 60, Box 540, Department of Justice Central Files.

<sup>13</sup> Description of the results in this and the following paragraphs are drawn from Ligon Johnson to Attorney General George W. Wickersham, 8 November 1911; W. J. Hughes to Attorney General James C. McReynolds, 25 August 1914; Caldwell to Attorney General James C. McReynolds, 25 August 1914; Ligon Johnson to W. J. Hughes, Department of Justice, 21 August, 1914, all from NARA, R.G. 60, Box 540, Department of Justice Central Files. See *Mountain Copper v. United States*, 142 F. 625 (9<sup>th</sup> Cir., 1906). This was the decision that denied the government's request for an injunction

<sup>14</sup> *Ibid.*, MacMillan, *Smoke Wars*, 219-228.

Balaklala installed a Cottrell electric precipitator. The precipitator was a disappointment. It proved successful when emissions were either wholly dry (as with dust particles) or wholly wet (as with sulfur dioxide in suspension), but the combination of wet and dry elements created a sludge that clogged the precipitators. Balaklala could not solve the problem. Being unable to comply with the injunction, it then shut down. As for the other California smelters, General Electric agreed to close its Bully Hill smelter. It declined to install new equipment because its operations were barely profitable before the litigation. Owners of the Engels smelter agreed that they would not begin operation until appropriate smoke abatement technology was installed.<sup>15</sup>

In the Montana litigation, Anaconda agreed to “use its best efforts to prevent, minimize, and ultimately to eliminate completely the emission of deleterious fumes and particularly those containing sulfur dioxide.” A three-member panel of scientific experts was then established to monitor technical progress. Despite the ringing promises of the settlement, the arrangement proved to be frustrating. Donald MacMillan argued that Anaconda was reluctant to install new smoke abatement methods unless they could be expected to produce commercially profitable by-products. In addition, the transition from Taft’s administration to that of Woodrow Wilson, and the advent of World War I, turned federal attention away from smelter issues.<sup>16</sup>

None of the western smelter litigation was totally successful, if success is defined as eliminating smoke pollution while leaving operations economically viable. Some plants managed to reduce pollutants. Others, as with Anaconda, used their resources to forestall significant improvement. A few plants shut down or relocated, benefiting farmers at the cost of smelter workers. Federal action was also limited geographically. In the absence of federal air pollution

---

<sup>15</sup> Ibid.

<sup>16</sup> United States v. Anaconda Copper Mining Company, Stipulation, dated 1 May 1911. MacMillan, *Smoke Wars*, 211-19, 228-56.

statutes (the first national Clean Air Act was not enacted until 1963) the government's interest in smelter problems was limited to the protection of its national forests. Government action occurred only in California and Montana, where smelters and national forests were in proximity. Yet, to the extent success was achieved in the federal smelter actions, it occurred at the hands of Ligon Johnson, using the knowledge and tactics he gained in *Georgia v. Tennessee Copper Co.*<sup>17</sup>

\*\*\*

The Georgia case had significance beyond smelter litigation. The 1907 opinion by Justice Oliver Wendell Holmes established the jurisdictional precedent that allowed states to confidently assert Supreme Court jurisdiction for trans-border pollution disputes. Additionally, the decision effectively created the federal common law of nuisance with its recognition that a state, as a quasi-sovereign, had the right to protect its natural resources from invasive pollution.<sup>18</sup>

A set of water pollution cases between New Jersey and New York began in the Supreme Court in 1908, just a year after the Georgia victory. New York sought to enjoin a New Jersey plan to divert sewage from the Passaic River via a tunnel to Upper New York Bay. Thirteen years later, the Court issued its decree rejecting the injunction. New Jersey's experts persuaded the Court that "the best obtainable sanitary engineers, chemists, and bacteriologists designed the project"<sup>19</sup>

---

<sup>17</sup> Richard N. L. Andrews, *Managing the Environment, Managing Ourselves: A History of American Environmental Policy* (New Haven: Yale University Press, 1999), 373-393 (chronology).

<sup>18</sup> For overviews of the federal common law of interstate nuisance, see; John E. Bryson, and Angus MacBeth, "Public Nuisance, the Restatement (Second) of Torts, and Environmental Law," *Ecology Law Quarterly* (1972): 241-81; J. P. McCarthy, "The Federal Common Law of Nuisance," *Tennessee Law Review* 49 (1982): 919-54; Kenneth M. Murchison, "Interstate Pollution: The Need for Federal Common Law," *Virginia Journal of Natural Resources* 6 (1986): 1-51; Robert V. Percival, "The Frictions of Federalism: The Rise and Fall of the Federal Common Law of Interstate Nuisance," University of Maryland, Pub-Law Research Paper No. 2003-02, available at <http://ssrn.com/abstract=452992>; Paul J. Walbeck, "The Development of a Legal Rule: The Federal Common Law of Public Nuisance," *Law & Society Review* 32, no. 3 (1998): 613-638.

<sup>19</sup> *New York v. New Jersey*, 256 U.S. 296 (1921); see Percival, "Frictions of Federalism," 39-44.

New Jersey filed its own trans-border pollution suit against New York City in 1929 to stop the city from dumping garbage into the ocean, from whence it washed up on Jersey beaches. The Court issued a decree in 1933 ordering a stop to ocean dumping and requiring the city to build incinerators to dispose of its trash. The decree was extended and modified to allow the city to dump sewage sludge, though not garbage, into the waters.<sup>20</sup>

The principles and techniques developed in an interstate context in *Georgia v. Tennessee Copper Co.* next served as the framework for the international dispute between the United States and Canada regarding air pollution crossing over the border into Washington State from the Trail Smelter in British Columbia. The international commission formed to resolve the dispute consciously sought to resolve it with the same emphasis upon technological solutions pursued earlier by John C. Hart and Ligon Johnson in the Ducktown Basin smoke controversies.<sup>21</sup>

Yet, for all of its importance in the New York-New Jersey cases, and in the Trail Smelter dispute, the holdings of *Georgia v. Tennessee Copper Co.* were applied with less frequency in later decades. Part of the decline arose from the clumsiness of original jurisdiction in the Supreme Court. The justices did not like to function as a trial court. Nor did they do so quickly. Eleven years elapsed between the initiation of the Georgia case and the injunction issued against Ducktown Sulphur, Copper & Iron Co. Thirteen years passed between the initiation of New York's injunction suit to stop the New Jersey sewage plan and the issuance of the Court's decree denying the requested injunction. The parties prepared their testimony between 1911 and 1913, but the Court did not set the matter for hearing until 1918. The Court then determined that the

---

<sup>20</sup> New Jersey v. New York City, 284 U.S. 237 (1933); Percival, "Frictions of Federalism, 44-50.

<sup>21</sup> John D. Wirth, *Smelter Smoke in North America: The Politics of Transborder Pollution* (Lawrence: University Press of Kansas, 2000), 43, 119, 203 (influence of Tennessee Copper case upon Trail Smelter dispute); D. H. Dinwoodie, "The Politics of International Pollution Control," *International Journal* 27, no. 2 (1972): 219-35; Percival, "Frictions of Federalism," 50-52.

evidence was dated and ordered the parties to take additional testimony. The matter was not heard on the merits until 1921. The great delays reflected the low priority of the original jurisdiction docket compared to the Court's usual docket of appellate cases. For the litigants, the delays kept major public works projects in suspense, holding up designers, contractors, political administrations, and bond financiers, not to mention the intended beneficiaries among the taxpaying public.<sup>22</sup>

A more important reason for the declining use of *Georgia v. Tennessee Copper* as an anti-pollution weapon was that it was simply a decision ahead of its time. Though far-sighted advocates fought pollution in earlier decades and centuries, issues of environmental pollution had yet to seize public attention to the extent they did after World War II. The growing power of the post-war environmental movement led state attorney generals to dust off the old Georgia case for use against a variety of industry and government polluters in the 1970s. Some states pursued their cases as matters of Supreme Court original jurisdiction. Others filed directly in the federal trial courts, demonstrating that the "quasi-sovereign" natural resource holding of the Georgia case was becoming more important than the jurisdiction ruling.<sup>23</sup>

The Supreme Court was well aware that the newly powerful environmental movement promised an incoming tide of original jurisdiction cases unless stopped. It did so first in *Ohio v. Wyandotte Chemicals Corp.* (1971), a case between a state and a (corporate) citizen of another

---

<sup>22</sup> Percival, "Frictions of Federalism," 40-42 (delays).

<sup>23</sup> Scholars debate the chronology of anti-pollution environmentalism, but judged in terms of national legislative policy, the movement undeniably gained its greatest traction after World War II and even more in the 1960s and 1970s. See Richard N. L. Andrews, *Managing the Environment, Managing Ourselves: A History of American Environmental Policy* (New Haven: Yale University Press, 1999); J. Brooks Flippin, *Nixon and the Environment* (Albuquerque: University of New Mexico Press, 2000); Robert Gottlieb, *Forcing the Spring: The Transformation of the American Environmental Movement* (Washington, D.C.: Island Press, 1993); Samuel P. Hays and Barbara D. Hays, *Beauty, Health, and Permanence: Environmental Politics in the United States, 1955-1985*, Studies in Environment and History. Cambridge (Cambridgeshire: Cambridge University Press, 1987). The cases are surveyed in Wahlbeck, "The Development of a New Rule," and Percival, "Frictions of Federalism," 52-76.

state regarding mercury contamination of drinking water. The fact situation was closely analogous to that of *Georgia v. Tennessee Copper Co.*, yet the Court nonetheless voted 8-to-1 to refuse original jurisdiction on the grounds that it should no longer function as the “principal forum for settling” controversies between a state and citizens of another state.<sup>24</sup>

The Court gained another rationale for refusing original jurisdiction pollution cases as Congress enacted a series of environmental bills in the 1970s. In only three years, it passed the National Environmental Policy Act (1970), Water Quality Improvement Act (1970), Federal Water Pollution Control Act (1972) (also known as the Clean Air Act), and the Endangered Species Act (1973). President Richard Nixon followed suit by creating the Environmental Protection Agency to administer the new regime. Together, the new laws and bureaucracies went far toward filling the regulatory vacuum on environmental matters that existed at the time of the Georgia case.

The new laws gave the Supreme Court the opportunity to refuse application of federal common law to pollution cases. In *City of Milwaukee v. Illinois* (1981), the Court declared that the Clean Water Act created “a balanced and comprehensive remedial scheme” that pre-empted the Court from fashioning its own common law of pollution nuisance. Such cases would, in the future, be directed to the federal trial courts to be handled under environmental statutes passed by Congress. The Court soon extended the pre-emption doctrine to other aspects of pollution law.<sup>25</sup>

The doctrine of pre-emption involves complicated issues of federalism and Congressional authority that occupy the minds of lawyers and law students. The concept is nonetheless simple in its broadest strokes. There were no relevant pollution statutes when Georgia began its fight against the Tennessee Copper Company and the Ducktown Sulphur, Copper, and Iron, Co. in

---

<sup>24</sup> *Ohio v. Wyandotte Chemicals Corp.*, 401 U.S. 493 (1971).

<sup>25</sup> *City of Milwaukee v. Illinois*, 451 U.S. 304 (1981). See discussion at Percival, “Frictions of Federalism,” 52-69.

1903. In the absence of congressional action on air pollution, the Supreme Court had to create pollution law of its own if the state was to have any remedy at all. Several generations passed before Congress established a comprehensive regime of pollution law, but when it did, the new statutes reduced the need for the Supreme Court and other courts to devise remedies of their own. Congress had finally spoken in a way that reduced, if not eliminated, the need to apply federal common law nuisance cases like *Georgia v. Tennessee Copper Co.*

\*\*\*

Pre-emption law put an end to the Georgia case as an anti-pollution tool—or so most commentators thought. In 2007, the majority opinion in *Massachusetts v. Environmental Protection Agency* demonstrated the continued relevance of the old case to pollution issues, this time concerning the problems of greenhouse gases and global warming. The new case involved a complaint filed by Massachusetts, together with a number of other states and environmental organizations, alleging that the EPA had wrongfully refused to consider, much less to implement, regulations to control automobile tail-pipe emissions in the fight against global warming.<sup>26</sup>

The plaintiffs' substantive arguments involved the latest atmospheric science, but before they could present them, they had to establish standing—their legal right to bring their case to court. At least one of the plaintiffs had to be able to show, among other things, that the EPA's failure to regulate greenhouse gases presented “a concrete and particularized injury that is either actual or imminent.” The EPA argued that global warming was a problem of such scale that it

---

<sup>26</sup> *Massachusetts v. Environmental Protection Agency*, 549 U. S. \_\_\_, No. 05-1120, slip op. at 15. For a discussion of the modern application of the Georgia case, see Sara Zdeb, “From Georgia v. Tennessee Copper to Massachusetts v. EPA: Parens Patriae Standing for State Global Warming Plaintiffs,” *Georgetown Law Journal* 96, no. 3 (March 2008): 1060-82

was difficult for any one plaintiff to establish an injury more specific, more “particularized” than that suffered by the public at large.<sup>27</sup>

Only one of the plaintiffs needed to establish standing. Massachusetts took the lead by relying upon the authority of *Georgia v. Tennessee Copper Co.* It argued that carbon dioxide and other gases caused global warming; that global warming led to rising ocean levels from the melting of glaciers and polar ice caps; and that rising sea levels threatened low-lying Cape Cod. The state then quoted from the 1907 Holmes opinion to assert that, as a “quasi-sovereign,” it had the right to relief in the federal courts to protect the natural resources within its borders. The Supreme Court agreed, by a slim vote of 5-to-4. In the majority opinion by Justice John Paul Stevens, the Court quoted at length from the Georgia case. Stevens wrote, “Just as Georgia’s ‘independent interest...in all the earth and air within its domain,’ supported federal jurisdiction a century ago, so too does Massachusetts’ well-founded desire to preserve its sovereign territory today.” With standing established, the Court then ruled that carbon dioxide was a pollutant within the meaning of the Clean Air Act, and that the refusal of the EPA to regulate tail-pipe emissions was arbitrary.<sup>28</sup>

The 1907 decision in *Georgia v. Tennessee Copper Co.* was the Supreme Court’s first air pollution decision. The 2007 decision in *Massachusetts v. Environmental Protection Agency* was the Court’s first global warming case. The earlier case created the jurisdictional and substantive rationale needed for states to combat smelter smoke and other regional forms of trans-border

---

<sup>27</sup> *Massachusetts v. EPA*, slip opinion (majority), 12-23.

<sup>28</sup> *Ibid.*, 15-18 (discussion and application of *Georgia v. Tennessee Copper Co.*). The vote was 5-4, with a dissent by Chief Justice John Roberts, joined by Justices Scalia, Thomas, and Alito. Roberts dismissed the Georgia case, writing, “The Court has to go back a full century in an attempt to justify its novel standing rule...The Court’s analysis hinges on *Georgia v. Tennessee Copper Co.* [citation omitted]—a case that did indeed draw a distinction between a State and private litigants, but solely with respect to available remedies. The case has nothing to do with Article III standing.” *Ibid.*, dissent, 3. The participants in the Georgia case would have disagreed with Chief Justice Roberts. Georgia’s claim of Article III original jurisdiction was the central issue resolved in the 1907 opinion. See the chapters 4 and 6 herein.

pollution. The latter decision extended the rationale of the Georgia case to address the national and international problem of climate change. The Georgia case, a matter that owes its origins to smoke suits filed in the 1890s by mountaineers in the Ducktown Basin, proved to have legal ramifications far beyond the imaginings of any of its participants.<sup>29</sup>

\*\*\*

But what of the Ducktown Desert? It is no longer to be seen. Grasses and scrubby pines now mostly cover the fifty-five square miles of formerly denuded badlands. To the visitor, they lack the threatening, alien beauty of the desert, but have a long way to go before reclaiming the sylvan appeal of the mature Appalachian hardwoods that once stood there. From the top of Burra Burra hill, the trees appear as plugs of green inserted into an otherwise red-orange terrain, looking somewhat like badly spaced hair implants in the scalp of a bald man. Yet they mark a considerable achievement in land reclamation, all of which occurred long after the 1918 settlement with Ducktown Sulphur, Copper & Iron Co. Ltd. ended active litigation in Georgia's smoke suit.

Ducktown smoke litigation was never about restoring the badlands of the Ducktown Desert. The law of nuisance provided monetary compensation to those who suffered ruination of their property, and also provided, at least to the state of Georgia, the power to abate some of the smoke by injunction. Both remedies were reactive, not restorative. Neither the state nor the individual litigants asked for restoration of damaged lands, nor did the courts suggest it. Besides, much of the damage was on company property. What was done was done. Plaintiffs limited their future thinking to the abatement of smoke in the hope of limiting the spread of the damage.

A legal effort to restore the Ducktown Desert in the days of Attorney General Hart would have been one of those exercises in futility that courts of equity seek to avoid. The worst and

---

<sup>29</sup> Zdeb, "From Georgia v. Tennessee Copper to Massachusetts v. EPA," 1060-1062, 1082-82.

most barren areas of smoke damage (compounded by historical logging and contemporary grazing practices) were so badly destroyed that they were beyond the capabilities of the reclamation techniques of the time. For decades it remained, in the 1943 words of Kenneth Seigworth, “a copper-red gully-scarred area [that] has suffered as have few areas anywhere in the world.” The copper companies attempted to plant some trees in 1929, but sustained reclamation efforts began in the 1930s soon after the creation of the Tennessee Valley Authority. The TVA recognized that the massive loads of silt washed down the Ocoee River from the Ducktown Desert posed an immediate threat to the operation of the power dams then in the river gorge, and a less immediate threat to navigation on the Tennessee River.<sup>30</sup>

Re-vegetation of the Ducktown Desert took almost seventy-five years. The scale of the project, the severity of soil loss, and continuous sulfur emissions by the copper companies all combined to pose a Herculean challenge that required years of hard science and experimentation. John C. Allen, a TVA forester stated the problem succinctly. The TVA “soon learned that erosion control-reforestation practices commonly used throughout the Tennessee Valley would not fit Basin conditions.” Scientists, foresters, and engineers of the TVA and other federal agencies eventually discovered effective techniques. Occidental Petroleum, the last corporate owner of what was once the Tennessee Copper Company, enjoys the benefits of those discoveries while performing reclamation work on company lands. Its environmental unit, Glenn Springs Holdings, Inc., is doing the work at company expense pursuant to the Memorandum of

---

<sup>30</sup> Kenneth J. Seigworth, “Ducktown—A Postwar Challenge,” *American Forests* 49, no. 11 (November 1943): 521-523, 558.

Understanding arranged with the Tennessee Department of Environment and Conservation and the federal Environmental Protection Agency.<sup>31</sup>

\*\*\*

None of this would have been possible a hundred years ago. The mountaineer smoke suitors, the state of Georgia, and the copper industry functioned under very different legal and technological constraints. The legal remedies sought were confined to those of traditional nuisance law. The only truly effective technological remedy was acid condensation, and that proved to be a partial cure at best. All of the parties operated in the absence of a comprehensive system of environmental law, much less the scientific and popular basis for it. There was no environmental bureaucracy to see things through. The litigants did what they could with the law and technology available to them.

There was one other alternative. Ducktown smoke could have been stopped, but only by destroying the copper industry. Georgia's legal and political leaders refused to let that happen. Though they wanted justice, and to a large degree obtained it in the Supreme Court, they never wanted the heavens to fall upon Ducktown's copper industry and the Georgians it employed.

---

<sup>31</sup> John C. Allen, "Pine Planting Tests in the Copper Basin," *Journal of the Tennessee Academy of Science*, 25, no. 3 (July 1950): 199-216 (the quotation is at 200); Ben B Faulkner, Franklin Miller, Frank Russell, and Ken Faulk, "The Copper Basin Reclamation Project," *Reclamation Matters* 2, no. 1 (Spring/Summer 2005): 24-27,

## BIBLIOGRAPHY

### Archival Sources

DBM Ducktown Basin Museum, Ducktown, Tennessee. This collection, only recently rescued by Museum staff from threatened total loss, has not yet been formally catalogued.

GDAH Georgia Department of Archives and History, Morrow, Georgia.

- RGS 1-1-5 Executive Correspondence (general): *TCC* case materials
- RGS 1-1-6 Governor's Unbound Correspondence: *TCC* case materials and smoke arbitration reports.
- RGS 9-1-1 Attorney General Correspondence, Briefs, and Opinions: *TCC* pleadings, briefs, and correspondence.
- RGS 9-1-8 Attorney General Annual Reports: annual reports on *TCC* case status.
- RGS 88 Depart of Natural Resources, Environmental Protection Division, Air Quality Control Section: air pollution agreement and related correspondence between the State and Tennessee Copper Company during Jimmy Carter's term as governor.

NARA National Archives and Records Administration, National Archives Building

- RG 267.3.3 United States Supreme Court Cases – Original Jurisdiction Cases. Note: the litigation between the State of Georgia and the two copper companies actually consisted of two cases, The first, filed in the October Term, 1903 as No. 14 Original, was captioned as *State of Georgia v. The Ducktown Sulphur, Copper, and Iron Co. (Ltd.)*, and the *Pittsburg and Tennessee Copper Co., and The Tennessee Copper Company* In 1904, this action was dismissed with leave to re-file. The second and main action, *State of Georgia v. Tennessee Copper Company and Ducktown Sulphur, Copper and Iron Company (Ltd)*, was originally filed in the October Term, 1905 as No. 13 Original. The case, which remained open on the Supreme Court Docket for more than thirty years, received a new term and case number designation for each term the case was considered. All of the case materials for both actions are archived by NARA under its final case number, October Term, 1937, No. 1 Original

TSLA Tennessee State Library and Archives, Nashville, Tennessee.

Robert Edward Barclay Collection, AC No. 189.

James Donaldson Clemmer Scrapbooks on Polk County, 1884-1934, mf. 1525. The original documents are at the Cleveland Public Library, Historical Branch, Cleveland, Tennessee.

Mayfield Papers, 1889-1929, mf 1529. This is a collection from the firm Mayfield & Mayfield, which appeared on both sides of the smoke nuisance litigation.

University of Colorado Library. National Farmers Union Papers, 1902–1980s. The University of Colorado holds the official archives of the National Farmers Union (NFU).

#### Newspapers

*Atlanta Constitution*

*Atlanta Journal-Constitution*

*Blue Ridge Post* (Blue Ridge, Fannin County, Georgia)

*Chattanooga News*

*Copper City Advance* (Copperhill, Tennessee)

*Ellijay Times-Courier* (Ellijay, Gilmer County, Georgia)

*Farmers' Union News* (the newspaper of the National Farmers' Union in Georgia)

*Knoxville Journal & Tribune*

*Knoxville Tribune*

*Nashville Tennessean*

*National Field* (the newspaper of the National Farmers' Union)

*New York Times*

*Wall Street Journal*

*Washington Post*

#### Published Primary Documents

Agency for Toxic Substances and Disease Registry. "Toxicological Profile for Sulfur Dioxide." 233. Atlanta, GA: U. S. Department of Health and Human Services, Public Health Service, 1998. <http://www.atsdr.cdc.gov/toxprofiles/tp116.pdf> (accessed 30 June 2007).

Allen, John C. "Pine Planting Tests in the Copper Basin." *Journal of the Tennessee Academy of Science* 25, no. 3 (July 1950): 199-216.

American Bureau of Mines and Union Consolidated Mining Company of Tennessee. *Report of the American Bureau of Mines*. New York: American Bureau of Mines, 1866.

American Institute of Mining Engineers. "A Brief Description of the Operations of the Tennessee Copper Company Prepared for the Ducktown Excursion." Paper prepared for meeting of the American Institute of Mining Engineers, Chattanooga, Tenn., 1908.

Ayres, H. B., W. W. Ashe, and George Otis Smith. *The Southern Appalachian Forests*. Washington: Govt. Print. Off., 1905.

Baes, C. F., and S. B. McLaughlin. "Trace Elements in Tree Rings: Evidence of Recent and Historical Air Pollution." *Science* 224, no. 4648 (1984): 494-497.

- Barrett, Charles Simon. *The Mission, History and Times of the Farmers' Union; a Narrative of the Greatest Industrial-Agricultural Organization in History and Its Makers*. Nashville, Tenn.: Marshall & Bruce, 1909.
- Bartram, William. *Travels through North & South Carolina, Georgia, East & West Florida, the Cherokee Country, the Extensive Territories of the Muscogulges, or Creek Confederacy, and the Country of the Chactaws; Containing an Account of the Soil and Natural Productions of Those Regions, Together with Observations on the Manners of the Indians*. Philadelphia: Printed by James & Johnson, 1791.
- Currey, Richard O. *A Sketch of the Geology of Tennessee: Embracing a Description of Its Minerals and Ores, Their Variety and Quality, Modes of Assaying and Value; with a Description of Its Soils and Productiveness, and Palaeontology*. Knoxville, Tenn.: Kinsloe & Rice, 1857.
- Emmons, S. F. and C. W. Hayes. *Contributions to Economic Geology*, United States Geological Survey, Bulletin no. 225. Washington: Government Printing Office, 1904.
- Emmons, W. H., and F. B. Laney. *Geology and Ore Deposits of Ducktown Mining District, Tennessee*. US Geological Survey, Professional Paper 139. Washington: Government Printing Office, 1926.
- "Farmer's Union Department." *Watson's Jeffersonian Magazine* 2, no. 2 (February 1907): 290-94.
- Freeland, W. H. "Smelting of Raw Sulphide Ores at Ducktown, Tenn." *Mineral Industry* 11 (1902): 191.
- . "Smeltery Smoke as a Source of Sulphuric Acid." *The Engineering and Mining Journal* 89 (May 28, 1910): 1116-121.
- Galloway, Dora T. *Little Girl in Appalachia*. Newport, Ky.: by the author, 1964.
- Georgia Code 1863
- Georgia. *Journal of the House of Representatives of the State of Georgia* (various years).
- Georgia. *Acts and Resolutions of the General Assembly of the State of Georgia* (various years).
- Georgia. *Journal of the Senate of Georgia* (various years).
- Gilmer, George Rockingham. *Sketches of Some of the First Settlers of Upper Georgia, of the Cherokees, and the Author. Rev. and Corr. by the Author*. Americus, Ga.: Americus Book Company, 1926.
- Glenn, Leonidas Chalmers. *Denudation and Erosion in the Southern Appalachian Region and the Monongahela Basin*, U. S. Geological Survey, Professional Paper 72. Washington, D.C.: Government Printing Office, 1911.
- Grice, Warren A. *Report and Opinions of the Attorney General for the Year 1914*. Atlanta: Byrd Printing, 1915.
- Hall, H. A. *The Annual Report of H. A. Hall, Attorney-General of Georgia*. Atlanta: Chas. P. Byrd, 1911.

- Hart, John C. *Second Annual Report of John C. Hart, Attorney-General of Georgia*. Atlanta: Geo. W. Harrison, 1904.
- . *Fifth Annual Report of John C. Hart, Attorney-General of Georgia*. Atlanta: Franklin-Turner, 1907.
- . *Sixth Annual Report of John C. Hart, Attorney-General of Georgia*. Atlanta: Franklin-Turner, 1906.
- . *Eight Annual Report of John C. Hart, Attorney-General of Georgia*. Atlanta: Chas. P. Byrd, 1910.
- Haywood, J. K. *Injury to Vegetation by Smelter Fumes*. U.S. Department of Agriculture, Bureau of Chemistry, Bulletin no. 89. Washington: Government Printing Office, 1905
- . "Injury to Vegetation and Animal Life by Smelter Fumes." *Journal of American Chemical Society* 29, no. 7 (July 1907): 998-1009.
- . "Smelter Smoke." *Science* 26, no. 667 (October 1907): 476-78.
- . *Injury to Vegetation and Animal Life by Smelter Wastes*. U. S. Department of Agriculture, Bureau of Chemistry, Bulletin no. 110. Washington: Government Printing Office, 1908.
- . *Injury to Vegetation and Animal Life by Smelter Wastes*. U. S. Department of Agriculture, Bureau of Chemistry, Bulletin no. 113. Washington: Government Printing Office, 1910.
- Henrich, Carl. "The Ducktown Ore Deposits and the Treatment of the Ducktown Copper." *Transactions of the American Institute of Mining Engineers* 25 (1896): 173-245.
- Holmes, Oliver Wendell. *The Common Law*. Boston,: Little Brown and company, 1881.
- Hursch, C. R. *Local Climate in the Copper Basin of Tennessee as Modified by the Removal of Vegetation*. U. S. Department of Agriculture, Circular 774. Washington, D. C.: Government Printing Office, 1948.
- La Forge, Laurence. *Physical Geography of Georgia*. Atlanta: Stein Printing Co., 1925.
- Lilienthal, David Eli. *TVA: Democracy on the March*. New York: Harper & Brothers, 1944.
- Marsh, George Perkins. *Man and Nature*. New York: Scriber, 1884. Reprint, Cambridge, Mass.: Belknap Press of Harvard University Press, 1965.
- McCallie, S. W. "The Ducktown Copper Mining District." *The Engineering and Mining Journal* 74 (October 4, 1902): 439-440.
- Meierding, Thomas C. "Marble Tombstone Weathering and Air Pollution in North America." *Annals of the Association of American Geographers* 83, no. 4 (1993): 568-588.
- Olmsted, Frederick Law. *A Journey in the Back Country*. New York: Madison, 1860. Reprint, Williamstown, Mass.: Corner House, 1972.
- Parmentier, Rosine M. "Journal of Rosine M. Parmentier, 1852." Cleveland Public Library, History Branch, Cleveland, Tenn.

- Perry, B. F. "The First Trip by the Hiwassee - The New Line to Knoxville." *Atlanta Constitution*, August 23, 1890, 3.
- Pinchot, Gifford. *Breaking New Ground*. New York: Harcourt Brace, 1947.
- Safford, James M. *A Geological Reconnaissance [sic] of the State of Tennessee: Being the Author's First Biennial Report. Presented to the Thirty-First General Assembly of Tennessee, December, 1855*. Nashville: G. C. Torbett, 1856.
- Safford, James M., and Tennessee Geological Survey. *Geology of Tennessee*. Nashville, Tenn.: S. C. Mercer printer, 1869.
- Schenck, Carl Alwin. *Forest Protection; Guide to Lectures Delivered at the Biltmore Forest School*. Asheville, N. C.: The Inland Press, 1909.
- \_\_\_\_\_. *Logging and Lumbering, or, Forest Utilization. A Textbook for Forest Schools*. Darmstadt, Germany: L.C. Wittich, 1912.
- \_\_\_\_\_. *The Biltmore Story; Recollections of the Beginning of Forestry in the United States*. St. Paul,: American Forest History Foundation Minnesota Historical Society, 1955.
- Shepard, Charles Upham. *Report of Charles Upham Shepard, on the Ducktown Copper Region and the Mines of the Union Consolidated Mining Company, of Tennessee*. Charleston: Walker, Evans, 1859.
- Smallshaw, James. "Denudation and Erosion in the Copper Basin." Knoxville, Tenn.: Tennessee Valley Authority, 1939.
- Snow, John. *On the Mode of Communication of Cholera*. 2d ed. London: J. Churchill, 1855.
- Stephenson, Matthew F. *Geology and Mineralogy of Georgia, with a Particular Description of Her Rich Diamond District; the Process of Washing for Diamonds, Their Price and Mode of Cutting and Setting; Her Gold, Silver, Copper, Lead, Iron, Manganese, Graphite, Kaolin, Coal, Fire-Clay, Mica, Corundum, Slate, Marble, &C*. Atlanta, Ga.: Globe Publishing Company, 1871.
- Taliaferro, Hardin E. "Ducktown, By "Skitt," Who Has Been "Thar"." *Southern Literary Messenger* 31 (November 1860): 337-342.
- Tennessee. *The Code of Tennessee: Enacted by the General Assembly of 1857-'8*. Return J. Meigs and William F. Cooper, ed. Revised by a Sub-committee of the Legislature, Composed of Joseph R. Heiskell, chairman, Micajah Bullock, and Samuel T. Bicknell. Nashville, Tenn.: E. G. Eastman, 1858.
- Tennessee. *Public Acts of the State of Tennessee Passed by the General Assembly*. Nashville, Tenn.: s.n., various years.
- Tennessee. *Senate Journal of the General Assembly*. Nashville, Tenn.: s. n., various years.
- Tennessee Valley Authority, Department of Forestry Relations. "A Proposal for Erosion Control and Restoration of Vegetation in the Copper Basin." 1945.
- Tennessee Valley Authority, Water Quality Department. "Status of the Ocoee Reservoirs: An Overview of Reservoir Conditions and Uses." Chattanooga, Tenn: Tennessee Valley Authority, Water Quality Department, 1991, OSTI ID: 5641599; DE91015961.

“The Ducktown Basin, Its Ore Deposits and Their Development.” *Chemical Industries* (May 1935): 81-83.

“The Mining Interest at the South.” *Russell’s Magazine* 3 (1858): 442-447.

United States. *American State Papers: Public Lands*. Washington: Gales & Seaton, 1832.

United States. *Articles and Agreement of Cession: Entered into on the 24<sup>th</sup> Day of April, 1802, between the Commissioners of the United States and those of Georgia*. Washington, D.C.: R. C. Weightman, 1807.

United States. *U. S. Statutes at Large*. Washington: Government Printing Office, various years.

United States Bureau of the Census. *Report on the Statistics of Agriculture in the United States at the Eleventh Census: 1890*. Washington, D. C.: Government Printing Office, 1895.

United States Census Office. *Twelfth Census of the United States, Taken in the Year 1900*, vol. 5 *Agriculture*, part 1 *Farms, Livestock and Animal Products*. Washington, D.C: Government Printing Office, 1902, reprint, New York: Norman Ross Publishing, 1997.

United States and Charles Joseph Kappler. *Indian Affairs: Laws and Treaties*. 2 vols. 2nd ed. Washington: Government Printing Office, 1904.

United States Department of Agriculture., U.S. Forest Service., U.S. Geological Survey, and U.S. Weather Bureau. *Message from the President of the United States Transmitting a Report of the Secretary of Agriculture in Relation to the Forests, Rivers, and Mountains of the Southern Appalachian Region. December 19, 1901. Read, Referred to the Committee on Forest Reservations and the Protection of Game and Ordered to Be Printed*. Senate Document No. 84. 57<sup>th</sup> Congress, Washington: Government Printing Office, 1902.

Walker, Clifford. *Reports and Opinions of the Attorney-General of Georgia from June 15, 1917 to December 31, 1918*. Atlanta: Byrd Printing Co., 1919.

———. *Reports and Opinions of the Attorney-General of Georgia from June 15, 1915 to December 31, 1916*. Atlanta: Index Printing, 1917.

Weed, Walter Harvey. “Copper Deposits in Georgia.” In *Contributions to Economic Geology*, S. F. Emmons and C. W. Hayes, eds. United States Geological Survey, Bulletin no. 225. Washington: Government Printing Office, 1904.

*West’s Tennessee Code Annotated*. St. Paul: West Publishing, 2002, 2007.

Worcester, S. A., and Elias Boudinot. *Cherokee Hymns*, 2d ed. New Echota, Ga.: J. F. Wheeler printer, 1830.

———. *The Acts of the Apostles*. New Echota Ga.: John F. Wheeler and John Candy printers, 1833.

#### Secondary Books and Journals

Anderson, William L. *Cherokee Removal: Before and After*. Athens: University of Georgia Press, 1991.

Andrews, Richard N. L. *Managing the Environment, Managing Ourselves: A History of American Environmental Policy*. New Haven Conn.: Yale University Press, 1999.

- Arnett, Alex Mathews, and Wayland Fuller Dunaway. *The Populist Movement in Georgia: A View of The "Agrarian Crusade" In the Light of Solid-South Politics*. New York: Columbia University, 1922.
- Ayers, Edward L. *The Promise of the New South: Life after Reconstruction*. New York: Oxford University Press, 1992.
- Baker, Andrew J. "Charcoal," in Richard C. Davis, ed. *Encyclopedia of American Forest and Conservation History*, vol. 1. New York: Macmillan, 1983), 73-77.
- Barnhardt, Wilton. "The Death of Ducktown." *Discover* (October 1997): 35-43.
- Barclay, Robert Edward. "The Great Copper Basin of Tennessee." *The Louisville & Nashville Employee's Magazine* 10, no. 9 (1934): 4-7.
- \_\_\_\_\_. *Ducktown Back in Raht's Time*. Chapel Hill: The University of North Carolina Press, 1946.
- \_\_\_\_\_. *The Railroad Comes to Ducktown*. Knoxville, TN: Cole Printing & Thesis Service, 1973.
- \_\_\_\_\_. *The Copper Basin, 1890 to 1963*. Knoxville? Tenn.: by the author, 1975.
- Bartley, Numan V. *The Creation of Modern Georgia*. Athens: University of Georgia Press, 1983.
- Beth, Loren P. *John Marshall Harlan: The Last Whig Justice*. Lexington, Ky.: University Press of Lexington., 1922.
- Bierce, Ambrose. *The Unabridged Devil's Dictionary*. Edited by David E. Schultz and S. T. Joshi. Athens: University of Georgia Press, 2000.
- Blair, Walter. *Native American Humor*. San Francisco: Chandler Publishing, 1960.
- Blakey, Arch Fredric. *The Florida Phosphate Industry: A History of the Development and Use of a Vital Mineral*. Cambridge, Mass.: Harvard University Press, 1973.
- Boles, John B. *A Companion to the American South*. Malden, Mass.: Blackwell, 2002.
- Bolgiano, Chris. *The Appalachian Forest*. Mechanicsburg, PA: Stackpole Books, 1995.
- Bone, Robert G. "Normative Theory and Legal Doctrine in American Nuisance Law." *Southern California Law Review* (Sept. 1986): 1104-1226.
- Brecher, Jeremy, Jerry Lombardi, Jan Stackhouse, and Brass Workers History Project. *Brass Valley: The Story of Working People's Lives and Struggles in an American Industrial Region*. Philadelphia: Temple University Press, 1982.
- Brenner, Joel Franklin. "Nuisance Law and the Industrial Revolution." *Journal of Legal Studies* 3 (1974): 403-33.
- Brooks, Richard Oliver, Ross Jones, and Ross A. Virginia. *Law and Ecology: The Rise of the Ecosystem Regime Ecology and Law in Modern Society*. Aldershot, Hants, England; Burlington, VT: Ashgate, 2002.
- Brown, R. Harold. *The Greening of Georgia : The Improvement of the Environment in the Twentieth Century*. 1st ed. Macon, Ga.: Mercer University Press, 2002.

- Brown, Walter J. J. *J. Brown and Thomas E. Watson, Georgia Politics: 1912-1928*. Macon, Ga.: Mercer University Press, 1989.
- Brundage, W. Fitzhugh. "Racial Violence, Lynchings, and Modernization in the Mountain South." In *Appalachians and Race: The Mountain South from Slavery to Segregation*, John C. Inscoe, ed. Lexington: University Press of Kentucky, 2001.
- Bryson, John E. and Angus MacBeth. "Public Nuisance, the Restatement (Second) of Torts, and Environmental Law." *Ecology Law Quarterly* (1972): 241-81.
- Burt, Jesse C. "Desert in the Appalachians." *Nature Magazine*, 48 (November 1956): 486-488, 499.
- Buxton, Barry M. and Malinda L. Crutchfield eds. *The Great Appalachian Forest: An Appalachian Story*. (Boone, NC: Appalachian Consortium Press, 1985).
- Charry, Stephen W. "Defending the Great Barbecue: W. Lon Johnson and the 1921 Northport Smelter Pollution Suits." *Pacific Northwest Quarterly* 91, no. 2 (Spring 2000): 59-69.
- Chase, Stuart. *Rich Land, Poor Land; a Study of Waste in the Natural Resources of America*. New York, London: Whittlesey House McGraw-Hill, 1936.
- Church, Michael A. "Smoke Farming: Smelting and Agricultural Reform in Utah, 1900-1945." *Utah Historical Quarterly* 72, no. 3 (Summer 2004): 196-218.
- Clay, Grady. "Copper-Basin Cover-Up." *Landscape Architecture* 73, no. 4 (1983): 49-55, 94.
- Clemmer, J. D. "John S. Hutchins Tells of His Copper Hauling Days." *Polk County News*, Feb 2, 1938.
- Clepper, Henry. *Professional Forestry in the United States*. Baltimore: Johns Hopkins, 1971.
- Cobb, James C. *Industrialization and Southern Society, 1877-1984*. New Perspectives on the South. Lexington, Ky.: University Press of Kentucky, 1984.
- \_\_\_\_\_. *Away Down South : A History of Southern Identity*. New York: Oxford University Press, 2005.
- Cobb, James C. and Thomas G. Dyer, "Economic Prosperity or Environmental Protection: Georgia, Tennessee, and the Tennessee Copper Companies, 1903-1975. Paper presented at Organization of American Historians, New Orleans, Lou. (April 1979).
- Coleman, Kenneth, ed. *A History of Georgia*. Athens: University of Georgia Press, 1991.
- Coleman, Kenneth, and Charles Stephen Gurr. *Dictionary of Georgia Biography*. Athens: University of Georgia Press, 1983.
- Cook, James F.. "Terrell, Joseph Meriwether." In *Dictionary of Georgia Biography*, ed. Kenneth Coleman and Stephen Gurr. Athens: University of Georgia Press, 1983.
- Cox, Thomas and others. *This Well-Wooded Land: Americans and their Forests from Colonial Times*. Lincoln: University of Nebraska , 1985.
- Craig, Robin K. *The Clean Water Act and the Commerce Clause*. Washington, D.C.: Environmental Law Institute, 2004.

- Crampton, John A. *The National Farmers Union; Ideology of a Pressure Group*. Lincoln,: University of Nebraska Press, 1965.
- Cronon, William. *Nature's Metropolis : Chicago and the Great West*. New York: W. W. Norton, 1991.
- . *Uncommon Ground: Toward Reinventing Nature*. 1st ed. New York: W.W. Norton & Co., 1995.
- Daniels, Pete. *Breaking the Land: The Transformation of Cotton, Tobacco, and Rice Cultures Since 1980*. Urbana: University of Illinois Press, 1985.
- Defoe, Daniel. *Robinson Crusoe: An Authoritative Text, Background and Sources, Criticism*. A Norton Critical Edition. Edited by Michael Shinagel. New York: Norton, 1975.
- Daniels, Karen. *Tennessee's Historic Copper Basin Area: An Overview*. Benton, TN: Polk County Publishing, 1985.
- Day, Joan. *Bristol Brass; a History of the Industry*. Newton Abbot, England: David & Charles, 1973.
- Dinnerstein, Leonard. *The Leo Frank Case*. New York: Columbia University Press, 1968.
- Dinwoodie, D. H. "The Politics of International Pollution Control: The Trail Smelter Case." *International Journal* 27, no. 2 (1972): 219-235.
- Dodds, Gordon B. "The Stream-Flow Controversy." *Journal of American History* 56, no. 1 (June 1969): 59-69.
- Donnelly, Ralph W. "Confederate Copper." *Civil War History* 1, no. 4 (1955): 355-370.
- Duggan, Betty J. "Being Cherokee in a White World: The Ethnic Persistence of a Post-Removal American Indian Enclave." Ph.D. diss., University of Tennessee, Knoxville, 1998.
- Dunaway, Wilma A. *The First American Frontier: Transition to Capitalism in Southern Appalachia, 1700-1860*. Chapel Hill: University of North Carolina Press, 1996.
- Ehle, John. *Trail of Tears: The Rise and Fall of the Cherokee Nation*. New York: Doubleday, 1988.
- Eller, Ronald D. *Miners, Millhands, and Mountaineers: Industrialization of the Appalachian South, 1880-1930*. Knoxville: University of Tennessee Press, 1982.
- . "Land as Commodity: Industrialization of the Appalachian Forests." In *The Great Appalachian Forest: An Appalachian Story*, eds. Barry M. Buxton and Malinda L. Crutchfield, 15-23. Boone, NC: Appalachian Consortium Press, 1985.
- Evans, E. Raymond. "Fort Marr Blockhouse: The Last Evidence of America's First Concentration Camps." *Journal of Cherokee Studies* 2, no. 2 (1977): 256-262.
- Faulkner, Ben B., Franklin Miller, Frank Russell, and Ken Faulk, "The Copper Basin Reclamation Project," *Reclamation Matters* 2, no. 1 (Spring/Summer 2005): 24-27.
- Finger, John R. *The Eastern Band of the Cherokees, 1819-1900*. Knoxville: University of Tennessee Press, 1984.
- Fisher, Commodore B. *The Farmers' Union*. Lexington, Ky.: University of Kentucky, 1920.

- Flagg, Samuel B. *City Smoke Ordinances and Smoke Abatement*. U.S. Bureau of Mines, Bulletin no. 49. Washington: Government Printing Office, 1912.
- Flippen, J. Brooks. *Nixon and the Environment*. Albuquerque: University of New Mexico Press, 2000.
- Floyd, Robert J. *Tennessee Rock and Mineral Resources*. Tennessee Department of Conservation, Division of Geology, Bulletin no. 66. Nashville, Tenn., 1966).
- Foehner, Nora Lynn. "The Historical Geography of Environmental Change in the Copper Basin." M.S. thesis, University of Tennessee, Knoxville, 1980.
- Friedman, Lawrence Meir. *A History of American Law*, 2nd ed. New York: Simon & Schuster, 1985.
- Gaston, Paul M. *The New South Creed; a Study in Southern Mythmaking*. New York: Knopf, 1970.
- Gates, William B. *Michigan Copper and Boston Dollars: an Economic History of the Michigan Copper Mining Industry*. Studies in Economic History. Cambridge: Harvard University Press, 1951.
- Gaussoin, Eugene. *The Ducktown Copper Mines of Tennessee, Their Value, Present Management, and Future*. New York: s.p., 1860.
- Geisen, James Conrad. "The South's Greatest Enemy? The Cotton Boll Weevil and its Lost Revolution, 1892-1930." Ph.D. diss., University of Georgia, 2004.
- Gennett, Andrew. *Sound Wormy: Memoir of Andrew Gennett, Lumberman*. Edited by Nicole Hayler. Athens: University of Georgia Press, 2002.
- Gigantino, Jim. "Land Lottery Sytem." In *New Georgia Encyclopedia*. <http://www.georgiaencyclopedia.org>.
- Gilbert, Grove Karl. *Hydraulic-Mining Debris in the Sierra Nevada*. U.S. Geological Survey, Professional Paper no. 105. Washington: Government Printing Office, 1917.
- Goad, Sharon Iowa. "Exchange Networks in the Prehistoric Southeastern United States." M. A. thesis, University of Georgia, 1978.
- Goodman, Claire Garber, and Anne-Marie E. Cantwell. *Copper Artifacts in Late Eastern Woodlands Prehistory*. Evanston, Ill.: Center for American Archeology at Northwestern University, 1984.
- Goodwyn, Lawrence. *Democratic Promise: The Populist Moment in America*. New York: Oxford University Press, 1976.
- Gottlieb, Robert. *Forcing the Spring: The Transformation of the American Environmental Movement*. Washington, D.C.: Island Press, 1993.
- Graves, Henry Solon. *Forest Mensuration*. New York: John Wiley & Sons, 1906.
- Griffin, Gary J. "Blight Control and Restoration of the American Chestnut." *Journal of Forestry* 98, no. 2 (February 2000): 22-27.
- Grimsley, Mark. *The Hard Hand of War: Union Military Policy Toward Southern Civilians, 1861-1865*. Cambridgeshire: Cambridge University Press, 1995.

- Grinder, R. Dale. "The Battle for Clean Air: The Smoke Problem in Post-Civil War America." In *Pollution and Reform in American Cities, 1870-1930*, ed. Martin V. Melosi, 83-103. Austin: University of Texas Press, 1980.
- Gugliotta, Angela. "Class, Gender, and Coal Smoke: Gender Ideology and Environmental Injustice in Pittsburgh, 1868-1914." *Environmental History* 5, no. 2 (2000): 165-193.
- Hahn, Steven. *The Roots of Southern Populism: Yeoman Farmers and the Transformation of the Georgia Upcountry, 1850-1890*. New York: Oxford University Press, 1983.
- Hall, Kermit. *The Magic Mirror: Law in American History*. New York: Oxford University Press, 1989.
- \_\_\_\_\_. *The Oxford Companion to the Supreme Court of the United States*. New York: Oxford University Press, 1992.
- Halliday, Stephen. *The Great Stink of London : Sir Joseph Bazalgette and the Cleansing of the Victorian Capital*. London: Alan Sutton, 1998.
- Hamilton, Henry. *The English Brass and Copper Industries to 1800*. 2d ed. New York: A. M. Kelley, 1967.
- Hargrove, Erwin C. *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1990*. Princeton Studies in American Politics. Princeton, N.J.: Princeton University Press, 1994.
- Hays, Samuel P. *Conservation and the Gospel of Efficiency; the Progressive Conservation Movement, 1890-1920*. Harvard Historical Monographs, 40. Cambridge, Mass.: Harvard University Press, 1959.
- Hays, Samuel P., and Barbara D. Hays. *Beauty, Health, and Permanence: Environmental Politics in the United States, 1955-1985*. Studies in Environment and History. Cambridge Cambridgeshire: Cambridge University Press, 1987.
- Heffington, Douglas. "Tennessee's Copper Basin: An Ethnic Overview." *The Tennessee Genealogical Magazine* 44, no. 2 (1997): 17-23.
- Hempel, Sandra. *The Strange Case of the Broad Street Pump: John Snow and the Mystery of Cholera*. Berkeley: University of California Press, 2007.
- Hicks, John Donald. *The Populist Revolt: A History of the Farmers' Alliance and the People's Party*. Minneapolis: University of Minnesota Press, 1931.
- Highsaw, Robert B. *Edward Douglass White: Defender of the Conservative Faith*. Baton Rouge: Louisiana State University Press, 1981.
- Hirt, Paul W. *A Conspiracy of Optimism: Management of the National Forests since World War II*. Lincoln: University of Nebraska Press, 1994.
- Hoffer, Peter Charles. *The Law's Conscience: Equitable Constitutionalism in America*. Chapel Hill: University of North Carolina Press, 1990.
- Hofstadter, Richard. *The Age of Reform; from Bryan to F. D. R.* New York: Knopf, 1955.
- Hoig, Stan. *The Cherokees and Their Chiefs: In the Wake of Empire*. Fayetteville, Ark.: University of Arkansas Press, 1998.

- Horwitz, Morton J. *The Transformation of American Law, 1780-1860*. Studies in Legal History. Cambridge, Mass.: Harvard University Press, 1977.
- Howe, Mark DeWolfe. *Oliver Wendell Holmes: The Shaping Years: 1841-1870*. Cambridge, Mass.: Harvard University Press, 1957.
- Hurley, Andrew. *Environmental Inequalities : Class, Race, and Industrial Pollution in Gary, Indiana, 1945-1980*. Chapel Hill: University of North Carolina Press, 1995.
- Hyde, Charles K. *Copper for America: The United States Copper Industry from Colonial Times to the 1990s*. Tucson: University of Arizona Press, 1998.
- Inscoc, John C. *Mountain Masters, Slavery, and the Sectional Crisis in Western North Carolina*. Knoxville: University of Tennessee Press, 1989.
- . *Appalachians and Race: The Mountain South from Slavery to Segregation*. Lexington: University Press of Kentucky, 2001.
- . "The Discovery of Appalachia: Regional Revisionism as Scholarly Renaissance." In *A Companion to the American South*, John B. Boles, ed., 369-386. Malden, Mass.: Blackwell, 2002.
- Isenberg, Andrew C. *The Destruction of the Bison: An Environmental History, 1750-1920*. Cambridge: Cambridge University Press, 2000.
- Jacoby, Karl. *Crimes against Nature: Squatters, Poachers, Thieves, and the Hidden History of American Conservation*. Berkeley: University of California Press, 2001.
- Johnson, Mary Elizabeth. "Box and Container Industry." In *Encyclopedia of American Forest and Conservation History*, vol. 1, Richard C. Davis, ed., 45-47. New York: Macmillan, 1983.
- Jolly, Harley E. "The Cradle of Forestry, Where Tree Power Started." *American Forests* 76 (October, 1970): 16-21.
- Jones, Alton DuMar. "The Administration of Governor Joseph M. Terrell in Light of the Progressive Movement." *Georgia Historical Quarterly* 48, no. 3 (September, 1964): 271-290.
- Judd, Richard William. *Common Lands, Common People: The Origins of Conservation in Northern New England*. Cambridge, Mass.: Harvard University Press, 1997.
- Kiefer, David M. "Sulfuric Acid: Pumping up the Volume: An 18th-Century English Physician's Lead Cathedrals Helped Launch a Chemical Industry." *Today's Chemist at Work* 10, no. 9 (2001): 57-58.
- Keiter, Robert B. *Keeping Faith with Nature: Ecosystems, Democracy, & America's Public Lands*. New Haven, Conn.: Yale University Press, 2003.
- Kephart, Horace. *Our Southern Highlanders*. New York: Outing Publishing Company, 1913.
- King, Duane H. *The Cherokee Indian Nation: A Troubled History*. Knoxville: University of Tennessee Press, 1979.
- Klein, Randolph Shipley. *Portrait of an Early American Family: The Shippens of Pennsylvania Across Five Generations*. Philadelphia: University of Pennsylvania Press, 1975.

- Koch, Tom. *Cartographies of Disease: Maps, Mapping, and Medicine*. Redland, Calif.: ESRI Press, 2005.
- Kurtz, Paul M. "Nineteenth-Century Anti-Entrepreneurial Nuisance Injunctions—Avoiding the Chancellor." *William & Mary Law Review* 17 (Summer, 1976): 621-70.
- Lamborn, John E. and Peterson Charles S. "The Substance of the Land: Agriculture V. Industry in the Smelter Cases of 1904 and 1906." *Utah Historical Quarterly* 53, no. 4 (1985): 308-325.
- Lamplugh, George R. "Yazoo Land Fraud." In *New Georgia Encyclopedia*. <http://www.georgiaencyclopedia.org>.
- Landis, Susan Hill. *You Have Stept Out of Place: A History of Women and Religion in America*. Louisville, KY: Westminster John Knox Press, 1996.
- Langston, Nancy. *Forest Dreams, Forest Nightmares: The Paradox of Old Growth in the Inland West*. Seattle: University of Washington Press, 1995.
- Lankton, Larry D. *Beyond the Boundaries: Life and Landscape at the Lake Superior Copper Mines, 1840-1875*. New York, Oxford University Press, 1997.
- Lathrop, William Gilbert. *The Brass Industry in the United States: a Study of the Origin and the Development of the Brass Industry in the Naugatuck Valley and Its Subsequent Extension over the Nation*. Rev. ed. Mount Carmel, Conn.: W.G. Lathrop, 1926.
- Lazarus, Richard J. *The Making of Environmental Law*. Chicago: University of Chicago Press, 2004.
- LeCain, Timothy J. "When Everybody Wins Does the Environment Lose? The Environmental Techno-Fix in Twentieth-Century American Mining." In *The Technological Fix: How People Use Technology to Create and Solve Problems*, ed. Linda Rosner, 137-154. New York: Routledge, 2004.
- Lewis, Ronald L. *Transforming the Appalachian Countryside: Railroads, Deforestation, and Social Change in West Virginia, 1880-1920*. Chapel Hill: University of North Carolina Press, 1998.
- Lewis, Sinclair. *Babbitt* (New York: Harcourt, Brace, 1922; reprint, New York: Penguin, 1996).
- Lichtenstein, Andrew. *Twice the Work of Free Labor: The Political Economy of Convict Labor in the New South*. New York: Verso, 1996.
- Lillard, Roy G. *The History of Polk County, Tennessee*. Benton, TN: Polk County Historical & Genealogical Society, 1999.
- Lowenthal, David. *George Perkins Marsh, Prophet of Conservation*. Seattle: University of Washington Press, 2000.
- Luconi, Stefano. "The Enforcement of the 1941 Smoke-Control Ordinance and Italian Americans in Pittsburgh." *Pennsylvania History* 66, no. 4 (1999): 580-594.
- Lutts, Ralph H. "Like Manna From God: The American Chestnut Trade in Southwestern Virginia." *Environmental History* 9, no. 3 (July 2004): 497-525.

- MacMillan, Donald. *Smoke Wars: Anaconda Copper, Montana Air Pollution, and the Courts, 1890-1924*. Helena, Mont.: Montana Historical Society Press, 2000.
- Marszalek, John F. *Sherman's March to the Sea*. Abilene, Tex.: McWhiney Foundation Press, McMurray University, 2005.
- Mathew, William M. *Edmund Ruffin and the Crisis of Slavery in the Old South: The Failure of Agricultural Reform*. Athens: University of Georgia Press, 1988.
- Maury, Matthew Fontaine, and Richard Owen Currey. *The Polk County Copper Company of Tennessee: Its Mineral Resources and Mining Prospects*. New Orleans: Bulletin Book and Job Office, 1859.
- McCarthy, J. P. "The Federal Common Law of Nuisance." *Tennessee Law Review* 49 (1982): 919-54.
- McCrary, Ben H. and LeRoy P. Graf, eds. "Vineland in Tennessee, 1852: The Journal of Rosine Parmentier." *East Tennessee Historical Society Publications* 31 (1959): 95-111;
- McEvoy, Arthur F. *The Fisherman's Dilemma: Ecology and the Law in the California Fisheries*. Cambridge: Cambridge University Press, 1986.
- McKinney, Louise. "Badlands of Copperhill." Draft for the Work Progress Administration, Federal Writers' Project, Guidebook series, 19 March 1936. Photocopied at Hargrett Library, University of Georgia, Clipping Files, Fannin County.
- McLaren, John P. S. "Nuisance Law and the Industrial Revolution—Some Lessons from Social History." *Oxford Journal of Legal Studies* 3 (1983): 155-221.
- McLeod, Kari S. "Our Sense of Snow: The Myth of John Snow in Medical Geography." *Social Science & Medicine* 50, no. 7-8 (2000): 923-935.
- McLoughlin, William Gerald. *Cherokee Renaissance in the New Republic*. Princeton, N.J.: Princeton University Press, 1986.
- McMath, Robert C. *American Populism: A Social History, 1877-1898*. New York: Hill & Wang, Noonday Press, 1993.
- Melosi, Martin V. *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present*. Creating the North American Landscape. Baltimore: Johns Hopkins University Press, 2000.
- Merrill, Karen R. *Public Lands and Political Meaning: Ranchers, the Government, and the Property between Them*. Berkeley: University of California Press, 2002.
- Miller, Char. *American Forests: Nature, Culture, and Politics*. Development of Western Resources. Lawrence: University Press of Kansas, 1997.
- . *Gifford Pinchot and the Making of Modern Environmentalism*. Washington, D. C.: Island Press, Shearwater Books, 2001.
- Moore, James William and Daniel R. Coquillette. *Moore's Federal Practice, Third Edition*. New York: Lexis, 2007.
- Murchison, Kenneth M. "Interstate Pollution: The Need for Federal Common Law." *Virginia Journal of Natural Resources* 6 (1986): 1-51.

- Murrill, William Alphonso. "A Serious Chestnut Disease." *Journal of the New York Botanical Garden* 7, no. 78 (June 1906): 143-53.
- Nash, Roderick. *Wilderness and the American Mind*, 4<sup>th</sup> ed. New Haven, Conn.: Yale University Press, 2001.
- Navin, Thomas R. *Copper Mining & Management*. Tucson: University of Arizona Press, 1978.
- Nelson, Lewis B. *History of the U.S. Fertilizer Industry*. Muscle Shoals, Ala.: Tennessee Valley Authority, 1990.
- Nelson, Scott Reynolds. *Iron Confederacies: Southern Railways, Klan Violence, and Reconstruction*. Chapel Hill: University of North Carolina Press, 1999.
- Newell, Edmund. "Atmospheric Pollution and the British Copper Industry, 1690-1920." *Technology and Culture* 38, no. 3 (1997): 655-689.
- Noe, Kenneth W. and Shannon H. Wilson. *The Civil War in Appalachia: Collected Essays*. Knoxville: University of Tennessee Press, 1997.
- Nolt, John. *A Land Imperiled: The Declining Health of the Southern Appalachian Bioregion*. Knoxville: University of Tennessee Press, 2005.
- Note. *Virginia Law Review* 10, no. 2 (December 1923): 147-150.
- Norgren, Jill. *The Cherokee Cases: Two Landmark Federal Decisions in the Fight for Sovereignty*. Pbk. ed. Norman: University of Oklahoma Press, 2004.
- Orth, John V. *The Judicial Power of the United States: The Eleventh Amendment in American History*. New York: Oxford University Press, 1987.
- Ottewell, Guy. "There Are No Ducks in Ducktown." *Defenders Magazine* 50, no. 4, (August 1975): 338-339.
- Parish, Thurman. *The Old Home Place: Pioneer Mountain Life in Polk County, Tennessee*. Benton, TN: Polk County Publishing Co., 1994.
- Parker, Ernest. *Days Gone By: Early Gilmer County, Georgia*. Ellijay, Ga.: Gilmer County Genealogical Society, 1999.
- Parish, Thurman. *The Old Home Place: Pioneer Mountain Life in Polk County, Tennessee*. Benton, Tenn.: Polk County Publishing Co., 1994.
- Percival, Robert V. "The Frictions of Federalism: The Rise and Fall of the Federal Common Law of Interstate Nuisance." University of Maryland, Pub-Law Research Paper No. 2003-02. Available at <http://ssrn.com/abstract=452992>.
- Perdue, Theda, and Michael D. Green. *The Columbia Guide to American Indians of the Southeast*. The Columbia Guides to American Indian History and Culture. New York: Columbia University Press, 2001.
- Perdue, Theda. *Slavery and the Evolution of Cherokee Society, 1540-1866*. Knoxville: University of Tennessee Press, 1979.
- Persico, Jr., V. Richard. "Early Nineteenth-Century Cherokee Political Organization." In *The Cherokee Indian Nation: A Troubled History*, ed. Duane H. King, 92-109. Knoxville: University of Tennessee Press, 1979.

- Phillips, Ulrich Bonnell. *Georgia and State Rights. A Study of the Political History of Georgia from the Revolution to the Civil War, with Particular Regard to Federal Relations*. Washington,: Government Printing Office, 1902.
- Pisani, Donald J. "Forests and Conservation, 1865-1890." *Journal of American History* 72, no. 2 (September, 1985): 340-359.
- Platt, Harold L. "Invisible Gases: Smoke, Gender, and the Redefinition of Environmental Policy in Chicago, 1900-1920." *Planning Perspectives* 10, no. 1 (1995): 67-97.
- Polk County Publishing Co. *Polk County Scrapbook: 150 Years of Memories*. 2 vols. Benton, TN: Polk County Publishing Co., 1989.
- \_\_\_\_\_. *Polk County Scrapbook: A Tribute to the Miners: Copper Basin Ore Mining 1843-1987*. Benton, TN: Polk County Publishing Co., 1989.
- \_\_\_\_\_. *Polk County News: Reprints of Articles Relating to the History of Polk County*. Benton, TN: Polk County Publishing Co., 1990.
- Powers, Ron. *Mark Twain: A Life*. New York: Free Press, 2005.
- Provine, D. M. "Balancing Pollution and Property Rights: A Comparison of the Development of English and American Nuisance Law." *Anglo-American Law Review* 7 (January/March 1978): 761-821
- Quinn, M. L. "Tennessee Copper Basin - A Case for Preserving an Abused Landscape." *Journal Of Soil And Water Conservation* 43, no. 2 (March/April 1988): 140-144.
- \_\_\_\_\_. "Early Smelter Sites: A Neglected Chapter in the History and Geography of Acid Rain in the United States." *Atmospheric Environment* 23, no. 6 (1989): 1281-92.
- \_\_\_\_\_. "The Appalachian Mountains Copper Basin and the Concept of Environmental Susceptibility." *Environmental Management* 15, no. 2 (March/April 1991): 179-94.
- \_\_\_\_\_. "Industry and Environment in the Appalachian Copper Basin, 1890-1930." *Technology and Culture* 34, no. 3 (1993): 575-612.
- Rees, Ronald. "The South Wales Copper-Smoke Dispute, 1833-95." *Welsh History Review* 10, no. 4 (1981): 480-496.
- Righter, Robert W. *The Battle Over Hetch-Hetchy: America's Most Controversial Dam and the Birth of Modern Environmentalism*. New York: Oxford University Press, 2005.
- Rome, Adam W. "Coming to Terms with Pollution: The Language of Environmental Reform, 1865-1915." *Environmental History* 1, no. 3 (1996): 6-28.
- Ronderos, Ana. "Where Giants Once Stood: The Demise of the American Chestnut and Efforts to Bring it Back." *Journal of Forestry* 98, no. 2 (February 2000): 10-11.
- Roper, Daniel M. "Logging the Cohutta Wilderness." *Georgia Backroads* 1, no. 1 (Spring, 2002): 6-18.
- Rosen, Christine. "Differing Perceptions of the Value of Pollution Abatement across Time and Place: Balancing Doctrine in Pollution Nuisance Law, 1840-1906." *Law and History Review* 11, no. 2 (1993): 303-381.

- Rosen, Christine Meisner. "Knowing Industrial Pollution: Nuisance Law and the Power of Tradition in a Time of Rapid Economic Change, 1840-1864." *Environmental History* 8, no. 4 (2003): 565-597.
- Rosner, Lisa, ed. *The Technological Fix: How People Use Technology to Create and Solve Problems*. New York: Routledge, 2004.
- Rothacher, Jack S. "Soil Erosion in Copper Basin." *Journal of Forestry* 52, no. 1 (1954): 41.
- Royster, Charles. *The Destructive War: William Tecumseh Sherman, Stonewall Jackson, and the Americans*. New York: Knopf, 1991.
- Salstrom, Paul. *Appalachia's Path to Dependency: Rethinking a Region's Economic History, 1730-1940*. Lexington: University Press of Kentucky, 1994.
- Sanders, M. Elizabeth. *Roots of Reform: Farmers, Workers, and the American State, 1877-1917*. American Politics and Political Economy. Chicago: University of Chicago Press, 1999.
- Scott, Carole E. Scott and Richard D. Guynn. "The Disappearance from Georgia of the Farm Union," accessed at <http://www.westga.edu/~bquest/1997/farmer.html> (accessed May 19, 2004).
- Seigworth, Kenneth J. "Ducktown - a Postwar Challenge." *American Forests* 49, no. 11 (1943): 521-523, 558.
- Sellers, Christopher C. *Hazards of the Job: From Industrial Disease to Environmental Health Science*. Chapel Hill: University of North Carolina Press, 1997.
- Shands, William E., Robert G. Healy, and Conservation Foundation. *The Lands Nobody Wanted: Policy for National Forests in the Eastern United States: A Conservation Foundation Report*. Washington: The Foundation, 1977.
- Shaw, Barton C. *The Wool-Hat Boys: Georgia's Populist Party*. Baton Rouge: Louisiana State University Press, 1984.
- Silber, Nina. *The Romance of Reunion: Northerners and the South, 1865-1900*. Chapel Hill: University of North Carolina Press, 1993.
- Simpson, John W. *Dam! Water, Power, Politics, and Preservation in Hetch Hetchy and Yosemite National Park*. New York: Pantheon Books, 2005.
- Simson, William. "Parades Amid the Standoff in the Old Red Scar: Interpreting Film Images of Striking Industrial Operatives in the East Tennessee Copper Basin, 1939-1940." *Journal of Appalachian Studies* 7, no. 3 (Fall 2000): 187-226.
- Smith, Charles Dennis. "The Appalachian National Park Movement, 1885-1901." *North Carolina Historical Review* 37 (January 1960): 38-65.
- Smith, David M. "American Chestnut: Ill-Fated Monarch of the Eastern Hardwood Forest." *Journal of Forestry* 98, no. 2 (February 2000): 12-15.
- Southern Appalachian Man and the Biosphere Cooperative. *The Southern Appalachian Assessment: Prepared by Federal and State Agencies Coordinated Through the Southern Man and the Biosphere Cooperative*. Vol. 5, *Atmospheric Technical Report*. Atlanta: U. S. Forest Service, Southern Region, 1996.

- Steen, Harold K. *The U.S. Forest Service: A History*. Seattle: University of Washington Press, 1976.
- Steen, Harold K., and Forest History Society., eds. *The Origins of the National Forests: A Centennial Symposium*. Durham, N.C.: Forest History Society, 1992.
- Steinberg, Theodore. *Acts of God: The Unnatural History of Natural Disaster in America*, 2d. ed. New York: Oxford University Press, 2006.
- . *Nature Incorporated: Industrialization and the Waters of New England* Studies in Environment and History. Cambridge, England: Cambridge University Press, 1991.
- . *Slide Mountain, or The Folly of Owning Nature*. Berkeley, University of California Press, 1995.
- Stevens, Robert Bocking. *Law School: Legal Education in America from the 1850s to the 1980s* Studies in Legal History. Chapel Hill: University of North Carolina Press, 1983.
- Stoll, Steven. *Larding the Lean Earth: Soil and Society in Nineteenth-Century America*. New York: Hill and Wang, 2002.
- Stradling, David. *Smokestacks and Progressives: Environmentalists, Engineers and Air Quality in America, 1881-1951*. Baltimore, Md.: Johns Hopkins University Press, 1999.
- Summers, Harry G. "Desolation and War: Necessity and Choice." Paper presented at the First International Conference Addressing Environmental Consequences of War: Legal, Economic, and Scientific Perspectives, Washington, D.C., June 1998.
- Surrency, Erwin C. *History of the Federal Courts*. Dobbs Ferry, NY: Oceana Publications, 2002.
- Sutter, Paul. *Driven Wild: How the Fight against Automobiles Launched the Modern Wilderness Movement*. Seattle: University of Washington Press, 2002.
- . "Let Us Now Praise Famous Gulies: Georgia's Little Grand Canyon and Conservation in the South." In *The Environment and Southern History*, ed. Charles Reagan Wilson. Oxford, Miss.: University Press of Mississippi, forthcoming.
- Taliaferro, Hardin E., and Raymond C. Craig. *The Humor of H.E. Taliaferro*. Knoxville: University of Tennessee Press, 1987.
- Tarr, Joel A. *The Search for the Ultimate Sink: Urban Pollution in Historical Perspective*. Akron, Ohio: University of Akron press, 1996.
- Tarr, Joel A. and Carl Zimring. "The Struggle for Smoke Control in St. Louis: Achievement and Emulation." In Andrew Hurley, ed., *Common Fields: An Environmental History of St. Louis*. St. Louis: Missouri Historical Society Press, 1997.
- Tate, Lucius Eugene. *History of Pickens County*. Spartanburg, S.C.: Reprint Co., 1978.
- Tate, William. *Documents and Memoirs, Genealogical Tables, the Tates of Pickens County*. Marietta, Ga.: Continental Book Co., 1953.
- Taylor, A. Elizabeth. "The Origin and Development of the Convict Leasing System in Georgia." *Georgia Historical Quarterly* 26 (1942): 113-128.

- Taylor, James W. "Ducktown Desert: A Study of the Impact of Industrial Culture Upon the Physical Development of a Secluded Area of the Southern Appalachians." M.A. thesis, Syracuse University, 1947.
- Teale, Edwin Way. "The Murder of a Landscape: Shortsighted Exploitation Poisoned and Denuded the Hills, and 100 Square Miles of Southern Countryside have Become an Almost Hopeless Desert." *Natural History*, 60 (October 1951): 352-356.
- Thornton, Russell. "Demography of the Trail of Tears." In *Cherokee Removal: Before and After*, ed. William L. Anderson, 75-95. Athens: University of Georgia Press, 1991.
- Twain, Mark. *Life on the Mississippi*. Boston: J.R. Osgood and Company, 1883.
- Tyner, James W. *Those Who Cried: The 16,000: A Record of the Individual Cherokees Listed in the United States Official Census of the Cherokee Nation Conducted in 1835*. N.p.: Chi-ga-u Inc., 1974.
- Uekoetter, Frank. "Solving Air Pollution Problems Once and for All: The Potential and Limits of Technological Fixes." In *The Technological Fix: How People Use Technology to Create and Solve Problems*, ed. Linda Rosner, 155-174. New York: Routledge, 2004.
- Urbinate, David. "London's Historic 'Pea-Soupers.'" *EPA Journal* 20, no. 1/2 (1994): 44.
- Vinten-Johansen, Peter, Howard Brody, Nigel Paneth, Stephen Rachman, Michael Rip, and David Zuck. *Cholera, Chloroform, and the Science of Medicine: A Life of John Snow*. New York: Oxford University Press, 2003.
- Walhbeck, Paul J. "The Development of a Legal Rule: The Federal Common Law of Public Nuisance." *Law & Society Review* 32, no. 3 (1998): 613-638.
- Ward, George Gordon. *The Annals of Upper Georgia Centered in Gilmer County*. Carrollton, Ga.: Thomasson Printing & Office Equipment Co., 1965.
- Waselkov, Gregory A., and Kathryn E. Holland Braund. *William Bartram on the Southeastern Indians*. Indians of the Southeast. Lincoln: University of Nebraska Press, 1995.
- Watson, Harry L. "The Common Rights of Mankind: Subsistence, Shad, and Commerce in the Early Republican South." *The Journal of American History* 83, no. 1 (1996): 13-43.
- Weed, Walter Harvey. *The Copper Mines of the World*. New York, London,: Hill Publishing Company, 1907.
- Wheeler, William Bruce, and Michael J. McDonald. *Tva and the Tellico Dam, 1936-1979: A Bureaucratic Crisis in Post-Industrial America*. 1st ed. Knoxville: University of Tennessee Press, 1986.
- White, Richard. "Are You and Environmentalist or Do You Work for a Living?" In *Uncommon Ground: Rethinking the Human Place in Nature*, ed. William Cronon, 171-85. New York: Norton, 1996.
- Wilkins, Thurman. *Cherokee Tragedy; the Story of the Ridge Family and the Decimation of a People*. New York: Macmillan, 1970.
- Williams, A. J. *Confederate History of Polk County, Tenn., 1860-1866*. Nashville, Tenn.: McQuiddy Print. Co., 1923. Reprint, Signal Mountain, TN: Mountain Press, 2002.

- Williams, David. *The Georgia Gold Rush: Twenty-Niners, Cherokees, and Gold Fever*. Columbia, S.C.: University of South Carolina Press, 1993.
- Williams, Michael. *Americans and Their Forests: A Historical Geography*. Cambridge Cambridgeshire: Cambridge University Press, 1989.
- Wilms, Douglas C. "Cherokee Land Use in Georgia before Removal." In *Cherokee Removal before and After*, ed. William L. Anderson, 1-28. Athens: University of Georgia Press, 1991.
- Wirth, John D. *Smelter Smoke in North America: The Politics of Transborder Pollution*. Lawrence: University of Kansas Press, 2000.
- Wood, Richard A. "Erosion Control and Reforestation of the Copper Basin, a Progress Report." Knoxville, Tenn: Tennessee Valley Authority, Watershed Protection Division, Department of Forestry Relations, 1942.
- Woodward, C. Vann. *Tom Watson, Agrarian Rebel*. New York: Macmillan, 1938.
- \_\_\_\_\_. *Origins of the New South, 1877-1913*. Baton Rouge: Louisiana State University Press, 1971.
- Workers of the Writers' Program of the Works Progress Administration in Georgia. *Georgia: The WPA Guide to its Towns and Countryside*. With an introduction by Phinizy Spalding. University of South Carolina Press, 1940.
- Wright, Gavin. *Old South, New South: Revolutions in the Southern Economy since the Civil War*. New York: Basic Books, 1986.
- Young, Timothy R. "Criminal Liability Under the Refuse Act of 1899 and the Refuse Act Permit Program," *The Journal of Criminal Law, Criminology, and Police Science* 63, no. 3 (September 1972): 366-376.
- Youngs, Robert L. "Right Smart Little Jolt: Loss of the Chestnut and a Way of Life." *Journal of Forestry* 98, no. 2 (February 2000): 17-21.
- Zdeb, Sara. "From Georgia v. Tennessee Copper to Massachusetts v. EPA: Parens Patriae Standing for State Global Warming Plaintiffs." *Georgetown Law Journal* 96, no. 3 (March 2008): 1060-82.